Supplemental Material S4

Concatenated alignments of retrotransposon flanking regions

1. Chiroptera+Cetartiodactyla

```
>Bos_taurus
TGT-----------CCCCAGTTAATGCTGTGGGCTGCTGAATCCTAT---ATCTTCCTCCCCAGCCCGCAGAATCCT---
-------------------------------ATACACAA---------CATTTGGTAGTTGACT-AAAAGGTTT-GTGAC
TGTTCATATTCTC----------------GCTGTAGCAAACAA----------TAATAGTAAATTCTAGCTGTCGAGTAC
CTGTGAGGTGCCAGACACACTTATCTTGAAGTGTCAGAAACATCTCTTCTGAGCACTATTTGTATCCTTGTTTTATAAAT
GAGAAAACA-----------------------------------GTGATCTCATGGCCAGTAAA---TAATGAAGCCGAGA
TTTATAATCATATCTCTTTGTCTCTAAATCCTTGATCTTTGAAGCATATCATACTACTTCCCAGAAATAAACCAAGA-AC
AAATGTGGCTGGAAAGGTAAGTTAAAATCTTGCTCCACAAAAGATTTTACATATTAGCCAAGATCAAATTGGTCTTCTCT
TAATCCAAGTAA--TGTTAAGGTGTAACTGGGGTAGG-ACAGATGTGGGTGA------------------AAGAAATTTA
GCTTCTCAGGAATTTCCCATTTTTACATGCTAAGC-------CGCAAACTA--CATTTTCCAGGCTCCCAAA-TTTTACT
GGGTAATGACCTAGCAGTAAAAATTGCTTATTTCATACAATAAAAACAAAACA---TATATTCCATCATTATTAAAAATG
AAAACACCATTTTCTGTTATTTT-GGTGGAAGTAATCATGTGGTTGCTCTGAAA-------TTTTTTAACAGCTTTATTA
AGGTGTGACT--ATATATGATAAAACTCACTTGTTTTAAACGTACAATTCAA------GATTTTTAGTATGTTTACAGAG
TTGTTGACCACCCCTT-TCCTTAAATAAGCATTTTTATTTCCCAGTTCCTTGCAAAGCTCTTCTGATGATTTGAGAGAGT
AGTTAACAACCCACACCAAATCAGATGC-AGTTGTAGCCT-------------------GGCAGAAATTGGACATATTCA
GTTACTTAAGTTACATGCCTCAGTTCTCTAACCT--ATCTAAAATTTTACCTTGCTCTCATTTCTGGTTG-TTGCCAGTG
AGCACTGGCTTGGGGCCTGATTTTTATCTTCTCTGTGTCATCCCCACCAGGGGTCTGAGAAATAACCC-TTCTTCACATT
ATTAGTATAAGAACAATACTAGTTTGTTATTGTTTCTTACTGTGGGTAGGAACCACATTACGAAAAACAAGTCATTGTCG
CTAAGGACTTAGGTTGTTGATATTTAATTCCAGAAATGACTTTATGATACAGTGCAGATAGATTTTTT--ACAAGGAAAA
TCAATAACTTCAGAAAGCATGTAGAAGGTTTTACTTAGACTGCTAATATGATTAAGT-GTGGGG-AAAAAGACATCTATA
ATTTCTTTAAACCTTTCTCTT-ACTAGAATAGAACATTAAAAAAATAAAAAATAAAACCATAGTGACTTCTACTCTAAAG
G-AAAGTTTTAAAAAT-----TTTCCAG-TGATTTTAGTGTAATAATTATATGCATA--TTTTTACATAGTTTTAATAAC
CACAAATCTATTTTGAAATATTATTGCTAAAGAAA-TAATATCCTACTGTGAGCAAGCCACGACAAA-GCTATCTTCAAT
TCTGAGTAGAT-ATAATTTCTATAGTTGCATAATACAATTTTATATAATTTTTTTTT----------------------C
TGAGTACAT
>Canis_lupus_familiaris
TGCTTCTGTCCTCACCCTAGTTAA---TGTGGCCTGCTGGATCCTAT---GGCTTCCTCA-CAACCTACATTATCCT---
-------------------------------GTGCACAAATTTTGAAATATTTGGTAGTT-----AAAATATTT-GTGGT
TGCTCATATCATC----------------ATTGTAACAAGAA-----------TAATAGTAACTTCAAGCTATTGAGTAC
CAGTGAAGTATCAGATATGCT-ATCTCAAAGTGATGAAAAGAT-TCT-CCAAGCACTATTCATATACTTGTTTTACAGGG
GAGAAAACAAA-GGTTCAGAGAATTT-------------GCTTAAGGCCTTATGGCAGGTAAT---CAACAGAGCTGAGA
TTTGTAATCATCTCTCTTTACTT-TCAGTCCTCGCCCTTTGGAGTCTATCGAAGTACCTCCGAGAAATAGACTATGA-AA
AAATGTGGCTAGAAAGGTAAGTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTGCAAGATA--TATTTACCAGGCTCCCAAT-AATGACT
TGGCAATGATTTAGTAGTAAAAACTGC-CATTTCTTAAAATAAAAACAA-----TATATATTCTACTATTATCAAAA-TG
AAAACATCAGTTTTTGCTGTATG-GGTAGAAATATGTGGATGANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNTGACCCCTCCTTTTCCCTAAGTAAGCATTGCTATTTCCCAATTTTGGACAAAATTCTCATGATAGTTTAAGAGAGC
GGTCACGGAACCACGCGGAATCCTGGGC-TGTGGCAGCCTGG-CTGCTGGAGGCTTGGTGGTAGAGATGTGCAGCCTGCA
GGTGCTGCAGTTAGGCCCCTCCG-TCTCTAACCCCGCCTGAAGG-TTTCCCTCGCTCTCAGGGCTGACTC-CTGCCAGGG
AGCCTTTGCTTGGGGCCCGACTTTTATCT--TCTGGGTAGTCTCCAG---------GAGAAATAAGCC-TTCCTCATATT
GTTCGTACAAGGACGATATTCGTGTGTTATTGTTTGTTACTGTTGATAGGAACG---TTACCAAAG-CTGGTCATTGTCC
CCGAGGACTTAGGTTGTTGATATTTAATTCCAAAAATGACTCTATGATATAGTTCAGATAGATTTTT---ACAAAGGGAA
TCAATAACTTCAGAAAGCATTTAGGAGGTTTTACTTAGATCACTAATATGATTAAGTGAGGGGGAAAAAAGACATCTATA
ATTTCTTTAAACCTTTTTCTTTGCTGGAACAATACCTCTTTT-----AAAAAAAAATCTGTAGTGTTTTCTACTCTAAAA
CAATAGTTCAGCAGTTTTTTTTTCCCAA-TGACTTTATTGTGATGGCTA--TCCATT-TTTTTTACCTATTTGTAAAAAT
CACAAATGTATTACTAAATAT-GCTGCTGAAGGAAATAACATCTA-CAGTGAGGAAACCATGAAAAA--ATAGCTTCCAT
TTTGAGTAGAT-ATA----CTATAGTTGCATAAGGCAATTTTAAGTACATTTGTCTCA----------------------C
AGAGTACAC
>Carnivora_Sp2
TGCCTGTCTCTTCACCC-AGCTAATGCTGTGGGCTGCGGGGTCCTAT---AGCTTCCTCC-CAACCCACATTATCCT---
-------------------------------GTGCACAG---------CATTTGGTAGTTGACT-GAAATATTT-GTGGC
TGTTTGTATCATC----------------ACTGTACCAAAA------------TAATAGTAACTTCTAGCAATCAGGTTC
CTGTGAAGTGCCAGACACACT-ATCTCAAATTGTCAAAAATAT-TCT-CTAAGTACTATTTGTATCCTTGTTTTACAAGT
GAGAAAACAAA-GGTTCGGAAAATTT-------------GCTTAAGATCTCATGGCCAGTAAT---CAATGGAACACAGA
TTTGTAATCA--TCTCTCTCCTC-TCGGTCCTTGCCCTTTGGAGTATAACAAACTACCTCCTGGAAATAGACTAAAA-AA
AAATGTGGCTGTAAAGGTATGTTAAAATCTTGCACTGCAGAGGATTTTGCAAATTGGCCAAAATCAGATTGTTCTTCTTC
TCACCCAGCTG---TGTTAAGGTGT---TTGGGCAGG-GAAGATGTGGGACA------------------GTGGAAGTTA
GCTTCCTAGGAATTCCCTGACTTTACCTGCCAAGT-------TGCAAAATA--TATTTACCAGGCTCCCGATAGTTTACT
TGGCAATGACTCAGTAGAAAAAATTGCTCATTTCTT-AAACAAAACC---------TATATTCTACTATTATCAAAA-TG
AAAATATCAGTTTCTGTTGTTTC-AGCAGAAATATCTGTGTGGCTGCTCTGACAAA-----TTTTTTAACAGCTTTATTG
AGGTGCAATT--ATATATG-TAAAATTCACTTATTTGAAGTATGTAATTCAAATTTTAGAATTTTAGTAAATTTACTGGC
CTGTTGACCCCTCCTTTTCCCTTCATAAGCATTTCTGTTTCCCAATTCTGTACAAAGTTCTCGGGATGACTTGAGAGTG-
-GTTAAGGAGCCACACCAAATGCTCGGC-GGTCGCAATGTGGTCT----CGTGGGACACGG--CAGAGGTTTGCAGTGTG
GTTATTCAAGTGACACCCCTGCC----------------TGAAGTTTTCCCTTGCTGGCACTGCTGAGTG-TGGCCGGGG
AGCCCTTGCTTGGGGCCTGACTTTTGTCT--TCTGGGTACTCTCCAGGAGGGATTTGAGAAATAAGCC-TTCCGCAGATT
```

GTTCATACAGGAACAATATTCGCGTGTTAGTGTTTGTTACCGTTGATAGGAGCGACGTTCCAAAAA-CCAGTCATTGTCT
CCGAGGCCTTAGGTTGTTGATGTTTAATTCCAAAAATGACTCTATGATATAGTTCAGATAGATTTTT---ACAACA-GAA
TCAATAACTTCAGAAAGCATTTAGAAGGTTTTACTTAGATTGCTAATATGATTAAGTGAAGGGG-AAAAAGACATCTATA
ATTT-TTTAAACCTTTGTCTT-ACTGGAACGATGCCTTTTTA---AAAAAAATAAATCTTTAGCGTTTTCTACCCTAAAG
AGAA----GAACAATT-----TTTTCAA-TGATTTTTT-GTTATGACTG--TACATATATTTTTACTTTTTTCTAATAAT
CATGAATGTATTACTAAGTAC-ATTGCCAAAGGAAATA---TCTA-CAGTGAGCAAGCCATGAAAGA-AATAGCTTCCAT
TCTGAGTAGAT-ATA----CTGTAGTTGTGTAATGCAATTTAAAATAGATATTTCTCC---------------------C
TGAGTACAC
>Cetartiodactyla_Sp2
TGT------CCTCACCCCAGTTAATGCTGGGGGCTGCCGAATCCTAT---AGCTTCCTCCCCAGCCCACAGTATCCT---
--------------------------------GTACACAG---------CATTTGGTGGTTGATTTAAAAGGTTT-GTGAT
TGTTCATATCATC----------------ACTGTAACAAAAAAA---------TAATAGTAACTTCTAGCTGTTGAGGAC
CTGTGACGTGCTAGACACGCT-ATCTTGAAGTGTCAGAAACAGCTCTTTTAAGTACTATTTGTATCCTTGTTTTATAAAT
GAGAAAACA-----------------------------------AAGATCTCATGGCCAGTAAA---CAATGGAGGCGAGA
TTTGTAATCATATCTCTCTGCCTCTAAATCCTTGATCGTTGAAGTATATTATACTACCTCTTAGAAATACACTAAGA-AC
AAATATGGCTGGAAAGGTAACTTAAAATCTTGCTCCAGAGAAGATTTTACATATTAGCCAAGATCCAACTGATCTTCCCC
TCACTCAGTTAG--TGTTAAGATGTAAGTGGGGTAGG-GAAGATGTGAGGGA------------------ATGGAATTTA
GCTTCTCAGGAATTCCCCATCCTTACATGCCAAGT-------TGCTAAATA--AATTTACCGGGCTCCCAAT-TTTTACT
GGGTAATGACCTAGTAGTAAAAATTGCTTATTTCATAAAACAAAAACAAAACA---TATATTCCACTATTAGCAAAA-TA
AAAACTTTATTTTCTGTTGTTTT-GGCATAAATATTCATGTGGTTGCTCTGAAAA-------TTTTTAACAGCTTTATTG
AGGTATAATT--ATATATGGTAAAATTCACTTGTTT-AAGTGTACACTTCAA------GATTTTTAGAAAATTTACAGAG
TTGTTGACCACTCCTTTTCCCTAAATAAGCATTTCTATTTCCCAGTTCCTTGCAAAGCTCTTCTGATGATTAGAGAAAGC
AGTTAACAAACCACACCAAATCCTATGC-AGTTGTAGCCTGGTCT----TGTGTGCCATGGTGGAAATTAGAAGTATTCA
GTTACTTAAGTTACACCCCTCAATTCTCTAACCTCTATCTAAAATTTTACCTTGCTCTCATTTCTGACTA-TTGCCAGTA
AGCACTGGCTTGGGGCCTGATTTTTATCCTCTCTGTGTAATCTCCATAAGGGATTTGAGAAATAACCC-TTCTTCACATT
GTTAATACAAGAACAATACTAGTTTGTTATTGTTTGTTACTGTGGGTAGGAACCACATTACGAAAAACTAGTCATTGTTG
CTAAGGACTTAGGTTGTTGATATTTAATTCCACAAATGACTCTATGATACAGTTCAGATAGATTTTTT--ACAAGGAGAA
TCAATAACTTTAGAAAACATTTAGAAAGTTTTACTTAGATTGCTAATATGATTAAGTGTGGGGG-GAAAAGACAGCTATA
ATTTCTTTAAACCTTTGTCTT-ACCAGAATAATGACTTTTTT----ATGAAATAAATCCATAGTGATTTCTACCCTAAAG
A-ATAGT-TAACAAT------TTTCCAA-TGATTTTACTGTGAGGGTTG--TACATGTATTTTTACTTAGTTTTAATAAC
CACAAATGTATTTCTAAATATTATTGCTAAAGAAAAGAACATC-TACAGCGAGCAGGGCATGACAAA-ACTAGCGTCAAT
TTTGAGCAGATTATACTTACTGTAGTTGCATAATGCAATTTTAAATAGATTTTT--------------------CCCACC
TGCATACAC
>Chiroptera_Sp2
TGCCTCTCTCCTCACCCCAGTTGAGGCTGTGGGCTGCCAGATCCTAC---AGATTCCCTTTCAACCCACATTATCCT---
--------------------------------GTGCACAG---------CACTTGGTAGTTGATT-AAAAGGTTT-GTGGT
TATTCATATCATCACGAATGATAATATTTGTTATAACAAAAA-----------TAACAATAACTTCTAGCTATTAAGTAC
CTGTGGGGTACCAGATATACT-ATCTCGAACTGCTAAAAATATCTCTTTTAAGTACTATTTTCATCCTTGTTTTATAGGT
GAGAAAACAGA-AGTTCAGAGAGCTT-------------GTTTAAGACCTCAAGGACAGTCAT---TAATGAAGCTGGTA
TTTGTGC-CATATCTCTCTGCATTTACATTCTTGCTCTTTGAAGGATATCATACTACCTCTCAGAAAGAGACAAAGA-AG
AAATATGGCTGGAAAGGCAAGTTAAAATCTTGCTCCACAGAGGATTCTGCATATTAGCCAAGATTGGATTGTTCTTCCTC
TCACTCGGCTAAAATGTTAAGACATGAATGGGGTAGG-GAGGATGGGGAGGA------------------ATGGAATTTA
GCGTCTCAGGAATTCCTTGCCCTCACCTGACAAGT-------TGCAAA------ATTGACCAGGCTCCCA------TACT
TGAGAATAACCTACTAGTAAAAACTGCTCATTTCTTAAAACAAAAACAAAATA---TGCATTCTACTACTATCAAA--TG
AGAACATCATTTTCTGTTGTTTT-GGCAGAAATATTTGTGTGGTTGCTCTGGAAAA----AAATTTTAACAGCTTTATTA
AGATGTAATT--ATACATGAAAAAATTCATTTGCTTTAAGTGTACAATTCAA-----TGATTTTTAGTAAATTTACAGAG
CTGTTGACCACTCCTTTCCCCTAATTAAACATTTCTATTTCCCAATTCCTTACAAAGCTCTTGCAGTGATTTGAAAGAGC
AGTTGACAAACCACGCCAAATCAGATGT-AGTTGTAGCCTGCCTGGTCTTGTGTAACATGGTAGAAATTTGCAGGATTCA
GTTATTTAAGTCATATTCCTTGATTCTCTAAACTCTATCTAAAGTTTTACCTTGCCTTCCTTTCTGAATA-TTGCCAATG
AACACTTGCTTGGGGCCTGT---------AGTTGTCATAGCTGCCACAAAGGATTTGCGAAATAACCC-TTCTTCATACT
ATCAATATAAGAACAATAGTAGTTTGTTATTGTTT-TTACTGTTGATGGGAACGACGCTATGAAAA-CTAGCTATTGTCT
CTAAGGATTCAGGTTGTTGATATTTAATTCCAAAAATGACTCTATGATATAGTTCAGATAGATTTTTT--ACAAGGGGAA
TCAATAACTTCAGAAAGCATTCAG---GTTTTACTTCTACTATTAATATGATT----GAGGAAG-AAAAAGACATCTATA
ATTTTCTTAAAACTCTGTCTT-ATTGGAATAATGACTTTTTT---TTTTTATTAAACAAATAGTGATTTTTACCCTAAAG
A-ATAATTTAACAGTTTTT--TTCCTAG-TGATTTTATTGTGATGGTCATATGCA---TTTTCTACTTATTCGTAATAAT
TACAGATGTGTTTTTAGATAT-ATTGCTAAAAAAG-TAACATTTC-CAATGAGCAAGCCAATGGCAAAAATAGCTTTCAT
TTTGAGTAGAT-ATA----TTATAGTTTCATAGTACAATTTTAGATAAATTTTTCCC---------------------CC
TGAATACAC
>Equus_caballus
GGCTTCTGTCCTCGCCCCCATTAAGGCTGGGGGCTGCTGCGTCCCAC---AGCTTCCTCCTCAGCCCATATTATCCC---
--------------------------------ATGCACAG---------CATGTGGTAGTTGATT-CAAAGGTTT-GTGGT
TGCTCATATCATC----------------ACTGTAACAAAAA-----------GAATAGTAACTTCTAGCAACTGAGTAC
CTGTGAAATGCCAGACACACT-ATCTCGAAGTGTCAAAAATATCT---CTAAGTCTTATTTTTATCCTTGTTTTATTGGT
GGGAAAACAAA-GGCTCAGAGAACTT-------------GCTTAAGCTCTCGCGGCCAGTAAA---CAGTGGAGCCAAGA
TCCGTAATCCTATCTCTCTGCCTCCGAAGCCTTGCTCTTTGAAGTGTATCACACTACCTCTCAGAAACCGACTAAGA-AA
AAATGTGGCTGGAAAGGTGAGTTAAAATCTTGCTCCATAGAGGACTCTGTATATCAGCAAAGATCAGATTGTTCTCCCCT
CGCCCACC-CAG--CTTTAAGACGTGAGTAGGGTGGA-GAAAACGC-AGGGA------------------ATGGAAGTTA
GCTTCTCAGGAATTTTCCCACCTCACCTGTCAAGT-------TGCAAAATA--TATTTATCAGGCTCCCAAT-TTTTACT
TAGTAATGACTTAGTAGTAAAAATTGCTCATTCCTTAAAACAAAAACGAAATA---TATATTCTACTGTTATCAAA--TG
AAAACATCACTTTCTGTTGTTTT-GGCAGAAATATTTGTGTGGCTACTCTGACAAA----TTTTTTTAACAGCTTTA---
----------------------AAATTCACTTC-----AGTGATCAATTCAA-----TGATTTTTAGTAAACTTGCAGAG
TTGTTGACCATTCCTTTTCCCTAAATAAGCATCTCTATTTCCCAATTCCTTACAAAGTTCTTCTGATGATTTGAGAGAGC
AGTTAACAAAACATGCCCAATCGTATGC-AGTGGTAGCCTGGTCT----CGGGTGACGTGGTGGAAATTTGAAACATTTA
GGTATTTAAGTTA--CCCCTCCATTCTCTAACGTCTATCTAAAATTTTACCTTGCTCTCATTTCTGACTATTTGCCAGTG
AGCACTTGCTTGGGGCCTGATTTTTATCTTCTCTGTGTAGTCTCCACAAAGGATTTGAGAAATAACCC-TTCTTCATATT
GTTAATACAAAAACAATATTAGTTTGTTATTGTTTCTTACTGTTGATAGGAACAAC--CACGAAAA-CTAGTCATTGTCT
CTAAGGTCTTAGTTTGTTGATATTTAATTTCAAAAATGACTCTATGATACAGTTCACATAGATTTTT---ACAAGAGTAA
TCAATAACTTCAGAAAGCATTT---AGGTTTTACTCAGATTCCTAAAATGATTAAGTGAGGAGG-AAAAAGACATCTATA
ATTTCATTAAACCTTTGTCTT-ACTGGAATAATGACTGTTTT----ATTAAATAAATTCGCAGTGTTTTCCATCCTAAAG

A-AGAGTTTAACAATT-----TTTCCAA-TGATTACATTGTGATGACTGTCCACATC-TTTTTTACTTATTTGTAATGAT
CACAAATGTATTGCTAAATAT-ATTGCTAAAGGACATAACATCTA-CAGTGAGCAAGCCATGATGAA-TATAGCTTCCAC
TTGGAGGAGAT-ATA----CTGTAGTTGCATAATACAATTTTAACTACATTTTTCC----------C
CGAGTACAC
>Myotis_lucifugus
CCCCTCTGTCCTCACCCCCGGGAATGCTGTGGGCTG-CGGCGCCTGC---AGCTTCCCCTTCGACCCACATGGCCC----
----------TGCACAG---------TATTTGGTAGTTGATT-AAAAAGTTT-GTGGT
TGTTCATATTAT----------TGCATTAACAAAAG----------TAAAAGTAACTTCTAGCTGATGAGTAC
CTGTGAGGTGCCAGACATACT-CCCTTGAAGTGCTAAAAACATCTCTTTTAAGTACTATTTTTATCCTTGCTTTATAAGT
GAGAACAAAAA-GGTTCAAAGTACTC----------GCTTAAGATCTCATAGCCAGTAGTAAACGACGGAGCCAATA
TTTGTGATCATATCTCTCTGCCTCTACATGCTTGCTCTTTGAAGTATGTCATACTGCCTCCCAGAAAGAGACTAAGAGAA
AAATGTGGCTGCAAAGGTAAGTTAAAGTCTTGCTCCATCGAGGATTTTGCACATTAGCCAAGATTGGATTGTTCTTCCTC
TCACCTGGCTAG--TGCTAAGATGTGAGTGGGGTAGA-AAACTTGTGGAAGA----------ATGTAATTTC
CCTTGCCAGGAATTCCCTGTCCTCAGCTGCCAAGT-------TGCAAA------ATTTACCAGGCTCCCAAT-TTTTACT
TGATAATAACCTAATAGTAAAAATTGCTCATTTCTTAAAACAAAAACAAAATA---TGCATTCCACTATTATCAAA--TG
AAAATATCATTTTCTGTTGTTTT-GGCAGAAATACTTGTGTGGTTGTTCTGACAAA----A-TTTTATGCAGTTTTATTG
AGGCATAATT--ATATATGAAAAAATTCACTTGTTTTAAGTATACAATTTAG-----TGATTTTTAGAAAATTTACATAG
CTGTTGACCATTCCTTCTCCCGAAATAAGCATTTCTATTTCCCAATTCCTCACAAAGTTCTTGTGATGATTTGAGAAAGT
AGTTGACAAACCATGCCAAATCATATGC-AGTTGTAGTCTGATCT-----GTGTGACGTGGTGGAAATTTGAAGCATTCA
GTTGGTTAAGATATGCCCCTCTATTCTCTAACCTCTATCTAAAAATTTACCTTGCTCATGTCTGAATA-TTGCCCGGG
AGTCCTTGCTTGGGGCCTGT----------CCTGTAGTCTCCACAGAGGATCTGAGAAATAACCC-GTCTTCCTATT
GTTAA-ATAAGAACAATAGTACTTTGTTATTGTTT-TTACTGTTGATGGGAACAACATTAAGAAAA-CAAGTCATTGTCT
CTAAGGACTTAGGTTGTTGATATTTAATTCCAAAAATGACACTATGATGTAGTTCAGATGGATTTTTTTCACAAGAGGAA
TCAATAACTTCAGAAAGTATTGAGAAGGTTTTACTTGAATTGCCAATATGATT----GAAGGGA-TAAAAGGCATTCATG
ATTTCCTTAAACCTTTGTATT-ACTGAAATAATGACTTTT-----GATTAAATAAGTACATAGTGATTTCTATCCTAAAG
A-ATAGTTTAACAATT-----TTTCCGA-TGATTTAATT-TGATGGTGG--TACATATTTTTTTACTTACTTGTAATCAT
CACAAATATATCTGTAAATAT-ATAGCTAAAGAAAATAATATCAC-CAGTGAGCAAGCCATGGCAAAAAATAGCTTTCAT
TTTGAGTAGAT-ATA----CTGTAGTTGCATAATACTATTTAAAATAGATTCCCCCCCCCCCCACACACACACACGCACA
CAAGTACAT
>Outgroup1
TGCCTGTGTCCTCACCCCAGTTAATGCTGTGCATTGCTGGATCCTAT---AGCTTCCTCCCCAGCCCACAGTATCCTATG
TTTGCACAGCATTTGCTTCATTAATCTATGTTTGCACAG---------CATTTGCTTCATTAA--AAGAGCTGTAGTATC
TGTACTCATCAGT----------TATAACAA----------TAATAGTAATTTCTGGTTATTAAGTAC
CTGTGAGGTGCCAGACATGCT-ATCTCAAAGTGTAAAAAATATCCCTTTTAAGTACTATTCTTATCCTTGCCTTATGGAT
GAGAAAATAAAAGGTTCAGAGAAGTTAGTTATTT-----GCTTAAGATCTTGTGGCCAGTTGA---CAGCAGAGCCAAGA
TTTGTAATCATATCTCTTTGTCTCTACACTCTTGCTCTTTGAAGTGTATCAGACTACTTTCCAGAAATAAACTAAGAGAA
AAGTGTGGCTGGAAAGGTAAGCTCAAATCTTGCCCTGTAAAGAAGTTTACACATTAACCAAGATCAAATTGTTCTTCCTC
TCACCCAGCCAG--TATGAAGATGTGAG-TGGTAGTG--AAGATGTGAGTGGTAGGGAAGATGTGGGCAAATGGAAATAA
GCTCCTCAGGAATTCTCCGTCTACACCTGCCCAGGAAGCAGCTGCAAAATGTTTATGTATCAGGCTCCAGAT-TTTTACT
TGTTATTGGCTTAATAGCACAAATCGCTCACTTC---AAACAAAACA----------TTTTCCACTATTGTAAAAA-TG
GAAACATCATTTTCTGCTGTTTT-GACATAAATATTTGTTTGGTCGCTCTAACAAA----AATTTTTAGCATCTTTATTG
AGGAATAATTTACCATATAATAAAATTCACTTGTTTTAAATGTACAATTCAT-----TGATTTTTAGTAAATTTACAGGG
TTATTGACCACTCCTTGTCTCTAAATAAGCATTTCTGTTTCCCAATTCCTTGCTGAGTTCTTCTGTTGATGTTAGAGAGC
AGTTAACAAACCACGTCAAATCATATGC-AGTTGTAGCCTGGTCT----TGTGTGACATGGTGGAGATTTGAAGCATTCG
GTTATCTGAGTTATATGCCTCGATTTTTTAACCCCTATCCAAAATTCTAATTTGCTCTGATGTCTGAATA-TTACCAGTG
AGCACTTGCTTAGGGCCTGATTCTG-TCTACACTGTGTAGCTTGCACAAAGAATTTGAGAAATAACCT-TTCTTTATATT
GCTAATACAACAACACTATTGGTTTGTTATTGTTTGTTACTGTTGATAGGAAAAGCTCCATGAAAA-CCAGTCATTGTCT
CTAAGGACGTAGGTTGTTGATATTTAATTCCAAAAATGACTCTATGATATAGTTCAGATAGATTTCT---ACAAGGGGAA
TCAATAACTTCAGAAAGCATTTAGAAGGTTTTACTTAGATTGCTAATATGATTAAGTTAGGGGG---GAAGGCATCTATA
ATTTC-TTAAGCCCTTGTCTT-ACTGGAATAATGATATTTTA-----TTGAAGAAATTCATAAAGATTTCTATCCTAAAA
A-ATAGGTTAGCAGTT-----TTTTCAAATGATTTTACTGTGGTTGTTG--TACATAGAGTTTTATTTATTTATAATAAT
CACAAATGCATTGCTCAATAT-ATTGCTAAAGGAAATAACATCTA-CAGTGAGCAAGCCATGCCAAA-AATAGCTTCCAT
TTTGGCTAAAT-ACA----CTGTAGTTATATGATACGGTTG----AATTTTTTTCTCC----------TC
TGAGTATAC
>Outgroup2
TGCCTCTATCCTCACCCTAGTTAATGTTGCGGGCTGCTGGATCCTATGATAATTTCCTCCTCCTTCCACATTATCCA---
----------GTACACAG---------CATTTGTTGGTTGATG-AAAAGATTTTGGTTT
TCATAGCATCACT----------GTAATCAAAATAATATTTTAATCAATAGGTAA-TCAAACTATTGAGTAC
CTGTGGAATGCTAG-GACATT-ATCTCTAAATGTC-AAAATATCCCTTTTAAGCCCTGGTGGTGCAGTGGTTTTATAGGT
GAGGACATAAA-GGCTCAGAGAAGTTAATTAAGCAACTTGCCTAAG-TCTCATGGCCAGTAAA---AAATGGAGCCACGA
TTTATAATTGTATCTTTCTGGTTCTAAATCCTTGCTCTTTCAAGTATATCAAACTACCTACCAGAAAAATACTAAGAAA-
----------TAATGAAAAATTCTGTCCGATAGAGGATTTTATACATTAACCAGAATCAAATAGTACTGCCTT
TCACCTGGCTAG--TGTTAAGA-------TGGTAGTGGGAAGATGTGTGGGA----------ATGGAAGTTA
GCTCCTCAGGAATTCCCCATCCATAGCTGCCC----------AGCAA----------GCA-GTTACAAAATTTTTACT
TGGTATCGACTTAGTAAAAA---TTGCTTATTTCTTAAAACAAAAACAAAAACTTACATTTTCCACTCTTACCAAAA-TA
GAAACATAATTTTCTGCTATTCT-GGCAGAAATATATGTTTGGTTGCCCTGACAAATATATTTTTTTAATGACTTTACTG
AGGTGTAATTT-ACATATGACAAAATCCTC-----TTAAGTGTGCAAATGAA-----AGATTTTTAGTAAATTTACAGAG
CTGTTGACAACTTCTATTCCCTTATCGAGGATTTCCGTTTCCTAATTCCTCGCAGAGTTTTGGTGAT---GTGAGAGAGC
AGTTAA-AAACCAAGCCAAATTATATGT-AATCA----------TGGCTCATACAGTGT-GATAGG--GCATTCA
ATTATTA-AGTTATACCCCTTAAT----------CCTCTAATTTTACTTTGCTTTCATTTCTGTATA-TTACCAGTG
AGC----------GCTAAATCGTGTAGAGTCTCCACAAACGATTTAAGAAATAAC----TCATCATGTT
GTTAATACAAGAACAATGTTAGTTTGTTATTGTTCGTTATTGTTGCTAGTTACAACACCAACAAAC-CTAGTCATTGTCT
CTAAGGACTTAGGTTGTTGATATTTAATTCCAAAAATGACTCTATGATATATTTCAGATAGATTTCT---ACAAGGGGAA
TCAATAACTTCAGAAAGCATTTAGAAGGTTTTACTTAGATTGCTAATATGATTAAGTGAGGAGGAAAAAAGACATCTATA
ATTTTTTTAAACCCCTGTCTT-ACTGAAATAATGACTTTTCT----ATTAAAGAAACCTATAATGATTTCTATGCTGAAG
A-ACAGTTTAGCAATT-----TTTCCCA-TGATTTTATTGTGATGGTTT--TACATATAGTTTTACTTAATTATAATAAT
CACA----------AATAT-ATTGCTAAAGAAAATA-GATGTA-CAGTGAGCAAGCCATGCAAAA-AATAGTTTCCGT
TTTGAATAGAA-ATG----CTGTAGTTA-CTAATACAATT--AAATTTTTTTTCCATCCC----------C
CAAGTACAC

```
>Perissodactyla_Sp2
TGCCTCTGTCCTCGCACCCATTAATGCTG-GGGCTGCTGCGTCCTGT---AGCTTCCTCCTCAGCCCACAGTA-CCT---
-------------------------------GTGCACAG---------TGTGTGGAAGTTGATT-CAAAGGTTT-GTGGT
TGCTCATATCATC----------------ACTGTAACAAAAA-----------TAATAGTAACTTCTAGCAATCGAGTAC
CTGTGAAGTGCCAGACACACT-ACCTCGAAGTGTCAAAAATATCT---CTAAGTACTATTATTATCCTTGTTTTATTGGT
GAGAAAACAAA-GGTTCAGAGAACTT-------------GCTTAAGCTCTCACGGCCAGCCAA---CAATGGAGCCAAGA
TCCGTAATCCTAGCTCTCTGCCTCTAAATCCTTGCTCTTTGAAGTACGTCAAACCACCTCCCAGAAACAAACCAAGA-AA
CAATGTGGCTGGAAAGGTAAGTTAAAATCTTGCTCTGTAGAGGATTTTGCATATTAGCTAAGATCAGATTGCTCTTCCTC
TCACCCAGCTAG--CGTTAAGATGTGAGTGGGGTAGA-GAAGATGTGGCGGA------------------ACAGAAGTTA
GCTTCTCAGGAATTGCCCCACCTCACCTGCCAAGC-------TGCAAAATA--TATTTACCAGGCTCCCAAT-TTTTACT
TGGCAATGACTTAGTAGTAAAAATTGCTCATTTCTTAAAACAAAACCAAAACA---TATATTCTACTATTATCAAA--TA
AAAACATCATTTTCTGTTGTTTT-GGCAGAAATATTCATGTGGTTGCTCTGACAAA----TTTTTTTAACAGCTTTATTG
AG-TATAAT---ATATATGATAAAATTCACTTGTTTTAAGTGTTCAATTCAA-----TGATTTTCAGTAAACTTACAGAG
TTGTTGACCACTCCTTTTCCCTAAATAAGCATTTCTACTTCCCAATTCCTTACAAAGTTCTCCTGATGATTTGAGAGAGC
AGTTAACAAGCCACCCCCAATCATATGC-AGTGGTAGCCTGGCCT----CGTGTGATGTGGTGGAAATTTGAAGCATTTA
CTTACTTAAGTTATACCCCTCGATTCTCCAACCCCTATCTAAAATTTTACCTTGCTCTCGTTTCTGAATA-TTGCCAGTG
AGCACTTGCTTGGGGCCTGATTTTTATCTTCTCTGTGTAGTCTCCACAAAGAATTTGAGAAATAACCC-TTCTTCATATC
GTTAATACAAAAACAATATTGGTTTGTTATTGTTTCTTACGGTTGATAGGAACAACATCATGAAAA-CTAGTCATTGTCT
CTAAGGACTTGGGTTGTTGATATTTAATTCCAAAAATGACTCTATGATACAGTTCAGATAGATTTTT---ACAAGGGGAA
TCAATAACTTCAGAAAGCATTTAGAAGGTTTTACTTAGATTGCTAATATGATT----GAGGAGG-AAAAAGACATCTATA
ATTTCTTTAAACATTTGTCTT-ACTGGAATAATGTCTTTTTT----ATTAAATAAGTTCATAGTGTTTTCTATCCTAAAG
A-ATAGTTTAGCAATT-----TTTCTAA-TAACTACATTGTGATAGTTG--CACAAGTATTTTTACTTATGTGTAATAAG
CACAAATGTATCGCTAAATAT-ATTGCTAAAGGAAATAGCACCTA-TAGTGAGCAAGCCATGACAAA-AATACCTTCCGT
TTGGAGTAGAA-ATA----CTGTAGTTGCATAATACAATTTTAAATATATTTTTTCCC--------------------CT
TGAGTACAC
```

2. Chiroptera+Carnivora

```
>Bos_taurus
TACTGAATCATCAACC-AATGTTTTGGTCACTTCCAGGAAAGTCAGAT-------------TTACAAAAGACAGGAAAAC
TTTTCTAATCATTTCAGGATCTAC--AGGGTATAGAAAGGAA-CTTGGACTCTTGGTGGTTAATGAATAGTTCATGGCAC
GGAAC-----TGAAAGGGACCATCTTGGGCAGAGGTAGTTTCTCTTGTGTTTTTAAAACTAATACTG------TT-GAGA
CCATAGG-AGACCTGCCTTTTGAGAGTAGGCAGG-------------------------------CTTGCTCTGAAGTCA
GATCTTACTCCTCAGTCCT-----------------------------------TCATTTT-CTGGAAGTTTG---TCT
CTATCTTTGTGGGGCTATGGCATAGCACACCATCAGCCAAGAGGGAGAATAATTTATTGCTAATCCAACTAGGAGCCATC
CTCTGTTAAATGAT---GA--CTAAATTAATTGTAGTCTACATAAA-----ATTTTCAATTGCCTTATTTTTAATTTTAT
TTACAATTTTAAACCTATGGAATTTCAGCCCCATATACAGTTGCCAGAAGCAGCAAGTTGAGCAGAGAAATTTATTTTCA
AC-ACAGGACTAAAAA--GCTCTGAAAAGGGA---CACTTACTGAATTCCTACCACATGTCAGGCGCTTTATATG-----
TTATGTCTCTGTACTCATTTAATATTCACACCAAAACTCTGAAGTAG-TAGTATTATTCCCATTTAACAGATAAGAAAAC
CTAGGCTTTGAGAGACTGACCAATTTGTTCCAGCCTCTGTAGTGAATAA--------ACAGCAGTT-CTGGGATTTCAAT
CTAAATATATTTAAATCCAAATCCTGAATT-AAATCCACTTAATCCTGTTCAAC------------CAAACCATATTATT
GGAAGTTTCAGAAGATTTTACTTCCTGATCTGAATTTCCTGGGTTTTGGTGACCTTATACTTTTTTCATGATATTAAAAT
CATATAGATGTAAGAGTGTCCCCTCCAGTACAGGC---AGAAACAGCATGGATTCTACACGTTTGAACATATTCATTAAT
TTCCTGGCTTCTCATGAGTCAGGGTCCTTCCAAGTTTCAACTTGTCAGATTAAGGATGGAGAGGAGAATGAA-----TTT
TCTTTT----------CTGAGAGTGGCTCCTGAATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNAAAGAAGTTCCTGCCAAAATCAGTGAGGGAATTAGTGGCAGAAATCAGTAACACCAAACTAA-------
-CACCAAGAG----------TGAGA------GTGAGGACA----ATAGTGAATGAGAGAGAGGAAGGGAA------AGAG
AA-AGAAACTACACTTCTAAAAGCACTAAAAAT-AAAAATTTCAAATTAGTCTAAAAA--TATTCAAAATAATACAAGCC
AGCACAAACCTGAATTCTCAGGAGGGCTAATCCAATGTTTATGATTTATAGTCCCTAAGAAAGACTACATTAACATGAGA
AATCCCATATTCAACTCATATGCGTGATGTCACAGGACTTGAGACTTTGGGTTTATCATTGACATGATAGATATGAAACC
AAGATGCTTTATTTCCTGACTCTTCAGAGAATAAATGCTTTTCCCTTGTTAGTAAACCTG--TTTGTTTTTCTCATTAAT
CTGTCTTTTGTTACAGGTGTCCCAGCC-AGAAC-AGAAGAGTGGGAGGGAAAACTA-TTTTTTCCTCCTTTACATCAATA
AATTATTAAAATGCAATGAACAACAACAACAAAAAAAGTAATGAACTAAGGGTTGTTACTA-TCTAGTACCTAGAAGTAG
CTATCAGAATTGGTGGTGAGAGAAAGAAAAAAATGACTAACT----TGGAATAGGTCAAAGA-------AAT-GTGAATA
GCCAGGTATGCTGCAGGTGAAACAGCATGTCCTTATATAGGGAAGCATGAAACAGAGTGGTATGCTGAGGAACACTAGGA
ACCCCAGAGCGTAACAGTAGGATTCAGGACACACTCCCCC-AAAATACAGAAAAA-CACTAATTAATGTTGATTGATTGA
TCAACTGATTCTATTTGTGTGA-TTTT-ACCAAAAGGATATTC-ATATACTCACAGACAATGTGTGTTTATGAACATGGA
TATGG----ACAAACCCT--------GGAATTTAGAAATCTATATCTTTGTTATTTTTAAAACATTCTT--TAAAATATG
TCTAAAA------TTTTTAATGCATT-TAATGCATG--CATATATGATATCTGCTC-TTTTTAATATTTGAATTGTGATT
TAATCTATGGCCATTCTGTCTTTGT--AATGCCAAGAGGCTCTTAGTTTTTATTTGCATGGGGAATAGTATGTTAAATAG
GA------AG---CACACTTGTCAGATAAGGACCACTTAGG-----------------------GAGAGGAATAACC-T
GAAATGAATATCCATACAT---------GCTAGTACCACACGAATGAATGGT--AGAGA--------GAGA----TCTTC
AACAGTTTTGCTCAT-AGAAAATTCCTGAG-AAGAGAG---TTACTATT-AAGTGGAAAAGAAAATTTCAAAGAAGATCA
AATCTGATAATTTGGCTTTGAGTCTCACAATG-TCTAACTCC---AGTTCAAGCTGGTAAATAATTTACAAAATGGACTT
AGGTTTAGAACTCAGCATTGCTGTAAGAGGCCAATATGTTTTTGTCAAATTTCCAACTTTATTTAG-AGGATTTCACATC
ACTGTAGAAATA---AGTTCTTTCTAAAAATTTGCAGT---------------CGCAAG--ACAG-ATTCTAGAATACAG
GGTTCTAGAAGGAAAAGTTCTGTGTACATTAA-----AAGAAGTATACAGTGCAAGACCTTAGACTGAATCCCAACTAAA
TGCTCAAGA-TCTGAGTAACATATTTTAGACTCCTGGCCTCTGAGA-CCTTTATTC---CAAGGACACCCTGGACCCCCT
CTCCTGTTGCAC---TCCCCCACGCTTTCCCTGCCCA----------------------------AATC---------TT
TTCAGAGACAGCCTAC-TTATCCTATCCCAACTAACCGGAAAATCCGGTCCCTTCCAAGGAAAGCTTTTTGTTGACATAG
TTACTCCTCCAGGCAG-----------------------GAGTAACAGTTCTCTCAGCACCTAATATGCA--AATGTCGA
AGG-CGTTTTT-GCTGACACTAG-----AGTTCAGTAGTCGCG--TCT----CTGCTGCGCACACTGTGAG---------
--------CTCGTCTCGCTAAGTTTTGTATTCGGTTACGAGCACAGTGCCCTGCTAGTGAGTTTTCAAAAGATGTTCAGT
AAAGGCTTTCTTTGATTGCTCATATTTAGTTTGACCTTTAAGAAAAACTGAACTCTGCTTCTA------AAGCAAAATTA
GTTTTACTTTTCAGATTGTTCTGGAG----CCAAGGAAGGGTACAAGGAGATTCCTAGCCTCAGTTTTAGGACATCTCCT
TTTATATGAAATTCTTAAAGCAACATTGTTCTCCTTTTATTATATTGAAAACTAGGTCATGAAGCACTTACAGGCAGAAA
GTGATTTTGAAAA-----------------------AGAAATAATTTAGAATCAAGT----AAAAAAAGTGGG-GCGTGT
AT----GGGACGGACAT-----ATTTAGACCTGTTGTGACTATTTGCTACAAAGCA--GTGTGTAGAAGTGAGGAAG-TG
ATCAGGAGGGACAGAAGACT--GAGT------------------TCTCAGCTTCTGGGACATCTGGGTTTCTTTGGGCCC
CAGACTGCC
>Canis_lupus_familiaris
TATTGAATCATTTGCC-AATGTTTTGGTCATTTCCGGGAATGGCAGAT-------------TTCCCTAGGGCAGAAAACA
TTTCTTGTTTATCTCAGTGTCTACCAAGTGTATAGAAAGGAA-TTTGGAACTTTGGTGCTCCATGAGCATTTCATTGCAC
AGAAC-----TGAAGGGAATCATCTTGTGCGGAGGTCGTTTCTTTGGTGATTTCTAAACTATTGATG------TT-GAGA
CCAGGGG-AGACCTGCCTTTTGAGAGCAGGTAGG-------------------------------CTTTCCCTGAAATCA
ATTCTAACTGCAGACAACTAATTCTCTTTCCCTCCTTCTCACCACCCCTCTCCCCTCATTTT-CTGGCAGCTTGTC-TTT
CTGTCTTCGTGGGGCTGTAGCGTTGCACACACCATACCCTGAGAGGGAATGATTTAAAGGTGACTTACTCAGGAAC----
---TGCTAAATCAT---AATCCTAAATTAATTGCGGCATATGTAAAA-CTTATTTTTAATAGGCTTGTTTAGAGTTTTCT
TTGCAATTTC-AAGCAATAGGATCTCAGTCCCAAATATGGTCTCTCCCAGTGGCAAGTTAAGAAGAGAAACTCATTTTTA
AT-AT--GACTAAAAA--GTTCTG-AAAGGGAGAACACTTGTTGAATTCCCACCATAGGCAATACACTTTATATATTTGA
TTATGTCCCTGAACTCATTTAATATTCATGTCAAAACTCTGAAGTTG-TATTATTAC------TTGATTTAATAGAATAC
CTGGGTTTTGAGAGGCTGACCAACTTGTCAGAGCTTATGTAGCGAGCAA--------ATGGCAGTT-CTGGAATCTGAAT
CTAAGTATATTTCAATCCAAATCCT--------ATCG-CTTAATCCTGCTCAAT------------AAAATTATAGTATA
AGAAGTTTCAGAAAATTTTAGCCCCTAACCTGAATTTCC-------TGGTGACCTTATAC--TTTTAACGATGTTAAAAT
CATATAAGTGTAAAAG-----CCTTCTGAAGAGGC---AGGAACAACATGGATTTCATATATTTG---------------
ATCCT---TTC--ATGAGCCAGGGGGTGTCCAGGCTTCAATTTGTCAATTAAGGAGAGAAGAGTAGAATGAATATTCTCT
TCTTTT----------CTGAGAGCGGCTTCTGAATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNAAAAAAATCCCTTCTCAAACCAGTGAGGAAATTAGTGGAGGGGATTAGTAACATCAGACTAATTA----
ACA---AGAG----------TGAGAACGAACATGAGAAGA----------AGGACAAGAGCACATGAGTGAG----AGAG
AA-AGAAACTACATTTTAAAAAGCATTAAAT---AAAAGTTTCAAATTAAACTAAAAATATACTCAAAATAATTCAGACT
GGCACAAGCCTGAATTATCAGGGGGGCTAATCCAGTATCAATGATTTATAGTCCCAACGAAATAATATGTCAGAATGAGA
AATCCCACAGTCAGCTTCCATGCCTGATGTCACAGGACTTGAGACTTTGGGTTTATCATTGACATTATGGATATGAAATC
```

AAGATGTTTTACTTCCTGACTCTTATGAAAATAAATGCTTTTTCCTTGTTAATAAAATTC----TGTTTTTCTCATTAAT
CTGTCTTTTGTTAGAGGGATCCCAGCCGAGAACTTACAAAAACAGAGGC-AAATTA-TTTTTGCCTCCTCTACTTAAACA
GATGATTAAAATACCATGAAC-----------------------TTAAGG----TTACTA-CTACATACCTAGAAGTAA
CTATCAGATTTGGTAGAAGAAAAA--------------AACTGA--TTGTATAGGTCAGGGTA--GCTTAACGGTGAATA
ACCAGACATGATGCAGGGGAAACAGCATGTTCCCA------GAGGCACGAAATACAGTGGTAGGCTGAGGTATATTATGA
ACCCCACGGTGTAA-------CCACAGGACATACTACACC-AAAAAGTGGAAAAA-CATCAATTAATATTTATTGAT---
---------TCTATTTATGTGA-TTTTGACTCAGGCAACATTC-ATATTCTCCAGAGCAATAAA-GTTTATGAACCTGTA
TATGACAAAACAAACCCTTAGAGTTTCAAATTTTGCAATATGTATCTTTGTTATTCTGAAAGCATTTGTTATATGATATG
TGTAACC------ATTAGCATGAGTT-TAATGCATG--CATATATGAAGTATGTTC-ATTTTGATATTTGAATCCTGATT
TAATCTATGGTCATCCTGT--------AAAGCCAAGAGGTTCTCAGTTCTGATCTGTGTGCTGAGTATTATCTTAAATAA
AA------CGACACATATTCATGAGATAAGCACAACTCATG-----------------------GAGAAGAATG-TGGC
GAAATGAGTATCTACCCTTGATGA----AATGAATATCTATGAATGAATGGC--AGAGAAGATTCCTGATGAAGGTCTTC
AAGAGCTTTACTAATCAGAAAATTACTAAGGAAGGAAGGAAGTATTATCAAAGTAGAAAAAGTAATTTCAAAGGCAGTAG
AATCTGATATTTTGACTTTGAGTTTCACAATG-TCTAAACTC---AGTTCAAGCTGGAAAATAATTTATAAAA------T
AGGTTTAGAATTCAGCATAGGTGTACAAGGCAAAAATATTTTTGTCAAGTTTCCAATTTCACTAAA-GTTTTTTCACACT
ACTATAAGACTA---TTTTCTCTCTAACATTTTGTAGTGCTTTTTGAAACAGTTTCAAGACACAG-ATTTTAGAGTACTG
TGGTCTACAAGGAGAAGTTCTGAGCTATGTATGTT--AAGAAATGTTCAATACAAGGTCCTAAACTGAAACCCAACTACG
TGCTCATGATTCTGAGTAACACACTAAAGACTCTTGGCCTCTGAGA-CCTTTATTC-GTTTAGAATGCCTT---------
-----CCACCCC---TTCCCTCTCCTTTCCCTCCCCATTTTTATTTATTTATTTATTTTTCAATCC-AGTTTTATT
TTTAAAGACAGTCTAT-TCATCCCTT-AAAACTAACTGGAATACTTGTTCCCTTCTGTGTGAAGCTTT-CTTTGACATCC
CTATTCCCCCAGGCAG-----------------------GAGTAAGTGCTCTCTGAGCACTTAATATATATAAATGACTA
AAAATATTTTT----GATATTAG-----AATGCACTATTTACA--TCTGTTTCTCATATT-AGACTATGAG---------
--------TTCATCTCATTAACTTCTGTATTCAGTTACCAGCACAGTGACTTGCTATCAAATTTTTTAAAGGTGTTCAGT
A----ATTCCTGTGATCACTTATATTTAGTTTAACCTTTAGGGAAAACTGAAATCTACCTCCA------AAATGAATTTA
ATTTAACTTTCTCGATTGCACTAGGG----GAGGAAAAGAAAA-----AGATTTCCAGCCTCA-TTTTAAGACCTCTCCT
TGTACATAAAATTCTTAAAACAATATTGTTTTCCATTTATTGTATTAAATA-TATACCATGAAGCACTTACAGGCAAGAA
GT--TTCTG---------------------------AAAAACAATTTAGAATGTAGT------AAAAAGTGGG-AGACTT
AT----GGGACAGACATTATCTATTTAGGCTATTTGTGACAATTTGCTACAAAGCA--GTATGCGGAAGTAAGTGGT-TA
GTTAGGAGAGAAAGAAGTCT--GCAT-----------AATTTGTAGTCATTCTCAGGGTCATT-GGGTTTCTTTGGTCAC
CAGGCTTCC
>Carnivora_Sp2
TATTGAATCATTTACC-AAGGTTTTGGTTACTTCCAGGAATGGCATAT-------------TTCCCAAGGGCAGGAAACA
TTTCTTGTTTATTTCAATGTCTACCAAGTGCATAGAAAGGAA-TTTGGAACTTAAGTGCTCCATGAGCACTTCATTGCAC
AGAAC-----TGAAAGGAACCATCTTGTGCAGAGGTCATTTCTCTGGTGATTTCTAAACTACTGA-------------GA
CCATGGG-AAACCTGCCTTTTGAGAGTAGGTAGG------------------------------CTTTCTCTGAAATCA
GTTCTTACTACAAAGAACTAATTATCTTTTCCTCCTCCTCACCTCC--------CTCATTTT-CTGGAAGCTTGTC-TTT
CTGTCTTTGTGGGG--TTGTAACAGCACATACCACACCTTGAAGGGGAATGATATGAAGGTAACTCAATCTGGAGCCATC
CTCTGCTAAATCATTGAAATCCTAAATTAATTATA---------------TATTTTCAATAGCCTTGTTTTACACTTTTT
ATGCAATTTC-AAGCAATAGAATCTCAGTCTCAGTTATGGTTTC-ATAAGTGGCAAGTTGAGAAGAGAAACTCGTTTTTA
GT-GTAGGGCTAAAAA--GTTCTG-AAAGGAAGAACATTTATTGAATCCCTATCGCATGCAATGAGCTTTACATAT----
TTATGTCCCTGAACTCATTTAATATTCGTGCCAAAACTCTGAAGTTG-TATGATTAC------TCGATTTCATAGAAAAT
CTGGGTTTTGAGAAGCTGCCCCACTTGTCCCAGGTTATGTAGAGAGTAA--------ATGGCAGCT-GTGGAATTTGAAT
CTAAATACATCTCAGCCCAAATCCT--------ATGCACTTAATCCTGACCAAGTTGCACCCCCCAAAATTTATACTGTG
AAAAGCTTCAGAATATTTT------------------CCAGGGTTTTAGCGACCGTGTGC--TTTCCATTATGGTTAAAT
TGTATAAATGTAAAAGCCTCCCCTCCTGAAAAGGC---AGAAACAACATGAATTTCACACATTTG---------------
AGCCT---TTC--TTGAGCCTGGGGCCTTCCAGGCTTTAACATATCAAATTAAGGGGACAAAGCAGAATGAATTTTTTCT
TCTTTC----------CTGAGAGTGGCTCCTGAATAATCTCCAATCTTCTT--------AAAAGAATATAAGTGACCTAC
ACTTTAGCTTTATTTCATTCAGCCTTTATACAAATATGCTGATCATTCATCTGTAATACATGCACATAATAAGTCTCCTT
ATTAATCTCTTAAAAAAATTCCTTCCAAAACCAGTGAGGAAATTAGTGGAGGGGAGCAGTAACATCAGAGTGAG------
------------------------AAGGAACACAAGGAGG----------AGGACAAGAGCTCATGAATGAG----AGAC
AA-AGAAACTACATTTTAAAAAGCATTAAAT---AAAAATTTCAAATTAAACTAAAAATACACTCAAAATAATTTACACT
GGCACAAACCTGAATTCTCA-GGGGGCTAATCCAATGTTAATGATGTATAGTCCCAAAGAAATAATATGTTAAAATGAGA
AAGCCCACAGTCAACTTCCATGCCTAATGTTACAGGACTTGAGACTCTGGGTTTATCGCTGACATTATGGATATGAAATA
AAAATGCTTTATTTCCTGACTCTTAAGAGAATAAATGCTTTTTCCTTGTTAATAAACTTG-TTTTGTTTTTCTCATTAAT
CTGTCTTTTGTTTTAGGGGTCCCAGATAAGAACTTACAATAATAAAGGGAAAATTATTTTTTTACCCCTCGACTTAAACA
AATGATTAAAATACAATGAAC------------------------TAAGGGTTGCTACTA-CTCAGTACCTAGAAGTAA
CTATCAGATTTGGTAGTAGAAAAAAGAA--GATTGATTAACTAAGCTTGTGTAGATCAAGGAATGGCTTAGTGGTGAAAA
GCCAGACATGTTGCAGGGGAAACAGCATGTTCCTATATATGGAGACATGAAACAGAGTGGTGTTTTGAGGTACACTATGA
ACCCCATAGTGCAACAATAGGGTTCAAGATATTCTACCCC-AAAATATGGAAAA--CACCAATTAATATTTATTGATTGA
T--------TCTGTTTTTATGA-TTTTGACTCATAAGGCTTTCCATATTCTCCAGGGCAATGAT-GTTTATGAATGCGTA
TATGA----ACAAA-CCTTAGAGTTTCAAATTTTGGAATTGGTGTCTTTGTTATTCTCAAAGCATTTGTTATATAACATG
TCTAATC------ATTACCATGAGTT-TAATGCATG--CATATATGATGTCTGTTC-TTTTTAGTATTTGAATTCTGATT
TAATCTATAGCCATTCTGTCTTTGT--AATGCCAAGAGGCTCTCAGTTCTGATCTGTGGGCAGAAGATTATCTTAAATAA
ATGCTTAAAGAAGCATATTTATGAGATAAGCACCACTCATG-----------------------GAGAAGAGGAATGGT
GAAATGAAAATCCGTACTTG--------GCAAGTGCCATTCGAATAAATGGT--AGAGAGGATTCCTGATGAAGGTCTCC
AAGAGCTTTA-TAATTAGAAAATTACTGAGAAAGAAAGGGGTTACTATCAAAGTAGAAAAGATAATTTCAAAGAAGGTGG
AATCTGATA-TTTGGCTTTGAGTTTCACAATG-TCTAAAGTC---AGTTCAAGCTAGAAAATAATTTATAAAATAGTCTT
AGGTTTAAAATTCAGCATCAGTGTACAAAGCTAAAATATTTTTGTCAACTTTCCAATTTTATTAAG-GTTATTTCACATC
ACTATAAAACTA---TTTTCTTTCGAAAATTTTGTAGTGCTTCTTGAAACATTTTGAAGACACAG-ATTCTAGAATACTG
TGGTCTATAAGGAAAAGTTCTGAGCTATGTATGTTA-AAGAAATGTTCAATGCAAGGTCCTAAACTCAAACCCAACTACA
TTCTCATGATTCTGAGTAACACACTAAAGACTCTTGGCCTCTGAGA-ACTTTATTCAGCCTAGAATGCCCT---------
-----CCCCCA--------------TTTCCCTCCCAA-----------------------------------TTTTTATT
TTTAAAGACAGCCTAC-TCATCCTTT-AAAACTAATTGGAATACTTGTTCCCTTCTGTGTGAAGTTTT-CTTTGACATCC
CTACTCCCCCAGGCAG-----------------------GAGTAACTGCTCTCTGAGCACTTACTATATATAAATGACTA
AAA-TATTTTT-GATGATATTAGAATGTAATGTATTATTTACA--TCTGTTTCTCATATTGAGACTATGAG---------
--------TACAACTCATTAATTTCTGTATTCAGTTACTAGCACAGTGACTTGCTATCAAATTTTTTAAAGATGTTCAGT
A----ATTCCTGTGATCGCTTATATTTGGTCTGACCTTTAGGGAAAACTGAAATCTACTTCCA------AAATGAAATTA
CTTTTACTTTCTAGATTACACTAGGG----GAGAAAAAAA--------AGATTTCCAGACCCAATTTTAAGACATCTCCT
TTTATATAAAATTCTTAAAACAATATTGTTTTCCATTTATTATATTAAATA-CACACCATGAAGCACCTACAGGCAAGAA

```
GTGATTCTG-----------------------------AAAAGTTTAGAATGCAGC------AAAAAGTGGG-GGATTT
AT----GGGCTGGACAT-ATCTATTTAGACCATTTGTGACTATTTGCTACAA-CCA--GTACGCAGAAGTTAGCAAG-TG
GTTAGGAGGGAAGGAAGCCT--GCAC-----------AATTTGTAGGCAGTCTCAGGGTCATTCGTGTTTCTTTGGTCAC
CAGGCTGCC
>Cetartiodactyla_Sp2
TACTGAATCGTCAGCC-AATGTTTTGGTCACTTCCAGGAGTGGCAGAT-------------TTCCAAAGGGCAGGAAAAC
TTTCCTGTTCATCTCAGTATCTACCAAGTGGTTAGAAGGGAA-CTTGGAACATAGGTGGTCAATGAATGCATCAT-GCAT
AGAAC-----TGAAAGGGATCATCTTGTGCAGAGGTAATTTCTCTTGTGATTTTAAACTATTCATG------TT-GAGA
CCATGGGGAGATCTGCCTTTTGAGAGTACGTAGG------------------------------CTTGATCTGAAGTCA
GATCTTACTAGAACGAACTAATTCTCTTTCTCTTCTC-CTCGTTCC--------TTCATTTT-CTGGAAGTTCG---TCT
CTGTCTTTGTGGAGCTATGGCATAACACACCATCGACCTATAGAGAGGATGATTTAATGCTAGCCCAACTAGGAACCATC
CTTAAGTAAATTAT---GA--TTAAATTAATTGTAGTGTACAAAAAA-TTGATTTTCAATGCCCTTATTTTAAATTTTCT
TCGTGATTTCAAAGCTATAGAATTTCAGTCCCAAATATGGTTTC-AGAAGCAGTAAGCTGAGAAGAGAAATTCACCTTAA
AC-ACAGGACTAAAAA--GCTCTGGAAAGGGAGAACACTCACTGAATTCCTACCACGTGCCAGGCGCTTTACATG-----
TTATGTCCCTGAACTCATTTAATATTCACATCAAAACTCTGAAGTAGGTATTATTATTCCCATTTAACAGATAAGAAAAC
CTAGGCTTTGAGAGACTGACCAACTTGTCCCAGCCTGTGTAGTGAGTAA--------ATGGCAGTT-CTGGAATTTGAAT
CTAAATATATTTAAATCCAAATCCTGTATTTAAATCCACTTAATCCTGCTCAAC------------CAAATTGTACTATT
GGAAGTTTCAGAAGATTTTGGTCTCTGATCTGAATTTCCTGAGCTTTGGTGACCTTGTAC--TTTCCATTATATTAAAAT
TATATAGATGTAAGAGTCTCCCGTCCTGTAGAGGC---AGAAACAGCATAGATTCCACACGTTTGAACACATTCCCTCAT
TTCCTAGCCTCTCGTGAGCCAGGG----TCCAAGTTTCAACTTGTCAAATTAAGGAGAGAGAGCAGGATGAATTTCCTCT
TCTTTT----------CTGAGAGTGGCTCCTGAATAATCTCTAGTCATTTATATT------AAAAAAATAAGTGACCTAT
ATTTTAGCTGTATGC----CAGCCTTTATACAAACATATTGATTATTCATCTATAACACATGTCTNNNNNNNNNNNNNNN
NNNNNNNNNNNAAAGAAGTTCCTGCCAAAACAAGTGAGGGAATTAGTGGAGGAGATCAGTAACATCAAACTAA-------
-CAC----------------TGAGAGCGAGAGTGAGGACACGAGCAAGTGAATGAGGGAGAGGAAGGGAA------AGAG
AA-AGAAACTATACTTTTAAAAGCACTAAAAAT-AAAAATTTCAAATTAGACTAAAAA-ATACTCAAAATAATATAGGCT
GGCACAAACCTGAATTCTCAGGGGGGCTAATCCAATGTCTGTGATTTGCAGTCCCAAAGAAAGAATACCTTAAAATGAGA
AATCCCATATTCAACTTACATGCCTGATGTTACAGGACCTGAGACCTTGGGTTTATTGCTGACATGATGGATATGAAATC
AAGATGCTTTACTTCCTTACTCTTAAGAGAATAAATGCTTTTTCCTCGTTAATAAACCTC----TGTTTTTCTCATTAAT
CTGTCTTTTGATACAGGGGTCCCAGCC-AGAAC-AGAAAAGTGGGAGGGAAAATTA-TTTTTTCCTCCTCTATATCAATA
AATTATTAAAATGCAATGAAC-------------------------TAAGGGTTGTTACTA-CTTAGTACCTAGAAGTAG
CTATCAGAATTGGTGGTGAAGGAAAGAAAATAATTATTAACTCAGTTTGAATCAGTCAAAGAAAGGCTTAAT-GTGAATA
GCCAGGTATGTTGCGGGTGAAATAGCACGTCCCTATATATGCAAGCACAAAACACAGTGGTGTATTGAGGTACACTAGGA
ACCCCATAGTGTAATGATAGGATTCAAGACACACTACCCC-AAAATATGGAAAAA-CACCAATTAATATTGATTGAT---
---------TCTATTTGTATGA-TTTTGCCTCAAAAGATATTC-ATATACTCCCAGGCAATGCATGTTTATGAACATGGA
TATGGACAAAGAAAGCTT-AGAGTTTTGAATTTTGGAATCTGTGTCTTTGTTATTTT-AAAGCATTCTT--AATAATACA
TCTAACA------ATTACCATGCATT-TAATGCACA--CATATATGGTGTCTGCTC-TCTTTAGTATTTGAATTCTCATG
TAATCTGTGACCATTCTGTCTTCTT--AATGCCAAGAAGCTCTTAGTTCTGATCTGTGTGGGGAATATTATGTTAAATAA
AA------AGAAGCACATTCACGAGATAAGCACCACTAATG------------------------GAGAAGAATAACAGT
AAAATGAATATCCATACAT---------GCAAGTGCCATACGAATGAATGGT--AGAGAAAATTCCTGAGACAGCGCTCC
AAGAGCTTTGCTAATTAGAAAATTACTGAG-AAGGAAGGAATTACCATC-GAGTGGAAAAGAGAATTTCAAAGAAGGTGA
AATCTGATAATCTGGCTTTGAGTCTCACAATG-TCTGACTCC---AGTTCAAGCTGGAAAATAATTTACAAAATGGACTT
AGGTTTAGAACTCAGCATTGTTGTAAGGGGCTAATATATTTTTATCAAATTTCCAACTTTATTAAG-GGGATTTCACATC
ACTATAAAAATA---TGTTCTTTCTAAACTTTTGCAGT---------------TGCAAGACACAG-ATTCTAGAACACTG
AGTTCTAGAAGGAGAAGTTCTATGCACGTTAA-----AAGAAGTATACAGTGCAAGGTCTGAGACTGCATCCCAACTAAA
TGCTCACAA-CCTGAGTAACACACTAAAGACTCCTGGCCTCTGAGT-CCTTTATCC---CTAGGATGCCCTGGCCCTCCT
CTCCTGTCCGACTCCTTCCGTACACTTTCCCTGCCCA---------------------------AATCCAACTCTTATT
TTTAGAGAGCGCCTAC-TCATCCTTT-AAAACTAAATGGAATATTTGGTCCCT-----GGGAAGTTTT-CCTTGACATCC
CTACTCCCCCAGGGAGTTAACTTCCCCACAGTAAAGTAACTTCCACTGCTCCCTCAGCACCTAATATATA--AATGACTA
AAA-CATTTCT-GATGATACTAG-----AGTTCCCTATTTACGTCTCTGCTTCACACACT-AGACTGTGAG---------
--------CTCATTTCATTAACTTCTGTATTCAGTCACTAGCATAGCGCCTTGCTACCAAGTTTTCAAAAGATGTTCAGT
AAAGGGTTTTTTTGGTTGCTCACGTTTAGTTTGACCTTTAAGAAAAACTGAACTCTACTTCCA------AAATGAAATTA
GTTTTACTTTCCAGATTGCACTGGGT----C--------GGGGCAGGGAGACTCCCAGCCTCAATTTTAAGACATCTCCT
TTTATATGAAATTCTCGAAGCAACATTGTTTTCCACTTATCATATTGAAAA-TAGATCATGAAGCACTAACAGGCAGAAA
GTGATTTTGAAAA-----------------------ACAAATAATTTAGAATGAAGT------AAAAAGTGGG-GGATTT
AT----GCAATGGACAT-ATCTATTCAGAC-TTTTGTGACTATTTGCTAGAAATCA--GTATGCAGAAGTTAGGAAG-TG
GTCAGGAGGGAAGGAAGACT--GAGC------------------TCTTAGCCTCTGGGATATTTGGGTTTCTTTGGGCCC
CAGGCTGCC
>Chiroptera_Sp2
TTTTAAATCATCTGCCCAACATTTTGATCACTTCTAGGAATGGAAGAT-------------TTCCCAAGGGCAGGAAAAA
TTTTCTGTTCATTTCAGTGTCTACCACGTGTAT-GTAAAGAAACTTGGAACATAGACGCTCAATGAGTGTGTCATTGCAC
AGAACCTCATTGCATGGGATCATCTTGGGTGGACGTCATTTCTCTTGTGGTTTCAAAACTGTTGATGAC----TTCGGGA
CCATGGG-AGGCCTGCCTTTTGAGAGTAGGTAGG------------------------------CTTTCC---------
-------------------------------------------------------TCATTTTCCATGAAATTTGTC-TCT
TAGTCTTTGTGGGGATCTAGTATAGCACACATTGTACTTCGAGGGAGGATGATTTAATGGAAATCCAACTGGAAGCTGTC
CTCGGCTAAATTAT---AATTCTAAATTAACTGTAGTGTATGTAAAA-TTTATTTTCAATAGCTTTGTTTTAAATTTTCT
TTGTGATTTCAAAGCAGTAGAATCTCAGTTGCAAATATGGTTTC-ATAAGTGGCAAATTGAGAAGAGAAACTTTTTTTTA
AT-ACAGGACCAAAAA--GCCCTGGAAAGGAAGAACATTTATTGAATTCCTACCATGTGCCATGCACTTTACATG-----
TTGTATCCCTGAACTCATTTAATATTTACGCCAAAACTTTGAAGTAG-TATTATTATTCCCACTTAACGGGTAGGAAAAC
ATAGGCTTTGAGAGGCTGACCAACTTGTCCCAGGTTATGCAATGAGTAA--------ATGGCAGTT-CTGGAATTTAAAT
CTAAATATATTTAAATCCAAATCCT--------ATGCACTTAATTCTGCTTAAC------------AAAATTATACTAGT
AGAAGTTTCAGAAGATTTTAGCCCC---TCCGAATCTCCTGGATTTGAGTGACTTCATAC--TTTTTATTATGTTAAAAT
CATATA-GTACAAAAGCCTCCCCTTCTGAACAGTG---TGGAACAAAGTGGATTTCACACATTTGAATATTTCCTCTCCC
ACACTGGTTTCACAAAAACCAG-GTCTCTCCAGGTTTCAACTTGTCAAATTAAAGAGAGACAGC-GAATGAATTGTCTCT
TCTTTT----------CT--GAGTGGCTCCTAAGTAATCTTCAGTCATCTCACTT----AAAAGAATAGAAATGACCTAC
ACTTTATTCTTATTT----CGGCTTTTATACATACATATTGATCATTTATCTGTAACCCATATACCTAATAAGTTTACTT
TTTAATCTCTTAAAGAAATTCCTGCCAAAATCAGTGAGGAAATTAGTGGGAGAGATAAGTAGCATTAAATTAATTAAATA
ACA---AGAG----------TGAAAATGAAAAGG---AGA----------AGGACAAGAGTAAGTAAATGAGCA--AGAG
AA-AGAAACTAAATTTTAAAAAGCATTAAAAGTAAAAAATTTCAAATTAGACTAAAAA-ATACTCAAAAAAATTCAGACT
AGCATAAACTTGAATTCTCA-GAGGGCTAATCCAATGCCTATAATTTATAGTCCCAAAGAAATAATATGTTAAAATGAGA
```

```
AATCCCATATTTAACTTACATGCCTAATGTCACAGGAC-------TTTGGGTTTATTATCAACATTATGGATACACAATC
AAAACGCTTTACTTC--GACACTTAAGAAAATAAATGCTTTTTCCTGGTTAATAAAC------TTGTTTTTCTCATTAAT
CTGTCTTCTGTTACATGGGTTCTAGCCAAGAAATAAGAAAGTTAGAGGAAAAATTATTTTTTTCCTCTTCTATATAAATA
AATGATTAAAAATAAATGAAG-------------------------TAAGGGTTATTACTAACTTAGTACCTAGAAATAA
CTATCAGATTTGGTAGTGGAAGAAAGAA-AAATTGATTAATTCAGCTTCAGTAGGTCAAGGACAGACTTAATGGTGAGCA
GCCCTGCATGTTGCAGGGGAAATATCATGCCCTTATGGAGGGAGTCATGAAAC--GGTGG-----------------TGA
ACTCCATAGTGAAATGATGGGATTCAAGACACATTACCCTAAAAATATGGAAAAG-AACCAATTTATATTTATTGACTGA
T--------TCTATCTGTATGA-TTTTGTCTCAGAAGGCATTC-ATATTTTTCTGGGCAATGCATGTTTATGAACCTA-A
TATGACCAAACGAATCTT-GTAGTTTCGAATTTTGGGAGCTGT--CTTTGTTATTTTGAAAGCATTTGT--TATAATATA
TCTAACA------ATTACCATGAATT-CAATGAATG--CAAATATAATGTCCACTC-ATTTTAGTATTTGAATTCTGATT
-----CATGGCTCTCCTGTCATTT---AATATCAAGA-GCTCTTAGTTTTGATTCGTGTGTAGTATATTATCTTAAATAA
AA------TGAAGCAGATTTATGAGATAAGCACTACTCATGTATTATTTTTTGGTTTGTTTCCCAATGTCTAATGATAGT
AAAATGAATATCCATACATG--------GCAAGTGTCATACAAATGAATGAT--ATAGT-TATTCCCAAGAAAGGTCTTC
GAGAGCTTTGCTATTTAGAAAATTACTGAGGAAGGAAGGAGTTACTATTAAAGTGGAAAAGGGAAGTTCAAAGAAGGTGG
AATATGATATTTTGGCTTTGAGACTCACAATA-TCTGAACTC---AGTTCAAACATGAAAATAATTTATAAAATAGAC--
AGGTTTAGAGATTGGCATTGGTGTACGTGGCTAAAATATTTTCGTCAAGTTTCCAATTTA---GAG-GTGATTTCACACC
ACTATAAAAATGTCTTTTTTCCTCTAAAAATTTAAAGTGCTTATTAAAACAGTTGCAAGATACAGTATTCCAGAATACTG
T--CCTAAAAGGAGGAGTTCTGAGCTATGTAT-----AAGAAGTGTACACTGCCAGGTGCTAAACTGGATCCCAACTACA
TGTTCATGATTC----TAACAAACTAAAGACT--TGACCTCTGAGA-CCTTTATTCAGTTTAGGATGCCCT---------
-----CCTCTAC---TTCTTTACCTTTTCCCTACTCCA--------------------------------------ACT
TTTAA-GATAGTCTACTTCATCTTT--AAAACTAACTGGAATATTTGTTTCCTTCTTTGTAAAGCTTT-TCTTGACATCC
TTACTCCCCCAGGCAG-----------------------GAGTACCTGCTCTCTCAGCACTTAACATATA--AATGACTA
AAA-CATTTTT-AATGCTATTAG-----AGTGCCCTATTTATGTCTCTGTTTCTCACACT-AGACTGTGAG---------
--------CTCATCTCATTAACTTCTGTATTCAGTTAATGCTACAGTGCCTTGCTATCAAATTTTCAAAAGATGTTCAGT
A----ATTCTCTTGATGGCTTATATTTAGTTTGACCTTTAAGGAAAACTGAAATCTACTTCCACTTCCAAAATGAAATTA
GTTTTACTTTCTAGATTGCACTGAAG----GGAAAAAAAA--------GGATTTCTGGCCTCAATTCAAGGACATTTCCT
TTTATATCAATTCTTAAAAGCAACAGTGCTTTCCATTTATTA----AATAT-AATCTCATGAAGCACTTAGAGGCAAGCA
GTAATTTTG--------------------------AAAAAAAAATTTAGAATGTAGTAAAAAAAAAAAGCGGA-GGATTT
AG----AGGATGGACAT-ATCTGTTTAGACCATTTGTCACTATTTGCTACAAACCA--GTATGCAGACGTTAGG-AG-TG
GTTAGGAGGGAAAGA---CT--GGGCTTTAGAGACGCAATTTGTTGATAGTCTCTGGGATATTAGGGTTTCTTTGGGCAC
CAGGCTGCC
>Equus_caballus
TTTTGTATCATCTGCC-AATGATTTGGTCACTTCCAGGAATGGCAGAT-------------TTCCC-AGGGGAGGAAAAT
GTTCCTGTTCATATCAATGTCTGCCAAGTGCGTGGAAAGGAA-CTTGGAACAGCGGAGCTCAAGGAACGATTCATT----
------------AAAGGGGTCCTCTTGTGCAGAGGCCGTTTCTCTTGTGATTTCAAAACTGTTGATGGTGATGTT-GAGA
TGATGGG-AGATGTGGCTTTTAAGAGTAAGTAGGAGTAAGTAGGCTTGATCTTACTCAAGAAGGCTTGAGTGAGTAGGCA
CATCTTACTGGAAAGAACTACTTCTTCTTCCCTCCTCTTTACTCCC--------CTTATTTT-CTGGACATTTG---TCT
CTGTCTTTGTGGGGCTGTAGCACAGTACATACTCTATCATGAGAGAGAGTGATTTAAAGCTAGCCCAACCAGCAGCCATC
CTCTGTTAAATTAT---GATTCTAAATTAACTGTAGGATATGTAAGA-TTTATTTTCAACGGCCTTGTTTTAAATTTTCT
CTGCCATTGCAAAGCCATCAAATCTCAGTTCCAAACATGGTTTC-ATAAGTGGCAAGTTGAGAAGAGAAACTCATTTTTC
AT-ACAGGACTAAAAA--GCTCTGGAAAGGGAGAACATTTACCGAATTCCTACCACGCGCCAGGCAC--TACGTA-----
TTATGTCCCTGAACTCATTTAATATTCACACCGAAACTCTGAAGTAG-TATTATTACTCCCACTTAATAGATAATAAAAC
CTAGGCTTTGAGAGGCTGCCCAACTTGTCCCAGGTCATGTAGAGAGTAA--------ATGGCAGTT-CTGGAACTTGAAT
CTAAGTGCACTTAGCCCCAAGTCC---------ATGCGCTGAATCCTGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNTTTCAGAAGATTTAGTCTCTAATCTGATTTTTGGGGGTTTTAGTGGCCTTGTAG--TTTCCATGATGTTAGAAT
CATGTAGACGTAAAAGGCTCCCCTCCTGAAGAGGC---AGGAACAACATTGATTTCATAGATTTAAGCACATTCACTCAT
TTCCTGGCTTCTCATGAGCCAGAGTCCTTCCATGTTTCAACTTGTCAAATGAAGAGGAGACAGCAGAATGAATTTTCTCT
TCTTTT----------CTGAGAGTGATCCCTGAATAATGTCTAGTCTTCTTACTTA---AAAAAAATGTAAGTGATCTAC
ACTTTAGCCTTATTT----CAGCCTTTCTACAAACATGTTGATCATTCACCTATAACATGTGTGGCCAATAAGTATACTT
AATAATCTCTTAAAGAAATT-CTGCCAAAACCAGTGAGGAAATCAGTTGAGGAGATCAGCAACATCAAATGAATTAAACC
ACAATGAGAA----------TGAGAATGAAAGAGAGAAGA----------AGGACAAAATCAAGTGGATG------AGAG
AA-AGAAACTACATTTTAAAAAGCACTGAAAAT-AAAAATTTCAAATTAGACTAAAAA-TTTCTCAAAATAACACAGATT
GGCACAAACCTGAATTCTCA-GGGGGCTAATCCAATGTCTATGATTTATAGTTCCAAAGAAATCATACGTTAAAATGAGA
AATCCCATATTCAACTTATATGCCTGATGTCACAGAACCTGAGGTTTTGGGTTTATTATTGACATTATGGATATGAAATC
AAGATGCTTTACTTCATGGCTCTTAAGAGAATAAGTGCTTTTTCCTTGTTAATAGACCTCTGTTCATTTTTTTCATTAAT
CTGTCTTTTGTCGTAAGGGTCCCAGCCAAGAATTCAGAAGGGTAGAAGGAAAACTA-TTTTTTCCTCCTCTACATAAACT
AATGATAAAAACACAATAAAC-------------------------TCAGGGTTTTTACTA-CTAAGTACCTAGAAGTAG
CTATCAGATTTGGTGATGAAAGAAAAGA----TTGATTAACTCAGTTCGAATAAGTCAAGGAGAAGCTTAATGGTGAATA
GCCAGACATGTTGCAGGTGACATGGCATGTCCCTATATATGGAGGCATGAAACAGAGTGGTGTGTTGAGGTATGCTACGA
ACCCCATAGTGTAATGATGGGCTTCAGGACATACTACCCC--AAATATGGAATAA-CACCAATTAATGTTTATTGGTTGA
C--------ACTGTTTGTGTGC-TTTTGCCTCAGAAGACATTC-ACATTGTCCTGGGCAATGGATGTTTCTGAAGCTGGA
TATGACAAAACATACCCT-AGACTTTCAAATTTTGAAATCTG--CCTTTGTCATTTTGATAGCGTCCCT--GTTAATATG
TCTAACA------ATTACCACGTTTT-TAATGCATGCAGATATA--ACGTCTGCGC-TTTGTAGTATTTGAACTCTGATT
TAATCTATGGCCATCTTGTCTTTGT--AATGCCAAGAGTCTCTCAGTTCTAATCTCTGTGCCGAATATCATCTTAAATAA
AA------AGAAACATATTCATCAGATAAGCACCACGCATG------------------------GAAAAGAACAACACT
GAAATGAACATCCATACATA--------GCCAGTGCCGTACAAATGAATGGT--AGAGAAAATCCCTGAGAAAGATCTTC
AAGAGCCTCACTCCTCAGAAAATTACTGAGGAAGGAAGGAGTTACCATCAAAGTGGAAAAGGGAATTTACAAGAAGGTGG
AGTCTGATAACTTGGCTTTGAGTCTAACAGTG-TCTAAACAC---GATTCAAGTTGGAAGATAACGTACAAAACGGACCT
ACGTTTAGATTTCAGCACTGGTGTGAGAGACTAAGCTATTTGTGTCAAGCTGCAAATTTTATTAAG-GTGATTTCACACC
ACTATAAAA-TA---TTTTCTTCCTGAAATTTTGCAGTGCTTCTTGAACCAGTTGCAAGACGCAG-ATTCCAGAGTACTG
AGGTCTGCAAG---AAGTTCTGCGCCACGTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCCAACGACA
TGCTCACGATTCCGAGTGACACACGACAGACTCTTGGCCTCCGAGA-CCTTTCTCCAGCCTAGAACGTCCT---------
-----CCTTGAC---CTCCCTAGCCTTTCCTTGCTCA----------------------------AATCCAACTTCTATT
TTTAAAGAGAGCCTAC-TCATCCTTT-AAGACTAACAGGACTATTTGTTTCCTTCCCTGTGAAGCTTT-CCTTGACATTC
CTACGCCCCCGCGCAG-----------------------GAGTAACTGCTCTCTCAGCACTTAACAGATA--AACGACTA
AAC-CATTTCT-GATGATGCTGG-----AGTTCACTCTTCACG--TCTGTTTCTCAAACC-AGACTATGAG---------
--------CTCATCTCATTAACTTCCGTATTCAGTTACTAGCACAGCGCCCTACTATCAAACTTTCAAAAGATGTTCAGG
AAAGGTTTTTTTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAGATATCTCCT
```

TTTATATGAAATTATTAAAACAACATTGTTTTCCATTTATTA-----AGAA-TATATCGTGAAGCATTTACGGGCAGGAA
GTAATTTTGAAAA-----------------------ACAAATAATTCAGAATGTAGA------AGAAAGTGAG-TGATTT
AT----GGGACGGAAAT-ATCTATTCAGAATATTTGTGACTATTTGCTACAAACCA--GCATGCGTAAGTTAGGAAG-TG
AGAAGGA-AGACTGAAGTCT--GGAGACAC-------AATTTGTAGTTAGTCTCTGGGTCATTCGGGTTTCTTTGGGCAC
CAGGCTCTC
>Myotis_lucifugus
TATTGAATCAGTTGCC-AGTATTTTAGTCACTTCCAGGA-TGGCAGAT-------------TTTCCAAGGACAGGAAGAT
TTTTCTGTTCATTTTAGTGTCCACTAAGTGTACAGAAAAGAA-CTTGGAACATAGGTGCCCAGTGAGTGCTTCATTGCAT
GGGGCTTCATTTCATGTGATCCTCTTGTGCAGAGGTCTTCTACCTTGTGATTTCAGAATCGTTGATG------TT-GAGA
CCATGGG-ACACCTGCCTTT-GAGAGTAGGTGGG-------------------------------CTTTCTCTGAATTCA
AATCTTACTGGAAAGAAGTAACTCTCTTTCCCTCC---TCAGTGCC--------CTCGTTTT-CTGGAAGT------TGT
CTCTCTTTGTGAGAATGTAGCATAGCATGCACCATATCACGAGAGAGGATGACTTAATGGTAACTCAACTAGACACCACC
CTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTAGTTTC-ATAAGTGGCAAGTTGAGAAGAGAAAATCATTTTTG
AT-ACAGGA------------TTGGAAAGAAAGAACATTTATTGAATTCCTACCATGTGCCATGCGCTTTACACA-----
TTATGTTCCTGAACTCATTTAATATTCACACCAATACTCTGAAGTAG-TATCAGTACTCCCATTTAATAGATAAGAAAAC
CTCGGCTTTGAGAAGCTGACCTACTTGTCCCAGGTTATGTAGTGAGTAA--------GCAG----T-CTGGAATTTGAAT
CTAAATATATTTAAATCCAAATGCT--------ATGAACTTAATTCTGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNTCCACACTTCAACTTGTCAAATTAAGAAGAGACAGCAGAATGAA-----TTT
CAACTT----------CTGAGAATGACTTCTGAATAAACTT--ATCATCTTACTT----AAAATAATATTAGTGACCTAC
ACT------TCACTT----CAGCCTTTATACNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTCATAAT
GGCACAAACCTGAATTCTCA-GAGGGCTAATCTAATACCTATGACTTATAGTCCCAAAGAAATAGTATGTTAAAATGAGA
AATCCCATATTCAACGT--ATGCCTATTGTAATAGGAC-TGAGACTTTGGGTTTATTACCAACATTATGGATATGAAATC
AAGATTCTTT-CCTCATGACTCTTAAGATAATAAATGCATTTTCCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNATAAACA
AATGATTAAAATGCAATGAAC-------------------------TAAGCG---TTGTTA-GAAC----CTAGAAACAA
CTATCAGATTTGGTGGTTGAAGAAAGAA----AAAATTAACTCAGCTTCAGGGGGTCAAATAGAGGCTTAATGGTGAGTA
GCTCAACATGTTGCAGCGGAAATAGCGTGTCCCTGTGTTTGGAGGCATTAAAATCAGTAGTGTGTTAAGGCACAGTATGA
ATCTCATAGTGTAATGATGGGGTTCAGAACACACTACCCC-AAAATATGGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCAAG--
--ATCTCTGGCTATACAGTCACTGT--AATACCAAGA-GCTCTCAGTTTTGATATGTGTACAGAATATTATCTTGAATTT
GA------AAAAGCATATGCATGAGATAAGCACCACTTATGTTTTTTT--------------CTGATGTCCAATAATAGT
AAGAGGAATATCTATACATG--------GCAAGTGCCATGCGGACGGATGGT--ACAGAATATTCCTGAGAACATCCTTT
AAGAGCTCTGCTAATTAGAGAATTACTGAGGAAGGA--------------CGTG--AAAAGGACTTTCAAAGAAGGTGA
AATCTGATAATTTGGCTTTGAGATTCACAATG-TCTAAAGTC---AGTTCAAGCTGGAAAATAATTTATAAAATGGACTT
ACGTTTAAAGTTCACCAATGGTGTAGAAAATTAAAATATTTTTGTCATGTTTCCAATTCT---GAG-GTGATTTCACACC
ACTATAAAAATA--TTTTTCTTTCTAAAATTGTGGATTGCTTATTGAAACAGTTGCAAGA-ACAG-ATTCTAGAATACTG
TGGTTTAGAAGGAGGAGTTCTGAGCTATGTAT-----AAGAAGTGTACAANNNNNNNNNNNNNNNNNNNNNCCAGCCACA
TGCTCATGATTCTGAGTAACACACTAAAGAGT--CAGCCTCTGAGATAATTTATTCAGCCCAGAATGCCCT---------
-----CCCCCAC---CT-CCTACCCTTTCCCTGGCCA----------------------------AATTCAACTTTTATT
TTTAAAGATAGCCTAC-TTAACCTTT-AAAACTAACTG-AATATTTGTTCCCTTCTGTGTGAAGCTTT-CCTTGACATCC
TTACTCCCTCAGGCAG-----------------------GAGTAACTGCTCTCTCAGCACTTAATATATA--AATGAGTG
AAA-TATTTTTTAAAGATATTAG-----AGTGTCCTATTTATGTCTCTGTTTCTCACACT-AGACCATGAG---------
--------CTCATCTCATTAACTTCTGTATTCAGTCACTAGCATAGTGCCTTGCTATCCAATTTTCAAAGCTGTTCAGT
A----CTTCTCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNATTAAATTCTTAAAACAACATTGCTTTCCATTTATTATATTAA----------ATGAAGCACTTCCAGGCAAGCA
GTGGTTTTGGAAAAAACAAAAACAAAAAACAACACCACAAATAACTCAGAATGTAGT------AAAAAGTGGGGGGATTT
ATGGATGGGATAGGTAT-ATCTATCTAGACCATATGTCACTGTTTGCTACAAACCA--GTATGCAGACGTTAGGAAG-TG
GTTAGGAGGGAAAGA---CT--GAGCTCTGGAG-----AT-----GTAATCTGCTGGAACATTCGAGTTTCTTTGGGCAG
CAGGCTGCC
>Outgroup1
CATGGGATTATCTGC----TGTTTTTGTCACTTCCAGGAAGGGTGAATTTCCCACGGACAATTCC-AAGGGCAGGAAAAT
TTTACTGTTTGTTAAAGGGTCTACAAAGCGTACAGAAAAGGAACTTGGTACCCAGGTGCTCAGTACGTGCCTTATTGCAC
TGAAC-----TGAAAGGGATCACCTTATGCAGAGGAAATTTTCCTCGGGATT-AAAAACTATTGATG------TT-GTGA
CTGTGGG-GAATCTGCCTTTTTAAGATAGGTGGG-------------------------------TTTTATTGGATGCCC
AATCTTACTAGAAAGAATGCATTTTCTTTCCCTCTTG-CTCACCCC--------ATCATTTT-CTGGAAGAAG----TCT
ATGTCTGTGTGGGGCTGCAGCCGAGCA--AGGCTAACCTGGTAGGAAAGTGGCTTAATGCTAGCCCACCATACCCA----
---TGTTCGATTAT---GATTCTAAATTCATTGTGTTACATATAAAA-TTTATTTCTAATAGGCTTGTTTTAAATTTTCT
TTGTGATCTCAAAGCAACAGACTTTCAATCCCAAATATGGTCTC-ATTAGTGCCAAGTTGAGAATAGAAACTCATTTTAA
AT-ACAAGACTAAAAA--GCTCTGGAGAGGGAGAACATTTACTGAATTCCTATCACATGCCAGGTACTTTACAGA-----
TTATATCCCTGAACTCATTTAATACTCACATCAGAATTTTTAAGTAGGTATTATTACTCCCATTTAATAGGTAAGAAAAT
CCAGGCTTGGAGAGGCTGACAAACTTGTCTGAGGTTATATAGTGAGTAA--------ATGGCAGTT-GTGGATTTAGAAC
CTAAATATATTTAAATCCAAATCCT--------GTGCACTTAATCCTGCTCAAC------------AAAATTATACTATT
AGAGGTTTCAAAAAACTAGATCTCC-GATCTAAATTTCCTGGATTTGGGTGACCTTATAC--TTCCGGTTATATTAAAAT
CATATAGGTCTAAAGGCATTCCCTCCTGTAAAGAT------------------TTAACACATTTAAGCAAATTCACACAT
TCCCTGGTGCCTCATGGTCCAAGGTTCTTCCAGGTATCAACTTGTTAAATTA----GAAAGA---GAATAA--TTTGTCT
TCTGTTTTGTTTTTCCCTGAGAGTGACTCCTGAATATTATCTAGTCAGTCTTCCTTCTTAAAAGATTATAATTGGCCCCC
ATTTTAGCCTTATTT----TAGCTTTTAAACAAAAGCATCGATCATTCACCTAAAACACATATCCCTAGTAAGTGTACTG
ATTTATCTCTTAAAGAAATTCCTGCCAAAACCAGTGAGGAAATTAGTGGAGAAGATCAGTAACATCAAACAAGTTAAACA
ACAGTGAGAA----------TGAGAATGAAAGTGAGGATG----------AGGACAAGAATGAGAGAGAGAGGGAGAGAG
AG-AGAATCTACACTTTAAAGAGCACT--------AAAATTTCAAAACATACTAGAAACATACTCAAAATAATACAGATA

GGTATAAACCTGAATTCTCA-GGGGGTTAATCCAGTGTCTTTGATTTATAATCCCAAAGAAATAATTTGTTAAAATGTGA
ACTCCCATCTTCAACTTACATGCCTGAGGTCACAGGACCTGAGACTTTGGGTTTATTGTTGACATTATGAATATGCAATC
AAGATACTTTACATCCTGACTCTT-----AATAAATGCTTTTTCCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTAAATA
AATTATTAAAATACAATGGAC-------------------------TGA--GTTGTTATTA-CTTAGTACCTAAAAGTAG
CTATCAGGTTTGCTGGTAGAAG-AAGA----TTCCATTAATTCAGCTGGAGTAGGTC-AGGAGAGGCTTAATGGTGAATA
TCAGAATATGCTGCAGATGAAATAACTCGTCCCTATATATGGAGGCATGAAACAGAGTGAGGTGTTGAGNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
T--------TCTATTCATGTGATTTTTGCCTCAAAACACATTT-ATATTTTCCTGGACAGTGAGTATTTATGAACCTAGA
TATGAC----CAAA-CCTCAGAGTTTTGAATTTTGAAATCTG-ATCT---TTATTTTAAAAGCATTTGT--ATTACTATG
TGCAATATTAATAGTTATCATAGTTT-TAATTCAGA--CATATATGGTGTTTGCTCTTTTTTAGTATTTAGATTCTGATT
TAGCCTATAGGCATCTTGTCTTTGT--AATGCCAAGAGTATTTCAGCTCTGATCTATGTGCAGAATACTATATTAAATAA
AA------AGAAACACATTCATGAGATAAGCACCATTCATG-----------------------AAGAAGAATGGCAAT
GAAATGAATACCCATAAATG--------GCAAGAGCCGTACGGATGAATGGT--AGGGAAGATTCCCGAGAAAGGTCTTC
AAGAGCTTTGCTAGTTAGAAAATTACTGAGGAAAGAAGCAGTTACTATC----CAAGAAAGGGCACCTCAAAGAAGGTAG
AATTTGATCAGTTGGCTTTGATTGTCACAAGG-TCTAAACTCTTCAGCTTAAGCTAGAAAATAATTTACAACATGAAATT
AGGTTTAGAATTTAGCATTGGTGTAAAAGGCTAAAATA-TTTTATAGAGTTTCTGATTTTAATAAG-GTAATTTTACACC
ACTATAAAAATA-------TTTTCTAAAATTTTGGGGTGCTTCTTAACACAGTGGCAAGA--CAG-ATTCTAGACTACTG
TGGTCTAGAAGGAGAAGTTATGAGCTATGTTTATT--AAGAAGTGTACAACACAAGGGTCTAAAGTGAACCACATCACAC
TACTCATGATTTTGAGTAATATACTAAAGACT--TGGCCTCGGAGA-CCTTTATTCAGTCTAGAACGCCCT---------
-----AGGCTTC---TTGCCCTTCCCTTCTCTACTCTTTCTCTGCCA-----------------AAATCCAACTTTTATT
TTTAAAAATAGTCTAC-TCATCCTTT-AAAACTAAGTGAAATATTTGTTCTCTTCC-TGTGAAGCTTTTCTT-GACATCC
-TATTCCCCTAGGCAG-----------------------AAGTAACTGCTCTCTCAGCACTTAATATACA--AATGACTA
AAA-CATTTTT-TATTGCATTAG-----AGCTCACTATTTCCATGTCAGCTTCTCACACT-AGACTATGAGCCCTTGAGG
GTC-----AGTGTCTCATTAACTTCTGTATTCAGTTACTAGCACAGTG-CTTGGTATCAGATTTTCAAAAGATGTTCAGT
A---TATTTTT-GATCCGATTACATTAAGTTTGACCTTTAAGGAAAACTGAAATCTACTTCCA------AAATGAAATTA
GTTTTACTTTCTAGATTGCACTGGAG-----------------AAAAAATATTTCCAGCCTCACTTTCAAGACTTCTTTT
GTCATATGAAATTCTTAAAACAACATTGTTTTCTATTTATTTTATTAAAAC-TATGTCACGAGGCACTTGTGGGCAGGAG
GTGATTTTGAAAA----------------------GACAAATAACTTAGGATGTAGT------AAATAGTGGT-AGATTT
AT----AAGACAGACAT-ATCCACTGAGACCATTTGTCACTATCTGCTAAAAACAAATGTGTGCAGAAGTTAGGAAG-TG
GTTAGGAGGGAAGGAAGACA--GCTCTGGAGACAA--AATCTGTAGTCAGTCTCTGGGACAAGCATATTTCTTTGGGCAT
ATAGCTGTT
>Outgroup2
TA----------TGCC-AGTGTTTTGGTCACTTCCTAGAATAGCAAAT-------------TTCCCAAAGACAGGAAAAT
TTCACTGTTCATTTTAGTGTCTACATAATGTATAGAAAAGAAACTTGGAACA-----------TAGGTCCTGCAGAGCAC
TGAAT-----TGAAAGGGATCATCTTCCACAGAG-TCATTTCTCACGGGATTTCAAAACAACTGATG------TT-GAGA
CCATGGA-TGACCTGCCTTTTGGAGAGAAGGTGGGCTTTATTG----------------------CTTTATCTGAAGTCA
AGTCTTCCTAAAGAGAACTAATTTTCTTTCCCTT----GTCACCTC--------TTCATTTT-CTAGAAGTTTGTCTTTC
TTGTCTTTGTGGGTTTGCTGCACAGCACACAGTATACCAGGCAGGAGAGTAACTTAATGCTAAGGCTAACAACAACAACG
ACTATTAAAATTAA-----TTCTACATTAATTGTACATTATGTAAAA---TTTGTTTGATGGCCTTATTTTCAGTTTT--
--GAAACTTCTCAGCAATAGAATCTCAGTCCCAAAAATCATTTC-ATAAGTGGTAAGTTGAAAACAGAAACTCATTTTTA
ATAATAGTACTAAAAAATGCTTTGGAAA--GAGTCCATTTACTGAGTTCCTACCATGTGCCAGGTACTTTACATA-----
TTATACCCCTCAATTCATTTAATACTCACACCACAACTTTGAAGTAGGCATTATTACTCCCATTTAATAGATAAGAAAAC
CTAGGCTTTG-GAGGCTGACCAACTTATCTGAGGTTCTGCAGTGTGTAATCTTTGTAGAAGCAGTT-CTGGAATTAGAAT
CTAAATATATTTGAATCCAAATCCT--------ATCCACTTAATCCTGCTCATC------------AAAATTATCCTATC
AAAAGCTTCAGAAGAGTATAGCCCT-GATCTGAATT-CCTGAGTTTTGGTAAGCTTGTGC--CTTCCATTATTTTAAAAT
CTGATAAGAGCAAAATCTACCCATA-TGAAAAGTC---AGGAACAAGATAG--TACATTCATTCA---------------
----TTCCCTCTCATGAGCCAGAACCCTTCTAGGTATCAATTTGCTGAATTAAGAAGAGAGAACAAAATGAATTTTGTCT
TCTTTT----------CCAAGAGTGGCTCCTGCATAGACTCTAATC--------------------TACAAGTGGTTTAC
ATTTTAGTCTTCTTT----CAGCCTTTATTCAAAACTACAAACCATTCCCCTATGTCACATGTCCCAACCAA-TCCACTA
ACTACTCTCTTAAAGAAATTCCCGCAAAAGATAGTGAGGAAACTAGCGGAGAAGATCAGTAACATCAAACTAGCTAAACA
ACAACCCTAC----------TGAGAGCAAAAGCGAAAGTGA---------GACAAGAGAGGGTAAAAGAGTGAGAGAGAA
AGCATGTGCACGATTTTAAAAAGCACTAAAAAT-AAAAAGCTCAAATTAGACTAGAAAAGTACTC----------AGGCT
GGCACAAACCTGAATCCTCA-GGGGACTAGTCCGGTGTCTATCATTTATAATCCCAAGGAAACAATATGTTAAAATGAGA
ATCCCCATATTCAAATTACATGTCTGATGTCACAGGACCTGAGACTTTGGGTTTATTATTGACATTGCGGACATGAACTC
AAGATGATTTTCTTCCTGACTCTTGAGAGAATAA-TGCTTTTTCTTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTAAACA
AATGGCTAAATTATAATGAAC-------------------------CAAGAG---TTATTA-TTTAGTACATAGAAGCAG
CTAT-----TTGGTGAGAGAAGAT-GAA-------ATTAACTCAGTTTGAGTAGATCCAGGAGAAACTTCATGGTGAATA
GCTGAATATTCTTCAGGTGAAATAGCATGTCCCTCTATAAGGAGGAATAAAACACAATGGTGTATTGAGGTAT-CTGTGA
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
--GGACCAAACAAATCCT-AGAGTTTAGAATTTTGGAATCTGTGTC--TGCTATTTT-AAAGTATTTGT--ATTAATATG
TCTAACA------ATCACCATACTTT-TAATGCCTG--CATGTATAATGTCTGCCG-TTTATAGTCTTTGAATTCTGATT
TAATCTATGGCCATCCTGTTTTTGT--AATGCTAAGAGGTTCTCAGTTTTGACCTAGATGCATAATATTGTCTTAAAATA
AT-----AAGAAGCACATTCATGAGCTAAGTACCACTCATG-----------------------AGGAAGAATAACAGT
GCAGTAAATACCATATCCGGGTAATTGTGCAAGAGCCATACGAATGAATGGT--AGGGAAGATTTCTGAGAAA-GTTTTC
AAGAGCTTTGATAATTACAAAGTTATTGAGAAAGGAAGGGGTTCCTGTCAAAAGGTAAAAGGGAATTTCAAAGAAGGTAA
AATGTGATAATTTGACTTCGAGTCCCACAATGTTCTAAACTC---AGCTCAAACTAGAAAAAAAATTACAAAATGGAGTT
AGGTTTAGAAGACAGCATTCGTGTAGGAGACTAAAATTGTTTTGTAAAGTTTCAGATGTTTT-AAG-TTGATTTCACTCC
ACTATAAAAA----TTTACTCTTTAAATTTTGTAGACTGTCTCTTGAAACAGTTGTAAGATA-AG-GTTTTAGAACACTC
TGGTCT---AGAAGGAGTTCTGAGCTATATATGTTAAAGGAATTTAAAAATGCAAGATCCTAAACTGGACCACATTAGGC
TGCTCATGATTCTGAGTAGCACACCAGAAACTGCTGGCTTCTGGGA-TCTTTATTCAGACTAGAACACTCT---------
-----GGCCTCC-TAATTGTGTCCCTTTCCCCAACCTCTACCTACA------------------AAATCCAACTTTTCTT
TTTAAAAACAGAGTAC-TCATCCTTT-AAAACTAACTGAACTATTTGTTTCCTTCCCTGTGAAGTTTT-CTTTGACACCC
CTACTCTCCCAGGCAG-----------------------GAGTAATTGCTCTCTCAGTACTTAACACATA--CATGACAA
AAA-CATTTCC-GATGACATTAA-----AACCAACCAGTTACATCTCTGCTTCTCACACT-AGGCTATGAGCTCT-GAGG
GCCAGGACAGTGTCTCGTTAGCTTCTGTATTCAGTTACTAGCACAGCACCTGGCACCTACATTTTCAAAAGATGTTCAGG
A----ATTTTTTTGATTGCTTATATTTAACATGACCTTTTAAGGAAA------TTTACTTCCA------TACTAAAATTA

GTTTTACTTTCTTGATTGCACTTTGGTGGGGGGGAGGGGGGCAGGGCAGGATTTTCAGCCTCAATTTTGAAATACCTCCT
TTTAAATGA--TTCTCAAAAAA---TTAATTTCCATTTTTTAAATTTAAAA-TATGCCATGAGGCATGTATAGGAAGAAA
CTGATTTTGAGAAA----------GA-AAATA-TTCAGGATGTAGT------AAAAAGTGGG-GAATTT
AG----GGGATGAGCAT-ATCTATTTAGGCTGCTTTTCACCATTTGCTACAAACCA--GTTTGCAGAAGTTCGGAAGTTG
GTTAGGAGGGAAGGAAGACTGAGCTCTGGAGAAGC--AATCTGTAGTTAATCTCTGGGACATTCACCTTTCCTTGAGTAC
CAGGTTACC
>Perissodactyla_Sp2
TATTGAATCATCTGCC-AATGTTCTGATCACTTTCAGGAATGGTAGGT----------TTCCCAAGGGCAGGAAAAT
GTCCCTATTCATTTCAGTGTCCTCCAAGTGCATAGAAAGGAA-TTTGGAACATAGATGCTCAATGAATGACTCATT----
----------AAAGG-ATCATTTTGTGCAGAGATCATCTCTCTTGTGATTTCAAAACTGTTAATG------TT-GACA
CCATGGG-AGACGTGGCTTTTAGGAGTAAGTAGG----------CTTAATCTGAAGTCA
AATCGTACTAGAAAGAACTATTTCTTTTTCTCTCCTCTTTAACCCC--------CTCATTTT-CTGGAACTTTG---TCT
CTGTCTTTGTGGAGCTATAGCGTAGCACACACGCTACCATGAGGGAGAATGATTTAAGGTTAGCCCAACCAACAGCCATC
CTCTGTTAAATTAT---GACGCTAAAGTAATTGTAGCATATGTAAAA-TTTATTTTCAATGGCCTTGTTTTAAATTTTCT
CTGCCATTTCAAAGCTACAGAATCTCAGTCTCATATATGGTTTC-ATAAGTGGCAAGTTGAGAAGAGAAACTCATTTTTA
AT-TCAGGACTAAAAA--GCTCTGGAAAGGGAGACCATTTATCGAACTCCCACCATGTGCCAGGCACTTTACATA-----
TTATGGCCCTGAACTCATTTAATATTCACACTCCAACTTGGAAGTAG-TATTATTACTCCCATTTAGTAGACGAGAAGAC
CTAGACTTTGAGAGGCTGCCCAACTTGTCCCAGCTTACGTAGTGAGTAG--------ATGGTAGTT-CTGGAATTTGAAT
CTAAATGTATTTAAATCCAAAGCCT--------GTCCACTGAATCCCGCTCAAC----------AAAATTATACTATT
AGAACTTTCAGAAGATTTTAGCTGCTAGTCTGAATTTCCTGGGTTTTGGTGACCTTGTAG--CTTCCATGATGTTAGAAT
CATATAGATGTAAAAGCCTTTCTTTCTGAAGAGGC---AGGAACAACATGGATTTCATAGATTTAAGCACATTCACTCAT
TTCCAGGCCTCTCATCAGCCAGAGTACTTACACGTTTCAACTTGTCAAATTAAGGAGAGAGAGCAGAATGAATTTTCTTG
TCTTTT----------CTGAGAGTGGTCCCTGAATAATCTCCAGTCTTCTTACTTT----AAAAAATATAAGTAACCTAC
ACTTTAGCCTTATCT----GAGCCTTTATACAAACA---CGATCATTCACCTATAATATCTGTTCCCAATAAGTCTACTT
ATTAATCTCTTAAAGGAATT-CTGCCAAAAC-AGTGAGGAAATTAGTGGAGGAGATCAGTAACATCAAATGAATTAAACC
ACAATGAGAG----------TGAGAATGAAAGTGAGG----------AGGATAAGAGCAAGCGGATG------AGAG
AC-AGAAACTACATTTTAAAAAGAACTAAAAAT-AAAAATTTCAAATTAGACTAAAAAAATACTCAAAATAATACAGATT
GGCATAAACCTGAATTCTCA-GGGGGCTAACCCAATGTCTATGATTTATAGCTCCAAAGAAATCATATGTTAAAATGGGA
AATCCCATATTCAACTTACATGCCTGAAGTCACAGGACTTGAGATTTTGGGTTTATTATTGACATTATGGATATGAAATC
AAGATGCTTTACTTCATGACTCTTAAGAGGATAGATGCTTTTTCCTTGTTAATAAACTTCTGTTCATTTTTTTCATTAAT
CTATCTTTTGTTCTAGGGGTCCTAGCCAAGAACTCAGAAGGGTAAAGGGAAAACCA-CTTTTTCCTGCTCTGCATAAACT
AATGATTAAAATACAATAAAC----------TAAGTGTTGTTACTA-CTAAATACCTAGAAGTAG
CTATCCGATTTGTTGATGAAAGAAAAGA----TTGATTAACTCAGTTTGAATAAGTCAAGGAGAAGCTTAATGATGAATA
GCTAGACATGTTGCAGGTGAAATAGCATGTCTCTATATATGAAGGAGTGAAACACAGTGGTGTGTTGAGGTATGCTATGA
ACCCCATAGTGTAAAGATGGGGTTCAGGACACACTACCCC-AAAATATGGAATAA-TACCAATTAATGTTTATTGATTGA
C--------TTTATTTGTGTAA-TTTTGCTTCATAAGACATTC-ACATTCCCCTGGGCAATGAATGTTTACAGACCTGAA
CATGACCAAACAAACCCT-AGAGTTTCAAATTTTGAAATCTGTGTCTCTGTCATTTTGATAGCAATCCT--ATTAATATG
TCTAACA------ATTACCATGTTTT-TAATGCATG--CATATACGATGTCTGCTC-TTTTTAGTATTTGAATTCTGATT
TAATCTATGACCATCCTGTCTTTGT--AATGCAAAGAGGCTCTCAGTTCTGGTCCTTGTGCAGAATATTATCTTACATAA
AA------AGAAGCAGATTCATGAGATAAGCACCACTCATG----------GAAAAGAATAG---T
GAAATGAACATACTTACATG--------GCAAGTGCCA--CAAATAAATGGTAGAGAGAAGATTTCTGAGAAAGGTCTTC
AAGAGCTTTGCTCATTAGAAAATTACTGAGGAAGGAAGGACTTACTATCAAAGTGGACACGGGAGTTTCCA-----GTGG
AGTCTGATAATCTGGGTTTGAGTCTCTTGGAG-TCTAAACAC---AATTCAAGTTGGAAAAAAGCTTACACAATGGACTC
AGGTTTAGAATTCACCATTGGTGTAGGAGACTAAGGCTTTTTTGTCAAGCTTCCAATTTTGTTAAG-GTGATTTCACACC
ACTATAAAAATA---TTTTCTTTCTAAAATTTTGGAATGCTTCTTGAAACAGTTGCAAGACACAG-ATTCTCCAGTACTG
CGATCTACACGGAGAAGTTCTGCACCCTATTA-----AAGAAGCACACAATGCAAGGCCCTGAACTGGGTCCCAACTACA
CGCTCATGATTCTGAGTA-------ACACACTCTTGGCCTCTGAGA-CCTTTATTTAGTCTAGAATATCCT---------
-----CCCCTAC---CTCTCTACCCTTTCCTTGCCCA----------AATCCAACTTTTATT
TTTAGAGAGAGTCTAC-TCATCCTTT-AAAATGAACTGGAATATTTGTTCCCTTCCCTGAGAAGCTTT-CCTTGACATCC
CTACTCCCCCATGCAG----------GAGTAACTGCTCTCTCAGCACTTAATATATA--AATGACTA
AAA-CATTTTT-GATGATACTCG-----AGTTCACTATTTATG--TCTGTTTCTTACACC-AGACTATGAG---------
--------CTCATCTCATTAACTTCTGTATTCAGTTACTAGCACAGTGCATTGCAATCAAATTTTCAAAAGATGTTCAGT
AAAGGTTTTTTTTGATCACTTATATTTAGTTTGACCTCTAAGGAAAACTGAAATCTACTTCCA------AAATGAAA---
----------GATTGGACTG----------GGGGAAAAAAAGATTCCCAGCCTCAATTTTAAGACATCTCCC
TTTATATGAAATTCTTAAAACAACATTGTTTTCCATTTATTATATTAAGAA-TATATCATGAAGCATTTACAGGCAGGAA
GTGATTTTGGAAA----------ACAA----TTTAGAATGCAGA------AAAAAGTGGG-AGATTG
AT----GGGATGGACAT-ATCTATTCAGACTATTTGTGACTATTTGCTACAAACCA--GTATGCGGAAGTTAGGAAG-GG
GGAAGGA-AGACTGAACTCT--GGAGACAC-------AATTTGTAGTTAGTCTCTGGGACACCCAGGTTTCTTTGGGCAC
CAGGCTGTC

3. Cetartiodactyla+Carnivora

```
>Bos_taurus
TAAACTCAGGCTATACTATTTTGTTAAAAAC---ATCA----TGGGTTTGTACATCTGAGCTAAG--TTGCCTTTG---A
GAAAGTACTATAGAAACTGTTTTTAA-TTGCCTAAA-C------ATTATCACATT---TTGTTATCACTTCAATCCATG-
TTACAGATTATAGTCACATAATGTAAAATTTAAAACAGTACTTAG-TAGTACCTTTAATCTCAATAGATGTG----TTAC
ATTTATTGCATAGCC-TGTATT-TAGTGTTTTATTCATATTGTCAAATTTAGTAAAATTCAGTAGTTCCCACAA--GTTG
TTTT-----AAGGCC-CGTTTAACAGATCTGCCGTATGATATTC--ATTTATCTTTTCAGGTGTAATAAATTTTCAGGGA
TAAGTCGGATGGACCATTGCTCAGTGATTTACACTGAGATGGGGCAGT-----------ATAGAATATGGGGAAGGTGAG
-AAAATGTAAGATCACAAAGAGCGAGGGAAAG-CACATATGAAGG-ACATGGCCTATGTTACACGAAATTAATA-----T
TGCTCCTGTGTTTCTGAAATTAGAGTTAAGCTACTTGCTCAGTT---------TTTCATTTTTTTAGAATGGAATAC---
-AAATATTGTTCACAG-TTTGCTTAGTAAATATTTAGGAAGATGAGAATGCAGAAGTAAGTGTAAAGAT-TGGGTCTCG-
----TTTCTTCATTGTAAAGTAAATCATTTT-TGTTTCTCATA---TGTTTAT-CAGAGATAAAATGAT---ATAAAATT
TCTAT---------CAGCACCTCTGCTTACCAAGTAAGTTAATCTTAGTTATGAACAAGTTAGCAGCAACCAG-------
----------TAAATT-CAAGGCAGATGTGACTAAGGTAA---TCTCTT
CCCACAGATAG----CCAATGATTCTACAAGAAAACAT-TCATTACTCCACACTTCTGCAATGTCTTTC--TAAAAGCCC
CTAAACTGTTCTAGAAAGATGTGTTCATGTTGTCTGAGGCATAAGATAG----GGTTCAGATGGGAAGATCATATTGAAA
AAATAAACACAGTGTTTGTGGACTAAAGTGTG--TCTTGGCATTATCAATAACTTAACTGTGGTGCGAACTCTTTAGG-T
GTCAACTTCT-CATCTGAAAAATGCATGTAATTCAAGAGAGGTGAATTACATGCATTTCAAGAGAGGTGACCCCCTACAC
TAGTCAGTACCAGGAATGAAAGATGACTCCC-------------------TTCTTACTGACAGCTCCTATTTCCCTGTCC
TCC-ATCCAGCTTCAATCCAG----GACA---GGG------AGATATTCTATTTACTGTCTAGGGTGTGTTACCCCAACT
CACTGGTGCTTGCTTCTTTCTGTCTCTCCCTTGT-----------TTCCTCTGCACCTCCCACACCGTGTAGTCTCTGTT
CTTGTGTAC-TGATTCCATCCTCCTTGATGGAGCTGGTAAAGCATCAGGAGGCTTCCAGGCCCTGTCTTTCCTCAGTTGT
TGTATTTGCTTGTCTTAATAAATAAATCTTCCTTTCGCTAATA--TTAATTTCTTTTTAAAACATCACAAACTCTAGAGA
T-----------TATG----TTAACAGCCTCTGCCTCTTTATTCTGCCTCTCAAGGACTGCTAAGATTTTCTTCTTCATA
CTTAAATATGTGCCATCACATCCAGAAAAAGTTAGAAAATTCCCTAATAGGAATGTAGATATGGGGAGGTAAAAA-CTTC
AGTCTACCATCATAGTGTTTGCAGTGTGTTCAGAGAC------------ACATGGANNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGAA
GTGTAATCAAACACA-AAAAACCTTCATCTTTC-ACAACCATTACCACTG--TCTTTCTAATTCATCTC-TGGAACACAA
AGAAATTTGTGTGTTTTTAGGATTCATCACCATTTGTTTAGTTG----TTTTCTACCTAACTATTTATCTAACAGCACTG
TTTGTTTGGAGGGAAAGCTGTCTC-AGAGAGTGAATTCTCTGAACTGTGGTGACAGGAAACCTATGGATTGAGTTTACAT
ATTTATACTTCTATGT---TGCCTGGAGATTTACAGGTTTATATTTTTAGTGAATCTGAACTCTAGACTA-AACTGCCAA
CAATCTACATGGTAACAACTCACCTAAAGGAAGGGCTACGTCTTATACCTCTTTCTACCCCCAGTGTGTATTATAGATTC
TGGCATACAATAAGGACTCAGCATACATTTGTCAAACTGAATTGACTTACATTCTATCTTGAAAGACCAATATTTAAATA
AT-GTCAGTA-TCCTTGGT--TTTACTTGGGGAGGGAGGTAGAGAGCACAGTTTT-AGAGAGCACAATCT-TGGGTTATG
ACTTCCTGCTTT-TCTATTACATTTCTTCACAATATATAATTACA-TTAATAGAGTCTCAGCAAACCAAAAGAACATTTC
AGATATTATCATCTAATGCCATCAGTATTGCTTTTGACAAAAC---TAGATATTAACTTTTGGTTGCACATATTTGCAGA
ATATTAAGCTTTAATAAAGTTGAAGGAAA------TTTGCTTAATGTAGTTGTATTCATGACATTGCTTTACCTATACCT
GACTACA--TACTAGAACTTAAATAATCCTGAAAACCCATGTCCCAGTGGAAGCAAGCAG-AAAGTCAGGCAAGCGTGAT
ATGTCTTGTTACTTGTTGGC-AAAGTGCTT-TCAGAAAAGTTCCATCATCTCTGCTTCCCTATTCTTG-----------A
CTTTTAAAAAA-GGTATCAGTTCAGAAATGAGAAATACCGTTTCCCACTGCACTCACCACTCTCTGCCCTC-GAGTCTCA
TGTCTGTGCCCTGCCCTGAATTACACTCTGCCTGTTGGCATCCCATGTGAGTATTTCACTTAGCACCAGCAGCAGCTGCT
C-CCCATAGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAATCCGTTTAAAAGACATTCCTAACCTGA
GGTTCAATCCTGGAAGCAAGACCTCTCTTTCCTGTA-CAAGCAAAGGT----AAGTCTCATCATTTTCTCATCCA-TTTT
CTTCTCAGCTTCTGCCTGGAGTCGGGGTGATGGTGGTGTATTTTCTAGTAATGATTCTCTCAAGCATTTTT--TACTATG
CTTTGAG-----TCTTCTCCATTTCCCTATGACTGTGGATTTT--ATA-ACTAGAGCTAAAGATAG--TT-CATTTCTGT
TCTCTGGCACCCCCTTGGCCTTACCTTGACCCAAAAACATTCCANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGCCAGA
CCAGGCTGGTCCTGATGGGGGA--------CGCTGGTTGCCTCGTCTTGCGAGTGGGTCCCGCCAGGCTGAAAGCTCTGT
GAGGACAGGGGTTCTTTGTGC-------TCCCTGTATACACAGTGCAGGGAGCCTGGTGAGTGCCCCA-G----------
--CAGGTGGACCAAGGAATCCCATATGCCTGGCTCCCCAGGCAACGTGTGGTG----ACCAGCTTTCTTTTTTTGCAAG
CCTGC--------TTACTCCTCAGAACGGAGACCTCCAGCCACCCTGGTCCCCTCCTGAGGACTAGTCTTTATGCTTGGC
TGAGG----GATGGCAGAGCTCTGACCCAGCTCTGTAACTCTCAGGATTGAGTCAACACAGCTGTGACCTTGCTTATAAA
GCTTCTGAAACTTTCTGAGCCCA-------C---TCGGCTTCCTCCTCT-GGAGGATTTTTC--CCTCCTTGAAGTTTGC
CACACAGTCT-TGATGAT---ATTATCAAGGCAAAAACTCTATGGGACTATTTAACAACCCTGGATGCTTTTATTGTAAA
ATGGATATT-----GAGTACATTCAGAATATGCATTTCTGTGAGAGGTTTATAATTACATACATGTAACTAAAATTTACA
AGAATGAA-AAGAATGAAATCTTGTCATACAAAATA-TTTAA--TCTGTTATCCAGTTATTGTGTTAGTGGTGATTGTGA
ATGTATCC-AATGTTATAGGCATTCTGCA----------TTTTAA------AGCATTGTATGGACAGGCACCAACCTACC
TTAATCAAGACTCTTG-ATAGT-CTTATTTTTTATAGAGTGCCTATGATA-TGCTAGGTTCT------------------
----------TAAGTAGTGGCCTAATCTCT-------------------------------AGTATTGAATC-------
TCT-AAGGTCCGTCTAATGGTCTCTGTAAAGTAGGTC-TGGGAAAGAA----CTT-CT-CGATTGTGAA-TGAGAGGCAT
TAAAGAACAGATAGGTACCAGAAATGAATCTT-ACACCTGTTTAACTACTTTCAAGTAAAAATAGAAAAGTTTTCGCACC
CATTTTGATTGAATCATAACAGTCACCTATGAGGAGAGCTTATAAATTA---AAAAATTAAATTTTCATCATGGGACAAA
TTTAACTGAAAGGGTGAAAAATTAGGACAAGAATTTAAATTATAAACCTCAGTTTTAATATTTGTGTGTACTTTCTAGCT
CTTGAAATTTGTTCCTGAAAAAAGTGATATTGACCTGTTGGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNTTCTTTTGGATT-TTTCAAAT---------------CTCCCCCAAGAGTCTCTACTACCTCTTCCTAAATTAAGCA
GAACAATGCCCATCTGAGGGTTGTGAGTATTA-AGTC-TTTGGAAACCTACTGAGTCACCTAGTTTCCTAAAGCTTCCTC
TCAAGTTCAAGTATATTGCTTATTAGCC----------AAAAAAAGATTAAAA-TTTCCTAAACATTGGCTAGATTCCCA
GCAAGTAATA--------TATAGAATCCTAAAAGGAGACACTCAGGAGAATCAGCAAGCCAATT-AAGAATATTTCAACA
TGAAGTTTTAAAAAAAAAATC--TGTTAGAAAATAACATGCATATTTGAGTAT---------GGAGAATTCTCATACAAA
CGGTAGTAAATTAAGAAACTAACTTTATTTAACATAGGT------------TGTAACAAG---------TGACATTAAAG
TGCC--TGCCACATTTAT-TTTTAAAAGTTGAATACTAAAT---TATTAAGACAAC-CTTAGAGTTATCTACTCATTTTC
TAGCTATTGAACAATACAACATGATT-AATGAAATATCATCTAACATAA-TTAAACT-----------------------
--------ATCAAATTTTAATTCAAACATGAGTTAAAATTCCAGAGAAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAGAG-GAAAATATTTGATAGGCTTCAAGTGTGAAACTTTCTGGGAG
```

```
AGAGTTTCAGGGAA--ATAATGAAGAAAATTA--AAATAAGAAGGACTGACACCAAAGTTGCATGCCTGAGTGGTTAGG-
-ATAATCTTGATATCTTAAAACTGAATTAAGGCAATCAAGGAAGTTTATTATTCACATCTCTGCCATGAGCAC-------
--CTCGTTGCAGCAACACGTATGTTACACATT--CT
>Canis_lupus_familiaris
TGAACGTTTGCTATAGAATTTTGTTAGAAGG---ATCC----TGAGTTTACACAACTGAACTAAG-------TTCGAAAA
GAAAGTGCTATGG-AATTGTTTTAAA-TTGTCTAAA-TCTGTGAGTGATAAG---GTTTTG--ATCGCTTCAGTCCATGC
TTACAGATAACAATCATGTAATGTGAAATTTGAAGCCGTACTTAA-TTCTACTTTGAAAAGCAATAGATATA----GTGC
ATTTATTGAATAGCCCTATTTT-CAGCCTTTTATTCATAACGCCATATTTATTAAAATCCAGTACTTCACACAA--GTAA
TTTT-----AAGACC-AGTTTAACAGATCTGTGGTATGATGTTG--GTTTCTTTTTTCATGTATAATAAA-TTTCAGTGA
CAAAGTAGATAGGCCATTGCTTGATGATTCATACTGAGATAGAGAAGCAAATTTTG------GAATATGTAGAAAGTGAG
AAAAATATTTTAAAAAAAAAGATACAAAAAAACCTCACCAC-AGA-ATATAGCCCATTTTATAC----TTAATA-----T
TGTTCATGAGTTTCTAAAATTAGAATTAAGGTACTTGCACAGTT---------ATTTTTAATTTGTTTGATAGCTAC---
-CAATACAAGGCATAATTTTTCTTAGTGAATATTTAGGAA------AATGCAGAAGTAAAGATAAAAAAGTGAATCTTA-
----TTGTTCCATGCTAAAGGAAGATGTCTC-------TTACT---TGTGTAGATGGAGATAAAATAAT----TAAAATT
TCCAT---------CAACATCTGTATGTCCAAAATTAATCCATTTTATTTCTCAATTAGTTAGTAGCAA--AG------
----------TTA--GT-CAG---TGATGAGATTAAAATAAACTTCTCTT
CCTAAAGACAG----TCAATGATTCTACAAGAAAACAG-ATATTACTCCACACT---ATGGTATCTCTCTTTTAAGGCCT
CAAAAGGATTCTATAAATATGTGCTCATGTGGGTGGAAGTGTAAGATAG----TTCCCAGATGCAAAAATCGTTTAG-GC
AAATGAAGGCAGTATTTGGAAACCAGAGTACAATTCTCGGCA---TGGATGATTT-GCTGTGGTGTAATCTCTGCAGG--
----------GCCAAATGAGTGTAACCCAAGGGAGGTA----------TCCCCTTCCC
TCATCTGTACCAGGAAAGACAGGTCACTCCC----------TCTGACACCCCTGTCC
TCAGATCTTGCCTT--TCCAA-ACCGACA---GGA------AGATGATCCACTCTCTG----GCTTGTGTTAGCCCGACT
CGCTGGGGCTT--CCTTGTCCTTCTCTCTCTTGG-----------TCAGTCCATTCTGCCCACACTGCATGATCTCAGTT
CTCAG-CACTTAATCATATTTGCCTTGATGGAATTGGGAAAATATTAGGAGGCCTTTATGTCCTGTCTTTACTCAGTTGT
TTCACTTGTTTACCTTAATAAACAAACCTTCCTCCTGCTAATA--CTAACATCCTTTTAAAACACAA----CCCTAGGGT
T---------ACAATG----TTGTTAATCTCTGCCTATTTGCTC-ACCCACCAAATACTA-AAAGTTTT-CTTCTTCATA
CTTATATATGAACCAAGAACCCCAGAGGAAGGCAAAAAATTCTCTCATAGGGATATGAGGATAGGGAGAAAAA------T
AATCTACCATAATAGTGTTTTTAATGTTA-CACAGAATCCCA-AAAATGCCATGAATTTTAAGATTAGGAAATCTGGCTT
CAGTTGATAATATAGGCAAAGGTGCTTT-TCTCTTTGCAACCATTTTTTGTCTCC-TTTTCCCACCTCTTGCTTTAGGAA
GTGTAGTCCAACACAAATA-----TTATCTTTCTACAACC-CCGTCAATGTGTATTTCTATTCTATTTC-TGGAACACAG
AGAAATTTATGTTGTGTTAGGGCTCATCAACATGAATTTATGTGTTGTTTTTTTCTCTTCCTATTTATCTAATAGTGCTG
TTTGTTTGTAGGAAAGAATGCATC-AAAATGTGAATTCTCTGTACCATGGTAACAGGAAGCCCATGAATTGAGTTTACAT
ATTTATACTTCTCTGT---TGGCTGAAGATTTACATCTTTATATTTTCAGTGAGTCTGAACTCTAAATT--TACTGCCAA
TCATG------GTTTCAACACACCTAGAGGAAGAGCTGTGCCTTATGCCTCTTTCCTTCCCCAGTCTATACTATGGGTCC
TGGGATATGCCAAAGATTCAATACACAGTTGTCATATTGAATTGACCTACGCTTTATCTTGAATGTTTGATATTTAAATA
ATTGTCCCTCTTTCTTTCTGATTTATCA------GGAGGAAGAGGCTCTTATTTT-AGGAAACACGGTCTCTGGATTATA
ACTTCCTGATTTATCTACTGTATTTCTTCACA-TGTAT-----TA-TTAATGCAGTCTCAGCAAACCACAATAACATTTT
GGATTTTATCACCCAGCAATATTATTCTCTATTTTGACAAAAT---TCGATATTAACTTTTGATTACATGTATTTGCAGA
ATATGCAGCTTTAGTAAAGTTGGAGATAATCCTGTTTTGCTGAATGGAGTGGTATTAATGACCTTGTTTTATCTACACTT
GATCACA--TATCAGAACC----TAAGCCTGGAAACTCATGTCCCAGTGGAAGCAAGCAG-AGAGGCAGTCAAACCTGAT
GTGTCTTGTGGCTTACTGACAAAAGTACTTGACAA-ATACTTGCATCATCTCTACTTATCTACCCTTG----------A
--TTTAAAAA--AGTCCCAAGTCAGAGGCCTGGGACACCGAGTCCCACGGTGCGCCGCACTTTCTGCCCC----GCCTGC
GGCCCGTGC----------ACCTGCCGGC----------GCACCTGCCTCGGCCACG
CTCCCTCGGCGAAGCAGCTGTGAAAGCTCATCAGCCAGGATTTTTCACTTGAATCCGTTTAAAAGACATCCCCAGCCTGA
GGTTCTGTCTCAGAAGCAGGGCCTTTCTTTCCAGCATCCACCAAAGGTAAAAAAAACTCATAGTTTTCCTGTCCA-----
TTCCTCCATTTCTGCGTGG----GGGGC----------TATTTTCCAATAATGGTTCTCCCAGGCATTTTG--TCCTATG
CTTTGGGTCCTCTCCTCTCCATTTCCCTAAGATCGTGGGCTTGGTAACT-CTAAAACCAAAGACAGCCTT-TGTTTCTAT
TCTCTGACGTGATGTTAGCCTTACCTTCCCCTGAGAACGTTCCACTAGGTCGTAAAGAGTGTGTGTGTGCATACCTGTGT
GTATCTGTG-------TAAGAGCATATACATGTGCATACGTACGTATACATGCGTAGGAGCACCCACACAGGCATGCATG
TACACACATAAGTGCTGGGT----------GGGGTGGATGGAGTAAA-TATCAGAGGAAAGCTATA
GGGGATGGATCCTCAGAGATACTGCAGATCTCTCTTCTC--TTC-CTTCCAAGTGAT-CCCATCAAGCTGTAAGCTCAAT
GAGAGCAAGGGTCTTCCCTTCCTGGTCATCACTGAACACCCAGCACCTGGAACATGGTGAGTGGTCAACA----------
--TGGGTGAGTGAATGGATATCATCCGCCATGTTTCCCAGGCTATGTATGGCG-----CCAGATTTTTC------GCAGA
CTTGC--------TTTTTCCTCAAAACTGAGAC--CCATCAACCCTGGTCCACTTCCAAGGACTAGTCCTCACATTAGGG
TGAGG----AATTCCAGAGCCTTCACCCAGCTCTGTGAGTCTCCACATTGACTCAATTCAGCTCTTACCTGGCTGGCAAA
TCTGAGCTCATCTTCTGGGACTTTCTGGGCC----------TC--AGAGACTTTTTT--CTTCCTTGAAATTTGC
CACACAGCCT-TG----------ATCAAGGCAAAAACTCTATGGGACAATCCAACAATTCTGGATGCCTTTG-TGTAAA
ATTGAAATTACATTGAGTACATTCAGGATATGCATTTTTGTGTGAGGCTTATGATCACACATCTGTAATTAAAAATTAAA
AGAATAAAC----AAGAAATTTTGCTGTACAGAATA-CTTTGTCTCTCTTATTAAGGCAGCATATAAATGGTCATTATGA
ACACAGCTAATGATAATAGATACTTTGCA----------TTTCATTTCACCATTTTTGTACGGTCGGGCACTGGCCTACC
TTAATCAAGACTCTTG-ATGATGTCATGTGTTTATGGGGTGTCTACTATA-TGCTAGGTTCCTGCCAGGCTGTGGGCAAA
CAACGAGAGATATAGACTGGCTTTGTCTCTCTGATCCTCAGTTGTATCATCTTCTA-ATGAGAGTGTTGAATC-------
TCCAAAGTCCCCTCTAATGGTCTATGCAAAATGGATCCTGGTAAAGAG----CTT-CTACAA-TCTGATTTGAGAGACAG
TATAGAATAGAGCGGTGCCAGGAATGCATCTTAATGCCAATTTCACTACTTAAAAGTAAAAAAGA-----TTAAAAATAT
TTTTTAAAAAGTATCTTAACAATGACCTGTACGCAGAACTTATAAAGTAAATAAAAGTTACTGTCTCATCTTGGGGCAAA
-TTAACTGAAAGAATGAAAAATTACTGCAAGCATCTAG-TTATAAACCTCAGTTTTAATACCTGCATGTACATTTTAGCT
CTTGAAATTTGTTCCCGAAAAAAGTGATATTGACCTGTTAGTTTCAAAACAGAAGGTGTTAGTAATTTCAGATTGTCATA
TTAGTTCTTTTG-ATC-TTTCAAAT----------CCCTCCCAAGGCTCTCTCCTAACTCTTCCTAAATTAAGCA
GAATAGTGCCAATCTGGTGGCTG-------TA-TGT--TTTGGAAACCTGATAGGCTACCCACTTTGCTAAAGC---TTC
TTGAGTTTAAGGATATTGCTTATTAGCC-------AAAAAAGAAAAAAATAAA-ATTCTTAAACGTTGGCTAGATTCCCA
GCAAGTGATA--------TATATAA---------GAGATACTCAGGAGAATCAGTAAGCCAATT-AAGAATATTTCAAAA
TGAAGCTTAAACAAAAA--TCTGTGCTAGAAAATAACATGATTATTTGAGTAC---------AGAGAATTCTCATATAAA
CTATAGTAATTTAAGGAACCAACTTTATTTAACACAGAT----------TGTGACATGTGTGAA---CCACATTAAAA
TGCC--TGACATAATCAT-AGGAAAAAGTTGAATATTAAAT---CATAAAAACAAT-CCTAGAGCTATCAACTCATCTTT
TAGTTGTTTAACAACATGACAAGATTAAATGAAATACTATCGAATACAATGTAAACT-GCCGAGG----------
----------CTCAAACATAGGTTAAA-TTCCAGGTAAAAAATATATTAAAACCAAGTTAATCATCCAAT
-GCCTT---------GTGACATTATAATAACCATGAGCTAATAAT----GGGCAAGT-CCTATGTGT-TAGGCAGTCATT
TGCCCTTATAACAATCCTAAGAGATGCTAC-AAGTATCCCTAG---TATTATCAATTAAGAAAATAA----GGCTTAG--
----GAAGAAAATAATTTT--CCAA-GTCATAATAGAGACAGAATATTTGATAGGAAACATACACATAATTTTCTGGAAG
```

```
AGAGTTTGAGGGAA--AGAATAAAGAAAATT---------AAAAGATTCACACAGAAGTTGTATACCTGAGTGGCTAGG-
--AAGTCTTGGGACCTTTAAATCAAAATAAGAAGATCA-----------------CATGTCTCAAATTAGTAC-------
--CTAGTTGCAGTGACAGATGCATTATATATT--CT
>Carnivora_Sp2
TGAACTTTTACTGTAGAATTTTGTTAGAAGG---ATCA----TGAGTTCGCACAACTGAGCTAAAAGTTGCTTTCAAGAA
GCAAGTACTGCAGAAATTGTTTTAAAATTGCCTAAAATCCATTAATTATAAG---GTTTTAAGATCACTTCAGTCCATGC
TTACAGATAATAAGCATATAATGTGAAATTTGAAACAGTACATAA-TTCTACTTTTAAGAGTGACAGATGTG----GTGC
ATTGAAAGCATAGCCTTATATT-CAGCCTTTGATTCATTTTGCTATATTTATTAAAATCCATTACTTCACACAA--GTAA
TTTT-----AAGACC-AGTGTAACAGATCTGTATTATGATGTTG--GTTTCTCTTTTCATGTATAATAAA-TTTCAGGGA
TAAAGCAGATAGACCATTGCTCAATGATTTATACTGAGATAGAGAAGCAAATTTTGTGAATAGAATATGTAGAAGGTGAG
AAAAAT-TAAAAAAAAATAAGATAATGAAGAA----AGAACATGGAACATGATGCATTTTACAC----TTAATA-----T
TGTTCATGTATTTCTAAAAATAAAATTGAGGTACTTTCACAATT---------GTTTTTATTTTTTTGGTAGAGCAC---
-CAATATAAGCCAGAACTTTGCTTAGTGAATATTTAGGAAAATGAGAGTGCAGAAGTAAAGGTAAATAAGTGGGGCTTG-
----TTGTTCCATGCTAAAGGAAAATGTCTC-----CATTTCT---TGTGTAGATGGAGATAAAATAAT---AGAAAATT
TCCAC---------CAACACCTCTATTTCCCAAGTTAGTTAATTTTATTTCTCAACAAGTTACAGCAAC-GAG-------
----------TTAAAGT-CAATGTAGATAGGATTAAGATAAACTTCTCTT
CCTAATGACAA----CCAATGATTCTATAGGAAAACATAATATTACTTCACACTTCTGTGGTATCTTTCACTCAAGGCCT
CAAAAGGATTCTATAAACATGTGCTCAGGTACGCTGAAGTCTAAGAGAG----TTCCGAGATGGGAAAATCATATAGGAA
AAATGAACTCAGTATTTGGAAACCAAAGTATGAGTCTTGGCA---CGAATGATTT-GCTGTGGTGCAATCTCTGTGGG-T
ATCGATATCT-CATG-GCAAAATGAGTGTAAGGTT----------TCCCCTTCCC
TAGTCCGTACT----------GGTACTTCCCTTTCT
GATAAAGA----------GGA------AGATGTTCCATTCTCTGTTTGGCTCGTGTAACCCCACCT
CACTGGGGCTG--CCTTGTCCCTCTCTCTTTTGG----------TGCTTCTGCTCTGCCCACACTGCAGGATCTCAACT
CTCAG-TACTTAATTCCATCTGTCTCAACAGAGATGGGAGTGTATTAGGAGGGCTTTATGCCCTGCATTTATTCAGCTGC
TTCATTTGTTTGTCTTAATAAACAAACCTTCCTCCTGCTAACA--CTAACATTCTCTTAAAACTCAA----CTCTAGGGT
T--------TACAATA----TTAATGATCTCTGCCTCTTTGTTC-ACTCATCAAAAACTGAAAAGTTTTTCTTCTTCATA
CTTAGATCTGAATCAAGAATCCCAGTGGAAAGTGAAAAATTCTCTCATAGGGATATGGAGATGGGGAGGGAAA------C
ATTCTACCATAATAATGTTTGCAATTTTTTCA--GAGTCCCC-CAAATGCCAAGGATTTCAAGAGTAAGAAGTCTGGTTT
CAGCTGATAATATAGGTGAAGGCCCTTT-TCTTTTCTGATCCATTTTTATTCCCC-TTTTCCCATTTCTTGCTTTAGGAA
GTATTGTCCAACACA-AGAAGTCTTTATCTTTCGATAATCCTCATCAGTGTGTATTTCTATTCTAT-TCATGGAAAACAG
AGAAACTTATGTTGGTTTAGGGCTCATCAACATGTATTTAG-TCCTTGTTTTCTCTCTTCCTATTTATCTAACAGTGCTG
TTTGTTTGGAGGAAAGAATGCTTC-AAAATGCGAATTCTCTGTGCCATGGTAACAGGAAGCCTATGAATTGACTTTACAT
ATTTATACTTTTATGT---TGGCTGAAGATTTACATGTTTTTACTTTCAGTGCGTCTGAACTCTAAATT--TACTGCCAA
CCATG------GTTTCAACACATCTAGAG-AAGAGCTGGGC-TTACGCCCCAATCTACCTCCAGTATATAATCTGGACCC
TGGCATATACGAAGGACCCAAT------TTGTCAGACTGAATTGACCTACACTTCGTCATAAATGTTTGATATTCAAATA
ATTGTCCGTTTACTTTGCT---CTATTT------GGAAGAAGAGTATCTTATTTT-AGGGAGCATGGTCTCTGAATTATG
ACTCCCTGACTTCTCTA--TTATTACTTCACA-TATATTATTACA-TTAATAGCGGCTCAGCAAACCACAGTAACATTTC
AGATTTTGTCATCTCACACTATCAGTCTCACTTTTGACAAAATGGGGAGATATTAACTTTCGACCACACATATTTGCAGA
ACACTAAGCTTCAGTAAAGTTGAAGATAGTCCTGTATTGCTGAATGTAGTTGTATTAATGACATTGCTTTAGCTACACTT
GATCACA--TACTAGAACT----TAAGCCTGGAAATTCATGCCCTAACAGAAGCAAGAAG-AGAGGCAGTCGAGCCTCAT
GTGTCTTGTTGCTTGCTGAC-AAAGTACTTGACAGAATACTTGCATTATCTCTGCTTATCTACCTTTG----------A
CTTTTAAAAAA-GGTACTAACTCAGAAACCTGAAACACTGTTTCCCACTGTGCTTAGCGCTTTCCGCCCTCTGAGTCTGG
TGTCTGCACCCTGTCTGT----------CTGTTGGCATCCTATGTGAGTATTTCACTTGGCACCAGCAGCAGCTGCT
C-CCTATGGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAATCAGTTTAAAAGACATTCCCAACCTGA
TGTTCTGTCTCAGAAGCAGGGCTTCTCTTTCCGGCATCCAGCAAAGGT-AAAAAACCTCATTACTTTCCTGTCCA-TTTT
CTTCTCCACGTCTGCCTGTG---GTGGGGGGGGGGGGATATTTTCTGACGGCGGTTCCCCCAGGAATTTTTT-TACAATG
CTTTGTGTCCCCTCTTCTCCATTTCCTTAAGGTTGTGGGCTTT---------AAAGCCACAGAGAGCCTT-TGTTTCTGT
TCTCCGGCACTGCATTAGCCTTACCTTGCCCTGAGAACATTCCACTGGGTCGAAAAGGATGTGTGTGCCCGTACATGTGT
GTATGCATGAGCGTGTGTGTGTGCACGCCCC----------GAACGTACATGCACA
TACACACATAGGGGCCAGGA----------GAATGGATGGAGTACA-TATTGGAGGGGAGCCACA
GTAGATTGATCTTCAGAGATATACCAGATCTCTCTTCT---TTC-CTTACCACTGAT-CCTGTCAAGCTGTAAGCTCTAT
GAGGGCAGGAGACCTTTCTTCCCATTCGTTGTCCTACA-CCAGTGCCTGGAACATGATGACTAGTCAACG----------
--TAGGCGAATGTATGAATCTCATCTGCTATGATTCCCAGGCTATGCATGGTG-----TCAGTTTTTAT------GCAGA
CTTGT--------TTACTTCTGAAGATCATAACCTCTATCAACCCTGTTCCACTTATAAGTACTAATCCTCACATTAGAC
TGAGG----AATCCCAGGGCTCTCATCCAACTCTGTGAGTCTCCACATTGACTCAACTCACC--CTAACTGGCTGATAAG
TATGAGCTCATATTCTGGAACTTTCTGGGCC----------TC--AGAGGATTTTTT--CTTCCTTGAAGTTTGC
CACTTAGTCG-TGATGATTAAATTACCAGGGCAAAATTTTTA----------GATGCTTTTGTTGCAAA
ATTGAAATTAAACTGAGTACATTCAGAACAAGCATTTTTGTGTAAGGTTTATAACCATATATGTATAATTAAAAATTAAG
AGAATAAACAAGAGTGAAATCTTTCCATACAGAATA-CTTTATTTCTATTATTAAGTCAGCATATAAGTGGTGATTATGA
ACATAGCCAACGATAACAGACCCTCTGCA----------TTTCAT------AGTTTTGTACAGCCAGGCACCAGCCCACC
TTCATCAGGACTCTTG-ATGACACTATGTGTTTATGGAGTGCCTACTTTAATGCTAAGTTCCTGCTAGGCTGTGAGCAAA
TGATGAGGCATACGAAGTGGTTTAATCTCTCTGGACCTCAGTTTTATCATCCACTTGATGAGAGCATTGAATC-------
TCCGAAGTCCCTCTAATGGTCTATGCGAAGCAGATAC-TGCTACAGGG----CTT-ACACGA-TCTGATTTGAGAGACAG
TATAGAACAGAAAGGTGCCATAAACGAATCTT-ATTCCAAT----------AAGTAAAAAAAGGAAAGTTTTT-----
---------TGAATCTTAACAATGACCCGGAAGTAGCACTTCTAAATGAAACCAAAGTTACAGTCTTGTCTTAGGGCCAA
-TTAACAGAAAGAGTGAAAAATTACTGCAATAATTCCG-TTATAAACTTCAGTTCTAATACTTGTGTGTACTTTTTAGCT
CTTGAAATTTGTTCCCGAAAAAAGTGACATTGACCTATTGGTTTCAAAACCGGAGGTGTTAATAATTTGAGGTGGTCATA
----TTCTTTTG-ATC-TTTCAAAT----------CGCCCCAAGGCTGTCTCCTAATGCTTCCTAAATGAAGCA
GAACAGGGTCCATCTGGTGGCTGTGAGCATTC-TGTC-TTTGGAAACCTGCTCAGCTACCCACTT-GCTAAAGCTTCCTC
TCAAGTTTAAGGATATTGCTTATTAGC---------AGCCGCACCCCACAAAA-TTTCTTAAACATTGGCTAGATTCCCA
GATAGTGATA--------TATAAGA---------GAC--ACTCAGGAGATTCAGTAAGCCAATT-AAGAATATTTCAAAA
TGAAGCTTAAACAGTTT--TCTGTGCTAGAAAATAACATGATTATTTGAGTAT---------GGAGAATTTTCATATAAA
CTGTAGTAATTTAAGGAACTAACTTTATTTAACACAGGG----------TGTGACATGTGTGAACCACCACATTAA-G
TGCCTACCCCGTATTTAT-AGGAAAAAGTTGAATACTAAAT---CATA-GAACAAT-CCTACAGCTATCAACCCATCTTT
TAGTTATTCAACAATATGACAATATTAAATGATATACTGTCAAACACGATGTAAACT-ACCTAGG----------
----------CTCAACCACAAGCTAA--TTCCAGATAAAAAAAATATTAAAACCAAGTTACCCATCCAAT
AACCTTGGTTATCTTGTGAC-TTTTAATAGCCAAGAGCTGACAAT----GGGCAAGT-CCTATGTGA-CAGGTATGCATT
TATCCTTACGACAATCCTAAGGGATACTAC-AAGTATCCCTAT---TTTTATCAATTAAGAAACTAA----GGCTTAG--
----AAAGAACATAACTTTT-CCAA-GTCATAATTGAGGCAGAATGTTTGATAAGAAACATACACATAATTTTCTAGAAG
```

AGAGTTTGAGGGAG--AGACTAAAGAAAATTAAAAAAAAAAAAAGATTCACACCAAAATTGTATGCCTGAGTGGCTTGG-
--AAATCTTGGGACCTTTAAATACAAATAAGAAAATGAAAGGAATTTATGATTCACATCTCTGACATTAGTAC-------
--CTAGCTGCTGCAGCAGATGCTTTATACGTT-GAT
>Cetartiodactyla_Sp2
TGAACTCATGCTGTAGAATTTTGTTAAAAAG---ATCA----TGGGTTTGCACAACTGAGCTAAGAGTTGCTTTCAAGAA
GAAGATACTGCAGAAATTGTTTTTAA-------------------TTATCACATTGTTTTGATATCACTTCAATCCATAG
TTACAGGTTATAGACATATAATGTGAAATTTAAAACAGTGCTTAGGTTCTACTTTTAATAGCAATAGATGTA----GTAC
ATTTATTGCATAGCCTTATATT-TAGCCTTTTATTCATATTATCAAATTTATTAAAATTCAGTAGTTCCCACAA--GTAA
TTTT-----AAGACCAGGTTTAACAGATCTGCCTTATGATGTTG--GTTTCTCTTTTCAGGTATAATAAATTTTCAGGGA
CAAAGCAGACGGACCACCAGTCAATGATTTACACTGAGACAGGGCAGC-----------ATAGAATATGAGGAATTTGAG
-AAAATATAGGATGGGAAAGAATGAGGGAGAG-GACACACATAGG-ATACGGCCCATTTTACACATAATTAATA-----T
CACTCATGTGTTTCTAAAATTAGAATTAAGGCACTTGCACAGTTTTTCCTTTTTTTTTTTTTTGTAGAGCAGAGTAA---
-CAATACAAGCCACAA-TTTGCTTAGTGAATATTTAGGAAAATGAGAATGCAGAAGCAAGGGTAAAGAGGTGCGTCTCG-
----TTTCTTCATTGTAAAGGAAATCATTTT-TGTTTCTCATT---TGTGTAGCCAGAGACAAAATAATGATATAAAATT
TCAAT---------CAACACCTCTACTTCCCAAGTTAGTTAATCTTATTTATGAACAAGATAGCAGCGACCAG-------
----------GTAA-TT-CAGGGTAGATGTGATCAAGGTAATCTTCTCTT
ACCACAGATAG----GCAATGATTCTATAGGAAAACAT-ACATTATTCCACACTTCTCCGATGTCTTCCATTTAAGGCCC
CCAAAGGATTCTAGAAACATGTGCTC-TGTTGGCTGAGGCATAAGACAGGGTTTTCCTAGATGGAAAAATCATATTG-AA
AAACGAACACAGTGTTTGTAGACCAAAGTCTGAGTCTTGGCATCATCAATAACTT-GCTGCGGTGCAACCTCTTTAGG-T
GTCAATTTCT-CATCTGCAAAATGCATGTCATTCAAGGGAGGTGT----------CCCCCTACCC
TAGTCAGTACTGGGAATGAGGGGTAACTCCC-------------------TTCTTAATGACAGCCCCTTATTTCCTTGTC
CTCAATCCAGCCTCAATCCAA----GACAA--GG-------AGACGTTCTACTCACCATTCGGGATGTGTTACCCTAACT
CACTGGGGCTCTCCCTTGTGCCTCTCCCTCTTGG-----------CCCCTCAGCTCCTCCCACACCACGTGGTCTCTGCT
CTTGGGTACTTAATTCCATCCTCCTTGATGGAGCTGGGAAAGTATTAGGAGGCCTTCAGGTCTTGCCTTTACTTAGTTGT
TCTATTTGTTTGTCTTAATAAATAGCTCTTCCTTTGGCTAATA--TTAACTTCCTTTTAAAACATAAC--ACTCTAGGGT
TTGTAAGGTTATAATG-TTTGTAACAGCCTCTGCCTCTTTGTTCTGCCTCTCAAAGACTGCTAAGTTTTCCTTCTTCGTA
CTTAGATGTGCACCAAGACACCCAGAGGAAGGTGGAAAAT-CTCTAATAGGAATATGGGGATGGGAAGGTAAAAA-CTTC
AATCTACCATCATAGTGTTTGCAGTGTGTTCGCAGACCCCCCCCAAAGACCATGGANNNNNNGATCAGGAAGTCTGGCTT
CAGT--------CTGGCTAAGGCCCTTTCTCTCTTTGGATCCATTTTTATTCCCC-TTTACCCATTTCTTGCCTTAGGAA
GTATAGTCCAGCACA-AAAAACCTTCATCTATC-ACAACCACTACCACCG--TGTTTCTAATCTATTTC-TGGAACACAA
AGAAATGTGTGGTGTTTTAGGGTTTATCAGCATTTGTTTAGTTGTTG-TTTTCTATCTTCCTATTTATCTAACAGTGCTG
TTTGTCTGG----AAGGATGAATC-AAAATTTGAATTCTCTGTACCATGGTGACAGGAAACCCATGAATTGAGTTTACAT
ATTTATACTTCTATGT---TGGCTGAAGATTTACATGTTTATACTTTCAGTGAGTCTGAATTCTAGGCTT-AACTGCCAA
C-ATG------GTATCAACACACCTAGAGGAAGGGTTGTGTCTTATGCCTCTTTCTCTTT-CAGTATATACTACAGATCC
TGTCATACACTAAGGACTCCGTTTATATTTGTCAAATTGAATTGACTTACATTCTATCTTGAATGACTGATATTTGAATA
ATTGTCAGTATTACTTGGT--CTTATTT------GGAGGGAGAAGGGCTTATTTT-AGGGAGCACAATCTCTGGGTTATG
ACTTCCTGGTTTTTCTATTACGTTTCTTCACATATATAAATTACA-TTAATAGAATCTTAGCAAACCATAAGAACATTTT
AGATTTTATCATCTAGTGCCACCAGTCTTGCTTTTGACAAAAT---TAGATATTAACTTTTGATCGCACATATTTGCAGA
ATATTAAGCTTTAATAAAGTTGAAGATAATCCTATTTTGCTAAATGTAGTTGTATTCATGACATTGCTTTACCTATACCT
GACTACA--TACTAGAACTTAAATAATCCTGAAAACTCATGCCCCAGTGGAAGCAAGCAG---AGTCAGGCAAGCCTGAT
ATGTCTTGTTACTTGTTGAC-AAAGTGCTTGACAGAAAAATTCCATCATCTCTGCTTCTCTACTCTTG-----------A
CTTTTAAAAAA-TGTATCCTTTCAGAAACATGAAATAGCATTTCCCACTGTGCTTACCAGTTTCTGCCCCCCGAGTCTGT
ACCCTG-------CCCTGAATCACACTCTGCCTGTTGGTATCCCATGTGAGTATTTCACGTGGCACTAACCAGCAGCTGC
TCCCCATAGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAATCAGTTTAAAAGACATTCCTAACCTGA
GGTCCTGTCTCGGAAGCAAGGCCTCTCTTTCCTGTA-CAACCAAAGGT---AAAATCTCGTCATTTTCTCATCCA-TTTT
CTTCTCTACTTCTGCCTGG-GGCGGGGCG-------GGTATTTTCTAGTAATGGTTCCCCCAGGCATTTTG--TACTATG
CTTTGAG-----TCCTCTCCATTTCCCTGAGATAGTGGGCTTT-TATA-ACTGGAGCTACAGATAG--TT-TGTTTCTGT
TCTCTGGCACCACCTGGGCCTTACCTTGCCCCAAGAACATTCCACTAGGTAAAAAAAGGTGTATGTGTGTGTGTGTGTGT
GTGTGTGCC-----CGCGCACGCGAGCACNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGCCATA
CCAGACTGATCCTCATCGAGATGCCAGCTCTCCCCGCTTCCTCG-T----GAGCGGATCCTGCCAGGCTGTAAGCTTTGT
GAGGGCAGGAGTCCTT----CACGCTCCCTGTTCAA--CCCAGTGCCCGGAGCTTGGTGAGTGATCCAGG----------
--CGGGCGAATGAATGGGTCCCATCTGCCATGTTTCCCAGGCTACGTGTGGTG----TCCAGGTTTCTT------TGAGA
CCAAC--------TTACTTCTCAAAACTGAGACCTCCAGCGACCCTGGTCCACTCCTGAGGACTGGTCCTTACATTCGGA
TGAGG----GATGG-----------CGGAGCTCTGTGACTCTCAGCATAAAGTCAACTCAACTGTGACCTGGCTTGTAAA
TCTGGGCTTATCTTCTGCAACTTTCTGTGCCCCCTCAGCTTCCTCTTCT-GGAGGATTTTTTT-CTTCCTTGAAGTTTGC
TACACAGTCT-TGATGAT---ATTATCAAGGCAAAATCTGTATGGGACTATTTAACAACCCTGGACGCTTTTGTTGTAAA
ATTGAGATTAAATTGAGTACATTCAGAATATGCACTTTTGTGAGAGGCTTATAATCACATACATATAATTAAAAATTAAA
GGAATAAAAAAGAATGAAATCTTGTCATATGAAATA-TTTTGTCTCTGTTATCAAGTCATTGTATTAGTGGTGATTGTGA
ACACAGTCAATGGTAATAGACCCTCTGCA----------TTTCAT------AGTTT-GTACAGACAGGCACCAGCCTACC
TTAATCAAGATTCTTG-ATAACACCATTTGTTTATGGAGTGCCTACGACA-TGCTAGGTTCTTGCTAAGCTGTGGGGAAA
CAATGAAGAATAAGAAGTGACCTAATCTCTCTGGACCTCAGTTGTAGCATCTTCTC-ATGAGAAGGTTGACTT-------
TCC-AAGGCCTCTCTAATGGACTATGTAAAGTGGGTCCT----------AGGGGCAC
TATAGAACAGATAGGTACCAGAAATGAATCTT-ACACCAGTTTAACTACTTTCAAGTAAAAATAGAAAGGTTTTTTT-CC
CATTTT-ATTGAATCTGAACAGTCACCTGTGAGGAGAGCTTATAAATTA----AAAGTTAAAATTTCATCTTGGGACAAG
TTTAACTGAAAGCGTGAAAAATGAGGGCAAGAATTTAAATTATAAACCTCAGTTTTAATATTTGCATGTACTTTTTAGCT
CTTGAAATTTGTTCCTGAAAAAGGTGACATTGATCTGTTGGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNTTTTTTTG-ATT-TTTCAAAT----------CTCCCCCAAGGCTCTCTCCTCCCTCTTCCTAAATTAAGCA
GAATAATGACCATCTGGGGGCTGTGAGTATTA--AG--TTTGGAAACCTACTGGGCCACTTAGTTTCCTAAAGCTTCCTC
TCAAGTTTAAGGATATTGCTTATTAGCAAAAAAAAAAAGAAAAAAGATTAAAA-TTTCTTAAACATTGGCTAGATTCCCA
GCAAGTAATA--------TATAGAATCCTAAAAGGAGACACTCAGGAGAATCAGCAAGCCAATT-AAGAATATTTCAAAA
TGAAGTTCAAAAAAAAAA-TCTGTGTTAGAAAATAACATGAATATTTGAGTAT---------GGAGAATTCTCATACAA-
CTGTAGTAATTTAAGAAACTAACTTTATTTAACATAGGT----------TGTGGCATGTGTGAACCGCCACATTAAAG
TGTC--TGCCATATCTAT-AGTAAAAAGTTGAACTTTAAAT---CATAACAACAAT-CTTAGAGTTATCAACTCATCTTT
TAGCTATTCAACAATATGACATGATTAAATGAAACATCATCTAACTCAACTTAAACT-ACCAATGAGATACTACAATCAT
TCCTGTTTATAAATTAAGACCTCAAACGTGAGTTAAAATTCCAGAGAAAATATATACTAAAATAAAGTTAATCATCTAAT
-CACTTGGTCATCTTATGACATTA----------CAAT-AGA----------
---CCTTACAACAATCCTATGAGATACTAA-TGTTATCCCTG-----TTTATAAATTAAGAAACTAA----AGCTTAA--
----AGAGAAAATAATTTTT-CCAAAATCAAAATAGTGACAGAATATTTGATAGGATTCATGTGTGTAACTTTCTGG--G

```
AGGGTTTGAGGGGA--AGAATGAAGAAAATTA--AAATAAAAAAGATTGACACCAAAGTTGCATGCCTGAGGGGTTAGG-
-ATAATCTTGGGACCCTTAAATCGAAATAAGGAGATCAAGGGAGTTTATTACTCACATCTCTGCCAGGAGTAC-------
--TTAGTTGCAGAGACAGA-----AATGTGTT--CT
>Chiroptera_Sp2
TGAACTCATGTTGTAGAATTTTATTAGAAAGAATATCAG---TGGGTTTGTACTACTGAGCTAAGAGTTATTTTCAAGAA
GAAATTGCTGCAGAAAGTGTTTTTAA-TTGCCTAAA-TCCATTAATTATAATATTATTTTGATATCATTTCAATCCAAGC
TTACAGATAATAGTCAT---ATGTGAAAGTTAAAACAGTACTTAA-TTTTACTCTTAATAACAATAGATGTA----GTGA
ACTTATTACACAGCC-TATAGT-CACCTTTTAATTCATATTGCCAAATTTGTTAAAATCTAATACTTCACATGA--GTAA
CTTTTTTT-AAGATCAGATTTAATAGGTCTACATTATGATGTTGTTATTTTTATTTTCAAGTGTAGTATATTTTCACAGG
CAAAACATATAGGCTATCGCTCAGTGATTTACACTG------------AAATTTTGTGAAGAGAATATGTAGAAGCTGAG
AAAAATATATGATAGCAAAGAATAAGGGAGAG-AACACAGATAGG-ATACTGCCCATTTTACACATCATTAACA-----T
CACTCATGTGTTTCTAAAATTAGAGTTTAGGTACTTGGACAGTT-------------TTTTTCTTTAACTCTAACACTGA
CCAATACCAGGCACAA-TTTGCTTAGTGAATGTTTAGAAAAATGAGAATGCAGAAGTGAAGATAAGTAAATGGATCTCAT
TTATTTATTCCATGCTAAAGGAAAATGGTTC----TCTGTTTC---TTACTTATGGAGAGAGAAAACAATAATAGAAAAT
TTGCA--------TCAACAGCTCTATTTCCCAAGTTAGTTAATTTTATTTATAAAAAAGTTAGGAGCAACTAG-------
----------------------------------------TTAAATATCAGGGTAGGTATGGTTAAGATAATCGTCTTTT
TCCACAGATAG----CCAATGACCCTA-------------TATTACTCCGTACTT---CTATATC--TCATTTAAGGCTT
CAAAAGGATTCTAGAAACATGTGCTCATACAGGCTAAAGTATAAGATAG----ATTTAAGATGGGAAAATCATACAG---
--------ACAGTATTTGGAAACCAAAGTATGAGTCTTGGCAT--TCAATGGTTT-ACTGTGGTGCAAACCTGTTGAG-T
-TCAAATTTT-CATCAACAAAATGAGTGTAATCCAAGGGAGGTG-----------------------TCCCCATTACCC
TAGTTAATA-----------------------------------------------------------TTATTTCCCTGTCC
TCAAATCCAGCATT--TCCAATTATGACA---GGG------GGACTTTTTACTCAATT----------------------
---TGGGTCTCTCCTTTATCCCTCTTTCTC--GG-----------TCCCTCTTCTCTTCCCACACTGCATGGCCTCAGCT
CTGAGTTACTTAATTACATTCACCTTGATAGAATTGGGAGAGTATTAGGAGGCCTTCAGATCCTGCATTTACTCAGTTGT
TTCATTCATTTGCCTTAATAAACAAATCTTCCTCTTGCTAAT------ACTTTCTCTTAAAACACAA----TTCTAAGGT
TT--------ATAATG----GTAACAGC-------------CTCTGCCTAGCAAAGACTGCTAAGGTTTCCTTCATCATA
CTTACATATGAGCCAAGAGCTTGAAAGAAAGGTGACAATTTC-CTAATGAGAATATGGAGATGAGGAGGAAAAAT-TTTC
ATTTTGTCATAATAGTGTTTGCAGTGTGATCAGAGATTCCCC-AAAAGGCCTTTGATTACAAAATCAGGAAGTCTAGCAT
TAGTTGATAGTCCAGGCTCAGACCCTTTGCCTCTTTGGATCCATTTTTATTTCCCATTTACAAACTTCTTGCTT------
---TAGTCTTGCACATACAATACTTCATCCTTTCACAGCTCTTACCACTGTGTATTTTTATTACATTTCGTTGAACATAG
AGAAATTTATGTTGTTTTAAAACTCATCAACACAT-TTTAGTTGTTG-TTTTCTATATCCCTGTTTATCTAATGGTGCTG
TTTGTTTTCAGAAAAGGATGCATC-AAAATGTAAATTCTCTGTAGCACTGTGACAGGGAGCCC-TGAATTGAGTTTACAT
ATTTATACTTCTGTGTTGATGACTGAAGATTTACATGTTTATATTTTCAGTGAGTCTGAACTCCAGACT--TACTGCCAA
CCATGC-----ATTTCAATAGATGCAGAGGAAGAGCTGTG---TGCTCCTCTTTGCACCCTTACTATATACTATAGATTC
TGGAAAACACTAAGGACTAAATATACATTTGTCAAATTGAATTGACCTATACTTCATCTTAAAGGTCTGATA-TTCAATA
ATTGTCAATC-TACTTGAT--TTCACCT------------GAGGGGTCTTATTTT-AGAGAAAATGATCTCTGGGTGATG
CCTTCCTGATTT-------------CTTCACA-TATATTATAACATTTATTGGGAACTTAGTAAACCAAAAGAATATTGC
AGTTTTTATCATATAGTGCCATCAGTCTTGC-TTTGACAAAGT---TAGATATTAACTTGTGATCTTACATATTTGCAGA
ATATTAAGCTTCAATAAAGTTGNNNNNNNTCCTGTCTTGCTGAATGTAGTCATATTAGTGACATTGCTTTGCCTACGCTT
GACCACA--TACTATAACTTAAATAACCCTGGAAACTCATGCCCCAATGGTAGCAAACAGAAAAGTCAAGCAAGTCTAAT
GAGT-TTGTTGCTTGTTAAC-GAAGTGCTTGACAGTATAACTCCATCATCTCTGTTTATCTACTCTTAATTTTTAAAAAA
TTTTTAAAAA--TGTACCAATCCAGAAACCTAAAATACCATTTCTCACTGTGCTTACCATTTTTTGCCCTCTGAGAATGC
TGTCTGCACCCTGCCCTGAATTACACTCTGCCTATTGGCATCCTATGTGAGTATTTCACTTGGCACCAGCAGCAGCTGCT
C-CCTATGGCAAAGCAGCTGTGAAAGCTGATCATCCAGGATTTTTCACTTGAATCAGTTTAAAAAATATTTCCTTCCGGA
GATTCTGTCTAGGAAGCAGAGCCTCTCTTTCTTGTACCCACCAAAGGT---AAAATCTTATCACTTTCCCATCCA-TTTT
CTTCTCCATTTCCGCCTGTGGGCGGGGGGA--------CATTTTCGAGCGATGGTTCTCCCAGGAAGTTTT--TACTATG
CTTCAAG-----TCCTCTCCATTTCACTAAGGTTGTGGTCTTT--AAATCCTAAAGCCACAGATAGCTTT-TATTTCTAT
CCTCTGGCACTACCTTAGTCTTATCTTTCCCTGAAAACACTCCACTAGGTTGAAAAGGTTGTGTGTGTGTGTGTGTGTGC
TCACGCGTG-------TGTGCGTGTGCACACCTATATACATGTGT-------------GGTACATGAGCATGCGTGCACA
AACACACACAGGTGCTGG-------------------------GAGATGAATGGAATAAATTCCTGGAGGGAAGCCACA
CTAGATTCATCTTCACAGATAAGCCAACTCTCTCTTCTGCTTTC-CTTAT---------------AGCCATAAGCTCTAT
GAGGGCAAGGGCCCTTTCTGCCTGTTCATTGCTGTGCACCAAGTGCCTGGA-CATGGTGAGTGCTTAACA----------
--TGGGTGAATGAATTCCTCCCATCTGTACTGGTTCCCAGGCCATGAATGGTGTGTGTCCAGT--CTTT------GCAGA
CCTGC--------TTACTCCTCAAAGCTGAGACTTCCATCAATCCTGGTCCACTTGTGAGGAATGGTCCTTACATT---G
TGAGG----AATTGTACAGCTCTGACCCAAATCTGAGAGTCTCAGCATCAAGTCAATCCAATTGTTACCTGGTT-ATAAC
TGTGGGCTCATATTTCGAACATTTCTGTGCC---TCAGCTTCCTCTTCT-GGAGGATTTTTT--CTTTCTTGAAGTTTGC
TACACAGACT-CGATGAT---ATTATCAAGGCAAAAACTCTATGGGACTATTTAACAACCCTGGACGCTTTTGTTGTAAA
ATTAAAATTAAATTGAGTACATTCAGAAAATGCATTTTTGTGTGAGGCTTATAATCACATATGTATAATTAAAAATTAGA
----TTAAAATAGACTGATTCTCTCTATACAAAATATTTTTGTCTCTGTTATCAAGCCACTGTAAAAGTGGTGATTGTGA
ACACAGCC---TATAATATACCCTCTGAA----------TTTCAT------ATCTTTGCACAGACAGGCACCAGCCTACC
TTAATCTAAACTCTTG-ATAACACTTCGTGTTTATGGAGTGCCTACTATA-TGCTAAGTTTTTGTTAGGCTGTGGGGAAA
CAGTGAAGAATAAGAAGCTG-TTAATCTCTCTGGGCCTCGGTTGTAATATCTCTTA-ATGAGAGGGTTGAACC-------
TCC-AAGGTCCCTCTAATTATCTATGCAAAGTGGGTCCTGGTAAGGAA----CGG-CCACAATTCTGATTTGAGAGGCAG
CATAGAACAGAAAAGTGCCAGGAATATATCTT-ATACCAAGGTAACTACTTTCAAGTGAAAATGAACAAATTTAAT----
CATTTCTATTGTGCCTTAACAATCACCTACGAGTAGAGCTTATAACTTAAACAGAAGTTAAAATTTCATCTTGGAACAAA
-TTAACAGAAAGAGTGAAAAACTATTGCAAAAATATACATTATAAGCCTTGACTTTAATATATGTGTGTACTTTTTAGCT
CTTGAAATTTGTTCCTGAAAAAGGTGACATTGACCTGTTGGTTTAAAAACTAAGGGTGTTAGTACTTTGAGGTTATTATA
----GTCTTTTG-ATC-TTTCAAAT------------CTCCCTACTCCAAGTTCTCTCCTACCTCTTCTTACATTAATCA
AAACAATGCCTATCTGGTGGCTATGAGTATTA-TCTC-TTTGGAAACATACTGGGCTACCCACTTTCCTAAAGCTTCCTC
TCCAGTTTAAAGATATTGCTTATTAGC-------AAAAAAAAAAAAAAAAAATT-TTTTTTAAACATTGGCTAGATTCTCA
GCAAGTAATA--------TATAAAATCCTAAAAGGAGACACTCAGGAGAATCAATATGCCAATT-AAGAATATTTCAAAA
TGAAGCTTAAAAAAAAA--TCTGTGTTAGAAAATAACATGAATATTTGAGTAT---------GGAGAATTCTCACACCAA
C--TAGTAATTTAAGGAACTAACTTTATTCAACATAGGT------------TGTGGTATCTGTGAACCACCACATTCAA-
TGTC--TGCCATATTTAT-AGTAAAAAGTTGAATATTAAAT---CATAAAAAATAACCCCAGAGTTA-----TCGTCTTT
TACCTACTC-ACAATATGAAATGATTAAATGAAATATCATCTAATACAACTTAAACT-ACCTAGG---------------
--------------------TTAAAACATGAGTTAAAATTCCAGAGAAAATATACACTAAAACTAAGTTAATTATCCAAT
-CCCTTAGTCATCTTGTGACAATAT--TAAT-AGCAGTTAACAAT----GGACATAT-CCTATGTGT-CAGGCAC----T
TTTCCTTACAACCATCCTAGGAGATACTAT-AAC-ATCCCTACTGTTTTTATAAGTTAAGAAACTAAAATTGGTTTTATA
AATTAAGAAACTAAGACTTT-CCAAAGTCATAATAGAGACAGAATATTTAATA-GATGCTTACATGTAACTTTATGGAAG
```

```
AGGG-TTGAGGGAC--AG-ATGACAAAGAAAA----TAA-----GATTCACTCTAAAGTTGTATTCCTGAGTAGCTAGG-
-ATAATCTTGGGACCTTTAAATCAAAATAAGGACATCAAAGGAACTTATTATTCACATCTCTATCGTTAGTAC-------
--CTAGTTTCAGTGCCAGATACATTATATGTT--CT
>Equus_caballus
TGGACTCATGCTGTAGAATTTTGTCAGAAAG---ATCATCCGTGGGTTTGTAAAACTGAGCTAAGAGTTGCTTTCAAGAA
GAAAGTGCTGTGGAAAGCATTTTTAA-TTATCTTAA-TCCACTAATTATAACATTGACTTGATATCACTTCAATCCAGGC
TTAT--GTAATAGTCATATAATGTGAAATTTAAAACAGTACTTAA-TTCTACTCTTAATAGCAATAGATGTA----GTGA
ACTTATTGTATAGCCTTATGTT-TAGCCCTTTATC----TTGCTGAGTTCATTAAAAGCCAGTGCTTCACACAA--GTAA
CTTTTTT--AAGACCAGATTTAACAGATCTGCATTATGATGTTG--GCTTTTCTTTTCAAGTATAATAAATTTCCAG-GA
CAAAGCAGATGGACTATTGTGTAGTGATTCCCACTGAGATAGGGGAGCAAATTTTGTGAACAGAATATGACAAAGGTGAG
AAAAATATAAGATGGCAAAGAATAAGGGAGAG-AACACAGATAGG-ATAGTCCCCATTTTACACAAAATTAATA-----T
TGCTCATGTGTTTCTAAAATTAGAATTAAGGTACTTGCACAGCT--------------TTCTTCTTCACCTTAACAC---
-CAATGCAAGCCACAA-TTTGCTTAGTGAATATTTAGGAAAATGAGAATGCAGAAGTAAGGATAAA--TGTGTCT--CG-
-------TTCCACACTAAACAAAAATGGTTC-TGTTTATTTCT---TATGGATACAGAGATAAGATAAAGATACAAAAGT
TCAAG---------CAACACTTCTACTTCCTAAGTTA----ATTTTATTTACCA---AGTTAGCAGCAACTAG-------
----------------------------------------TTAAATT-CTGGACAGATGTGATTAAGATAATCTTCTCTT
CCCTCAGATAG----CCAATGATTCTATAAAAAAA-AT-ACATTATTCTACATTTCAATGATATCTTTCATTTAAGGCCT
CAGCAGAATTCTGTAAACATGTGTTCACATAGGCTGAAGTATAAGATAG----ATTTCAGATGGAAAAATCATATAG-AA
AAATGAACACAGTACTTGGAGACCAAAGTGTGAGTCTTGGCATCATCAATAATTT-GTTGTGGTCCACACTCTTTGGG-T
GTCAGTTTCT-CATCAGCAAAATGCATGTAATCCAAGGGAGGC--------------------------CCCCCTACCC
TAGTCAGTACTGGGAAAGAGGAGCAACAGCC--------------------------------CTTACTTCCCTGTCC
TCAGATCCTGCCTT--TCTAA-GGTGACACGGGGG------AGAC-TTCCACTCACTGTTAAGCATGTGTTACTCCAACT
CACTGGGGCTTCCCCTTGTCCCTCTCTATCTTGG-----------TCCCTCTGCTCTTCCCACACTGAATGGTCTCAGCT
GTCAGTTACTTAATTCCCTTCTCTTTGATGGAGCTAGGAGAGTATTAGGGGCCCTTCAGATCCTGCATTAACTCAATTGT
TTCCGTTGTTTGTCTTAATAAACAAACCTT-CTCCTACTAACA--CTAACTTCCTCTTATGGCGCAA----TTCTAGGGT
TT---------CAATG----TTAACAACCTCCACCTCTTTGCTCTGCCTACCAAAGACTGCTAAGATTTCCTTCTTCATA
CTTATATATAAGCCAAGAGTTCCAGAGGAAGGTGGTAAATTCTCTAAGGCGTGTACGGGGTTAAAGAGGAAGAAT-CTTC
ATTCTATTGCAATAGTGTTTGCAGTTTGACCAGAGATTCCTC-AAAAGGCCATGGATCTCAAGATCAGGAAATATGGCTT
CAGTCAATAAGACAGGCTCAAGTCATTTGCTTCTTTGGATCCATTTTTATTCCCC-TTTACCCACTCATTTCTTTAGAAA
GTATAGTCTAACATCTACAAGAGTGTATCTTCCTGCAACCACCACCACTGTATGTTTCTATTCCTTTTC-TGGAACACAG
AGAGATTTACATCATTTTAGGACTCACCAACACATATTTAGCTGTTC-TTTTCTATCTTCCTGTTTATCTAACAGTGCAG
TTTGTTTAGAAG-AAGGACACAAC-AAAATGTGAATTCTCTATAGCATGGTGACAGGAAGCCCATGAATTGAGTTTAC--
ATTTACACTTCTATGT---TGACTGAAGATTTACATGTTTATA-CTTCAGGGAGTCTGAATTCTAGACT--TACTGCCAA
CCATGC-----TTTTCAATATCCCCATAGGAAGAGCTGTGTCTAGTGCCTCTTAGAACTGTCAGTAAGTGCTATAGATCC
TGGCATACACCAGGGACTCAATATACATTTATCAAATTGAATTGACCTACACTTCATCTTGAAGGTCTGGTA-GAAAATA
ATTGTCAGTCTTTCTTGGT--TTTATTT------GGAGGAGGAGGGGATTATTTT-AAGGAGCATGATCTCTGGGTCAAA
ACTTCCTGATTTCTCTG---TTTCTTCACATATTATATTATTCCA-TTAGCAAGGTCTTAGCAAACCACAAGGTCATTTC
AGATTTTATCATCTAGTGCCATCAGTCTTGCTTTTGACAAAGT---TAGGTATTAACTTTTGATCACACACATTTGCAGA
ATATTAAGCTTCAATAAAGTTGGAGATAATCCTGTTTTGCTGAATGTAGTTGCATTAGCAGCATTGCTTTATCTACACCT
GACTGCG--TACTAGAACTT---TAACTCTGGAAAATCATGCCCCAAAGGAAGGAAGCGG-AGAGTCAGGCAAGCCTGAT
GCGTCTTACTGCTCATTGAC-GAAGTGCTT-CCAGTATGCTTCCATCATCTCTGCTTATCTACTCTTG-----------A
CTTTTAAAAAA-GGTGCCAATTCAGAAACCCAAGATACCATTTCCCACTGTACTTACCACTTTCTGCCCTCTGAGTCTGA
TGTCTGTACCTTGCCCTGAATTACACTCCTCCTGTTGGCATCCTATGTCAGTATTTCACTTGGCACCAGCAGCAGCTGCT
C-CCTATGGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAGTCAGTTTAAAAGACATCTCCTACCTGA
GATTCTGTCCAGGAAGCAGGGCCTCTGTTGCCTGTACTCACCAAAGGT---ACAGTCCCATCGCTTTCCCATCTG-TTTT
CTTCTCCCCTTCTGCCCAC----GGGGC----------TGTGTTCTAGCGACGGTTCTCCCTGGCAGCTTT--TACTATG
CTTTGAG-----CCCGCTGCATTTCCCTAAGGTTGTGGGTCTT--AAAGACTAAAGCCACAGACAGCTTT-TGTTTCTAT
TCCCTGGCACTCCCTTAGCCTTACCTTGCCCTGAGAACACTCCACTAGGTCAAAAAG------TGTGTGCACATGTGTGT
GTGTGTGTG-------CACATGCATGCAC-----------------------------------------------TCACA
TACACACAAATATGCTG---------------------------GGGGTGGGTGGAGTAAACTATTGGAGGAGAGCCATG
CTAGACTGCTTGTCACAGATAGGCCTGCTCTCTCCTCTCCTTTC-CTTAGGAGTGAATGCTGTCAAGCTGTAAGCTCTCT
GAGGGCAGGAGCCCTTTCTGC-------------------------CATGAACATGGTGGGTGCT-AACA----------
--TGGGTGAATGAATGAATCCCATGCACCCTGCTTCCCAGGCTATGCATGATGGGTGGCCGGT--CTTT------ACAGA
CCTGC--------TTACTCCTTGAAGCTGAGAC-TCCGTCAACCCTGGTCCACTTCTGAGCACTAGTACTTACATTAGGA
TGAAG----ACACACACAGCTCTGACCCAACCCTGTGAGTCTCAGCATCAAGTAAACTCAGCTGTTATCTGGCT-GTAAA
TCTGGGCTCATACACTAAACCTTTCAGCTTC-----------CCCTTCT-GGAGGATTTTTT--CTTCCTTGAAGTTTGC
TACACAGTCT-TGATGAT---ATTATCAAGGCAAAAACTCTATGGGACTATTTAAGAAACTGGGATGCTTTTGCTGTAAA
ATTGAAATTAAATAAAGTATATTCAGAATGCACAGTTTTGTGTGAGGCTTATAATCATGTATGTGTAATTAAAAATTAAA
----TTCTAATAGACTTATTCTCTCTATACAGAATA-CTTTT----TGTTATCAAGTCGTCATATTAGCGGTAATTATGA
ACACAGTC-ATGATAATGGAC---CTGCA----------TTTCAT------AGCTTTGTAGAGACAGGCACCAGCCTATC
TTAATCAAGTCTTTTG-ATAACAGCATGTGTTTACTGAGTGCCTACTATG-TGCTGCGTTCTTGCTAGGCTGTGGGGAAA
CAGTGAAGAATAGGAAGAGGCTTAATCTCTCTTGA-CTCAGTTGTATCCTCTTCTC-ATGAGAGGGTTGACAT-------
CTCCAGGCTCCCTCTAACAGTCTGTGCAAAGTGGGTCCTGGAAGAGAGCTTCCTT-CCACAGTTCTGACTTGAGAGGCAG
AATAGAGCAGAAAGGTGCCAGGAAGGAATCTT-ATACCAATTTAACTACTTTCAAGTAAAAATGGAAAGATTTATT----
CATTTCTATTGTATCTTAAGAATCACCTGTGAGCAGAGTTTACAAATTAACAAAAAGTTAAAATTTCATCTTGGGACAGA
-TTAACTGAAAGGGTGAAAAATTGCTACAAGAATTTAGATTATAAACCTCAGTTTGAATATTTGTGTGTACTTTTTAGCT
CTTGAAATTTGTTCCTGAAAAGAGTGACATTGACCTGTTGGTTTCAAAATGGAGGGTGTTAATAATTTGAGATTGTCATA
TTCATTCTTTTG-ATC-TTTCAATTCACCACCCCCCCCGCCCCCCGCCAGGCTTTCTCCTATCTCTTCCTAAATTAAGCA
GAACAATGCCCATCTGGTGGCTGTGAGTATTATTATC-TTTGGAAACCTGATGGGCCACCCACTTTCCTAAGGCTTCCTC
TCAAGTTTAAGGATATTGATTATTAGC-AAAAAACAAAAATAAAAATAAAAAA-TTTCTTCAATCTTGGCTAGATTCCCA
GCAAGTAATA--------TATAGAATCTTAAAAGGAGACACTCAGGAGACTCAATAAGCCAGTT-GAGACTATTTCAAAA
TGAAGCTTAAAAAAAAAA-TCTGTGTTAGAAAATAACACGAATGTTTGAGTAT---------GGCGAAGTTTTCTACAAA
CTGTAGTGATTTAGGGAACTAACTTTATTTAATATAGGC------------TGGGATATGTGTGAACCACCACATTAAAC
TTCT--CGCCATATTTAT-AGTAAAAAGTTGAATATTAAAC---CATAAACACAAT-CCTAGTGTTATCAACTTATCTTT
TAGCTACTC-ACAATATGACATGATTAAATGAAATATCATCTAACACAACCTAAACT-ACATAGG---------------
--------------------TTCAAACATGGGTTAAAATTCCAGAGAAAATATATACTAAAACCAAGTTAATCATTCAAT
-CCCTTAGTCATCTTATGACACTATAATAGCCAAGAGCTAACAAT----GGTCAAGT-CCTATGTGT-CAGGTAC----T
TATCCTTACAACAATCCTATGAGATACTAC-AATTATCCCTAT---TTTTACAAATAAAGAAACTAA----GGCTTAG--
----AGAGAAAAGAATTTTT-CCAAAATCATAATAGAGACAGAATATTTGATAGGATGCATACATGTAACTTTCTGGAAA
```

```
A--GTTTGAGGGAA--AGAATGAAGAAGGAAA-AAGTAATCAAAGATTCACAGCAAAGTTGTATGCCTGAGTGGGTAGG-
-AAAATCTTGGGACCTTTAAACTGAAAT--------CAAGGGAATC-------------------ATTAGTAC-------
--CTCGTTGCAGTGGCACATACGTTATATGTT--CT
>Myotis_lucifugus
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTAAA-TTCATTAATTATAAACTA---TTGATACCATGTCAATCCATGC
TTACAGATAATAGTCACATAATGTGAAATTTAAAGTGGTACTTAC-TTCTACTCTTAGTAGCAACAGATATAGTACGTAC
ACTCATTGCATATCCTTATATT-CAGCCTTCTATTTATATTGCCCAATTTATTGAAATGCATTACTTCACATGA--CTAA
GTTTTTTA-AATACCTGGTATAATAGATCTTCATTATGATGCTG--GTTTTTATTTTCAAGCATAGGAAATTTTCAGAAA
CAAAAGATATGGGCCATTGCTTAGTGATTGACACTGAGATAGGTAAGCCCGTTTTGTGAATAGAATATGTAGAAGGTAAG
AAAAACATAAGATAGCAAAGAATAAGGGAGAG-AACAC----AGG-ATACCACCCATTTTACACATAATTAATA-----T
TGCTCATGTGTTTCAAAAATTAGAATGAAGGTACTTGTGCAACT-------------TTATTCTGTAACAATAACAC---
-CAATACAAGACACAA-TTTTCTTGGGAAATATTCAGAAAAATTAGAATGCAGAATGAAAAATAAACAAGTGTGTCTCT-
----TTATTCCATGCTAAAGCACAATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGTGTGATTAAGATAA---TCTCTT
CCTATAGATAA----CCAATGACTCTA-------------CATTACTCCATACTTCCGTAATATCTTTCATGTATGTTTT
CAAAAGGATTTTAAAAACGTGTGCTCACACAGGCCAAAATATAAGATAG----GTTTAAGATAGGAAAATCATAAAG---
------ACACAGTATTTAGAGACCCAAGTATGAGTTTAGGCATAATCAATGGTTT-GCTGTGGTGCAAATCCTTCATG-T
GTCAATTCCT-CATCAGCAAAATGAGTGTAATCCAAAGGAGATG-----------------------TCCCCCTTACCC
TACTCAGTGCTGGGGACGAAGGGTAACTTCC--------------------------------CCTATTTTCCTGTCT
TCAAATCCACCTTC---CCAA-TATGACA---GGG------AGATTTTCCACTCACCGTT--------------------
---TGGGGC----CTTTATCCCTCTCCCTAGTGG-----------CCCCT--------------CTGAAAGGACTCAGCT
CTCAGTTAACTAATTGCATTTGCCTTCCTAGAGCTAGGA-AACATCAGGAGGCCTTCAGGACCTGCATTTGTTCAGTTGT
TTCATTCATTTGCCTTGATAAACAAACCTTCCTCTTGCTAATA--CTAACTTTCTCTTAAAATACAA----TTCTAGGGT
TT--------ACAATGTTAATTAACAACCTTTGCCTCTTTGCTCTGCCTGTTAATGACTACTAAGATTTCCTTATTCATA
CTTAGATATGAGCCAAGAGCTCCAGAGAAAGGTATCAAATTC-CTAATGGGGGCATGGGGATAAGGACAANNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTTCCAGATCAGGAAGTCTGGCTT
CAGTGGGTAATACAGGTTCTGACACGGTATCACTTTGGATCCATTTTTAGTCCAC-TTAACCTACTTCTTGCATTAGGAA
ATATAGTCTAACACATACAAGACTTCATCCTCC-ATAGCTCCCACCACTGTGTGTTTCTATTGCATCTC-TGGTATACAG
CAAAATTTATCTTGTTTTAGGACTCATCAACAAAT-TACAGTTATTG-TTTTCTATATCCATAGTTATAAAACAGTGCTG
TTTGTTTACAGAAAATGAAGCATCTAAAATGTGAATTCTCTACAGCATGG--------------TAAGTTGAGTTTAGAT
ATTTATACTTCTATGT---TGACTGAAGATTTACATGCGTATATTTTCAGTGAGGATGAACTCTAGACT--TACTGCGAA
GCACGT-----GTTTCAATAGATGTAGAGAAATACCTGT--CTTGTACCTCTTTGTAGCTTTAGAATATACTATAGATCC
TGGAATACACTGAGGACTGAATATACATTTGTCAAATTAAATTGACCTTCATTTCATCTTGAAGGTCTGATG-TTAAATT
ATACTCAATCTTTCTTGGT--TTTATTT------------AGGGGATCTTATTTT-AGGAAGCATGATCTCTGGGTTATG
AATTCCTGATTTCCCTG---TATTTCTTCACA-TATATTATTGTA-TTAAGGGGGTCTTAGCAAGCCATAAGAACATTTT
AGATTTTGTCATCTAGTGCCATCAGTTTTGC-TGTGACAAAGT---TAGATATTAACTTTTGATCATAGATATTCACAGA
ATATTAAGCTTCAATAAAG-TGAAAGTAANNNNNNTTTGCTGAAGGTAATTGTATAAATGGCATTGCTTGACTAACACCT
GACCGGA--TACTAGAATGTAAATAGTCCAGGACGTTCAGGCCCCAGTGGAAGCAAGCGG---AGTCTGGCAAGCCTAAT
GTGTCTTGTTGCTGGTTGAC-AAAGTGCCTGACAGTGTACCTCCAGCATTTCTGCTCATCTACTCTTG-----------A
TTTTTAAAAA--GGTGCCAATTCAGAAACCTGAAATATCACTTCCCGCTGTGCTTCCCACTTTCCGCCCTG-GGGCCTGC
TGTCGGCACCCTGCC------------------GCTGGCATCCCCTGGGAGTG-TTCACCTGGCACCTGCAGCAGCTGCT
--CCCATGGCAAAGCAGCTGTGAAAGCGGATCAGCCAGGAGTTTTCACTTGAATTCGTTTAAAAGACATTCCCTACCTGA
GATTCTGATTAGGAAGCAGGGTCTCTCTTTCCAGTACTAGCCAAAGAT---AAAATACCATTACTTTCCAGCCCATTTTT
TTTCTTCCTTTCTGCCTGG----GGGGC----------TATTTTCTATTGAT-GTTTTGCCAGCCATTTTTG-TACTATT
CTTTGAG-----TTCACTCCATTTAACTAAGGTTGTGTGCTTT--ACAGTCTAAAGCCACAGACAGTTTT-TGTTTCTAT
CCTCTGGCACTACCTTGGCCTTGCCTTGCCCTAAAAACACTCCACTAGGGTGAAAAGAGTGTGTGTGTGCATGTGTGTAC
GTGTGTGTG-------CCTATGGATGCACAGGCACACACACAC------------------------ACACACACACACA
CACACACACGGGCACTGG--------------------------GGGATGGATGGAGCAAATTATTGGAGG-GAGCCACA
CTGGATTGATCGTCATGGATAAGCCAACGCTCTCTTTTCTTTTC-TGTGTGAGGAATGCCTGTGAAGCTGTAGGCTCTGT
GAGGGCAGGAGTCCTTTCTGCCTCTCCATTGTTGTAC-CCAGGTGCCGGAAACATGGTGAGCACTCAACA----------
--TGAGTGAATGTATGAATCCCATCCAC-TTGCTTCCCAGGCCACC---AGTG----GCCTAG-CCTTT------GCATA
CCTGC--------TGACTCCTCACAGTTGAGACCTCCATCAACCCTGGTCCACTTTCAAGGACTAGTCCTTACATGAAGG
TGAGG----AATTACATGGCTCAGACACAAATTCATGAGTCAAAGCATCAAGCCAACTCACCTGTTACCTGGCT-GTAAA
TCTGGGTTCATATTTCCAACCTTTAGGCACC---TCAGCTTTTCTTTGTGGGAGGATTTTTT--CCTCCTTGAAGTTTGC
TACACAGTCT-CAATGAT---ATTATCAAGGC-AAAACTCTATGGGACTATTTAACAACCCTGGACGCTTTTGTTGTAAA
ATTAAAATTAAATTGAGTACATTCAGAAAATGCATTTTTGTGTGAGGCTTATAATCACATACATATAATTAAAAATTACA
----TTAAAA-ACACTGGCTTTTTCTATACAGAATA-CTTTGTCTCTGTTACCAAG------TATATGCGGCAATTATGA
ACACAGCC---AATAATAGATGCTCTGCA-----------TTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNAGTTTTCTAACCTCTCTGGACCTCGTTTGTACCATCTTCTA-ATGAGAGGGTGGGATC-------
TCC--AGGGCCCTCAGATGGTCTGTGTGAAGAAGGGCATGGTGAAGAA----CTG-CTGCA-TTCTGGTTTGAGAGGCAG
GACAGAACAGAAAGGGGCCGGGAATGAATCTT-ACACCAGTTTATCTACTTTCAAGTAAAAATGGAAAGATTTAGT----
CGTTTCTAGTGTATCTTAACAATCACTTCTGAGCCGAGCTTATAAATTAAACAAAAGTTAAACTTTCATCTTGGGACAAA
-TTAACTGAAAGAGTGAAAAATTACTGAAGAAATTTAAGTTACAGACCTCACTTTTAATATTTGTGTGTTCTTTTTAGCT
CTTGAAATTCGTTCCTGAAAAAAGTGACATTGATCTTCTGGTTTCAAAACTGAGTGTGTTAGTAATTTGAGGTTGTTATA
TTAGTTCTTCTA-ATC-TTTCAACC----CCCCCTCCACCACCACCAAAGAG----CTCTACCTCATCCTAAATTAATCA
GAACAATGCCCATCTGGTGGCT----GTCTTA-TATC-TTTGGAAACATGCTG--------ACTTTCCTAAGGCTCCCTC
TCAAGTTTAAGATTATTGCTTACTAGC---------CAAAAATAAGATAAAAATTTTATTCAACATTGGATAGATTCCCA
GCAAGTAATA--------TATAGAATCCTAAAAGGAGACACTCAGTAGAATTCATAAGCCAATT-AAGAATGTTTTTAAA
TGAAGTTTTAAAAACA------CTGTTAGAAATTAACATGAATATTTGAGTAC------------GAATTCCCATACAAG
CTGTAGTACTTTAAGGAACTACCTCTATTTAACATAGGT------------TGTCACATGTGTGAACCACCACATTAAAC
TGCT--TGCCATATTTAT-AGTAAAAAGTTGAATATCAAAC---CATA----------CTAGAGTTACCAATTAATCTTT
CAGTTACTC-ACAATATGACATGATTAAATGAAATATCTTCTAACACAACGTACACT-ACCTACA---------------
--------------------TTCAAACATGGGTTAAAATTCCAGAGAAAATATATACTAAAACTAAGTTAATCATCCAAT
-CCCTTAGACATCTTGTGACATCACAAGAGCCAAGAGCTAACAAT----GAACAAGT-CCTATT----CAGGCAC----T
TTTTCTTACAACCATCCAATGAGATGCTAC-AATTATTACTAT---TTTTATAAATTAAGTAACTAA----GGTTTAG--
----AGGGAAAATAATTTTT-CCAAAGTCATAGTAGAGACAGAATATTTTATAGGATGCTTACATGTAACTT-CTGGAAA
```

```
AGAATTTGAGGAGGGAAAAATGAAGGAAAATA---ATAATCAAAGATTCACACCAAAGTTGTATTCCTGAGTATCTAAAA
AATAATCTTGGGACCTTTAAATCAAAATAAGGAAATCAAGAGAATACATTATTCACATCTCTATTGTTAATAC-------
--CTAGTTTCAGTGCCAGATACTTCATATGTT--CT
>Outgroup1
TGAACTCATGGTATAGAATTTTGGTAAAAAAAATATCAT---TGGGTTTGCATACCTGTGCTAAGAGCTGCCTTCAAGAA
GAAAGTGCTACCTAAGGCATTTTTAA---TTCTAAA-TCTATTAATTATAATATCA-TTTGATATCATTTGAATCCGTGC
TTACAGACAATAGTTATATAATATGAAATTTAAA-CAGCACTTAA-TTCTATTCTTAATAACAATAGATATC----ATGC
ATTTATTGTACAGCCTTGTATT-TAGCCTTTTATTCATGTTGTCAAATTTACTAAAATCTGATATTTCATACAA--GAAA
TTATT----AAGACCAGGTTTAACAGATTTGCATTATGATGTTG--ATTTGTCTTTTCATGTATAATACATTTTCAGAGA
CAAAGCAGATGAATCGTGGCTCAGTGATTTACACAGAGTTGGGGAAGCAACTTTTGTGAATAGAATATGTAGAAGGTAAG
AAAATAAAACAGGAAACGAGGGAGAG-------AAAGTAGATAGG-AAACTGC--ACTTTGTGCACAATTAATA-----T
TCTTCAATGGTTTCTAAAATTATTACAAAGG--TTTTTGCAGTT--------------ATTTTCTTTGCTGTAAC-----
-----ATCA-TTGCAT----ACTCAGTAAATATTTAGGGACAGAAGAATACGGATAATAAGGATAATAAGTGGATTTCTG
---TTTCT-CACAGTTGAA-GATGAA--------------------------------GATTAAATAATGATATAGAATT
TCTAC---------TAACACCTCTGTTTG-CAAGCTAGATAATTTTATGTATCAACAAGTTAGCAGTAGCTAGCAGTTTA
AAGTAATTGCAAAAACCGTAATTACTTTTGCACCAACCTAATAA-TTTCAG---AGAAGTGTTAAAGAATATCTCTTCTT
CCCACAGATAG----CCAGTGATTCTACAGGAAAACAT------ACTCCACCTTTCTAGGTTTTCATTTATTCAAGCCCT
CAAAAGGATTCTATAAACATGGGCTCATCTAGACTGAAGTATAAATAGG----TTTAA-GATGGGAAAATCACATGG-AA
AAATGAACATGGTATTAGGAGACCAAACGTGAGTCTTGGTGTCGCCGCTGATGTG--CTGTGGTGTAAACGGTTTGGG-T
GTCAGTTTCT-CAGCAGCAAAATGAATGTAATGCAAGGCAGATG------------------------TTGCCCCCACCT
TAGTCAGCACTGGGAAAGAGGGATCACTTGC--------------------CTATATTGACAGCCCCTTACTTACTGTCC
TCAGATCCAGCCTT--TCTAA--TGGACAG--GGG--------ACTTTGCATTCACCATGTGGTATGTG-TACTTCTACT
CATTGGAACACTCCCTTGACCTTGCCCCTTCTGG-----------TTCCTCTGCTCTTCCCACACTGTGTGGTCTCAGCT
CTCAGTTAATTAAGTCCATTCTTCTTGGAGCTGGAGAGTATTGGGAAACCT----TCAAGTCCCACATTTACTCAGCTGG
TTCATCTGTTTGTCTTAACATGTAAACCTTCCTCTTACTGGTGTTCTAACTTCCTCTTAAAACACAG----CTCTAGGGT
TT--------ACAATG----TTATC----------------CTCTGCCTATCAAAGACTGCTAAGGTTTCTTTCCTCATA
CTTAGATATGGGCCAAGAGCCTCAAAGATAGGTGACAAACTCTCTAATAGTAACAGGGAGAAGAAA---------GCTTC
CTTCTACCATAACAGTGTTTGCAGTGTGTGCAGAGATTTCCCCAAAGGNNNNNNNNTTTCAAGACCACAAAGTCTGGTTT
CAGTTGATAATACAGGATCAGGCCGTTGTCTCTTTAGGCTT-ATTTTTATTCCCC-TTTATCCATGTCTTGCTTTAGAAA
CTGTAATCTAGCACATACCAATATTCAGTTTTCCACAATCTCTGCCACTATGTGTTTCTATTCCATTTG-TGGAGCACAG
AAATATTTGTATTGCTTCAGAGCTCATCAATATTTGTTTAGTTGTTC----------TTTCTGTTTATCTAACAGTGTTA
TTTGTTTGGTGGGAAAGGTGCAAC-CAGATGTGAATTATTTGTACCACAATGACAAGAAGTTCGTGAATCGAGTTTACAT
ATTTATACATCTATGC---TGGCTGGAGATTTACATGTGAATATTCTTAATGACTATATACTCTACGCA--TATTGCCAG
CGATTT-----GTCTCAATATACCTAGAGGGAGACCTGCATCTTATGCCTCTTTGTACACCCAGTAAACGCCATAGATCC
TGGCATCTACTAAGTCCTCAATATGCATTTGTCAAATTGAATTGACCTACACTTCATCTGGAGAGTCTGATGTTTAAATC
ATTGTCAGTGTTGCTTGGT--TTTATTT------GGAAGGAGATGGGCTTATGTTTAGGGAACATAATCTCTAGGTCATA
ACTTTTTAATTTCTCTATTACATTTATTCACA-TATATTATTACA-TTAATAGGGTTTCAGCAAACCACAAGAACTTTTC
AGATTTTATCATCTAATGCCATCAGCCTTTCTTTTGATGAAGT---TAGACATTCACTTCTGATCACACACATTTACAGA
ATATTAAATTTCAATCAAGTTGGAGATAACCCTATTTTGCGGAATGTACTTGTATCAATGACATTATTTTACCTATACCT
GACCATT--TACTAGAACTTAAATAATCTCAGTAACTCATGCTCCAATGGAAGCAGGAAG-AGAGTCAGGCAAGCTTGAT
GTGTCTTGTTGTTTGGTGAC-AAGGTTCTTGACAGTATACCTCTATCATCTATGCTTATCTACTCTTG-----------A
TTGTTTAAAAA-GCTGCCAACTTAGAAACCTAAAATGCAATTTTCCATTGTGCTTACTACTTTCCACCCTCTCAGGCTGA
TGTCTATGCCTTGCCCTGAACTGCCCTCCACCTGC-GGCATCCTATGTGAGCATTTCACTTGGCACCAGCAGCAGATGCT
T-TCTATGGCAAATCAGCTGTGAAAGCTCATCAGCCTAGACTTTTCACCCGAGTCCATTTAAAAGATATTTCCTGCCTGG
GATTCTGTATAAGAAGCAGGGCCTCTCTTTACATGACCTACGAAAAGT---ATGATCTTACCACTTTCCCTTTCA-TTAT
CTTCCCCACTTCTGGCTGT----GGGAA----------CATTTTCTAGGATGGATCTTTCCAGGCATTTTTTTTCTGTG
TTTTGAG-----TTCTCCCCATCTCCCTGAGGTTGTGGGCTTT--AAAGACAAAAGCTACAAATAGCCTTTTATTTCTAT
TCTCTAGCACTATCTTAGCCCTTCTTTGCCCTGAGAACATAACACTGAATTGAAAAGTGTGTGTGTATATGTGCCCATGC
AGCTACACGCATGTGTAC-----------------------------TCAGGCACATACAGGGGCTAGGGAGTGTTGGAG
TATTGGAGGGGAGAAA----------------------------GTATTGGAGGGGAGAAAGTATTGGAGGGGAACCATG
CTAGATTGGTTCTCACAGATATGCCGGATCTCTCTTCCCTTT------ATCACCTTTTCCTCTCCAGCTGGAAGCCCTGT
GAGGGCAGGAGTCTTT---GCCTGTTTGCTGTTGTATACCCAGTGCCTGGAATGCATTAGGTGCTCAGCT----------
--TGGATGAATGAATAAACCCTACCCTCTCTGCTTCCCGGGTGAGGTGTGGTGT----CCAGT--CTTC------ACAGA
CCTGCAGACCTACTCACTCCTCAGAGCCGTGGCCTCTGTCAACCCTGCTCTACTCTGAGGCTCTTCT--TTACATTAGGA
TGAGG----GATTACACTGCT-TGACCCAAA-CCGTGGGTCTCAGCATCAGCTGTTACCCA-------------------
----GCTGTAATGCTGGGCTCTTGCTCTG----CAAAGTTCTGTGC-CTCAGCGTTATTTTTTTCTTCCTTGCAGTTTGC
TACTCAGTCT-TGATGTT---ATTATCAAGGCAAAAACTCTATGGGATTATTTAACAACCCTGGATGCTTTTGTTGTAAA
ATTGAAATTAAATTGAGTACATTCAGAATACACATTTT-GTGTGAGGCTTATAATTACATACATATAATTTAAAATGAAA
-----TGAAATAGACTGGTTCCCTCTATACAAAGTC-CTTTGTCTCTGTTATCAAGTCACTGTATTAGTGGTGATTATGA
ACACAGTCAATGATAATAGACCTTCTGCATTTTTTTTGATTTCAT------AGCTTCGTATAGACAGAAACCAGACTACC
TTGGTTAAGAGTCTTG-ATAACACCATGTGTTTGTTGAGTGCCTACTATA-TGCAAGGCTCTTGTTAGACTCTGAAGAAA
CAATGAAGAGTAAAGAGTGGCTTACTCTCCCTGGACCTCAGTTGTATCATATTCTG-ATGAGAGCATTGAC-T-------
CCCTAAGGTCCTTCTAGTGGTCTGTGAAAAAGAGGTTCCAGTAGAGAA----CTC-CCACAATTCTGATTTGAGAGGCAG
TAGAGAACAGAAAGGTGCCAGGAATGAATCTT-ATACCCATTTAACTACTTCCAAGTAAAAATGAAAAGATTTAAT----
CATTTCTATTGTATCTTAACC------TGTGAGCAGAGCTTATACACTCAACAAGAGTTAACATTTTATCTTGGGACAGA
-TTAACTGAAAGGGTGAAAAATTACTACATGGATTTAAGTGATAAACCTCAGTTTTAATATTCGTGTGTACTTTTCAGCT
CTTGAAATTTGTTCCTGAAAAAAGTGACATTGACCTATTGGTTTCAAAAAGGAGGGT-ATAGTAATTTGAGATTGTCATT
TTAGTTCTTTTG-ATCTTTTCAAAT----------------CCCCCCAAGGCTCTCTCCTACCTCTTCCTAAGTTAACCA
GAACCATGTTCACCTGGCAGCTGTGAATATTA-GATC-TTTGGAAACCTGCCCGGCCACCCACTTTCC---AGCTTCCTC
TGAAGTTTAAGGATATTGCTCATTAAG----AAAAAATAAAATAATATAAAAA-TTTCTTGAATGTTGGCTAGATTCTCA
GCAAGTAATAAAGTAATATACAGAAATCTAAAAAGAGATACTCAGGAGAATCACTAAGTCAAGT-AAAGATATTTCAAAA
TGAAGTTTAAAGTAAA---TCTGT--TAGAAAATAACACGAATATTTGGC----------------GAATTCT-ATAGAAA
TTGTAGTAATTTAAGGAACTGACTTTATTTAACATAGGTCAACACACAGGTCATGACATTTATGAACCACCACGTAAAAA
TGCC--TGCCATATTTATTAGCAAAAAGTTGAATATTAAAT---CATAAAAATAAT-C-------------AGTTATCTTT
TAGCTACTC-ACAATATGATATGATTAAATAAAATATTGTCCAACACAAATTAAACT-ACTTATG---------------
--------------------TTCAAACATGGATAAAAATTCCAAAGAAAATATGTACTAAAATCAAGTCAATTATTCCAT
-CCCTTGGTCATCTTGTGACATTACAGTAACCAAGAGCTAACATT----GG-CATGT-CCTATGTAC------------C
TATCCCTACTACAATCTTTTGAAATACTATTAATTATCCCTAA---TTTTACAAATTAAGAAACTAA----GGCTTAA--
----ACAGAAAATAATTTGT-TCAAAGTCAGAGTTAAGACAGAATATTGAATCAGATGTGTACACATAACTTTCTGGAAG
```

```
GGGGTTTGAGGGAG--AGAGTGAAGAAAAAAA--GGTAATCAGAGAGTTACACCAAGATTGCATGCCTGGGTGGCTAGG-
-ATAATCTTCGGATATTTAAATAAAAAC---------AAGGAAATCTATTGTTCATATTTCTGTTGTTAGCGT-------
--CTGGTTGCAG--GCAGATGCATTATATAT---CT
>Outgroup2
TG-ACTCATGCTGTAGAACTTTGTTAGAAAGATCATCAG---TGGGTATGTACAACTGAACTAAGAGTTGGTTTCAAGAA
GAAAGTGCTACAGAACGTGTTTTTAA-TTGTCTCAC-TATGTTAGTTATAATATCTTTTTGATATCACTTCAGTATAAGC
TTATACATAATAGTCGTATAACAGGAAATTTAAAA--GT-CTTAA-GTTTACTTTTAACAGCAATAAATGTG----GTGC
ACTTAATGAACA-----ATATT-CAG-------TTCCTATTACCAAATTTACTAAAATCCGATACTTCACGCAA--GTAA
ATTGTTTTTAAGACAGGAAATAACAGGTTAGCATTATGATGTAG--GTTTTTCTTTTCAAGTTTAACAATATTTTAGGGA
CAAAGCCGATGAACCATCACTCAGTTAGTCACACTGAGTTATGGAAGCTCTTATTGTGAGTAGCATGAGTAGAAAGTGAA
AAAAGCAGGTGATGGTAAAGAATGAAGGAGAA-ACTACAGATAGG-AGACT----ACTTTA-ACATAATTAATA-----T
TGGCCATATGCTTCTAAAATCAAAATTGATAAACATCCTCACAAC-----------TTTTTTCTTTCTTTGTAACAC---
-TAAAATAAGCTTCAA-TTTCCTTTGCAAACATCTAGGGGAATTTTGAAGTAGAAATCAGGATGAATATGTAAGT--CTG
---T-TCTGCCATATTAAATGAAGATGGCTT-TACTTGTGTGAAGGGAAATAGTAATATGTGTTATTAAATTTCCATTGG
TTCACCTTTTATTTATTTACTTATTTTTGTCAAGTTAGTTAAT-TTAATTTTTAACAAGTTAGGAGCAGCATG-------
----------TTAAATTCCACCC-AGGTATGATTAATATAATCTTTTCTT
CTCACAGACACAGTGCCAATGATTCTATAGGAAAACAC-ACGTTACTCGACACTTCTATGATATCTTTCGT--AAGGCCT
CACAAAAAGCCTATCAACGTGTGCTCATATTT-CTGAAGTATAAGGAAG----ATTTAAGATAGGAAAGTCATACAG-AA
AAACAAAAACTGAGTTTGGAGACCAAAGGATGAATCTTGTCCTCTCCACTGATTG-TCTGTGGTATAAACATCTTCAGAT
GTCAGGTTTTTCATTGGCAGAGT-AAGTGTAATCCAAG-AGAGG----------TGTCCCTCCTTACCC
TAGCCAGTACTGGGAAAGAGGGGTAACTCAGGGCCCTCCCAAGTCCCTTCCTTTTTTTACAACCTCTTACTTCCCTGTCC
TCAAATCCAGCCTT--TCTAA-TGTGACAA--GGA-----GAATCTCCCTCGTTAT----------TACACCAACT
CACT-GGGCCTCCCTTCTCCCTCTCCCCCTTTGCACCTTCTTTTTCCCCTCTGCTCTTT--GCACTGCAGTGTCCCTGCT
TTCATTTAATTAATGCCATTCTCCTTGATGAAGCTGGGAGAGTATGGGCAGGCCTTCAGGTCCTACATTTACTCAGCCTT
TTCATCTGTTTGTCTTAATAAACAAACCCTCCTCTAGCTAATA--CAAACTGTCTCTA-AAGCACAA----CTCTTGAGT
TT--------ACAATG----TTA------TTTGCCCCTTTTATATGGCCACCAAA-AATAGTTTCCTTCTTCATACCTTA
ATTACATATGACCCAAAATCTCCAGAAAAAAGGGACAAATTCTCTATTGAGGGT-GGGAGGAGAAAA---------CTTC
ATTCTACCATAATAGCATTTGCAGTGGGTACAGAAATTCCCC-AAATGGCCATGGATTTCCAAATCACTGAGTCTAGCTT
TAGTTGGTGACCCAGACACAGGTGCTCTGGCACTTAGGATAGAATTTCATTTCTC-TTTACCTTTATCTTGCTTTAGGAA
AAGTAGTCTAGCACAGCT----------TCAGTCTCTTACTCCCCACTCCTTTCTCTCTCCATGTCCTG-AATGCAG
AGAGTTTTATCTAGTTTGAAGGTCCACCAACATTTGTTTTCTAGTTG-TTTTCTGTCTTTATATGTATCTATCAGTGCTA
TTTGTTTGAAG-AAAAGGTACATC-AAAATGTGAATCCTCTGTACCATG-TGACAGGAAGCCCATGGATTGAGTTTACAT
ATTTATACTTCTGTGT---TGGGTGAAGATTTACACATTTGTATTTGCAATGCTTCTGAACTCTATACACTTACTGCCAG
GCAAAA-----TGTATTAG-CACACACAGGAGAGGAATTCTTTGTACTCTC----------CAGTACATACTATAAAGCC
TTGCAGACACTAAGAACTCAATATATATATGCCAATTTAAATTGGCCTATGCTTCATCCTGAAGGTCTGATATTTTAATC
ATTGTCAGTCTGGCTGGGT--TTTATTT------GCAGGAAGAGGGGCTTATTTC-AGGGAACATGATCTCTGGGTTATG
ACTTCCTAATTTCTTTATTATATTTCTTCACA-TATATGATTACA-TTAATGGGGTCTTAGCAAACCACAAGAACAGTTT
AGATTTTATCATTGAGTGCCACTAATCTTGCTTCTGGCA--GT---TATATATTAGGTTTTGATCACATCCAAATGCAGA
ATATTAAGCTTCAATAAAGTTGGAGATATTCCTGTTTTGCTGAATGTGGTTGTATTAATGTCATTACTTTGCATGTACCT
GGTCACT--TACAGGAATTTAAATAAGCCTGGTAACTCATGCCCCAGTGGAAGCAGGAGG---AGTTAGGCAAGGCTGAT
GTATCTTGTTGTTAATTGAT-AAAGTATTCGAAAATATATTTCCATCACCTATGCTTATCTACTCTTA----------A
TTTTTTTAAAAAGATACCAATTCAGAAATCTAAAATACCATTTTCCATTGTGCTTACTACTTTCCACCCTCTGAATCTGA
-ATCTGTACCCTGCCCTGAGTTACAC-GTGCCTGTTGGCATCCTATGTGTGTATTTCACTTGACACCAGCAGCAGCTGC-
--TCTCTGGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAATCAGTTTAAAAGAACTTCCCTGCCTGA
GATTCTATCTAGGAGACAGGGCCTCTCTTCCCAGTACCCACCAAAGGT---AAACTCTCACCACTTTCCCATTCA-TTTT
CTTCTACCAT----------ATTGATTTAGTAAC-GCTTCTCCTGGCATTTGT--TTCTATG
CTTTGAGT----CTTCTTCCATTTCCCTAAGGTTGTGGGCCTT--GGGGACCAAAGCTAGAAATAGTCTTCTGTTTCTAT
GCTGTGACAGTACCTAAGTCTTTCCTTGCCTTGAGAGTAGTCCGCTGGGCTGAAAAGGATATGTATGAGTGTGTATGTGC
ACATAAGTACACACATACGCTGAGGATGAAGTAAACCATAGTTTATTGGAGGAACTTATAAGCACTTTGAAAACTTAGAG
AGATACAGGCACAACACAAAATAATATCACAGTACACTGGCAATCTGGGATAATGAACAAAAGAGA-CACGGGATCCACA
CTATATTGATTGTTA----------ATTTCTATTTT--CCTATGACCTATTCCA-TC-AAGCATAAGCTCCCT
GAGGTC------GCTTTCTGCCTGT-CCTTGTT-TAGACCCAGTGTCTGGAATGTGGTCAATGCTCGACTTGAGTGAATG
AATGGCTGAATGAATGAACCCTATCCATTCTGTTTCTCAGGCTATGTACAGCGC----CCAGG--CTTT------GCAGA
TCTGC--------TTTCTTCTCCAAACTGAGTCCTCCTTCAACCCTGTTCCACTTCTGAAGACTCGACCTGACACGAGGA
CCAGGGATTATGCACACAGCTCTGACTCAACCTCATGAGGCTCAGCATCAAGTCTGCTCAGCTGCTACCCAGCT-GTAAA
TCTGGGCTCATATCCTCCAATTTTCCGTGCC--TCAACTTCCTCAT-CTGTACGGGTTTTT---CTTCCTTGAAGTTTGC
TAT--AGTCT-TGGTGAT---ACTATCAAGGCAAAAACTCAATGGGATTATTTAACAGCCCTGGAAGCTTTTGTTGTAAA
ATTGAAATTAAATTGAATACATTCAGAATATGCATTTTTGTGTGAGGCTTATAATTACATACATATAGTTAAAAATTAAA
----TTAAAATAGATTGGTTCTCTGTATACAAGATA-CTTTGT------TAGCAAGTCACCGTATTAGTGGTGATTATGA
ACACATCCAATGATAACAGACCCTCTGCA------TTGTTTTCAT-TTAATAGCTTTGTATAGACAGGCACCTGCC-ACG
TTAATCAAGACTGTTG-ATAACACCATGTGTTTATTGAGTGCCTACTATA-TGCTAGGCTTTCG-TAGGCTGTGGGGAAA
CAATGAGAAATGAAAAGCTGCTTAATATCTCTGGACCTCAGTTTCATCTTCTAGA--ATGAGAGGGTTGAACTAAATTAT
CTCTAAGGC----CTAATGGTCTAGGCAAAGTGTGTCCTGGTAATGAA----CTT-GCATAATTCTGATTTGAGAGGCAG
TGTCCCATAGAAAGGGGTCAGGAATGAACCTT-ACATCGTTTTAGCTATTTTCAGGTAAAAATGAAAACCTTTAAT----
CATTTCTATCACATCTTAACAATCACCTGTGAGCTGAGCTTATAAATTAAACAAAAGTTAAAATTTCATCTTGGACAAA-
-TTAACTGAAAGGGTGAAAAATTACTGCAGGAATTTAAATTAAAAACCTCAGTTTTAATATTTGTGTGTACTTTTTAGCT
CTTGAAATTTGTTCCTGAAAAAAGTGACATTGACCTCTTAGTTTCAAAAAGGAAGGTGTTAATTATTTGAGATTGCCACC
TTAGTTCTCCTG-ATC-TTTCAAAT----------
----------
----------AATATTACTCAGTACC---AGGAAAAAAAAGGCAGATGAAAA-TTTCTCAAACATTGGCTAGATTCTCA
GCAAGTTATA--------TGTAGAATCCCAACAGGAGACACTCAGGAGTATCACTAACT-AATT-AAGAATATTTCAGAA
TGAAGTAAAGGAGAGG---TTTGTGTTAGAAAATATCATGAACATTTGCATATTAGAGACTATTCATATTCTTATATGAG
CTGTAGTAATTTAAGGAACTGACTTTATTTAACATAGGT----------CGTGATATGTGTAGACCACCACATTGAAG
TGCC--TGACATATTAAC-AGTAAAACGTTGAATATTAAATTAAAAAAAAAAAAAT-CCTAGAGTTATCAACTTATTGCT
TAACTACTG-ATAATATGACATGACTGGATGCAATACTGTCCAACACAACTTAA-CT-ACCTAGA----------
----------CTCAAACATGGGTAAAAATTCCAGAGAAAATGTGTACTAAAACCAAGTTAATCATCCAAT
-TCTTTGGTCATCTTGTGACATTATACTATCCAACAGCTAATATTTATTGGGCAAGT-CCTATATTCTAGATGCTTCTTT
AATCCTTACAACAACCCTATGAGGTACT------TATTCCTAT---TTTTACAAGTAAGGAAACTAA----GCCTTAG--
----AGAGAAAATAATGTTTTCCAAAGTCATAGCTGAG-CAGAATATTTGATAGGATGCGTCAATTTAACTTTCTGGAAG
```

```
GGGATTTGAGAGAA--AGGGTGAAGAAGAAAA--AGTAATCAAAGATTCATACCAAGATTGTGTGTCTGTGTAGCTAGG-
-ATAATGGTAATACTGTTAAATAAAAATAATGAAGTTAAGGCAATCTAGTAGTCACATTTCTGTCATTAGTAC-------
--CTAGTAG-AGTGGCAGATGCATTATATATGTTTT
>Perissodactyla_Sp2
TGAACTCATGCTGTAGAATTTTGTTAGA-TC---ATCAG---TGGATTTGTAAAACTGAGCTGAG--TCGCTTTCAAGAA
GAAAGTGCTGCAGAAAGCATTTTTAA-TTATCTAAA-TCCATTAATTATAATATTGTTTTGATATCACTTCAATCCATGC
TTAT--GTAATAGTCATATAATGTTAAATTTAAAACAGTACTTAA-TTCTACTCTTAATAGCAATAGATGTA----GTAT
ACTTATTGTATAGCCTTATATTTTAGCCTTTTATTTATCTTGCCAAGTTTATTAAAATCCAGTACTTGACACTA--GTTA
ACTTTTTT-GAGACCAGATTTAACAGATCTGCATTATGATGTTG--GTTTTTCTTTTCAAGTATAATAAATTTCCAG-GA
CAAAGCAGATGGACTATTGTTCAGTGATTCACACTGAGATAGGGAAGCAAATTTTGTGAATAGAATATGCAAAAGGTGAG
AAAAATATAAGATGACAAAGAATGAGGGGGAA-ATCACAGATAGG-ATGCTCCCCATTTTACACGTAATTAATA-----T
TGCTCATGTGTTTCTAAAACTAGAATTAAGGTACTTGCACAGCT--------------TTTTTCTTTAATGTAATAA---
-CAATGCAAGCCACAA-TTTGCTTAGTGAATATTTAGGAAAATGAGAATGCAGAAGTAAGGATACATAAGTGGGTCTCG-
-------TTCCATGCTAAAGGAAAATGGTTT-TGTTTGTTACT---TATGCATATGGAGATAAAATAATGATATAAAATT
TCTGT---------CAACACCTCTATTTCCCAAGTTAGCAAATTTTAATTTTCA-ACAACTAGCAGCAACTAG-------
----------------------------------------TTAAATT-AAAGGTCGATGTGATTAAGATAA---TGTCTT
CCCACAGATAG----CCAATGAATCCATAAGAAAACAT-ACACTATTCTACATTTCAATGATATGTTTCATTTAAGGCCT
CAAAAGGTTTCTGTAGACATGTGCTCATATAGGCTGAAGTATAAGATAG----GTTTAAGATGGGAAAATCATATAG-AG
AAACGAACACAGTATTTGGAGACCAAAGTATGAGTCTTGGCATCATCAATAATTC-CCTGCGGGGCAAACTCTTTGCG-T
GTCAATTTCT-CATCAGCAAAATGCATGT---CCAAGGGAGGG-----------------------------CCCCTACCC
TAGTCAGTGCTGGGAAAGAGGAGTAACAGCC--------------------------------CCTACATCCCTGTCC
TCAGATCCGGCCTT--TCTAA-GATGACAGGGAGG------AGACATTCCACTCACCACATGGCATGAGTTACTCCAACT
CAATGGGGCTCTCCCCA-TCCCTCTCTCTTTTGG-----------TCCCTCTGCTCTTCCCACACTGTATGGTCTCAGCT
CACAGTTGCTTAATTCCATTCT--------------------------------TCAGGTCCTGCATTAACTCAGTTGT
TTCATTTGTTTGCCTTAATAAACAAACCTT-CTCCTACTAATA--CTGACTTCCTCTTAAGGCGTAA----TTCTAGGGT
TT---------CAATG----TTAACAACCTCTGCCTCTTTGCTCTGCCTATCAAA-ACTGCTAAGGTTTCCTTCTTCATA
CTTAGATATGAGCCAAGAGCTCCAGAGAAGGGTGGTAAATTCTCTAATGGGGATATGAGGATGAAGAGGAACAAATCTTC
ATTCTACTATAATAGTGCCTTCAGTGTGATCAGAAATTCCCC-AAAAGACCATAGATTTCAAGATCAGGCAGTCTGGCTT
CAGTTGATAAAACAGGCTCAGCCCGTTTGTCTCTTTGGATCCATTTTTATTCCCC-TTTACCTACTTCTTGCTTTAGGAA
GTGTAGTCTAGCACATACAAGGCTTCATCTCTCTGC-TCTGCCACCACTGTATGTTTCTACTCTGTTTC-TGGAACACAG
AGAAATTTATGTTGTTTTAGGACTCATCAATACTTGTTTAGTTG----TTTTCTATCTCCCTATTTATCTA-CAGTGGTA
TTTCTTTGGAGGAAAGGATGCACC-AAAATGTGAATTCTCTGTAGCGTGGTGACAGGGAGCCCATGAATTAAGTTTACAT
ATTTATACTTTTTTAT-ATTGACTGAAGATTTACATGTTTATACTTTCAGTGAGCCTGGGTTCTAGACT--TACTGCCAA
CCATGC-----ATTTCAATACACCTAGAGGAAGAGCTGTGTCTTATGCCTCTTTGTACCCTCAGTATATACTATAGATCC
T----------AAGGATTCACTATACATTTGTC-----GAATTGACCTACACTTCATCTCGAAGGACTGGCA-TAAAATA
ATTGTCAATGTTATTTGGC--TTTACTT------GGAGGGAAAGGGGCTTATTTC-AGGGAGCATGATCTCTTGGTTATG
ACTTCCTGATTTCTCTA---TATTTCTTCACA-TACATTATGACA-TTAATGGGGTCTTAGCAAACCACAAGACCATTTC
AGACTTTATCATCTAGTGTCATCAGTCCTGCTTTCGGCAAAGT---TAGATATTAACTTTTCATCACACATATTTTCAGA
ATATTAAGCTTCAATAAAGTTGGAGATAATTCTGTTTTGCTGAATGTAGTTGTATTAACAGCGTTGCTTTACCTACACCT
GACTGCA--TACTAGAACTTAAATAACCCTGGAAAATCATGCCCCAACAGAAGTGAGCCG-------AGGCAAGCCTGAT
GTGTCTGATTGCTTGTTGAC-ATAGTGCTT-CCAGTGTACTTCCATCATCTCTGCTTATCTACTCTTG-----------A
CTTTTAAAAAA-GGTACCAATTCAGAAACCCAAAATACCACTTCCTACTGCGCTTTCCACTCTCTGCCCTGTGAGTCTGA
TGTCTGTACGTTGCCCTAAATTACACTCCGCCTGTTGGCATCCGATGTGAGTATTTCACTTGGCACCAGCAGCAGCTGCT
C-CCTATGGCAAAGCAGCTGTGAAAGCTGATCAGCCAGGATTTTTCACTTGAATCAGTTTAAAAGACATTTCCTACCTGA
GATTCTGTCTAGGAAAGAAGGTCTCTATTTCCAGTACCCACCAAACGT---AAAATCCCATCACTTTCCCATCCA-TTTT
CTTCTCCACTTCTGCCCGG----GGGGA----------TATTTTCTAGCACTGGTCCTCCCAGGCAGTTTT--TACTATG
CTTTGAG-----CCCTCTCCATTTCTCTAAGGTTGTGGGTCTT--AAAGACTAAAGCCACAGATGGGTTT-TGTTTCTTT
TCTCCAGCACTACCTTAGCCTTACCTTGCACTGAGAACACTCCACTAGGTGGAAAAGTGTGTGTGTATGCACATGTGTGT
GCTTGTGTG-------TGTGTGCACGCAG-----------------------------------GTGCATGCACTCACA
TACACACATAGGTGCTGG-------------------------GGGATGGAAGGAGTAAACTATTGGAGGGAAGCCATG
CTAGACTGATCGGCACAGATATGCCAGCTCTCACCTCTCTTTTC-CTTATGAGTTAATCCTGTCAAGCTGTAAGCTTTCT
GAGGGCAGGACCCCTTTCTGCCTGTTCATTGTTGTACACTCCTTGCCGTGAACATGGTGAGTGCTCAACG----------
--TGGGTGAATGAATGAATCCCGTCCACACTGCTTCTCAGGCTATGCATGATGGGTGTCCAGT--CTCT------GCAGA
CCTGC--------TTATTCCTCAAAGCTGAGAC-TCTGTCCACCCTGGTCCACTTCTGAGGACTAGTCCTTACATTGGGA
TGAGG----ACTCACACAGCTCTGACCCCACTCTGTGAATCTCAGCATCAAGGCAACTCAGCTGTTACCTGGCT-ATAAA
TCTAGGCTCATACCCTGAACCTTTCAGCTTC-----------CTCTTCT-GGAGGATTTTTT--CTTCCTTGAAGTTTGT
GACACAGTCT-TGATGAC---ATTATCAAGGCAAAAACTCTATGGGACTGTTTAACAACCCGAGATGATTTTGCTGTAAA
ATTAAAATTAAATTGAGTACATTCAGAATATACATTTTTGTGTGAGGCTTATAATCACATACACATAATTAAAAATTAAA
----TTAAAATATACTTGTTCTCTCTATGCAAAATA-CTTTGTCTCTGTTATCAAGTCACTATATTAGTGGTAATTATGA
ACATAGCCAATGATAATAGACCCTCTGCA----------TTTCAG------AGCTTTGTAGATACAGGCACCAGCCTACT
TTAATCAAGACTCTTG-ACAACAGCATGTATTTATTGAGTGCCTACTATA-TGCTAGGTTCTTGCTAGGCTGTAGGGAAA
GAATGAAGAATAAGAAGTGGCTTAGTCTCTCTGGA-CTTGGTTGTATCATCTTCTC-ATGAGATTGGT------------
CTCCAAGCTCCCTCTGATAGTCTGTGCAAAGTGGGTCCTGGTAAAGAA----CTT-CCGCAATTCTGATTTGAGAGGTAG
TGTGGAACAGAAAGGTGCCAGGAATGAAGCTT-ATACCAATTTAACTACTTTCAAGTAAAAATGGAAAGATTTATT----
CATTTCTATTGAATCTTAATAATCACATGTGAGCAGAGTTTATAAATTAAACAAAAATTAAAATTTCATCTTGGGACAA-
-TTAACTGAAAGGGTGAAAAATTGCTACAA---TTTAAATTATAAACCTCAGTTTGAATATTTTTGTGAATTTTTTAGCT
CTTGAAATTTGTTCCTGAAAAGAGTGACATTGACCTGTTGGTTTCAAAATGGAAGGTGTTAATAATTTGAGATTGTCATA
TTAGTTCTTTTT-ATC-TTTCAAAT-----------CCCCCCCACCCCAGGCTTTTTCCTACCTCTTCCTAAATTAAGCA
GAATAATGCCCATCTGGTGGCTGTGAGTATTA-TATC-TTTGGGAATCTGCTGGGCCACCCGCTTTCCTAAGGCTTCCTC
TCAAATTTAAGGATATTGCTTACTAGTCAAAAAAAAAAAAAAAAAGACAAAAAATTTCTTCAACATTGGCTAGATTCCCA
GCAAGTGATA--------TATAGAATCCTAAAAGGAGACACACAGGAGAATCAATAAGCCAATT-GAGAATATTTCAAAA
CGAAGCTTAAAAAAA----TCTGTATTAGAAAATAACAGGGATATTTGAGTAT---------GGAGAATTCTTCTACAAA
CTGTAGTGACTTAAGGAACTAACTTTATTTAACATAGGT------------TGTGACATGTGTGAGCCACGACATTAAAC
TGTC--AGCCATGTTTAA-AGTAAAAAGTTGAATATTAAAT---CATAAAAACAAT-CCTAGTGTTATCAACTCATCTTT
TAGCTACTC-ACAATATGACATGATTAAATGAAATATCATCTAACACAACTTAAACT-ACGTAGG---------------
--------------------TTCAAACGTGGGTTAAAATTCCAGAGAAAATACATAATAAAACCAAGTTAATCATTCAAT
-CCCTTAGTCATCTTAAGACACTATAATAGCCAAGAGCTAACAAT----AGGCAAGT-CCTATATGT-CAGGTAC----T
TAGCCTTACAACAATCCTATGAGATACTAC-AATTATCCCTAT---TTTTAAAAATTAAGAAACTAA----GGCTTAG--
----AGAGAAAATAATTTTT-CCAAAGTCATAATAGAGGCAGAATATTTGATAGGATGCATACATGAAACTTTCTGGAAG
```

```
AAAGTTTAAGGGAA--AGAAGGAAGAAGAAAC-AAGTAATCAAAGATTCACAGCCAAGGTGTGTGCCTGTGTGGCTGGG-
-ATAATCTTGGGACCTTTAAATCAAAAT---------AAGGGAATTGATTATTCACATCTCTATCATTAGGAC-------
--CTAGTTGCAGTAGCAGAAACGTTATATGTT--CT
```

4. Perissodactyla+Carnivora

```
>Bos_taurus
AGGAGTAGAG--TGGCTGTCATTTGAGA--GCTAAGGAGGAAGCCGACT-CTAGGGGACCCC-C-ACAGTGGGATTTGAG
GAGAAGTAATGTC---TAATAACCAGTTTTAAACTCTCCTCTTTATCTCTC---GTAACTTTTTTTTTTTTCTTTTCTTT
TCTTTTCAATATCCTCAAGT-CTGTAACGAAGTCAGACATTGGAGTTGG-TTTGGCACTTCCTCAGGGAAACGGAAGGAA
G--GACCACATCCACATGTAGGGTGGATGAAGCATGTGCATCAAA-TCCTTCACTTCCATCCTCCTCCTTTGTAGCACGA
TTTGTTT-AGACACAAGCATTTAAAAGAAGACATCCCACTTTAATACCG-TAAAACTA--TTACCCACTATTGTCTTCTG
TGAATCTT---TCTTCTGTTGCCTCAAGAATGTAGAACTGTAGCCAGTCTCAAAGGGCTAAAAGTAAGAGCATTCAACTG
TTGATTCTCTCAAGCAGGAAAAGGCATTTGGTGCTGCAAACCTCCCTCCAAGCCC-----AACACAAGCTCCCAGAGCT-
--GACGGGGGTGGGGG---------TGTCTCTTGCACCAGGGAAGAACCGTGAAGTGTAGGTGACCGAGTTACTTCCATG
GGTGCAGGCACG------------ACAGGGAA----TACTGACTGATGTGGCACAACTGTTCCTTCAGGAATGGGGCTGA
CATCCTAACTGGGGAAACAGTGGTAACACACTGAATGAAAAGGCAGTGAACAAGC----AAACACAACCAAGTGGTAAAT
TGCATGGGAGA-AGCTGTAGA---CAGACAGCAGGAGTTCAGAG-ACACCAGATCACTGAAGGCAGGAGCAG--------
---------AAAGGAAGTGAAACCTGAAA-CCATCTCTCAGAAGGTCACGAAGCTTTGCTTGGCTA--------------
-----TAATTTCAGTTTCAGCAAAATAAAGATAAA----TGAATGTAGAAATCCTATTCTTTTTAAGGGAAATGACCTTG
GAAAAGGAAA-AATTGATTATCTGACCTATTTAAATGATTT-AAAAATTATAGCATTTC---------------------
------TCAGT------------------GCTATAAAAA--GTTGTAAATAACATAAAACCTACTTAAATTTCTAATTTA
GAAAAAAAA-TAGTTCTGATTATATGAAATGTTGCATCCA----------GGAAATTTTATTTTTC-------CAGGGAG
GTTTCTCA-TAATTTGTAAACACTGATGAGT---TTTTCCTTTGCTGAAGTAAGATAAAAATA---TTCATAATTTAGGA
GTACTCCTCTTTGTAATC-TGTTTCAAGGAATCTGAAAAACTCAAAGCAGTGTTTTTATAACCAGTATTCAG----TCTG
TGTCTCGC----------AGTATCTCCCTCTGCCTTCACGGGACAG----ACTTACACGCTGAGCTGAGAGCTAACCACC
TCCCTCCACAGCCACCACCAGCCTCCA-------------ATGCC---TAGAAGCCAGCAAAATGCATCAGC-ATTGTGA
TTTCTAGATTTCTCGTCTAAGCCAAGG-----CCACCCTTTAGCACCACACTGACACCTATCACGTGAGGGACC-ATTTC
ACTCTCGCAGAAGGTGAGCA----TCATCAGTGT-TTCTTCACATCTGATTTCACAGAGGATATCAAGCCAACCTCGCTT
CCTATTAGCAC---TCAGAGAGCAGC---CTGCCTCCCAGAACATC-GGACCCCACAA--GGCCC----------CAAGC
CCCTTCCAGCCCCCTCCTCAAATCGAGCAGGCTCAGAAGATCCCTGGAGAAAG-TGGCAGATAGTCCAAAAGACATTTTT
TATTTGGCTTTGGAATATACGT-ATGCACTTACCTTTGAATATGGCGATGT--------------AATTTATTTCAAACC
AAATTAGGAAGCCAAACTGGGAAGGCTTCATGCCCCTGGAACTAAGAGGCTATGTCCAACTTCTAGTCTTGCCAACCTCA
ATTAATTTCACCTTGCGACTCACTTCAAGCTGTGGAAAAGCATGAAGGATTTTCAGACTCATTGTCATTTCATTCTCGG-
----CCAAACCCATGCTGAAGCA-GGAAGGAGTTAAATAGACCCATTTCAATAGGTTTCCTGAA-------CAGAGATAC
TTGAGAATTTAACAGAACTACATTTAATACAGATTTAAGAATTAATCAGTAAAGAGCCTGTGTGTTCTTTCAAAGATCTG
T--TTTTGAAAGATTTAGAGCACTGCTGATCGAATTTAGTAGTTTAATC-----TCATTCCACTTTCAACATC--TACTT
TAGTGAAATCTTTGAGATCACTGCTTAGTTCAGATTTCTTTAGTCTTACAGTGCTTGTTTCCAA-GTGTGAATATGCTTT
-------------------AAAATATGAGTAGC-TTCTCATGGTT-AAGAGTCTTCATATTTTCTGTTCATATTATCTCT
TGCCTACTTTTTACTCAAGAAACAATAATTGACTTCTTATTATATGAAAAGATCTGTGCCATACACACTGAAGATGC--A
CCAAAGTGAAAGACGTCTTC-ATTCTTCTGGGAACTTACACT----------AAATCTG------ACATTTAAACATA--
--GTGACATTGATACGTGGCATGCGAGTGGTA-AAATAACCATT-------------------------------------
-----ACATAATCAGCTCAGCTGAGGGTAAGAAAATTAGAAG------GGAGAAAGTCATTTCTCTGCTC----------
TCTAAAAAATTCTACCTTAATGCTTGTATTCCAAAACTATGGAAAGAAGCATGAATAAGTACTTATGAAA--TTTACCT-
-AATGTAGTTTAAAGTAGGTC-------TTTGTTGAAGCCAACCAGAA---TCTGT-GTCCCAATACCAGGCAAG----A
TTTTTGCCCACCTGGTT-GCTCAGAAAAGTTTAATGCCTGAA----CTGATCCTGATACAGTGGCTTGGAAATATATGTA
CAACTATTTAGTTAGGAAACTATGATTA---TTGCTTAACAGCATTGTTCAAATCTAACTAATCAAG-ACATCTACTTCA
CTCCAGAGAAGAAATATTCTAGAAA-AATCTCCAGATCTACTGCGATGATATTTATCTATGGCATGGCTTTAAAAA-TTC
CTTAATAATTACCAAGAATCTACTCAGGATGTAAAATTGAAGCTTCTTACCTAAGTTCAAAAATTTGGAATTTGTATGGT
TTTTTCTTG-AGGCTTGTTTTGTTTCAGTGATCTCATTCTCA----GAAAGAAGA-GTTATCAGTATCCTTTAAGCTTTC
AGTCGGTTCCAATGGAATCTCAGCAGCAA---GTAGC----ACTAATAACT--------GTTTCCAGAAATAAATAAGCA
GTTTTTTTCCTTTCTCTCTCTCTGGCTATGAAAAGAAGTAA-AC--------------------------------------
--TGGGAAAAAA---CACTACAAATGAAAATTGCAAGCATATTAAA---ATGTTCACATTCCCC-AAGATAATTGCATTC
AGAGTATTATAATTTCAGAGTA-TTGATCATTTACCTATGAGGATTTCTATTTATAGTCTATTAACGAAAAGCAGGCAGA
TATTACAATTGTGCATGTCACCCTATTTTCCTGTT-TGTGTCTGAATTTCAGCCTACCCTCTAACTCATTTTACAGATGC
TCATTTTGCTC-AACAAATCTGTAGTTA-GTGCCAGCCAATAGCCAGAACA-ATCCGAG----TTTGAGAAAGGTGATCA
TCATATTCCTCATTTGCCTTCTCAAGTCTTCT-CTGCTCACATTATCCCCTTATTATGGTAGAACTACATGATGGTACTT
TAAAATTTTCCAAATTATCATTTGTTTAAA-ACTGTGAGCCTTGCATAGAGGCATGGAATTTCA------TGAAATCATT
ACCCAGGGTGC-TAATGCAGTATAC----------TTTGTTTACTTGTTTTTTAAAATGCTAAATTGGAAATCTTTGTGA
AATAATCCAATATTACCTACAAATGTAAATTATTAAATACACAAACATAATGAGGGTTCTGAGGCCTCTGAGTCCCCCAG
GTCCATATTGTGGACAGTACTGGTTTGCCTACCCTAAT----TTTAAACAAATGTTCAAAACAATGTTTGAC-CATGGCT
AGTA-C-A-----------TAG-TAAAACATGCATGTAAAAAAA-TTT--AAA-GCATGAGATTAGAAAATAAAGAGAGA
TCCCAGT-----TTTTAAAATTTCCATACCACCCTGTGAGGCTCAC-----ACAGTTTTGCCTTAGACAAAACTGTCCCA
CACGGCTGTAGTTGGACTTGCCTGTGGGACA----TGGTTGGCTCCTGAAATTGGGACAGAGGGGTGGGGAAGGGTGAC-
---------------TGACCCCCCAGCTCTCATCTGAATTTAGACATCTA----TGTAGGAA-----------TTCAGTG
GANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCAATAAGCCCAAATTATGGACTATAGCAGTT
TAATAATCACTGCCATTTTT--CTTACTTCCAAAATAAAGCCTTGATTAAACCACTTATACCCTAT-ATTA---------
-----------------------------------CTCATACCTTTACTTCAGAGATTG-AGGAACTATGTACAACAAACG
AATTTATTTTCACCATAGGGATAACATA-TTGTACCTCTCTGCCAATGTTACTTGAAAACCGTCCATGTCAAAACAATTT
GACAACAGATATAAACAATTCAATAAATACGCAATGATCTTTCATTACAGTCCTTTAAAGACGCATGTTAAGTCATGCTG
TTAA-CCTTAGG
>Canis_lupus_familiaris
---------GTATGGCAGATAACTAAGT--GGGAAGGAGGAAGCTAATA-CTG-GGGAAGCT-TTATGGTGGGAATTGAG
AAG---TGA-ATC---TAATTACCA--TTTAAGCTCTTTTCCCTTTTTGCT-TTAGAATTCCTT----------------
-------AATATGTTCAAGT------------TGAGGCATTGGGATTGGGCTTGGGACATATTTATGG-AATGAAAGGAA
A--GACTGCATACACATTTTGGATGGATAAAGCACATTCATCAAA-TCCTCTACTTTCATCCATGTCCTTTGTAGTG-TG
TTTGTTT-AAAAACAATAATTTGAAAGAAGACACCCAATTTTAATACCA-TAAAACTA--TTATCCACTATTGTCTTCCA
TGACTGTT---TTTTCTATTGATTCAAGAATGCAAAACTGCAGCAAGTCTCAAAGGGCTAAAAGTAAGAGCATTTAGCTG
TTGATTCTCTCAAATGGGGAAAGGAACATGGTGCCACATGCCTCCTTCCGAGCCT-----ACCAGGCTATCTGGGAGCA-
--------------------------GACTCCTCCACTGGGTAAGAATCTCATAGT---GGTGACTAAGCTCTTCCTGTG
GGCTCAGT--CT------------AGAAGAAA----TACTGGTCTATGTGGTATGACTGCCTTTTATGGAATGAGGCTTA
```

```
CATCCTAATTTGGGCAAT-GGAGTAATACACTGAAGATAAAGGCAACAAACAAAC--------AAAATT---TGGAAAAT
TGTAT-------GGCTATAAG-----------------------------ATCACTGAGGGCAGGAGCAG--------
---------AGAGGAAATAGAATCTGAAACCCATTTCTTAGAAGGCCTGGCAGTTTTGCTTAGAG----TTCACTTTATT
T----TAATTTCAGTTTTTGTAAAATAAATACAAATACCTAAACATAAAAATACTATTTTTAAATTGAGATGTGACCTTG
GAAAAGGAAA-GATAGATTAATTGGCCTATTTAAACAATTA-AAGAATTATAGCACATT---------------------
------ACAGT------------------GCTATTAAAAATAT-----GTAACATAAAACCTGTTTTAATCTCTGACAT-
GAAGAAAGA-TAGTTCTGATTATATGTGATAGAGCATC------------AGGAAGTTTTTTTCCCACCCCCACAGAGGG
TTTTCTCT-TATTTCATAAACACTGATGAGT---TTTCCCTTTCCTGAGGTAAGATAAAAATA---TTTA----------
----TCCTCCTTGTCATA-TATTTCCAGGAATCTAGAGAAATCAGAGTACTATTTTTATAGCCTATATCCAGATGACCT-
---CCCACCCAAA----------------------CCATAAAAAAG----GATTATGAACTGAGCTGAGAACTGCCAGCC
TTCCTCCAGAATCATCCATAGCCCCAGTTAGTGACTTCTCATGTC---CAGAGGCCAGCAAATGGCTCCAACCATGGTGA
TTTC-----TTCTT---TAAATGAGT------------CCTAGTGCCATACTGATAACTACTACGTGAGAGATT-ATTTC
CCTCTCACAGAATGTAAGCATCA-TCACTGGTGTCTTCCTCACATCTGCTTTCACAGA---AGTCAAACTAGCCTCACTG
TCTATTAGCAC---CCAGAGAACAGC---CTGCCTCCCAGAACATCAGAATCCCACAAAAGGTCCCAGACAAGAACCAGC
CACCTCCAGATCCCTTCCAAAATCAAGGAGGCTCAGAAAATCCCTGGAGAAAA-TGACAGATAATCTAAAAGACAT-TTT
CATTTGGCTTTGGAATATAGAT-ATATACTTACCTTTGAATATGGGGATGTTTG-ACATTCCAGAAATTTATTTCAAACC
AAATTAGGAAGCCAAACTGGGAAGACTTCATGCCCCTGGAACTAAGAGGCTATGTCCAATTTCTAGTCCTGCCAACCCCA
ATTAATTCTACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGGACTCTCAGACTCATTGACATTTTATTCTCTG-
----CCAAACCTGTGCTGAAGCAAGAAAGGAGTTAAATAGACCAGTTTCAGTAGGTTTCTCAAAGTAAA--CAGAGAGAC
TTGAGAAGTCAACAGAACTCTGGTTAATACAAATTTAAGAATTAGTCTATAAAGAGCATATATGTTCCTTCAAAGATTTC
CTCTTTTGAAAGATTTAGAGTTCTGCTTATTGAATTTGGTAGTTTAATTTAATATGATTCAATTTTAAATGTC--TACTT
TAGCAAAATCTTTGAGGTGCTTCCTTAGTTGAGATTTCTTTAGTCTTACAGTGCTGTTTTCCAA-GTGTAAATATACTTT
-------------------AAAATGTGAGGAGC-TTTTTATGGTT-AAGAGTCTTCATGTTTTCTACTAATATTATCTTT
TGCCTACTTTTCACTCAAAAAAGAATTATTGAC---TTATTATATAAAAAGATCTTTGCCATACATACTCAAGATAT--C
CCAAAGTGAAAGATGTCTTCTATTCATATAGGAACTTAAAGTCTAGTTGGAAAGATCCA------ACATTTAAACACA--
---------------ATGGCATGTGAGTGGCA-AAATAACCAGTGGGATATGCATTTA---------TTCAGAAGTATAT
ACACTACCTGAGCAGATAAACTGAGAATAAGCAAATGAGAAGAA---TGGAGAGAATGATTTCTGTTCCT--------TT
TTTAAAAAAACATCCCTTAAACCTTGATTTTCAAAAA--TGAAAAGAGTAC--AAACAG-AATTATGAAG--ATCATTT-
-AGTTTAGTTAAAAATAGGTC-------TTTGTTGAAGCCAAGGAGAAGGAGGTAG-ACCCCCATACCAAGCAAG----T
CTTTTGTCCATTTGGAT-ACTCAGAAAACTTTCATTG----A----CTAATCCTGACATGATGACTAGAAAATAGATGTA
CAATAATTTCATTAGGAAACTATGATTAACATCATTCAAAAGCATAGTTCACATCTAA----CCAAACACATCTACTTCT
TTCCACAGGAAAACTATTCTAGTATATATTCCCAAATCTGCTGTGATGATATTTATCTACTACATAGCTTTTAAAA-TTT
CTTATAAACCACAGAGAATCTGCTCAGGA-ATAAAGGAGGAGTTCCCTGCCTTCATTCACTATTTCAGAATTTGTATGGT
AGTTTCTAGCAGCCTATTTATGCTTCATAGACCTCATGATCATATAGAAAGAAAA-GTTTTTAGTATTTTTTAAA-CAGA
TGTTGTTTAAGAAGAGATCTCAGCAGCAA---GAAGCAATAACTAAGAACT----AAAGG---CCAGAGATCAACAAGCA
CA-------TTTTTT-TCTCTCTCTGGCTATGAGCAGAAGTAATCC---------------------------------
--AAAAAAACAAAACTGCTATGAATAAAAATTTCAAGCGCATTAAA---ATGCTCACATT----------AATTTCATTC
AGAGCATTATAATTT----GTATTTGACCATTTATCTCTGAGGATTTCTACCTAAAGTCTATTAACAGAAAGCAGGCAGA
---TACGATGATGCATGTCACCATGTTTTCCTGTC-TGTGTCTGAATTGCAGTCTTCCCTCTAACTCATTTTACAGATGC
TCATTTTGCTC-AACAAGTCTGTAGCTAAGTGGCAGCCAACAGCCAGAACAGAGGCAAGA-TTCCTGGGAAAGCTGAT-A
CCAGAATCCTTTTTTCCCTCTCCTCATTTTCTTCTCCCATTATTACCTCTCTTTTCTGGTGAAACTAAAGGGTAGTATTT
TAAAGTTATGCACATGATAGTTTGTTAAAA-ACTGTGAGCCTTGCTTATGTGGATACAATTTAA-----ATAAAATCATT
ATCCAGGGTGATTAATGCAGTAAGC-TTTTGTTTGTTTGTGTGCTTGTTTTTTAAAATGCTGAACTGAAAATGTTCATGA
AATAATTCAGCATT-----------------------------------------------------------CCCACGG
GTCCCTATCGTGGACACGACTAGTTTGCTTCGTTTAATAAAACTGCACTGCGCTGGG-AAAAAATGTTTGAC-TATGGAC
TGTAATAATATTTATATATATA-AAAAACACGCATGCAAAAAAA-TTTT--AAAGTATGAGATTAAAAAATA----GAAA
TTC---------TTTTTTTACTCCCATATCATCTTGTGAACCTCATTTTGGAGATTACAACTTTAGAATAAATTATCCAT
TACTCATTCCATTGGACTTGCCCATGGGACAGACATGGGCAGCTAGTAGAGTTAGGACAGAGTGAGTGGGGG--AGCACT
GTATTTATTCACCTATTCTCCCCTGTATCT-ATTCACACTTAGACATCCA----CACAGAAACTACTAAGGAGATTCACG
GAGAGTTGCTCAAACACA--TAAATGAAATAGTATTTAAGCTATACGTCATATGCCGATGGCTATTAGGAAAT-AATAGA
ATATAATTAACTTGAAAAACCCATCAGTGATAA-CTATAAATATGATCACTACATAT---------------------TT
TAATTATCCCCATTATCTCTTTCATACTTGCACA-------CATGATTAGCTATCTCTTACACTGT-ATT----------
----------------------------------CTTATCCCTTTACTTCAGAAACTG-AGCAACTAGGAACAA--CAT-
-ATTT-TTTTTTCCATAGTCAGAAAGTA-TTTGAACTCTTTATCAATGTTACTAGAATTCCCTCCATGTCAAAACAATTT
GAGGGCAG--ATAAATAATACA-GAATTATGCGATCATCTTTTAG-GCAGCCCTTTAGACAATCATATTGACTCATGATG
CTAA-ATTTAGA
>Carnivora_Sp2
---------GTATGGCAGCCAGCTGGGT--GCTGAGGAGGAAACTATCT-TTAGGGGACCC---TAAGGTGGAACTTAAG
AAG---TAA-GTC---TAATAACCAGTTTCAACCTCTTTTCCCTTTTTGTG-TTGGAATTCCTTTTTT------------
------AAGTATTCTCAAATCCTGCAGCAAATTGAGGCATTGGGACTGGCATTGACACATATTCAGGG-AATGAAAGGAA
A--GACTGCATACACAGTTTGGGTGTATAAAGCACATTCATAAAA-CCTTTTACTTTCATCCAGGTCCTTTGTAGTG-TA
TTTGTTT-AAAAACAAGCATTTAAAAGAAGACACCCAATTTTATTACCA-CAAAACTA--TTATCCACTACTGTCTTTCA
TGAATCTT---TTTTCTACTGGCTCAAGAATGCAAAACTACAGCAAGTCTCAAAGGGCTAGAAG----AGTGTGTAACTA
CTGATTCTCTCAAATGGGGAAAGGAACATGGTGCTGCATGCCTCCTCCTGAGTCT-----GCCAGGCTATCTGGGAGCA-
--GACTGGGG----------------AGTCTCTTCCACTGGGTAAGAAACCTACAGT---GGTGCCTGAGCTCCTCCTGTG
GGCACAGT--CC------------ATAGGGAA----TACTGACCTGTGTGGCATGACTGCTTTTTATAGAATGGTGCTTA
CATTCTAACTGGGGCAAT-GGAGTGACACACTGAAGATAAAGACAACAAATAAAC----AAAAACAATTAAGCGGAAAAC
TGTAC-------GGCCCTAAGACAGAGACAGTGAGAATTGAGAG-AAACAAGATCACTGAG----------G--------
---------ACAGGAAGTAGAACCTGAAA-CCACCTCTTGGAAGGCCAGGCAGCTTTGCTTACTCT------TAGTTATT
T----TAATTTCAGTTT-AGTAAAATATAAATACCTAAACATAGGAATACTATCTATTT-------GAGATATGACCTTG
GAAAAGGAAA-GGTCGATTACTTGGCCTATTTAAACAATTA-AAAAATGACAGCACGTT---------------------
------ACAGT------------------CCTTTTAAAAATGTTGTAAATAATGTAAAACCTG---AAATCTCTAACAC-
GAAGAGAAAATAATTCTAATCATATGTGCTAGAGCATC-----------AGGGAAGGTTTTTTTGTTC-----CAGAGCA
GTTTCTCA-TATTTCATAAACAGTGATGAGT---TTTCCCTTCCCCGAGGTAAGATAAAAATA---TTTGTAATTTAGGA
GTACTCCTCCTTGTCATG-TATTTCAAGGAATCCAAAGAAATCCAAGCACTATTTTTATAACCCATATCCAGGGTGCAT-
--CCCGCCCCAAA----------------------CCACAAAAAAGG----ATGACAAACTGAGCTGAGAGCTGACTGCC
TTCCTCTAGAATCATCCAGAGCTTCAGTTAGTGACTTCTAATGTC---CAGAGGCCAGCAAATGGCTCCAACCACAGTGA
CTTCTAGATTTCTGGTCTAAATGAGT------------TCTAGCACCATACAGATAACTACTCTGTGAGAGACT-ATCTC
CCTCTCACAGAATGTGAACAGCA-TCACTGTTGTAGTCTTCACATCTGATTTCACAGA---AGTCAAACCAGCCT----C
```

CCTATTCGCAC---CCAGAGAAGAGC---CTACCTCCCAGAACATCAGGATCTCACAA--GGCTCCAGACAGGAACCAGT
CACCTCCCGACCCCTTCCAAAATCAAGGAAGCTCTGAAGCCCCCTGGAGAAAA-TGACACATAATCTAAAAGACAT-TTT
CATTTGGCTTTGGAATATAGAT-ATATACTTACCTTTGAATAGGGGGATGTTTG-ACATTCCAGAAATTTATCTCAAACC
AAATTAGGAAGCCAAACTGGGAAGACTTCATGTCCCTAGAACTAAGAGGCTATGTCCAATTTCTAATCCTGCCAACCCCA
ATTAATTCTACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGCACTCTCAGGTTCATTGACATTTTGTTTTCTG-
----CCAATCCTGTGCTGAGGCAAGAAAGGAGTTAAATAGACCAA--TCAGTAG-TTTCCGTAAGTAAA--CTGAGAGAC
TTGAGAAATCAACAGAACTCTGGTTAATACAAATTCAAGAATTAGTCTACAAGGAGCACGTGTGTTCCTTCAAAGATTTC
CTC-TTTGAGAGATTTAGAGCACTGCTTATTGAATTTGGT-----AACTTGATATGATTCAATTTTAAATGTC--TACTT
TAGTGAAATCTTTGAGACCCTTCCTTAGTTGAGATTTCCTTAGTCTTCTAGTGTTATTTTCCAA-GTGTAAATATACCTT
-------------------AAAAGGTGAGGAGC-TTTT-ATGGTG-AAGAGTCTTTATACTTTCTACTAATGTTATATCT
TTCC-ACTTTTCACTCAAAAAACAGTTATTGAC------TTATAGAAAAACTTTTCTGCCATACA--CCAAAGATGT---
CCGAAGTGGAAGATGCCTTCTATTGTTATAGGAACTTGCAATCCAGTTGGAAAGATCCA------GCATTTAAACACA--
---------------ATGGTATATGAGTAGCA-AAATAACCAGT--GATATGCATTTA---------TTCAGAAATATAT
CCTTTACATAAGCAGATCAACTGAGAGTAA------GAAAAGAA---TGGAGAGAACCATTTCTGTTCCTT-------TT
TTTTTAAAACCATCCCTTAATCCTTGAATTTCAAACA--TGAAGAGAGT-ATAAATAA--AATTATGAAA--ATTATTT-
-ACTTTAGTTAAAAATAGGTC-------TTTGTTGAAGCCAAGGAGAAGGAGATAG-CTCCCCC-ATCAAGCAAG----C
CTTTTGCCCATTTGGAT-AGTCAGAAAAATTTAATAAACCAA----CTTATCCTGACTCAGTGGTTAGGAAATATATATA
CAATAACTTCATTAGGAAACTGTGATTACCATTATTGAACAGCATAGTTCAGATCTAA----CCAAACACATCTACTTTA
TTCCATAGGAAAAATATTCTAGAATATACTCCCAAATCCACCGTAATCATAGTCATCTACTACCTAGCTTTT-AAA-TTC
TTTAGAGAATAGAGACAACCTGCTCAGGATATAAAGTAGGAATTCTCTGCCTTCATTCATTATTTCAGAATTTGTATGGT
AGTTTCTTGGAGCTTATTTATACTTTGTAGACCTCATGATCATATAGAAAAAAAG-GTCTTCAGTATTTTTTAAG-CAGA
TGTTGTTTAAGGAAAGATTAAACTGGTT-----------------------------------CAAACATCAACAAGTA
CA-----TTTTTTTTCTCTCTCTCTGGCTATGAGCAGAAGTAAACT---------------------------------
--AAAACAACAAAAATGCTATGAATAAAAATTTCAAATGTATTAAA---ATGTTCACATTCCCC-AAGATAATTTCATTC
AGAGCATTATAATTT----GTATTTGACCATTTACCTCTGAGAATTTCTACCTATAGTCTATTAACGAAAAGCAGGCAGA
TATTATGATGATGCATGTCACCATGTTTTCCTGTC-TGTGTCTGAATTTCAGCCTTCCCGCTAACTCATTTTACAGATGC
ACGTTTTGCTC-AACAAGTCTGTAGCTA-GTGGCAGCCGACAGCCAGAACAGAAGCAAGA-TTCCTGGGAAAGCTGGTCA
TCAGAATCCTCCTTTCCCTTCCCCTC-ATTCT-CTTCTCGCATTACCTCTCATTTCTGGTGAAACTAAATAGTAGTATTT
TAAAGTTATGCACATTATAGCTTGTTAAAA-ACTGTGAGCCTTGCTTACAACGATGGGATGTAA------TAAAATCATT
GCCCAAGGTGATTAACACATAATAA-----TTGTGTTTATGTGCTTGTTTTTTAAAATGCTGAATTGGAAATGTTCATGA
AACAATTCAGTATTCCCTTCATGTGCAAAGTATTAAATATACGAACATGGCGAGGTATCTGGGGCCTCTGGGGCCTCCAG
GCACATAT-GTGGACAATATTGGTTTGCCTACTTTAATAAGACTGTACCACACGAGGAAAAAAATGTTTGAC-CGTGGAC
TATAAC-ATTTATACATGTGTG-TGAAACAGGCATGCAAAAAAAATGTT--TTGGTGTGAGATTAAAAAATA----GAAA
TTCTATTT----TTTTTTTATCCCCGTGCCATCTCGGGAAGCTCACTTGGAAGACCACTGCCTTAGACAAAATTACCCTT
TATCTATTCAGTCGGACTTGCTGTGGGGTAT-----GGCTAGCCAGTGGAGTTGGGGCAGGGTGGGTGAGGG--GGCAT-
-------------GCTTCTCCCCTGTACCT-ATTCACACTTAGACATCCA----CATGGGCGCTACTCAGGAGGTTCGTG
GAGAGTCGTTCAAACACA--TAAATGAAATAGTGTTTTGTCTCTAGGACTCATGTCGATGGCTATCAGGAAAT-AATTGA
ATATAATTAACTTGTTAAAACTGTCTGTGATAA-TTATAAATGTGATCACTACATAT---------------------TT
TAATTATTCCTGTTGTCTTTTTCATACTTGCAAA-------CACGATTAGCTATTTCTCACATTGC-ATT----------
-----------------------------------CTTATCTCTGTACTTCAGAAATTG-AGCAGCTGTGAGCAACGTAT-
-ATTTATTTTTTCCATAGTCAGAATTTA-TGTGAACTCTTTGTCAATGTTACTAGAATTCCTTCCATGTCAAAACAATTT
GACAGCAA--ATAAATAATACA-GAATTGTGCCATCACCTTTTAT-GCAGTCCTTTAGACAATCATGTTAACTCATGATG
CTAA-ATCTAGA
>Cetartiodactyla_Sp2
AGAATTAGAACGTGGCTGTCATCTGAAA--GCCAAGGGGGAAGCTGGCT-CTAGGGGACCCC-TTATGGTGGAACTTGAG
GAGAAGTAATGTC---TAATAACCAATTTTAAGATCTTCTCCCTTTCTGTC-TTGGAACTTTTTTTTTTTTT--------
-------TTTATTCTCAAGT-CTGTAACAAAGTCAGACATTGGAGTTGG-TTAGGCTCTTCCTCAGGGAAATGGAAGGAA
G--GACTGCATCCATATTTTGGGTGGGTGAAGCACATGTATCAAA-TCCTCCACTTTCACGCTCCTCCTTTGTAATGCTG
TTTGTTT-AGAAACAAGCATTTAAAAGAAGACATCCCATTTTAATACTG-TAAGACTA--TTACCCACTATTGTCTTCTG
TGAATCTT---TCTTCTATTGGCTCAAGAAAGAAAAACTGTAGCAAGTCTCCAAGGGCTAAAAGTAAGAGCATTCAACTG
TTGATTCTTCCAAAGGAGGAAAGGCACTTGGTGCTGCAAGCCTCCCTCTGAGCCT-----AACACAAGATCCCAGAGCA-
--GACTGGGAGGGG-----------GTCCTCTTCCCCTAGGGAAGAGCTCTGCAGTGT-GGCGACTGAGCTACTCCTATG
GGCGCAAGCACA------------ACAGGGAA----TACTGATTGATGTGGCACAACTGCTCCTTCAGGAATGAGGCTGA
CATTCTAACTGGGGAAACAGGAGTAACACACCAAATGAAAAGGCAGTGAACAAGC----AAACACAACTAAGTGGTAAAC
TGTATGGTAGA-AACTGTAAGACAGAGACAGTAGGAGTTCAGAG-AAACCAGATCACTGAGGGCAGGTGCAG--------
---------AGAGGAAGCAGAACCTGAAA-CCATCTCTCAGAAGGCCAGGCAGCTTTGCTTTGCTTAC----TGTTTATT
T----TAATTTCAGTTTCAGTAAAATAAA--TAAGTACCTGAATGTAGGAATCCTGTTCTCTTTGAGGGAAATAACCTTG
GAAAAGGAAA-AATAGATTCTTTGACCTATTTAAATGATTT-AAAAATTACAGCACATT---------------------
------ACAGT------------------GCTATTAAA--TGTTGTAAATAACATAAAACCTACTTAACTCTCTAATAT-
GGAGAAGAA-TAGTTCTGATTATATGAGATGTAGCATCAA----------GGAAGTTTGTTTTTTT-----TCCAGAGAG
GTTTGTCA-TATTTTGTAAACACTGATGAGT---TTTTCCTTTACTGAGGTAAGATAGAAATA---TTCATAATTGAGGA
GTACTCCTCCTTGTCATA-TATTTCAAGGAATCTGAAGAAATCAAAGCAGTATTTTTATAACCTATATCCAG----GCTG
CGTCCCACCCACACAAAGGGTATCTCCCTCTGCCTTCACAGGACAG----GGTCGCACACTGAGCTGAGAGCTGACGACC
TTCCTCCGGAGCCATCCCAAGCCTCAG-------------AAGCC---CAGAGGCCAGCAAACTGCTCCA-GCATGGTGA
TTTCTAGATTTCTCATCTAGGCAAGCGCT-----ACTCCTTAGCACCAAACTGACAACTATCACGTGAGGGACC-ATTTC
GCTCTCACAGAAGGTGAGCATCG-TCATCAGTGT-TTCTTTACATCTGATTTCCCAGAGGACGTCAAACCAGCCTTGCTG
CCTGCCAGCAC---CCAGAGAGCAGC---CTGCCTCCCGGGACATCAGGACCCCACAA--GGCCC----------CAGGA
CCCGTTCAGCCCCCTCCCCAAATCAAGGAGGATCAGAAGATCCCTGGAGAAAG-TGGCAGACAATCCAAAAGACAT-TTT
TATTTGGCTTTGGAATATACAT-ATACACTTACCTTTGAATATGGGCATGTTTG-ACATTCCAGAAATTTATTTCAAACC
AAATTAGGAAGCCAAACTGGGAAGGCTTCATGCCCCTGGAACTAAGAGGCTATGTCCAATTTCCAGTCCTGCCAACCCCA
ATTAATTCCACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGGATTTTCAGACTCACTGTCATTTCATTCTCAG-
----CCAAACCTGTACTGAAGCAGTCAAGGAGTTAAATAGGCCAGTTTCAGTAGATTTCCTGAAGTAAATAGAGAGAGAC
TTGAGAAATCAACAGAACTGGTGTTAATACAGATTTAAGAATTAATCCATAAAGAGCCTGTGTCTTACTTCAAAGATTTC
CT-TTTTGAAAGATTTAGAGTGCTGCTTATTGAATTTAGTAGTTTAATC-----TGATTCCATTTTCAAAGTC--TACTT
TAGTGAAATCTTTGAGATCACTCCTTAGTTGAGCTTTCTTTAGTCTTACAGTGCTGTTTTCCAA-GTGTGAATATACTTT
TCAAGTGTGAATATACTTTAAAATGTGAGTAAC-ATTTTATGGTT-AAGAGTCTTCCTACTTTCTGCTAATATTACCTCT
TGCCTGTTTG-CACTCAAAAAACAATCATTGTCTTCTTATTATATGAAAAGATCTCTGCCATACACACTGAAGATGC--A
CCAAAGTGAAAGATATCTTCGTTC-TTCTGAGAACTTACACT----------AAACCTG------AATTTTAAACATA--
--GTGATGTCTATAAGTGGCATGTGAGTGGTA-AAATAATCAGT--GATATGCATTCAGAACATTCATTAAGAAATATAT

```
CCATCACAAAATCAGCTCAGCTGACGGCGAGAAAATGAGAAAAAC---CGTGAGAACTGTTTCTCTTCTC--------CT
TTTGTAAAAGCTCTCCTTAATCCTTGAATTCCCAAACTCTAGAAAGAAGCATAAATAAGTACTTATGCAA--TTTATTT-
-AATTTAGTTTAAAGTAGGTC-------TTTGTTGAAGCCAAGGAGCGGAATCTAG-GCCCCAACACCAAGCAAG----T
CGTTTGTCCACTTGGGT-ATTCATAAAAGTTTAATGAATGAA----CTCATTTTGAAACAGCAGCTTGAGGAAACCACA-
----------ATCAACGTTCAGCGGCATAGTTCACATCTAT----TCAAGTACATCTACTCTA
CTCCAGAGGAGAAATATTCTAGAACATATCCCGAAATCCACCATCATGATATTTATCTATGACGCGGCTTTAAAAA-TTC
TTTAATAAGTACAGAGAATCTGCTCAGGTTATAAAACTGGAGCTCCTTACCTTAGTTCAATAATTTGAGATTTGTATGGT
AGTTTCTTGAAGCTTGTTTATGCTTCAGAGACCTCATGCTCAGACAGAAAG-----GTTTTCAATATCCTTTAAGCTTTA
AATCTGTTCCAGTGGAATTTCAACAGCAA---ATAGCACTGACTAAAAACT------AGGCTTCCAAAGATCAACAAGCA
GT-------TTTTTCCTCTCTCTCTGACTATGAAAAGAAGTAA-AC----------
--TGGAAAAAAAAAATGCTATGAATAAAAATTTCAAGCATATTAAA---ATGTTCACATTCCCC-AAGATAATTTCATTC
AGAGCATTATAATTT----GTATTTGACTATTTACCTATGAGGGTTTCTACTTAAAGTCTATTAACTAAAAGTAGGCAGA
TATTATGATGATGCGTGTCACCATGTTTTCCTGTC-TGTGTCTGAATTTCAGCCTACCCTCTAACTCATTTTACAGATGC
TTGTTTTGCTC-AACAAGTCTGTAGCTA-GTGCCCGCTGACAGCCAGAACAAGATCAAGCTTTCCTGGGAAAGCTGATCA
TCAGAATCCTAATTTGCCTTCCCATCTCTTCT-CTCCTCCCATTATCCCCTTATTATGGTGGAACTACATGACAGTACTT
TTAAATTTTGCAAATTATCATTTGTTTAAA-ACTGTGAGCCTTGCATACAGGGATGGAACTTAA------TAAAATCATT
GCCCAGGGTGATTAATGCA--ATAC--TTTTTTTGTTTGCTTGTTTGTTTTTTAAAGTGCTAAATTGGAAATATTCATGA
AATAGTCCAATATTACTTTCAAATGGAAATGATTAAACACACTAAAATAATGAGGCGTCTGGGGCCTCTGGGTCCCACAG
GTACATATTGTGGACACTACTGGTTTGCC----------CTCCCAATTTAAAAATAATGTTTGAC-CACGGGT
TGT-ACTATTTATGTATGCATG-TGAAACATGCATGCCAAAAAAAGTGT-TAA-GCATGAGATTAAAGAATAGATAGAAA
TTCCATT------TTTAAAATTTCCATACCACTGTGTGACGCTCAC----------GTTGCCTTAGATAAAATTATCCTG
CACACAGGCA----------AGTTGGA-
----------CTTGCCCCCCATATCT----------AATCTAACC----TTAGACATCTACGCAGGAACTCAGTG
GAGATTTTC-CAAACATAAATAAATGAAACAGTGTTTAGGCAGCAGGGTTTATGCTGATGGCTAGCAGGAAGT-AACAGA
GTGTAATCTACTTGGAAA----------AAAAGTCGTTAATGTACAAATAACAAGCCCAAATTATGGACTGCAGCAGTT
TAATCATCACTGTCATTTTT------CTTCCAAAATAAAGCCTTTATTAAACCATTCATACCCTAT-ATTACCTTTACTT
TACTATAAATACTATATTTACTTTACAATACCCTATATTACCTTTACTTCAGAGATTG-AGGAACTATATACAACAGATG
AATTCATTTTCACCAGAGGGATAACGTA-TTCTACCTCTCTGCCAATGTTACTTGAAAACCGTCCATGTCAAAACAATTT
GACAGCAGATATAAACAATTCAATAAATACGCAATGATCTTTCATTACAGTCCTTTAAAAACGCATGTTAATTCATGCTG
TTAA-CCTTAGG
>Chiroptera_Sp2
AAAAGCAAAGCATGGCAACTGGATGGGG--TC-AATGAGGAAGCTAGCT-CTA---GACCCC-TTATAGTGGGACTTGAG
GAGAAACGATGTT---CAATAACCAATTTTAAACTTTTTCTCTTTCTGCC-TTGGAATCTCTTTTTT----------
--------ATATTCACAATT-TTGTAGCAAAATCAGGCATTGGCATTGGGATTGGGGCCACCTGGGGA-CATGAAAGGAA
A--GGCTGCATCCACATTTTGGGTGGATGAAGCACATTCATCAAA-TCTTCTACTTTCGTCCACATCCTTTGCAGTG-TT
TTTGTTT-AAAAACAAGCATTTAAAAGAAGACACCTAATTTTAATACCA-TAAGATTATTTTACCCACTGTTGTCTTCTG
TGAATCT----TTTTATATTGGCTCAAAAATGCAAAACTGTAGCAAGTCTCAAAGGGCTAAAAGTAAGAGCATTCGACAG
GTGATTCTCTCAAATGGGGACAGGCACATGGTGCCGCACGATTCCCT--GAGCCG-----ACCGTGCCCTCCCAG-GCAG
GTGCTGGGGCTGGTGGGA-------GGGTTCTGCCATCAGGCAAGAACCCCGCAGT---GGTGGCCCGGC---TCCTGTG
GGCTCT-GCACC----------ACAGAGAAGTCCCCCTGATCTACATGACATGACCGCTCTTTAAGGGAAGGTGTTCA
CGTTCTAATTGGGT-----GAAGAAAAACACTGAATAAAGAGGCGGCAAACAAAC----AACAACAATTAAGTGGTAAAT
T----------AAGAGAAACAAGATCC----------
---------AGAGGAACTGGAACCTGAGG-CTATTTCTCA-AAGGCCAGGCAGCTTTGCCTAC------TTTTTTCTATT
T----TAAGTTCAGTTTCAGTAAAATAAACACAAATATCTGAACATAAGAGTACTATTCTTTTTAAGAGAAATGACCTTG
GAAAAGGAAA-GGTCAATATTTTTACCTATTTAAACAATTT-AAAAATTATAGCACAGTAAATCTAGTTAATATCCATCA
TCATACATAGTTACAAAAAAATTTTAATAGTAATTAACAATGTTGTAAATAATGTAAAACCTAGTTAAATCTCTAATAT-
GAAGTTAAA-TAGTTCTAATTGTA----------ATTTTTTTT----------CAGAGAG
-TTTCTCA-TATTTTATAAATACTGATGAAT---TTTTTCTTCCCTGAGGTAAGATAAAAATA---TTCGTAATTTAAGA
GTACTCTTCCTCGTTAAG-CATTTTAAGGAATCTGAAGAAATCAAAACACTATTTTTATAATACGTATCCAAAAATGTTG
AATCCCACCCAAACAAACAATATCTCCTTCT-TCTCCATAGGAGAG----GGTTACAAGCTGAGCTGA-------CTGCT
TTCCTCCAAGGTCATCTAGAGCCTCAATTAGTGATTTCAGATGCC---CAGAAGCCAGCAAACTGCTCCAACCAGGGCAA
GTTTTAAATTTCTTTTCTAAGCGAGGGCCCCTCCACCCGCCAGGCCCACGACGATAACTATCATGTGA-GGACCTATTTC
ACTCTCACGGAATGTAAGCACTG-TCATTAGTATCTTCTTCACATCTGATTTCACAGGGGCAACCAAGCCAGCCTCACTG
CCCATTAACTC---CCAGGGAGCAGCATTTTTTCTCCTGGAAAAGCAGGACCCTACAA--GCCC----------CAGGC
CACTCTCAGACCCCTGCCAAAATCAGGGAGGCTCAGAAGACCCCTGGAGGAAA-TGGAAGATAATCCAAAAGATGT-TTT
CATTTGGCTTTGAAATATCCAT-ATATACTTACCTTTGAATGTGGCGATGTTTG-ACATTCCAGAAATTTATTTCAAACT
AAATGAGGAAGCCAGACTGGGAAGACTTCATGCTCCTGGTACTAAGAGGCTATGTCCAATTTCTCTTCCTGCCAACCTCA
ATTAATTCCACCGTGCAACTCACTTCAAGCCGTGGAAAAGCATGAAGGATTCTCAGACTCATTGACATTTTACTTTTAG-
----CCAAACCTGTGCTGAAGCAGGGAAGGAGTTAAACAGGCCAGTTTCAGTAGGTTTTCGGAAGTAAA--C----AGAC
TTGAGCAATCAACAGAACCGTGGTTAATACAAATGTAAGAATTAATCCATAAAGAGCCTATNNNNTCCTTCAAAGATTTT
CT-TTTTGAAAGATTTAAAGTGCCACTTATTGAATTTGGTAGTTTAATTTAAGATGACTCCATTTTCAATGTC--TGCTT
TGGTGACATCTTTAAGATACC-CTTTAGTTGAGATTTCTTTAGTTTTACAGTACTGTATTCCAA-AGGTGAATATATTTT
----------AAAAAGTTGGAAAC-TTTTT-GCTTT-----GTCTTTATATTTTCTACTAA---TATCTCT
TGTTTACGTTTCACTCAAAAAATAATCATTGACTTTTTATTATATAGAAAGGTCTCTGCCATACACACTGAAAAAGT--A
CCAAAGGGAAAGATATCTCTTACTCTTCTGGGAAATTAGGGTCTAGTTAAGGAGATCCG------ACATTTAAACACA--
--GTGATGTCAATAAGTGGCTTATAAATGGTG-AAATAACCAGT--AATATGCATTCA---------TTCAGAAATATAT
ACATTACACAATCAGCTGAGCTGATGGCAAGGAAATGAGAAAAACAATAAAACAA-CCATTTCTGTTCCT--------TT
TTTTTTTATCCATCTCTTAATTCTTGAATTTACAAAA--TGGAAAGAAACATAAATAAGTACTTATGAAA--ATT-----
-ACTTAATTTAAAAGTAGGTC-------TTTGTTGAAACCAAGGAGTAGGATCTAG-GACCCAATCAATACCAAGCAAGT
CTTTTGCCGACTTGGTG--CTAGGAAAAATTTAACAAACAGA----C--ATCCTGTTATAGTGGCTACGAAATATATGTG
CAATAGTTTAGTTAGAA----------CCATTCAACAGCATAGTTCAAATCTAA----TCAAGCACATCTACTTTA
CCCTGAAGGAAAAATATTTTAGAACATGTCCCCAAATCTATTGTAATTATATTTAACTACTACGTGGCTTTAAAAA-TTT
GTCATTATGTACAGAAAATATACTCAGGATATAAAATAGGAGTTTCCTACTTTAGTTCAATAACTTAGAATTTATATGGT
AGTTTCATGCAAGTTCTTTATGCATCAGGGTCCTCATGCTCATACACAGAGTCTG-GTCTTCAT-ATCCTTAAAGATTTA
AGTCAGTTCTAGCAGAATCTCGGCAACAG---GTAACAATA----AGAACT------AACATCCCAAGGAACAGCAAGCA
CT----TTTATTTTCT-CTCT--CTGCCTATGAACAGAAGTAAC----------
--TAGAAAAAAA---TTATATGAATAAAAATTTCAAGCATATTAAA--AATGTTTACATTTCCC-AAGGTAATTTCATTC
ACAGCATTATAATTT----GTATTTGACTATTTACTGTTCAGGATTTCAACTTATAGTTTATTAACGAAAAGCAGGCAGG
TATTTTGATGATGTTTGTCACCATGTTTTCCTGTC-TGTGTCTGAATTTCAGCCTGCCCTCTAACTCATTTTACAGATGT
```

TCATTTTGTCT----------GTAGCTA-GTGGCAGCCGACA-GCAGAACAGGAACAAGA-TTCTTGGGAAAGTAAATCA
TCTGAGTCCTATTTTATCTCTCCTTCTCTTCT-CTCCTTCTATTTTCCCTCTTTTATTGTGAAACAGTATGATAGTATTT
TAAAGTTATACAAATTATAGTTTATTGAAA-ACTGTGAGTTTTGCTTACTGGGATGGAATTTAT------CAAACTCGTC
ACCCAGAGTGATTAATGCAGTACAC-----TTTTGTTTGCTTGCTTGTTTTTAAAAATGCT-AATT-GAAATATTCATAA
AATAGTTGAGTATGACCTTCAAATGTGAATTATTAAGTACATTAACATAATGAGGTATCTGGG-CCTCTGGGTCTTACAA
GTCCATATTATGGCCACTACTGGTTTCCCTACTTTAATAAAACTGTAGCCCATTAAG-AAAAAATGTTTGAC-CATAGAT
TGTAAC-ATTTATATATGTGTTTATATACAGGCATACAAAAAAA-TTTT-AAT---GTAAGATTAAAAAATAAATAGAAA
TTTTGTTTGTTTTATTTTAATTCCCATATCATCTTATGAAGCTCACTTTGGATGCCTTTGCCTCAGACAAAATTATCCTG
CACGTACTCAGTTGAACT--CCAGTGGGACA----TGACTAGCTGGTGGAGTTGGGACAGAGTGGGTGG-AGGAGTGAGA
---------------TTCTTCCATGGATCT-GTTCACACTTAGACATTCA----CACAGGAACTATGAAGAATCTCCT-G
GTGATTTTC-CAAACATAAATAAATG-AATAGTGTTTAGGCAGTAGGGCTCATGCTGATGGCTAGCAGGAAGT-AACAGA
GTGTAATCTACTTGG--------------AAAAACCGTTAATGTACAAATAATAAGCCCAAGTCATGGACTGCAGCAGTT
TAATCATCACTGCCATTTTT--CTTACTTCCAATATAAAGCCTTGATTAAACCACTCATACCCTAT-ATTA---------
----------ATCATACCTTTACTTCAGAGATCG-AGGAACTATATACAACAAATG
AATTTATTTTCACCATAGGGATAACGTA-TTGTACCTCTCTGCCAATGTTACTTGAAAACCTTTCATGTCAAAACAATTT
GACAGCAGATATAAACAATTCAATAAATACGCAATGATCTTTCATTACAGTCCTTTAAAGATGCATGTTAATTCATGCTG
TTAAACCTTAGG
>Equus_caballus
AGAAGCGGAGCATGGCAGCTGGCTGGGG--GCTGACGAGGAAGCTGGCT-CTAGGGGACTCC-TTATGGTGGGACTTGAG
AAG---TGATGTT---TAATAACCAATTTGAAGCTCTCCTCCCTTTCTGCC-TTTGAATTCCTTTTTT----------
-------GCTATTCTCAAGA-CTGTAGCAAAGTCAGGCACTGGAATTGGTTTTGGCACA---TCAGGG-AAGGAGAACAA
A--GACTGCATCCACGTTTTGGGTGGATAAAACATGTTTATCAAA-TCCTCCACTTTCATCCAGATCCTTTGTAGTGCTG
TTTGTTT-AAAAACACGTATTCACAAGAAGACACCCAATTTTAATACCA-TAAGACTG--TTACTCACTATTGTCTTCTA
TGAATCTT---TTTTCTATTGACTCAAGAATGCAAAAGTGTAGCAAGTCTCAAAGGGCTAAAAGAGCGAGCATTCAACTC
TTGATTTTCTCAAACGAGGAAAGGAATGTGGTACTGCACGCCTCCCTCCTAGCCT-----AACATGCTACCCCAAAGCA-
--GACGGGGG----------AGCCTATTCCACTAGGAAAGAACCCTGAACT---GGTAACCAAGCTCCTCCTGCA
GGCTCAGTC-CT----------AGAGGGAA----TACTAATCTATGTGGCACAATTGCTCCTTAAGGAAGGGGGCTTA
CATTTTAATTGGGGAAATAGGAGTAACACACTGAATACAAAGGCAATAAACAAACATACAAAAACAATTAAGTGGAAAAT
TGTAT-------GGCCATAAGATAGAGACAGCAGGAGCTCAGAGAAAATAAAATCACTGAGGGCAGGAGTAG--------
---------AGAGGAAGTAGAACCTGAAA-CCATCTCTCAGAAGGCCACTCAGCTTTGCTTAC---------TGTTATTT
ATTTCAATTTTAAGTTTCAGTAAAATAAACATAAATACCTGAACATAGGAATAGTATTTCTTTATTGACGTATGACCTTG
GAAAAGGAAA-GATAGATTCCTTGACCTATATAAACAATTA-AAAAATGACAGCAAGTT----------
------ACAGT----------GCTATCAAAAATGTTGTAAATAATGTTAAACCTACTTAAATCTCTAATGT-
GGAGAAAAA-TAGTTCTAGTTAAATGTGATGTAGCATCATGTTAAATGTGATGAGGCTTTTT----------GGGGA
GATTCACC-TATTTTGTAA--ACTGATGCAT---TCTTCCTTCCCTGAGGTAAGATAAAAATA---TTTGTAAATTAGGA
GTATTCCTCCTTGCCATG-TATTTCAAGGAATCCAAAGAA-----AGCACTATTTTTATGAGCCATATCCAG----GCTG
CAACCCACCCA---AAAC----------ATAGGAAAA----GGTTACAAGCTGAGCTGAGAGCTAACTGCC
TTCCTCCAGAGTCATTCAGAGCCTCAATCAGTGACTTCTGATGTC---CAGAGGCCAGCAAACTGCTCCAGCCAAGGTGA
TTTCTAGATTTCTAGTCTGGGCCAGGG-----CTGTCACCCAGCACCATGCTGATAATTATCCTGTGAGGGACA-GTTTC
ACTCTCACAGAATGTGAGCATCG-TCATCAGTGTCTTCTTCACATCTGATTTCACAGA---AGTCAGACCAACCTTACTG
TCTGTTAGCAC---CCAGAGAGTAGC---CTGCCTCCTGGAATATCAGGATC----------CCAGC
CACCTCTAGACCCCTTCCAAAATCAAGGCAGCTCAGAAGACCCCTGGAGAAAA-TGGCAGATAATCCAAAAGACAT-TTT
TATTTGTCTTTGGAATATACAT-ACATACTTACCTTTGAATATGGGGATGTTGG-ACATTCCAGAAATTTATTTCAAACC
AGATTAGGAAGCCAAAGTGGGAAGACTTCATGCCTCTGGAACGAAGAGGCTATGTCCAATTTCTAGTCCTGCCAACCCCA
ATTAATTCCACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGGA--CTCAGGCTCATTGACATTTCCCTCTCTG-
----CCAAACCTGTGCTGAAGCAGGGAAGGAGTTAAATAGATTGGTTTCAGCGGGTTTCCTGGAGTCAA--CACAGAGAC
TTGCAAAATTAGCAGAACTGTGGTTAATATAGATTTAAGAATTAATCCATAAAGAGCAAATGTCNTCCTTCAAAAATTTC
CT-TTTTGAAAGATTTAGACTGCTCCTTATTTAATTTGGTAGTTCAATTAAATATGATTCCATTTCCAATGCC--TACTT
TAGCGAAATCTTTGAGATCCCTCCTTAGTTGAGATTTCTTTAGTCTTAGGGTGCTATTTTCCAA-GTACGAATATACTTT
----------AAATTGTGAGGAAC-TTTTTATGGTT-AAGAATGTTCATATTTTCTACGAA---TATCTCT
TGCTTACTTTTCACTCAAAAAGCAAC-A--GACTTCTTATTATACAAAAAGATCTCTGCCATACATACTAAAGATAT---
----
----------AATAACCAGT--GATATTCGTTCA---------TTCAGAAATATAT
CTATGATATAATCAGATCAGCTGAGGGTAGGGAAATGAGAAGAA---TGGACAGAACCATTTCTGTTCCTTTTA----TT
TGTTTTTAATCCTGCCTTAATCCTTGAATTCCCAAAA--TGAAAAGAAGTATAAATAAGTAACTATAAAA--ACTGCTT-
------AGTTTAAAGTAGGTC-------TTCGTTGAAGCCAAGGAGAAGGAGCCAGGCTCCCAATACCAAGCAAG----T
GTTTTTCCCACTAGGGT-ACTCAGAAACACTTAATGAATTAA----CTTATCCTGATACGGTGGCTACGAAATATATGTA
CAAAAATTTACTTAAGAAACTATGATTAACTTTGTACAACATTATA-TTCAAATCTAA----TCAAGTACATCTACTCTA
CTCCAGAGGAAAAATATTCTAGAATATATTCCCAAATCCATTGAAATGATA----CCTACTACGTGGCCTTTAAAA-TTC
CATATAAAGTCCAGAGAATCTATTCAGGATATACAATAGGAGTTCCCTGCCTTAATTCAAGAATTTGAAATTTGTATGGT
AGTTTCTCACAGCTTGTTTAGACTTGGAAGACCTCATGCTCATATAGAAAGAAAG-GTCTTCAGCATCCTTTAAG-CAGG
TGTTGTTTAAGGAGAGATCTCAGCAGCAA---GTAGCCAGAACCAAGAACT----------AAGA-AAAAAAGCA
TT--------TCTCT-TCTCTCTCTGGCTATGAACAGAAGTAA-AC----------
--TGGAAAAAAA---TGCTATGAACAAAAATTCCAAACATATTAAA---ATGTTCACGTTCCTC-AAA-TAATTTCATTC
AGAGCCTTATAATTT----GTATTTGACCATTTCCCTCTGAGGATTTCTAGTTATAGTCCATTAACAGA--GATGGCAGA
TATTACGATGATGCACGTCGCCATGTTTTCCTGTC-TGTCTGTGAATTCCAGCCT-CCCTTGAACTCATTTTACAGATGC
TCATTTTGCTC-AACAAGTCTGTAGCTA-GTGGCAGCTGACAGCCAGAACAGGAGTAAGA-TTCCTGGGAAAGCTGATCA
TCAGAATCCTACTTTCCCCTCCCCTCTTTTCT-CTCCTTCCATTATCTCTCTTTTGTGGTGACACTACATGATAGTGCTT
TAAAATTATATGAATTATAGTTTTTTAAAA-ACTATGACTCTTGCTTACAGGGATGGAATTTAATAAATATTAAATCATT
GCCCAGGGTGATTAGTGTAATATGCC----TTTTGTTTGCTTGCTTGTTTTTTAAAATGCTAAATTGGAAAT-TTCATTA
AATAGTCCAGTATTACTCTGAAAAGTAAATTATTAAATACACTAAGACAGTGAGGCGTCTCGTGCCTCTGGGTCCCCCAG
GTCCATATTGTGGACACTACTGATTTGCCTACTTTAATGGGACTATACCCCATTAGGAAAAAAATGTTTGAC-CATGGAT
TCTAAC-ACTTATATATGCATG-TAAAACATGCAT--AAAAAAA-TT----AAAGCATGAAGTTAAAAAATAAGTAGAAA
TTCTA-------TTTTGTTATTCCCACACCATCTTGTGAAGCTTACTTTGGAGACCACTGCCTTGGACAAAATTATCCCC
CACTCATTCAGTTGGACTTACCAGTGGGACA----TGGCTAGCTAAAGGAGTTAGGACAGAGTGGGTAGGGGG-TGCAG-
----------TTCTCCTCTGCGTCT-ATTCATACTTAGACATCCA----CATAGGATCTACTAAGGAGATCCATG
GAGAGTTGCTCAAACACG--TAAAGGAAATCATGTTTAGGCAATAGGGCTCATGCTGATGGCTATCAGGAAAT-AATAGA
AGGTAATTAACTTGGAAAA-TTGTCAATGACAAATTATAAATGTGATCACTACATA----------TT
TAATCATCCCTGTTATCTTTTTCATACTTGCAAAACAAAGGCATAATTAGCTATCTCTTATGCTGT-TTT----------

```
----------------------------------CTTATCCCTTTACTTCAGAAACTG-AGCAACTACAGAAAATACCT-
-ATTTATTTTTTCCATAGTTAGAACATATTTGGAACTCT----GTCAGTTACTTGAATTCCTTCCCTGTCAAAACAATTT
GACAGCACAGATAAATAATATA-GAACTGTGCAATCATCTTTTAT-ACACTCCTTTAGATAATCATGCTAACTCATGATG
CTAA-AGGTAGA
>Myotis_lucifugus
AGAAGCTGAGCA-GGCAGTTGGATAGGG--GTTGA-GAGGAAGCTGTCT-CTAAGGGACCTC-TGA-AGTGGGACTTGAG
CAG---TGATGCC---TA--------CTTTCAGCTCCTCTCTCTTTCTGCC-TTGGGATTTCTTTTC-------------
--------ATATTCTCAAAT-CTGTAGCAAAGTCAAGCATTGGGGTTGGGAATGGCATTTCCTTGGGG-AATGAAAGGAA
G--GTCCACATCCACATTTTGAGTAGGTGAAGCACATTCATCAAA-TCCTCCACTTTCATCCAGGTCCTTTGTAGTG-TG
TTTGTTT-AAAAACACGCTTTTAAAAGAAGACACCCACTTTTAATACCATTAAGATCA--TTACCCACTGTTGTCTTCTG
TGAATCTTTTGTTTTCTATTGGCTCAAGAAAGCAAAGCTGTAGCAAGTCTCAAAGGGCTAACAGTAAGAACATTCAACAA
TTGCTTCTCTCCA-CTGGGAAAGGAACATGGTGCTGTGTGCTTCCCTCTGAGCCT-----AACACACTATCCCAGAGCAG
GGGCTGGGGGCCGTGG---------TATCTCTCCCACTAGGTAAGAACCC-------------ACAGAGCTCCTCCTGTG
GGCTCAGTC-TG------------AGAGGGGA----TACTGATCTATGTGGCATGCCTGCTCTTAGAAGGATGGGGCTTA
CATTCTAATTAGGGAAATGGGAATG--ACGCTGAATGAGAAGGCAATGAACAAAC----CAAGGAAAACAAGTGGTAAAT
TGTACAGTAGA-GGCTATAAGATAGAGACAATAGCTGTTCAAAG-AAATAAGATCACTGA-GGTAGGAGCAG--------
---------AGAGGAAGTGGAACCTGAAG-CCACTTCTCAGAAGGCCAGGCAGTTTTGCTTACTGTTATTTATTTTAATT
T----TAAGTTCAGTTTCAGTAGAATAAACAAATATACCTGAACATAAGAATACTCTTC----GAAGAGAAATGACCTTG
GAAAAGGAAATAATAGATTTCTTCACTTACTTAAACAATTT-AAAAATTACAGCAGATT--------------------
------ATAGT------------------GCTATCAAAAATGTTGTAAATAATGTAAAACCTACTTAAATCTCTATTGT-
GGAGAAAAG-CAGTCCTAATTATATTTGATATAACATCAC----------AAGAGTTTTTTT-----------CAGAGAG
GCTTCTCA-TATTTTATAAACACTGATGAGTTAGTTCTTTTTCCCTGAAGTAATATAGAAATA---TTTGTAATTTAGGA
GTCTTCCTCCTTGTTACG-TATTTCAAGGAATCTGAAGAAATAAAAAGAGTATTTTTAGAACACATATCTAG----GCTG
AATCCCACCTAAACAAACAATGCCTCCCTCTATCTCC--AGGAGAGGACTGGTTCTAAGCTGAGCAGA-------CTGC-
TTCCTCCAGTGTCATCAGCAGCTTCAATTAGTGATTTTAGTTGCC---CAGAGGCCAGAAAACTGCTCAAACCAGAGTGA
TTTCTAGCTTTCTCATCTAAGCGAGGGCCCCTCCAGCCCCCAGCCCCACAATGATAAGTATTATGTGAGGGACC-ATTTC
GCTCTCA------------ACTTCTCATCATTGTCATCTTCACATATGATTTCACAGAGGAAGTCAAACCAGCCTCACTG
CCCATTAACAC---TCAAAGAGCAAC---CTTTCTCCTAGAATATTAGGATCCTACAA--GGCC-----------CAGGC
CACCTCCAGACCCCTTCCAAAATTGAGGAGGCTCAGAAGACTCTTGGCGAAAA-TGGCAGATAATCCAAAAGGCAC-TTT
TATTTGGCTTTGAAATATACATAATATGCTTACCTTTGGATAGGAGGGTGTTTGCATTTTCCAGAAATTTATTTCAAATC
AAATGAGGAAGCCAAACTGGGAAGCCTTCATGCCCCTGGTACGGAGAGGCTGTGCCCAATTTCTATTCCTGCCAATCCCA
ATTATTTCCACCTCCCAACTCACTTCAGAATGTGGAAAAGCATGAAGGACTCTCAGATGCATTGACGTTTTATTCTCAG-
----CCAAACCTATGCGGAAGCAGGGAAGGAGTTAAATAGACCAGTTTCCATAGTTTTCCAGAAGTAAA--CAGAGGGAC
TTGAGAAATCAACAGAACTGTGGTTTATACAAATTTAAGAATTAACCCATAAAGAGCCTATGTTNTCCTTCAAAGATTTT
CT-TTGTGACAAATTAAGTGTTCTGTTTTTTGAATTTTGCAGTTTAATTTAA--TGATTTCTTTTCTAATGTG--TAATA
TAGTGAAATTTTTAAGATCCATTCTTAGGTGAGATTCCTTTTTTCTTATAATCCTGCTTTCCAA-ATGAGAATATACTTT
-------------------TAAATATTAGGTAC-TTTTTAT-GTT-AAGAGTCTTCATATATTCTACTAA---TATCTCT
TGTGTACTTTTCACT-AAAGTATAATCATTGAT---CTATTATATAAGAAG-------------------------T--A
CCAAAGTGAAAGATATCTTC-TTGCTTCTAGGAAATTACACT----CTGGGAAGATCTA------ACATTTAAACACA--
--GCAATGCTGCTAAGTGGTGTATGAGTGGTA-AAATCATCAGT--GATATGCATTCA---------TTCAGAAACATAT
CCATTACATAATCACCTCAGCTGATGGTAAGGAAATGAGAACAA---TGGACAGAACCATTTATGTTCCG---------T
TTTTTAAAACCCTCTCTTAACTCTTGAATTTCAAAAA--TGTCAAGAAACATAAAT----ACTTCCAAAA--ATTATTTT
TAATTTCATTTAAAGGAAGTT-------TTTGTTGAAACCAAGGAGCAGGATCTAG--ACCCAATACCAAGCAAG----T
CCTTTGCCTACTTGGTT-GCTCTAAAAAATTTCATAAACAAA----CTCACCCTGTTACCCTGACCAGGAAATATATGTG
CAACAATTTAGTTAGGAACCTATGAGTAACACCATTCAATAGCATAGTTCAAATCTAA----TCAAGAAAA--ATCTTAA
CTCTAAAGGAAAAATATTTCAAAATATATCCCCAAATATACAATAATGATACTT-ACTACTACACGACTTTAAAAA-TTC
CTCATCATGTACAGAGGACCTACT-AGGTTATAAAATAGGAGATTCCTGCCTTAGTTCAATAACTTGGAATTTATATGGC
AGGGTCTTGCAGGTTCTTTATGCTTCAGAGACCTCATGCTCATACAGAAAGTCAG-GTCTTTAGTATCCTTTAAG-----
------TTCTAGCAGAATCTGAGTAGCAACTAACAATAAAACCCAACATC-------------CCAAAGATCAGCAAGCA
CT------TTTTTTTCTCTCTCTAGCTATGAACAGAAGTAA-CC----------------------------------
--AGGAAAAATA---TGCTATGAATAAAAAATTCAAGCATATTAAA---AAGTCTACATTCCCC-AAGGTAATTTTATTC
ACAGCATTATAATTT----GTATTTGACCATTTACTGCTGAGAATTTCTACTTATAGTTTATTAAGGAACAGGAGGCAGG
TATTATGATGATGTTTATCACCATGTTTTCCTGTC-CTTGTCTGAATTTCAGCTAGACCTCTAACTCAATTTACAGATGT
TCA-GTTGCTCAAACAAGTTTGTAGTTA-ATAGCAGCCAATAGCCAGAACAGGAGCAAGA-TTCTTAGGACAGTTAATCA
TCAGAATCCTACTTTCCCTTCCCCTCTCTCCT-CTCTTCTAATTATCCTTCTTTTATGGTGAAACTATATGATAATATTT
TAAAGTTATGCAAATTATAGTTTGTTGAAA-ACTGTAAGTCTTACTTACAGGGATGGGATTTAA------TAAAATTACC
ACCCAGAGTCATTAATACAGTATAC---------TTTTCCTTGCTTGTTTTTTTAAATGCTAAATT-GAAGTAATCATGA
AATAGTTCAGTATGACCTTCAAATGTAAATTATTAAGTACACTAACATAATGAGGTGTCTGGGGTCTCTGAGGCCCACAA
CTCCATATTGTGAACACTACTGATTTGCCTACTTTAATAAAACTGTATCCTATTAG--AAAAAATGTTTGAC-TATAAAT
TGTAGC-ATTTGTATATGTTTT-ATATACATGCATGTAGAAAA--TTT--AAAAACATAAGATT-AAAAATAAATATAAA
TTCTATT-----TTTTT--ATTCCTGTATCATCTTATAAAGCTCACTTTGGAGACCATCGCCTTAGACAAAATTACCCTC
CACTTATTCAGTTGGACTTGCCATTGGGACA----TGTCTAGCGGGTGGGATTGGGATA-AGGGATTGGGG---GGGA--
---------------TTCTCCCCTAGATCT-GTTCATACTTAAATATCCATCTGTATAGGAACATTTAAGGAGCTCCATG
ATGGTTTTC-GAAACAAA--TAAATGAAATAGTGTTTAGGCAGTAGGGCTCATGCTGATGGCTAGCAGGAAGT-AACAGA
GTGTACTCTACTTGG--------------AAAAATCATTAATGTAC---AAACAAGCCCAAATTATGGACTGCAGTAATT
TAATCATCACTGCCATTTTT------CTTCCAAAATAAAGCCTTGATTAAACCATTCATACCCTATTATTA---------
----------------------------------CTCATACCTTTACTTCAAAGATTAAAGGAACTATATACAACAAATG
AATTTATTTTCACCATAGGGATAACATA-TTGTACCTCTCTGCCAATGTTACTTGAAAACCTTCCATGTCAAAACAACTT
GACAGTAGATATAGACAATTCAATAAATACGCAATGATCTTTCATTACAGTCCTTTGAAGATGCATGTTAATTCATGCTG
TTAA-CCTTAGG
>Outgroup1
AGCAGCACAGCATGGCAGTCAGATGGGA--GCTGAGGAGGGAGCTAGCT-CTAGGGGACCCC-TTACAGTGGGACTTGAA
GAG---AAGTGCCAATTAATAACCAATGCTAAGCTCTTCTCCCTTTCTGCC-TAATAATTCATTTTT-------------
-------TATATTTTCAAAT-CTGTAGCAAAGTCAGGCATTGGGATTGGGCTTGGCACTTCCTTGGGG-AAAGAAAGAAG
A-ACTG--CATCCGCATTTTAAAGGATTGCAGCACATTCATTAAA-TCCTCCACTTTCTTCCAGCTCCTTTGTAATGCTA
TTTGTTT-CAACACAAGTGTTTAAAATAAGACACACAATTTTAATACCT-TTAGAC-----TACCCACTATTGTCTTCCC
TGAATCT----TTTTCTATTGGCTCAAGAATGCAAAACTGTAGCAAGTCTCAAAGGGCTAAAAGTC-GAGCATTCAACTG
TTTATTCTCTCAAATGGGGAAGGGAACATGGTGCCGACTGCCTCCCTCTGAAGCTAAACTAACATGCTATCACAGAGCAG
ACTGAGGG-----------------TATCTCTTCCACACAGTAACAAGCCCTCAGT---AATTAATAAGCTCCCACTATG
```

GCTTAGCA--TT------------ATAGGGAA----TACTGATCTAAATGACACGACTGTTCTTTAAGGGATGGAGCTTA
CAATCTAAGTGGGGAGATGGGAGTAATACACTAAAAGAAAAGATAACTGACAAAC----ACACACAATTAAGCGGTAAAT
TATATGGTAGA-GTCCAAAAGATATAGACAGTAGGCATTCAGAG-AAACAAGATTGCTGAGGGCAGGAGCAGTGAAGGAA
GGGGTTTTTAGAGGAGGTGGAACATGAAA-CCATCTCTCATAAGGCCAGGTAGATTTTCTTACTGTTGTTTATTTTCATT
-----TTATTTCAGTTTCAATAAAATAAACCTAAATACCTGAACATTGGACTATTATTCCTTTTAAGGGAAATGACCTAG
GAAAAGTAAAGATAGAGTTTTTTGACCTTTTTAATTTTTTT-TTAAATTACAGCACATT----------
------ACAAG----------GCTATTAAAAGTGTTGTAAATAATGTAAAATCTATTTAAAACTCTAATAT-
GGAGAAAAA-TTACTCTAATTATATGTGCTGCAGCATCAA----------GGAAGTTTTTTCCC---------CCAAAGG
GCTTCTCA-TATTTCATAAACACTGATGAGT---TTTCCCTTCACCGAAGTAACATCAAAATTATATTTGTAATTTAGAA
GTAAGTCTCCTTGTCAGTATATTTCAAGGAATCTGAAGAAATAAAAGCACTATTTTTA----------
----------CAAAACATTGTCACCCTGTGCCTCCATAGGAGAG----GGTTATAAGCTGAACTGAGAGCCGACTACC
TCGCTCTGGAGTCCTCCAGAGCTTTGAGGAGTGATTTCCAGTGCC---CATAGGCCAGCAGACCACTCAGACAAGGGCAA
TTTCGAGATTTCTAATCTAGGCAAGGGCC------GTGCCAAGCACCACACTGACAGCTATCATTTGAGGC-AATATTTC
ACTCTTATAG--TGTGGTCACCG-TC-CCAGTGTGTTTTTCACATCTAATTTCATACAGGAAGTCAGCCCAGCCTCACTG
CTTAT--CAGA---ACAGAGAACAGT---CGGCCTCCTTGACTCTGAGGATCCCATAA--GGCCTCAGTGAT---AAGCT
GGCTGCCCCCAGATTCCTTCTCATCAGGAGGCTCAGGAGACAACTGGAGAAAA-TGGCAGATAATCCAAAAGCTAT-TTT
TATTTGGCTTTGGAATATACGT-GTATACTTACCTTTGAATATGGAAATGTTTG-ACATTCCAAAAACTTATTTCAAACT
AAGTTAGGAAGCCAAGCTGGGAAGACTTCATGCTCCTGCAGCTAAGAGGCTATGTCCAATTTCTAGTCCTGCCAACCTCA
ATTACTTCCACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGGACTCTCAGGCTCATTCATACATTATTCTCTGT
TCTGTGAAACCTGTGCTGAAGCAGGGAAAGGGTTAAATAGATCAGTTTCTATAGGTTTCCTGAAATAGA--GAGAGAGAC
TTGAGAAATCAACAGAATTGTGGTTAATACAAACTTACGAATTAATCCATGAAGAACATCTGTCTTCCTTCAAATATTTC
CT-TTTTGAAAAATTTAAAGGCCTGCTTATTGAATGTCATAGTTTGATTTAAAATGATCTTATTTTCATTGTCAATACTT
TGGTGAAATCTTTGAGATCTTGCCTTAGTTAAGATTACTTTAGTGTTCCAGTGCTGTTTTCCAATATACAAATATATTGT
ATATATTTGTATAATATACAAAATGCGAGAAAC-TTTTTAT-GCT-AAGACTCTTCATATCTTCTACTAATAGTATCTCA
TGCCTACTTTTTATTCAAAAAACATCCATTGACTTCTTACA----ACAAGGATCTCTACCATGTGCACTGAAGATATACA
CCACAGTAAAAGAGATCTATTTTTCTAGGTGCTTACCAGCTA----GTTGGGAAAATTG------ACATCTAAACACG--
--GTGATGTAGTTAGGTGGCTTGTTAGTGGTACAAATAATTAGT--GATATGGATTCA---------TTCAGATGTATAT
CTATTACACAATCAGATAAGCTGAAGATAAGTAAATGGGAAGAAGAATGGAGAGAACGCTTTCTATCCCCACCCCCCACT
TTTTTTTAACCCTCTTTTAATCCTTGACTTAGGAAAA--TAAAAGGAAGCTTAAAAAAGTACTTATGAAAAATTTAC---
-AACCAGATTTAAATCTGGTTTTAAGGCCTTGCTGAAACCAAGGAGCAGAAACTAG-GCCCCAGTGCCAAGCAAT----T
CTTTAGCCCACTTTGGGTGCTCAGAAAAATTCAATAAAAGAA----CTTATCCCAATAGGATGGCCAGGAAAAATATGTA
CAATAATTCAGTTGGG-TGCTATGATCAAAGTCTTTCAGTAGCATCATTCAAATGGAA----AAAAGCACATGTACTTTA
CTCCAGAAGAAAAACATACTAGAATATATCCCCAAATCCACTATAATGATAATTATCTACTATGTGGCTTCTAAAA-ATC
CTAACAAAGTACATAAAATTTACTCAGGATATGAAACTGGAGTTTCCGGCTTTAGTTCAATAATTTAGAATTTATGTGGT
AGTTTCTTGC----------AGCTTTAGAAA-CTCGTGCTCATACAGAAAGTAAAGATCTTCAATAGTCTGTGAGATTTA
AATCAGTTCTAGCAGAATCTCAGCAATGG---ATAGCAATAGTTAAGGTCC----------AGAGATCAACAAGCA
CA--TTTTTTTTTCCTCTCT----GGCTATGAAAAGAAGAAGCACTTTTTTTTTCCTCTCTGGCTATGAAAAGAAGTAA
CCTTAAAAATT----TGCTACAAATAAAAATTGCAAGCATCTGAAATATTCATTCACATTCCCCCAAGATAATTTCACAT
AGAGCATAATAATTT----GTATTTGACCCTCTGCCTCTGAGGAGTTCTACTTACAGCTTATTAACTAAGCCCAGGCAGA
TACTGTGATGGTTCATGCCACCATGTTTTCCTGTCTTCTGTCTGAATTTCAGCCTACCATCTAACTCATTTTACAGATGC
TCAGTTTGCCC-AACAAGTCTGTAGCTA-TTGGTGGCCAACAGCCAGAGCAGGAACAAAG-TTTGTGGGAAAACTTACCA
TCAGAATCCTACTTTCCCTTCCC-TCTCTC---CTCCTTCCATTACCCCTCTTTTATGGCAAAACTACAAAATAATATTT
TAAGCTTATGAAAATTACAGTTTATTTAAATATTTTCGGCCTTGCTTACAGGGATGTAATTTAA------T-ACATCACT
ACCCAGGATGATTAATGCAATACCCTTTTGGTTTGTTCCCTTGCTTGTCTTTTAAAACGGTAAATCGGAAATACTTATAA
AATAGTTTAGTATTGCCTTCAAGTG-AAATTATTAAATACACGAACACAATGGGTG-TCTGGGGCC--------CCACAG
GTCCATCTTGTGGACACTGCTGGATTACCTACTGTTACAAGACTGTACTCCACTCAG-AAAAAATGTTTGAC-CATAGAT
TGTAAT-GTTTACACATGCACG-TAAAACATGAATGCAAA-TTTTTTT--AAA-GCATGCAATTAAAAAATAAATAGAAA
TTATATA-----TTTTTTCCTTCCCATACCA-CTTGTGAAACTCACTTTGGAGATTACTGTCTTAAACAAAATTTCCCTT
CAGCTATTCTGTTACACTGTGCAGT-AGACA----TGGCTGGCCAGAAGAGTTGGGACAGAGGGCTAGGAAA-GGTGG--
----------ATTCTCCCCTGAGTCT-ATTTGTACTTAAATCCACA------TAAGAACTG---AGGAGCTCA-TG
GAGGGTTTC-CAAACATAAATAAATGAAATAGTGTTTAGGCAGTAGGGCTCATGCTGATGGCTAGCAGGAAGTTAACAGA
GTGTAACTTACTTGGA----------AAAAATCTTTAATGTACAAATAACAAGCCCAAATTATGGACTGCAGCAATT
TAATCATCACTGCCATTTTT--CTTACTTCCAAAATAAAGCCTTGATTAAACCATTCATACCCTAT-ATTA---------
----------CTCATACCTTTACTTCAGAGATTG-AGGAACTATATACAACAAATT
AATTTATTTTCACCATAGGGATAACATA-CTGTACCTCTCTGCCAATGTTACTTGAAAATCTTCCATGTCAAAACAACTT
GACAGTAGATATAAACAATTCAATAAATATGCAATGATCTTTCATTACAGTCCTTTAAAGACGCATGTTAATTCATGCTG
TTAA-CCTTAGG
>Outgroup2
CATGGCAG-GCACAGCAGCTAGGGCTAC----------GGAAGCTGGCTGGTAGGGGA-CCC-TGATGGTGGGGCTTGAC
AAA-GAGAGAGCTC--TAATAACCAATTTTAAGCTTTTCTTCCTTTCTGCC-TTGTAATTTTTTTTTTTTTTTT------
-------AATATTCTCCGGT-CTGCAGCCAAGTCAGGCATTGAGATTGTG--TTGTCCTTACTTGGAG-AATGCAAAGAA
GGGGTGAGTCTGCTTGGGG-GAGGGAGCGCG--GCATTCATCAAATTATACCACTTCTGTTTAACTCCTTTGTAGTGCTG
TTTGTTTAAAAAACAAGCATTTAAAATAAGACACACAATTTTAATACCAGTAAGAG-----TACCTGCTATTGTCTTCCC
TGAATCC----TTTTCTATCG-TTCAAGAATGCAAAACT--AGCAAATCTCCAAGGGCTAGAAGTCTGAACACTCAACTG
TTTATTCTCTCACATGGGGAA-GGAATGTG-TACAGCATGACTCCCCCTGAACCT-----AACGTGATAACA-TGAGCAG
ACCATGGGTGGGGGTTTGGGGTTG-GGTTTCTTCCAATAGGTAATAAACCCTCAGT---GGTGGCCAGGTTCTTGCTATG
GGCTCAGGAAGT----------ATAGAGAA----TACTGATTTGTGTAGTATGACTGCTATTTTAGGGATGGGCC-TA
TAGTTTAATTGGGAAATGTGAATAA-TACACTAAATGAAAAGGCAACAAACACAA----------CCAAGTGGCAAAT
TGTATGATAAA-GGC----------TAAAAGATAGAGCA-ATGGCGTTTTT--------
---------AGAGGAGCTGGAA-CTCAAAATCATCTCTCAGAAGGGCAGGTAGTTCTGCTTATAA----AAATTGTTATT
T----TAATTTTAGTTTCAATAAAATAAACATCAATACATGAACATTGGAATACTATTCTTTTTAAGAGGAATGACCTTG
GGGAAGGAAA-GACAGTTTCCTTGACCTATTTAACAACTTTAAAAAATTAAAGCACA----------
------TTAGA----------CACTGTTAACATGCTGCAAATAACATAAAAGCTACTTTGAACTCTAGTAT-
AAAGAAAAA-TGATTCTAATTA-ATGTGATGTAGCATCAA----------GGAAATTTGTTGTTTTT------CTGAGGG
GCTTCTCAGTATTTCATAAACACTGATGTGT---TTTTCCTTCCCTGA-GTAAGATAAAAACAACATTTGTAATTTAGTA
GTACTCCTCTTTATTACG-TATTTCAAGGAATCTGAAGAAATCCAAGCTTTATTTTTATAACCCATATCCAT----GTTT
CTGTCCACCTA-CCAAATGTCATCACCTCCAGCCTCCCTAGGAAAG-----AAGCTGACCTAAAAGCT-GGCTGGCTGCC
TTGCTCCAGAGTCCTCCAGAGACTTGATTAGTGACATCCAGTACCACTATCTGGTCAGCAAACTTCTCAGATAATGACAA
TTTCTAGATTTCTAGTAT-AGCAAGGGCC------ACCACCGGCACCACACTGATA-TTGTCATGTGAGGTACT-GTTTC

```
ACTCGCATGGAATGTGGACAGCA-TCATCAGTATCTTCTTCACATTTCATTACATAGAGGAAGTCAAACTAGCTTTTCTG
CCTAATATAACGAACCAGAGAGTAGC---CTACCCACTTGACCTTGGGGATTCAACA---GGTCTTGGGCAGGAGCCTGT
TGCTTCCAGTCC--ACTCCCAACCAGGAACTCTCAAAAGGCCCCTGAAGAAAA-TGGCAGATAATCCAAAAGATAT-TTT
TATTTGGCTTTGGAATATACAT-ATATACTTACCTTTGAATATAGGAATGTTTG-ACATTCCAGAAATTTATTTCAAACC
AAATTAAGAAGCCAAACTGGGAAGACTTTATGCCACTGGAACTAAGAGGCTATGTCCAATTTCTAGTCCTGCCAACCCCA
ATTAATTCCACCTTTAAACTCGCTTCAAGCTGTGGAAAAGCATGAAGGATTCTCAGGCTCATTTATATTTTATCCTCTG-
----CCAAACCTTTGATGAAGTAGGGAAGGAATTAAATATACCAGTTTCAATAGGTTTTATGAAGTAAA--CAGAGAGAG
CTAAGATAGCAACAGAACTGTAACTGATACAAATTTAAGAATTAATCCATAAAGAGCATATGTCTTCCTTCAAAAATTTC
CT-TTTTGAAAGATTTAGAGGTCTGTTTATTGAATTTAGTAGTTTATTTTAAATTTATTCCATTT-CAATGTC--TACTT
CAGTGAAATCACTGAGATCTTTCCTTAGCTGAGATTTCTTTAATGTTACACTGCTGTTTTCCAA-ATGTGAATATACTTT
-------------------AAAATGTGAAAAAT-TTTTTTATGGT-AAGAGTATTTATTTCTTCAAATAATATTACCTCT
TGCTCACTTTTCATTCGACAAACATTTGTTGAGTT------ATATAAAAAGATCTCTAGTATACACACTGAAGACGT---
GCAAAGTAAAAGATATCGTCTGTTCTAGGAGCTTATAATCTA----GTTGGGAAGATCC-----AACACTTAAACATG--
--ATGATATAGGTAAGTGGCATGTGAGTGGTACAAATCATTGGT--GATATGCATTTA---------TTCAAAAATATAT
CTATTAAATGATCAGATCAGATGAGGGTAAGGAAATGGGAAGAA---TACAGAGAACCATTTCTGTTCCTTTTTTTTTTT
TTCTTTTAACACTCCCTTAGGCCTTAAGTTCCAGAAA--TGGAGAGAAGTGTAAACAAGTACTTATAAAAA--TTATTT-
-AAGTT-GGCTAAAGTAGTTC-------TTTGGTGAAGTCAAAGAGCAGGGGCTAT-GTTCCTTACATCAGCAAG----T
CCTTCGCACACCTGGGT-GTTTAGAATAGTTTGTTAAATGAGTGAATTTATTTAGATATAATGGCCAGAATATATATATA
AAATAATTTAGTTAGGAAACTATAATTAATGTCATTAATCAGCATAATTCAAATCTAA----TCAAGAAGATCTATT-CA
CTTTAGAGGAATAAAATTCTAGAATATACCCCCAAATCCACTAT---GATTCTTATGTACTATGTGGCTTTAAAACTTTC
CTTATAAAGTAGATAGAACCGATTCCGGATATAAAATTGTGACTCCCTGTCATAGTTCAATAATTTGGAATTTATGTGGT
AGTTTCTTGAAACTTGTTTATGCTTCAGAGAATTCATGCTCACACAGAGAGAAA-GATCTCCAGTATCCTTTAAGGTTTA
AATTAGTTTTAGCAGAATCTCAGCAACAG---GTAGCAAGAGCTAAGAACTAACAACTAAGTTCCAAAGATCATGAAGCA
CATTTGTTTTTTATTCTCTGGCCCG-------------------------------------------------------
--GAGAAAAAAG---TCCTATGAATAAAAATTTCAAGCATATTTAA---CTGTTCATTTTCCTCAAAGATAATTTCATTT
AGACTATTATAATTT-----TATTGGACCATTTACTTTTGTGGATTTCTGCTTATAGTCTATTAACGAAAAGCAAGAAGA
CA----GATGGTGCATGCCGCTATGTTTTCCTGTCTTGTGTGTGAATTTAGCCTACCCTC----TCATTTTACTCACGC
TTAATTTGCTC-AGTAAAATAGTTTGTA----------GCTAGTGACAGCAGGAGCCAAGATCCATGGAAAAACTGATCA
TCAGAATTCTACTTTCCTTTTACTTATTTCCT-TTCCCTTCATTACCCTTCTTTTATGGTGAAACTAGAAGATAGTATTT
TAAAGTCCCTCACTTTATAGTTTGTT-AAATTCTTTGAGCCTTGTTTACAGGGGTGGATTTAA------TAAAATCATT
GCTGAG--TGATTCATACAATATGC-----TTTTGTTTGTTTGCTTGTTTTTTAAAATGCTAAATTTGAAATATTTATGA
AATAGTCCAGTATTGACCATTACTG-AGATTATTAAATACGCT-----AATGCTGGGGTCTCTTGCCTCT----CCTTAG
GTCTATCTTGCAGACTATTCTATTTTGCCTACTTCTGTAAGACTACACCCCATTCAGAAAAAAAAGTTTGAC-CATGGAT
TTTAAC-ATTTATAGATGTATG-TAGAACATATATCCAAAAAGAATTT---AA-GCCTGATATTAAACAATAAATAGATT
TTTCTAT----ATTTTTTTCTTCCCATACCATCTTGTGAAGCTTGATTTGGAGACTACTGCCTTAAATGATATTATCACC
TATCTACTCAGATGCACTTACTGGTGGGACA----TGGTTGGCCAGTGAAGTTAGGAAAGGCAGAGTTGGA-GAGTAAG-
---------------ATGCTCTTTGTATTT-ATTAGCACTTCA--ATCCA----TCCAGGAATTT---AGGAACTCCATG
AAGATTTTC-CAAACATAAATAAATGAAATAGTGTTTAGGCAGTAGGGCTCATGCTGATGGCTAGCAGGAAGT-AACAGA
GTGTAATCTACTTGG--------------AAAAATCTTCAATGTACAAATTACAAGCCCAAATTATGGACTGCAGCAATT
CAATCATCACTGCCATTTTTTTTTAACTTCCAAAATAAAGCCTTGATTAAACCATTCACACCCTAT-ATTA---------
----------------------------------CTCATACCTTTACTTCAGAGATTTGAGGAACTATATACAACAAATG
AGTTTATTT-CACCATAGGGATAACATA-TTGTACCTCTCTGCCAATGTTACTTGAAAACCTTCCATGTCAAAACAATTT
GACAGCAGATATAAACAATTCAATAAATATGCAATGATCTTTCATTACAGTCCTTTAA-GACGCATGTTAATTCATGCTG
CTAA-CCGTAGG
>Perissodactyla_Sp2
AGAAGCAGAGCACGGCAGCTGGCTGCGA--GCTAAGGAGGAAGCTGGCT-CTCCGGGACTGC-TTATGGCAGGCCTTGAG
AAG---TGA-TGC---TAACAACCAATCTTAAGCTCTTCTTTCTTACTGCC-TTGGAATTCCTTTTTTT-----------
--------CTATTCTCAAGT-CTGTGACAAAGTCAGACATTGGGATTTGTATTGGCACATCTTCAGGG-AATGAACAGAA
G--GACTGCATCTACATTTTGGGTGGATGAAACATATTTATCAAA-TCCTCCACTTTCATCCAGATCCTTTGCAGTGCTG
TTTGTTA-AAAAACA----TTTAAAAGAAGACACCCAATTTTAGTACCA-TAAG-CTA--TTACCCACTATTGTCTTCCA
TGGATCTT---TTTTCTATTGGCTCAGGAACGCAAAACTGCAGCAAGTCTCAAAGGGCTAAAAGTAAGAGCATTCAACTG
TTGATTCTCTCAAATGGGGAAAGGAACATGGTACCGTATGCCTCCCTCCCAGCCT-----AACACGTTATCCCAAAGCA-
--GACTGGGG---------------AGTCTCTTCCACTAGGTAAGAGCCCTGCAGT---GGTGACCAAGCTCCTCCTGTA
GCCTCAGTC-CT------------ATAGGGAA----TATTGATCTATGTGGCATGACTGCTCTTTAAGGAATGGGGCTTA
CATTCTAATTGGGGAAATGAGAGTA-CACACTGAATGCAAAGGTAACAAACAAAC----AAAAACAATTAAGTGGCAAAT
TGTATGGCTAC------AAGA---TAGAGAGCAGGAGTTCAGAG-AAACAAGATCACTGAGGGCAGGAGCAG--------
---------AGAGGAAGTGGAACCTGAAA-CCATCTCTCATAAGGCCAGGCAGNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGACCTTG
GAAAAGGAAA-GATAGATTCCTTGACCTTTATAAACAATTA-AAAAATTACAGCACATT---------------------
------ACAGT------------------GCTATTAAAAATGTTGTAAATAATGTTAAACCTACTTAAATCTCTAATAT-
GGAGAAAAA-TAGT-CTAATTAAATGTGATGTAGCATTAAGG-----------AAGCTTTTGGGG----------GGGGT
GGTTCTCA-TATTTTTTAAACACTGATGAAT---TTTTCCTTCCCTGATGTAAGATAAAAATA---TTTGTAATTTAGGA
GTACTCCTCCTTGCTGGG-TATTTCAAGGAATCCAGATAA-----AGCACTATTTTTATAACCCATATCCAG----GCTG
CAACCCACCCAAACAATAGGAAAA--------------------------GGGTACAAGCTGAGCTGAGAGCTAACTGCC
TGCCTCTGGAGTCATTCAGAGCCTCAGCAAGTGATTTCTGATGTC---CAGAGGCAAGCAAACTGCTCCAGCCACAGTGA
TTTCTAGATTTCTAA-CTAGGCGAGGG-----CCGTCCCCAAGAACCATACTGGTAAGTATCCTGTGAGGGACC-ATTTC
ACTCTCACAGAATGTGAGCATTG-TCATCAGCGTCTTCTTCACATCTGATTTCACAGA---AGTCAAACCAGCCTCCCTG
CCTATTAGCAC---ACAGAGAGTAGC---CTGTCTCCTGGAATATCAGGATCCCACAA--GGCCCCAGGCAGGAACCAGC
CACCTCTAGATCCCTTCCAAAATTGATGAGGCTCAGAAGACCCCTAGAGAAAA-AGGCAGATAATCCAAAAGACAT-TTT
TATTTGGCTTTGAAATATGCGT-ATATATTTACCTTTGAATATGGGGATGTTGG-ACATTCCAGAAATTTATTTCAAACC
AAATTAGGAAGCCAAACTGGGAAGACTTCATGCCCCTGGAACTAAGAGGCTATGTCCAATTTCTAGTCCTGCCAACCCCA
ATTAATGCCACCTTGCAACTCACTTCAAGCTGTGGAAAAGCATGAAGGG--CTCAGACTCATTGACATTTTATTCTCTG-
----CCAAATCTGTGCTGAAGCAGGGAAGGAGTTAAATAGACCAGTGTCCGTGGGTTTCCTGAAGTAAA--CAGAGAGAC
TTGAGACATCAACAGAACTGGGGTTAATACAGATTTAAGAATTAATCCATAAAGAGCATATGTCTTCCTTCAAAAATTTC
CT-TTCTGAAAGATTTAGAATGCTGCTTATTCAATTTGGTGGTTTAATTTAATATGATTCCATTTTCAATGTC--TACTT
TAGTGAAATCTTTGAGATCCCTGCTTGGTTGAGATTTCTTTAGTTTTACAGTGCTGTTTTCCAA-GTGTGAATATACTTT
-------------------AAAATGTGAGGAAC-TTTTTGTGGTTAAAGAATCTTCATATTTTCTACTAATATTATCTCT
TGCCTGCTTTTCATTCAAAAAACAAC-ATTGACTTCTTATTATATAAAAAGATCTGTGCCATACACACTGAAGATGC--A
TCAAAGTGAGATATCTTCTCTT--CTTCTAGGAACTTACAATCCAGCTGGAAAGATCCCATTTAAACATTTAACCA----
```

```
--ATGATTTCAATAAGTGGCATGTGAATGGTA-AAATAACCAGT--GATATACATTCA---------TTCAGAAATATAT
CTATTACACAATCAGATCAGA---------------------------CGAGAGAACCATTTCTGTTCCT----------
TTTTTTTAACCCTCCCTTAATACTTGAATTCCAAAAA--TGAAAAGAAGCATAAATAAGTACCTATGAAA--ATTATTT-
------AGTCTAAAGTAGGTCTA-----GTTATTGAAGCCAAGGAGAAGGAGCTAGGCTCCCAAGCCCAAGCAAG----T
ATCTTGCCCACTTGGGT-ACTCAGAAAAGTTGAATGGGCTAA----CTTA-CCTGATACAGTGGCTAGGAAATATATATA
CAATAACTTAATTAAGAAACTGTGATTAACATCATTCAACATCACAGTTCAAATCTAA----TCAAGCACATCT-----A
TTCCACAGGAAAAATATTCTAGAATACATTCCCAAATGCACTGTAATGATACTTATCTATTATGTGGCTTTTAAAA-TTC
CTT-ATAAGTACAGAGAATCTACTCAGGATATAAAATAAAAGTTCCCTGCCTTAGTTCAATAATTTGAAATTTGTATGGT
AGTTTCTTGCAGCTTG-TTATGTTTCAGAGACCTCATGCTCAC--AGAAAGAATG-GTCTTCAGTATCCTTTAAG-CAGA
TATTGTTTAAGGAGAGATCTCAGCAGAAA---GTAGCAAGAACTAAGAACT-----AAGG--TTCAAAGATGAATGAGCA
TG---TTTTTTTCTC-TCTCTCTCTGGCTATGAACAGAAGTAAACT---------------------------------
--GGAAAAAAA----TGCTATGAATAAAAATTCCAAACATATTAAA---ATGTTCACATTCCTC-AAGATAATTTCATTC
AGAGCATTATAATTT----GTATTTGACCATTTACCCACAAGGATTTCTACTTATAGTCTGTTAACAAA--GCTGGCAGA
TATT---ATGATGCACGTCACCATGTTTTCCTGTC-TGTCCCTGAATTTCAGGCT-CCCTTGAACTCATTTTACAGATGC
TCATTTTGCTC-AACAAGGCTGTAGCTA-GTGGCAGCCGACAGCCAGAACAGGAGCAAGA-TTCCTGGGAAAGCTGATCA
TCAGAATCCTACTTTCCCCTCCCCTCTTTTCT-CTCCTCCCATTCTTTCTCTTTTATAGTAAAACTACATGATAGTATTT
TAACTTTATACAAATGACGGTTTTTTAAAA-ACTGTGACTCTTGCTTATAGGTATGGAATTTAATAAATATTAAATCATT
GCCCAGAGTGATTAATGCAATACAC----TTTTTGTTTGCTTGCTCGTTTTTTAAAATACTAAATTGG-AACTTTCATGA
AATAGTCTGGTATTACTTCAAAATGTAAATTATTAAATACACTAACTCAATGAGATATATGGTACCTCTTGGTCCCACAG
ATCCATATTGTGGACACTACTGGTTTGCCTACTTTAATAAGACTGCACCCCATTAGG-AAAAAATGTTTGAC-CATGGAT
TGTTAC-ACTCTTATATGCATG-TAAAACATGCATGCAAAAATAATTT---AAAGCA-GAGATTAAAAAATAAATAGAAA
TTCTAT------TTTTTTTATTCTCACACCATCTTGTGAAGCTCACTTTGGACACCATTGCCTTAGACAAAATTATTCCC
CACTTATTCAGTTGGACTTGCCAGTGGGACA----TGGCTAGCTAATGGAGTTAGGACAGAGAGGGTGGGGGGATGCAA-
---------------TTCTCCCCTGTATCT-ACTCACACTTAGACATCCA----CATAGGAACTACTAAGGAGATCCACA
GAGAGTTGCTCAAACACA--TAAATGAAATCATGTTTAGGCAATAGGGCTCATGCTGATGGCTATCAAGAAAT-AATAGA
ATATAATTAACCTGGAAAA-TTGTCAATGATAAATTATTAATGTGATCACCACATA----------------------TT
TAATCACCCTT---ATCTTTTTCATATTTGCAAAACAAAGGCATAATTAGCTATCTCTTATGCTGT-ATT----------
-----------------------------------GTTATCCATTTACTTCAGAAATTG-AGCAACTGTTGAAAACATAT-
-ATTTGTGTTTTTCATAGTTAGAATATATTTTGAACTCT----GTCAGTGACTTGAATTCCTTCCCTGCCAAAACAATTT
GACAGCACAGATAAATAATATA-GAATTGTGCAATCATCTTTTAT-ACAGCCCTTTAGGTAATCATGCTAACTCATGATG
CTAA-ATTTAGA
```

5. Chiroptera+Perissodactyla

>Bos_taurus
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAACTGGGATTTG---GGGAGTTC-TGGGGTACCCATGTC
AATGGAATAGGT--GATTGACACCTG----TTGCCTGCTCTGCTGTTTCTTCATCTGCCATCCAGATGATGATTTGTCAA
TGTTAGATGAGT----------AGAAACAACTGTAACTTAACATTCCTCTTGAATTCACTTGAGTCAAACA--TTAAGGG
GTATAGTTTATTCTT-GGT-ACAAGCATTA------CTCTTCTA-------AAGAAAAAGCACATTTTTCAGGGTTTTT
TTTTTTTTCCCTCTCATTTGACTAGTGGTGTGGACACTAATTACAGTGCTTTCTTGACACAATATTT--AAAAATAAAAA
CTTTTAAAAGACTGAAGGCTGTTATACAGAGGTAGAAAAGAATGGCTAAATGTCATTGTCCCATCTGGCATTTAACTTTA
GAGTCAGAAAGACAAGAAGG-AATGGTGGAAAATGTGGACACCTGGAAAATACATGTTGGCTAAAGG-GAAAGC----TT
CAGTTTCATCCAGGAGA----CTGTCGTTCTGTGGAAATGCAGGCCTGACTGTGCTCACA----------------CTTC
TTTCTCCTTTTATACTTTTTTCATGAGAAGCTGCAAATCTCA--AC----------------TGATTGTTAAATGCGAGT
AATCCATTTTTTAATCCTATATGAACCAAA----ATAGCACTGGGCAAAATAAAACAGGACTGTAGGTCAAATTTGGCCT
GTGTGT---CTCCAAAAGACAACT----GCTCAGATAAAGACAATAAAACCTAGG-GCAAAAAGATATTCAAATCAGTGT
TAAAAGTAAAGTGTCTCCAAACGTA------TTAATATACACATATAAACTGGTTTTTGTCTT-----------------
----AAATCCAG-GTCTAAGGAGATATGGATAATCCATATGGATTCTCAGAAGGTAATCAACATCCTACTGCCCATATTC
TGAAATTTATCAAAGCTCAGAAAGCTGGACCA----------------GA-CCAAAGAGTGTCTTGAGACAGTTTAGGAA
AATGCTCTGGAACAGCACTGCTTCCCC-----------TCAGTCATGTTTGAAAATAGGATCAAGGCTTGAATTC-TCTC
CCCTGAAATGCACAGACACCCAGTGTTCACATAAAGTCACAAAG---GGGT--CAGATTTTCTGAAGCCCTGCACCC-AG
GGTCAAACATCCTTGACCTACACAAACAGTAACGTTGGCTGCAAGGGAACATGTAGACTGTCCAAAAGTGTCTCTTGCAC
CCTTAA---------------------AA-GGGAA--ACTTCTCATTGCTTCNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNTTCTTACATACC--GTCAGCCTTATAGGAAATAAAGTAAGACCCACCACTGGAGAGC
CAAGGAAA------------ACAATAGAGACTAATCTCAACTGAACACCATTGTGGCAGAATTGTGAAAA---------A
ATAAAGCCACA-ACTTTACTGGATTTTAAAGGAAATTACAT--AGAGAAAAGCACATTTCTTTTTGTATACCCAAATAAA
TAACATGTAACTCTATTAGAAACTTTTACTAATAGTGAATGCCCACCCTCTTCTACTGAAAACATTTCATTTGCAGACAG
TATGTATCAATGACTATAGGTCTTAAAGCACTGAC--AAAAACTCAAGATTCAAAATATAACAAGTTTGATTCAGT---T
TGTTTTAATCACAGATGCC----AATGTTTTCATCTTCATCTCTAAAATGGAG-CAGCAGCACTTGCCCTTGCATGTCAC
TGTAAGCACTGGGTGGGATCATGTATA--AAGTACCCATCAGAATGTTTGACATACAACTGGTATTTGCTAGATGCAATC
CATGGAAGGTAACAGGTGCAGGAAACAAGAGATTAAACTCT---GGAGTTAGAAGCTAGCTCA-AA-CCTTATCATCCCC
A--CTGCTTAAACAAGATGTATGATATTGGCCAGGCGACTTAGCTTCTCCTAGCTTCAGTTCCATTATCTGCAAAATG--
GAAATGTTAGTATTTACCTTGTAGGGCAGT----TTTGGGATTC-AAATATTCTAATGAATTTAAAGTGTCTATTTTACC
ACCTGGCATG-TAGCAGGAGCTCGAAATATAAC---AGTTCTTAGTTTGGTTCCCTTTAGATTAAT-AAAATATTT----
---------GAGG-AAAAATA--------------------------GTTGCA-----------TCAGAATACCTG----
-------AGACAC-ATATTCAAATACTGGATTAAACATACACTGAAATATTGGAA----TTAAAA-----GAAAAGTCAA
----GAGAAATAAACAA--GAAA--CTAAATGTATAATTTAAAAATCAAACC-CATTTCAAT-ACAAAAAAA--TCATCC
TCCATAAAA-AAAGAATGTTATAATCAT---GCAATGTTGCA-------ATTAAAA-TTAAAAACTTT-GGC-AAAATAT
CACTTTGTATTGCAGTACTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTGTAAGCAGTAGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCCGCCTGAAGCATACAACTTCTAAAAGGAAATATATATGGGAAA
TGTGTGTGTGTG--------------------------------TCTGATGGGG--------------------------
TCTTTCTCTCAAGTGATTTTTCTATCTTTGAGCCT-CC----------AGGATAGAGTGGT-CTAACCTTTCCAGC-TCT
GCTTATTTGCTAGGTTCTAGGATTCATTTTCAAGTTGGGGCTCCAAAGCCTATTTTCAACAAGATTT-------------
---TTTAGTTATTCTTCCAATGAGGTT-TAAAGCAATAAAACAG-------------------------AATAAGAACAC
GTCCTTGAAGGAGGAATCTGCTCCTTTACTCTTAATGCTGTAATTGTTC--ACAATAAGGGTGTGGTGAAAGGACACGAA
AAGGAAAG----TTCAGCTTAAAAATGAGAAGACAGAGGGAAGGAAATGTAAT------CTGGTGGTGGATTTAGATGAG
GATTAGCATTCTGGAAGCCAGGCATCATTACAAGCCCATCGTCAGCTGATCTGTCT-ACCTTTCTTTCCCTCTGTTCTT-
--------GAGAGTCACTTTCACGGAGTCCCAAGTATTCTATGGAGGTGACTCTCCA-TTTTTCCC-ACTGGAAAACCAA
ATCCAAAGCAGAACA----AACTCCG-----------ATCTCACTCTTTTACAGTTGT-----ATTTTTAAAGTGTGCAT
CTTGTCCAAATGGCAAAACTTCTTCC--TTGGGTACTATACA--------------TGTATATCCACTGCACTGAATCAG
AGGGGGAAAAAAAGT-------GAGTCAGCAGCTGTTGCTGGAGCCCAGCCACTCCTGGAAGTATGACTGGGTTAATCCT
TACTGAGAAATTTC------------------AGGCTGC--TTCTACCTACTATCCCCACCATGCACAACCAGCCCTGGG
AAGT-GTAGA---CCGTCTTTCCTCTGCTTGGTGAATGAGC----TATCTTTTCCTTTAAGGTAGGG-TCACGTGCTATT
CACATT--TAATATT-TTATTTCATAACACGTTTCTATTTAATGAAAACCTTAAAAAGAAAAT---------GTTCACTC
TGTAC----TACCTCCTGCTTTGTGAGGTAAATGCTTCCCTCATAAA----CTTCCTGAGATGAATTCTGAAGGATTTAA
A---AAGAAGACTTCTCTGTG--AGAGGGAAAATATTGCACCC--AAAGAGGGAACCTGAGAAGGAAGGCAAGTAAAGAG
AAGGAAAATGTGTGGAAATACCATTTACAGGAAGA--CCCCTTTCCCTCCTGTCTAGACTGAGTAATATAACATTGACCA
ATACAGGGTGTCACAGAAATGCTAATGCATAATGGAAGTGACAAAGGGATGGCAAAACTCAATCCTGATTTTTGGATTTC
TGTCTTCCCATGCTATGAACTGATAATTAAAGCTTTATGGGGAAAAAAGTGAG-------TTAATGTACAAAAGTAGACA
TACATTGTTCAATGTCAAGGACTGTAATATATGTGAGTCATC-AAATCCTTAGTGA--CAA-----CTTC------TACT
TTTGCCCTGCTATT-AAAAAG-AGGTGAAGTGAAAATTTCAAAAA-ATAAATAATATGTCAGCATTTATTTT-AAATTTC
TAAAGTTATTC-TATAGAATAACCTCTATCACTCCATCATCTTTCTAATTATCTTTTGTCTAAATGAATAAACTTTCAAC
TTAGAGTTT---------------AAAAATATTTATCACAA-TGCCC--ACACATAAAAAAA-AAATACAGGTGCT-AAA
ATTATGTGCATTCTATTTACTTATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAATACT---AAA----T-ATGTT-
CAC-AGACATATGTTTGGCATA--TAGAAAGT-GCTCTA------------------TA--GAAATTTATTATTTCCTTA
TTC-ATAC-----------TCATTAAACAAAG---ATAA-CTCTCAGCACCC---TTTTCCACTAAACCAGTGTGACACT
TCGATTCGATTATT---TGGAAATATA-CCATGTTTGAC----------------------GGATACTAAGTTTTA--TT
TTAGG-CTTCGCCTT-GTTTCTTAGAGAC-GACTTGGGCATTCCTGCTCTTTATCCC-CAATCATGGAGATCTGTAGAAT
AATTTTAGCTGCAAAACAGACCCTGC-TTTGC-TTTCCTGTGTTTGAGAAAAGGCATTCATTGTAGTATTATAAAGTGTG
TTAGAGCGATGGTTTGCTGCTACTTA
>Canis_lupus_familiaris
GGGGAGTAGGGGGACTTTAGTTTGAGCAC-TTATGT-----------------------------TAGTGTG-TCATTTC
TGTAGAATGAGTTGGGTAAATACGTA----TTGTCTAAAT--ACGTTTCTTCATCTGCTATCCAGATAAT--------AG
TGTTAAATGAGTATAAGTGAAGAGAAACAACTGTAACTT-----TGTTTTTGTTTTCACTTGGGTTAACTA--TTGAGGG
ATATAGTTTATTCTTAGGT-ATAAGTGTTA--------------ACTCTTGT-TGAAAAAAAA---TTTTCAAG-----T
TCTTTTT----TCTCTTTAGGCTAATGATATGG--AATGATTACAGT--TTTCTTGGTAGCATATTT-TAAAAATAAGAA
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTGACTTTCAGCTTCA
GAGTCAGAAGCACAAGAAAG-CATGGCAGAGA--------------AGAATTCATGTAGGCTGAAGGGGAAAGC----TT
CAATTCGACACAGTAGA----TTATCATCATGTGGAAATGCAGGCCTTGTGCTGTCAACA----------------GTTG
GTTGGT------TGTTTTTTTCACGAGAAGCTGCAAATGTAA--ATTCTAAACAAATCTAATTGATTCTTAAATGCCAAC

ATCCAATGTTTTAATACTATACAGACCAAC----ATTGCATTGGGCAAAATAAAACAGGA-TGTGGATTAGATTTGGCCT
GAGGGCTATTACCAGTGTATAACC----ACTCAAATAAAAAATACACAGCCTGGT-GGGAAATTACATTCAAATCAGTGA
CAAAAGTAAAGTGCCTTTAAATATATATTAGTTAATATATGCACATCAACTAATTTT--TTTT----------
----TAA-CCA----------
------TCATCTAA----GAAAAGTTGAGCTG----------GA-CCAAGCAGTGTCTCAAGACAATTTAAAGA
AATACCCTAGAACAGTGTTTCTTCCCCC----------TCAGATATGTTTGAGAATTTGATAAAAGCTTGAACTC-TCTC
CCCTGAAATGCGCCAATGTCTGGTGTTCAAATACAGTCCCAAAG---GGCTCACAGGTTTTCTGAAG-CCTGGAACC-CT
CGTCAAGGACCCCTGATCTGGAAAGACATTTATGTAAACTGCAAGGAGACCTATAGGTTTTCCAAAAGTGTCTCCCACAC
CTTTAAAATGTCTTGCCCATGAAAAATAA-GGGCA--ATGTCTTAACACTTCAT-AGCAGTAAAGGTAAAGCTGGTCTAC
AAGGCTGACCATCCTCAGA----TGCTTACATACCCAGCCAGCCGAGAAG-TAATAAAGTATTACTCGCCATCGGAGAGT
GAAGGAAA----------ACAAAACAAACAAACCTCAAATGAACACCACCATGGCAGAATCATGAAAA---------A
ATAAAGCCACT-GCTTGATTGGATTTAAAA-GAAATTACGCAAAGAAGAAAGAACGTTTCTTTCAGTTCACCCAAATTAA
TAACATTTAACTCTAC----------TGAAAGCATTCAGTTTGCAGAGAA
TATG--------ATTATAGGTC--AAGCCACCAAC--AAAAAGTTGGGATTCAGAATGTGATAACTTAGAATTGG----C
CTTTTGTATCACA-ATGTC----AGTGTTTTCATTTTCATCTCCAAAATGGAGACAGCAGCACTTGCCCTTGCATGTGAT
TGTGAGCATTGCAGCGGCCCATGTATG--TAGTACCCATCAGAGTGTTTGATACACAATAGGCATTTGATAAATGAAATC
CATGGGAGACAGCAGGGGCAGAAAAC-GGAGTTTGAACTCTGGAGGAGTTCGGAGCTAGCTTAGAA-TCATATCAGCTCT
G--GTGTTTGAA-AAGATGTATGACTTCACTTAAGTGACTTGGCTTCTCGCAGCCTCAGCGTCTTTATCTATAAAACGCC
TTTAT-CTAATATTTATCTTGTAGAGTGAT----CTTGAGATTT-CGAAACTATAATGTATTTAACAAACCTAGTTTATC
CCCTGGCACC-TAGTAAGAGGTCAAAAAATAAC---AGTTCTCAGGATGGTTCCTTTGAGAATAGT-AAAATATT-----
---------TTGGGAAAAATA----------CTTAACA----------CTAGAATGCTGTA-TG
TCAACCTAGGA--------CATAT--------ATTCAAATATTGAATTAAACATATAT----------TAAAATGAT
------AAAGTGAAGAGAAATAAAAATAAATCTAGATTTTAATAGTAAAACCTC-TTTCAATTATAAAAC----TCATCA
TCCATTA---AAA--ATGTTGTAACTAT---ATAATGTTGCA-------ACTAAAA-TTAAAAACTTCTGGC-AATGTAT
CATTTTGTATTACAATATTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTGGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCTGCCTGAAGCATACAACTTCTAAAAGGAAATATATATGGAAAA
TGTGTGTGTGTG--TGTGTGTGTGTGTGTGTG-TC---------TATAATGAG----------
TTTTTTTCCTAAGTGACTTTTCTATCTTTGAGCTT-TC----------AAGATAAAGAGGTGCTAACCATCCCAGC-TCT
ATTGATTTGCTGGGTTCT-GGATTCCTCTACAAACTGGGGCTTCAAGGCCTATCTCCAACAAACTTTT----------
---TGTTGTTTTTTGGCCAATGTGGCT-CAAAGCAACAAAATG----------AATAGGAACAT
GTCCTTGAAAGAGGAATTTGCTCCTTTACTCTTAATTCTACAATTGTTG--AGAATAAGGGTGTGGTGAATAGACACTAA
A--GAAAG----TTTGGCCTAAAAATGAGAAAACAGAGAGAAGGAAATACAATACTGATCTGGAAGTGGATTTAAATGAG
GATTAGCATTCTGCAAGGCAGGCATAGCTCCAAGTCTGCTGTGAGCTGGCCTCCCTGACCTCTCTCTCCCTCTGTTCTC-
CGG-----TGTAGTCATTTCCTCCAACTCCCAACTACTCCACGGAGACGACTCTCCAGTTTTTCCC-AGTGTCTCACCA-
-----AAACAGGAGAACT-GACTTGG----------GTCTGACTGTCTTACAGTTTCATTTTTTTTTTAAAATGTGAAT
CTTGTCCAAATGGCACAACGTATTCC--TTAGGTACCTCATA----------ACTGTGTCCGCTGCACTGACTCAG
A----------AAGAGGTGAGCTATTGAGGCAGTGCAGCTGCTCTTGGAAATACAACTGAGTAGAT--T
TACTAAGAACTTTC----------ATACAGC-CTCCGAC---CTCTCCCCACCAGGCATGGCCAGCCCCAGG
AAG-GGGACGTGTCTTTCTTTCCTTTGCTTGGTGGATGAGA----TGTCTTTTCC--CAAGGTGGGGATCATGTGCTATT
GACATT--TCATATT-TTACATCATGACATGTTTCTATGTAATGAAAAACTCAAAAAAAAAAAAAAAGAAAACTTTTGCTC
TGTGCCTCTTGCTTTGTGCATTATGAAGTAGATACTCTCTTCGTAGAACTTCTTCCTGCAAAGGATTCTGATGGGTTTAA
----AATAAGAATTCTATGTG--AGATGGAAAAGTCAGTACCCAAAAAAAGGGAACCCAAGAAGGATGGTGAGTAAAGAG
-AGGAAAATGTGTGGAAATCCCATTTACAGGAAGA-CCCCCGTTCCCTCCTGTCTAGACTGAGTAATATAACATTGACCA
ATATAATGTGTCATAGAAATGCTCATGCATAGTGGAAGTGATACAGGAATGGCAAAACTCAATTCTGATTTTTGAATTTC
TGGTTTTCCACCTTACCAGCCTATAATGAAAGCTATCAGAAAAAAAAAAAAAAAACAAG-TTTCATCTACAAAAACAGGCA
TAGCTTGCTCAACATCAAAGATTCT-GCACGTGTGAGACATCAAAATCCTTAGTGA--TAAGGATCCTTAGTG---CACC
TTTGCCCTGCTCTT-AAAAAT-GAGTGAGATGAAAACTTCAAAAAATTAAACAATATGTTAGATTTTATTTT-AGATTTT
GAAAGTTATTT-TCTATAA-AACTTTT--------GTTATCTTACTATGTATTTTCTGTCCAACTGAATTAAGTTTCAAC
CTAGTATTA----------AAAAATATTTATCACAA-TGCCC--ATATATGCAAAAATACCTAAAAGTGCT-AAA
AA-ATGTGCATCCTATTTGCTCACTTGAGAACTTAGCTCTAGGAGTTTTTGTAGAATAACAAATAAAA----TAATGTT-
CAT-AAACG--TGTTTGGCATA--TGGAAATT-TCTCTGAATGCTAGTTTGTTTTTAATGCTAGTTTTATTATTTCCT-C
TCC-ATAT----------CCATTAAAACAAA---AATAATCTCTGACCACC---TTTTTTTACTAAGCCA-CATGACAAT
CAATTTTGATTATTATTTAGGAATATAAACATATTTGAC----------AGATATTAAGTTATTTTTT
TTAGG-CCTTGCCTT-TTTTCTGAGGGATTG----------CTCTTTATCCCTTGGTCATGTGGCTCCACACAAT
ACTGTTAGTTGCAAAGCTGACCAAGC-TTTGC-TTTCCTATGCTTGAGAGAAAGCATTCATTGTAGTATTTAAAGGTGT-
TAAGAGAGGCTCTTTGTCACTTCTTA
>Carnivora_Sp2
GGGGACTAGGGGGACTTTAGTTTGAGTAC-TTACGTAAGTTG----------TAGT---TGGGGTA-CCATTTC
TGTAAAATGGATTGGGTAAACACTTAA---TTGCCTACTCGGCTGTTTCTTCATCTGTCATCCAGATGAT--------AG
TGTTAAATGATT----------AGAAACAACTGTAACTA-----TGTTCTAGTTTTCATTTGAGTTTAGTA--TTGAGGG
ATACAGTTTATTCTT-GGTTATAAGTATTA------GTATT---ATTCATG--TGAAAAAA-----TTTTCAAG-----T
TCTTTTT----TCTTATTAGGCTAA---TATAG--AATGATAAT-----TTTCTTGATACAATATTT-AAAAAATAAAAA
CTTTTAAAAGAACGAA---TGTTATACAGAGGCAGGAGAGAATGTCTAAATTGTATTGTTTGATCTGACATTCAGCTTCA
GAGTCAGAAACACAAGAGAG---CACAGCAGAAACTGGATACCTGAGGAATACATGTTGGCTAAAGGGGAAAGT----TT
CAACTTGACACTGAAGATTATCTATCATCAGGTGGAAATGCCAGCCTTGTGTTGTCCACAGGTTTTTTTTTCTTTCGTT
TTCTTTTCTTTTCTTTTTTTTCATGAGAAGCTGCAAATGTAATTGTTCTGAACAAGTCTAATTGATTCTTACATGCCAAC
AACCAATTTTTAAATACTATACAGACCAACA---CTGCATTGGAAAAAAATAAAACAGTGTTGTGGGTGAGATTTGGCCT
GTGGGCTACTACCAGAGAATAACC----ACTCAGATAAAGAATACACAATCTGGT-GGGAAATTATATTCAAAACAGCAA
CAAAAGTAAAATATCTTCAAATAAATACATATATATACATATATCTCAACTAATTTT---TTT----------
----AAA-CCAGTGTCTAAGGAAAAATTA----------CGGCTTCTCAGAAGCCAGTCAA-ATCCTACTGCCCACATTC
TTAAATTTTTCAAAGCTCAGAAAGTTGAACTG----------GACCCAAGCAGTGTCTCAAGACAATTTAAGGA
AATGCTCTGGAATAGCATTTCTTACCC----------TCAGATATGTTTGAGAATTTGATAAAAGCTTGAACTG-TCTC
CTCTGAAATGCACAGATGTCTAGTGCTCAAATACAGTCTCAAAGCGGGGGTCACAGGTTTTCCAAAGCCCTGCGCCC--T
GGTCAAAGACCCCTGATCTGAAAAGACAGTTACATAAACTGCAAAGGAACATGTAGGGTTTCCCTACAAGTGTCTCCCAC
CCGTAAAATGTTTTAA-CAAGAAAAGTAA-GTGAA--ATTTCTCAACACTTGATCAGTAGTAAAGGCAAAGCTGGTCTAC
AGGGCTGACCATCTGGTAATT--CCTTTACA--GCCAGCCAGCCTCAGAGGTA--AAAGTATTATCCAACATTGGAGAGC
TAAGGAAA----------ACAAAACAAACCTC---TGAACCCCAATATGGCAGAATTTTGAAAA---------A
ATAAAACCACA-CCTTGGTTGGATCTAAAAGGAAATTACCT--AAAGAAAAGAATATTTCTTTCGGTCCACTCAAATTAA
TAACATCTAA--CTAC----------TGAAAGCACTTAGTTTGCAGTGAA

TGTGTATCAGTGATTATAGGTC--AAGCCATTAAC--AGAAACTCAGGATTCA-AATGTAACAACTTAGAATTTGCTTTT
TTTTTTTACCATAAATGTC----AGTGTTTTCATTTTCATCTCTAAAATGGGGATAGCAGCACTTAATT-TGCATGTTAT
TCTG----TTGAGTGGGATCATGCATA--TAGTACCCATCAGAGTGTTTGATATTTAA-----------TAAATGAAATC
CATGGAAGATATCAGGTACAGAAAAC-AGAGTCTGAACTCT---GGA----GGAGCTAACTTAGAA-TTGCATCAGCTCT
G--GCGCTTAAA-AAGATGCATGACTTCAGGTGGGTGACTTGGCTTCTCCCAGCCTCAGTGTCTTTATCTGTAAAATGCC
TTAAT-CTAATATTTGCCTTGTAGGGTGAT----CATGGGATTT-CAGTAATCTAATGTATTTAAAGAGCCTAGTTTATC
ACCTGGCACC-TGGTAAGAGCTCAAAAAATAGT---TGGTT------TGGTTCCCTTAAGAATAAT-AAAATATTT----
---------TGGGGAAAAATA--------------------------CTTATC-----------TTAGAATACCTTA-TG
TCAATCTAGAA--------CACAT--------ATTCAAATACTGAATTAAACATATGTTGAAATAAACTGATAAAGTGAA
----GAG----AAACAAA-GAGAAATTGAAACTAGATTTTAATAGTAAAACCCCA-TTCACTTATAAAAT----TCAACC
TCCATAAG--AAAGAATGTTATAATCAT---ATAATGTTGCA-------ATGAAAA-TTAGAAGTTTATGGC-AATGTAT
CATTTTGTATTGCAGTATTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGTTTTT-CAGAATCTGCCTGAAGCATACAACTTCTAAAAGGAAATATATATGGAAAA
TGTATGTGTGTATATAGGGTATGTATGTGTGTGTC---------TGTAATGGT--------------------------
TTGTTTTCTCAAATGACTTTTCTATCTTTGAGCTT-GC----------AGGATAAAGGGATACTAACCATTCCAGC-TCT
ATTGATTTGCTAGGTTCTAGGATTCCTCAACAAATTGGGGCTTTAAGGCCTATCTCCAACAAACACTTTTTTTTTTTTTT
T--TTTGGTTATTCTCCCAATGAGGTT-CAAAGCAATAAAACTG-------------------------AATAGGAACAC
GTCCTTGAAAGAACAATTTGCTCTTTTACTCTTAATTCTATAATCATTG--AGAAAAGGGGTGTGGTGAATGGACACTAA
A-GGAATG---TTTTGGCCTAAAAATGAGAAAACAGAGAGAAGGAAACAGAATACTGATCTGGAAGCAGATTTAGATGAG
GATTAGCATTCTGCAAGGCAGGCATAATTCCAAGTCTGTTGTGAGCTGGTTGCCCTCACCCATCTCTCCCTCTCTTCTC-
CTG-----CACTGTCATTCCCATGAACTCCCAAGTACTCATGGAAATGG-CTCTCCATTTTTTCCCCACTGTGAAACCAA
ATCCAAAACAGGAGAACTTAACTTGG-----------GTCTGATTCTCTGAAATTAAT-----TTTTTTTTAATGTGAAT
CTTGTCCAAATGGCACAACTTATTCC--TTAGGTACCTTACA--------------ACTCTACCCACTGCACTGAATCCA
A---AGGAAAGAAAC-------GAGCCGACAGCCATTGCTGGACCACAGCTGCTCCTGGACTGTGACTGGAGA-GATACT
CACTGAGAAACCTCCTGCAATCCGTGCCCCGCCCTCGCCCCCCCCCCCCCCACTTCCTACCATGCACAG-CCGCCCCGGG
-AGGGGTCTGCGTCTCTCTTTCCTTAGCTTGGCGGGTGAGA----TATCTTTTCCTATAAGGTAGGGGTCACGCGCTATT
TACATT--TAATATT-TGACATCATAGCATGTTTCTACGTAATGACAAACTCCAAAAGGACAC---------TTTCGCTC
CGTGGCTCTTGCTCTGTGCTCTGTGATGAAGATGCCCTCCTCGTAGAGCTTCTCCCTGAAATGGATTCTGATGGGTTTAA
AAATAAGAAGAATCCTCTATGCGAGAGGGAAAATTTAGTACCC--AAAAAGGGGACCCAAGAAGGAAAGTCAGTAGAGAG
-AGGAAAATGTGTGGAAATGCCATTTACAGGAAGA-CCTCCTCTCCCTCCTGTCTAGACTGAGTAATATAACGTCGACCA
ATACAGTGTGTCATAGAAATGCTAATGCATAATGGAAGTGGCAAAAGAATGGTGAAACTCAA--CTGATTTTTGGATTT-
-GTTTGCCCACCTCACCGGCTGATAATTAAAGCTATCAGAAAAAAGGGA----------GCTCATGTACAAAAATAAGCA
TAGATTGCTCAACATCA--GACTCTAACACATGTGAGTCACCAAAATCCTTGGCAA--TAA-----CTTG------TACT
TTGGCCTTTCTATC-AAAAAT-GAGTGAGATGAAAGCTTCAAAAAATTAAA-----TGTTAGAATCTATCTT-AGATTTC
TAAAGTTATTT-TCTATAATAACTTTT--------GTTATCTTCATATTTATTTTCTGTATAAAG--------TTTCAAC
--AGCATTAAAAAATATTTATCACAAAAATATTTATCTTAA-TGCCC--CTATATACAAAAATACTTAAAAGTGCT-AAA
A-TATGTGCATCCTATTTGCTTACTTGAGTACTTATCTCTAGGAGTTGTTGTAGAATATAAAAAAAAAAAAATTATGTT-
CAT-AAACA--TGTATTTGATATATGGAAAATTCCTCTA----------------AACACTAGTTTTGTTATTTCTTTC
TCC-ATAT----------CCATCAAAAGAAGT-AATTAATTTCTGATCACCCTTTTTTTTTACGATATCA-TGTGACAAT
CA-----GATTATTATTTGGGAATACAAACAT-TTTAAC----------------------AGATACTA--TTTT---TT
TTAGA-CCTTGCCTT--TTTCTGAGAGACTGACTTAGGCACGCTTGATCTTTATCCC-TAGTCATGTGGCTCCACAGAAT
CATATGAGTTGCAAAACCGACCATGC-TCTGCTTTTTCTATGCCTGAGAGGAAGCGTTCATTGTAGTATTTAAAGGTGT-
-AAGAGATGCTCTTTGTCGCTTCTTA
>Cetartiodactyla_Sp2
GGGAGGTAGGGGGACTTCAGTTTTAGCAC-TTATGTAATTTGACTAGGATTTGGGGTGGGGGTTTTGGGGTA-CTATGTC
TATGGAATGGGTTGGATATACGCCTG-----------CTCTGTTGTTTCTTCGTCTGGCATCCAGATGATGTTTTGTCAG
TGTTAAATGAGT----------AGAAACAACTGTAACTTA-CATTCATCTTGCTTTCACTTGAGTCAAACA--TTGAGGG
ATATAGTTTATTCTT-GGT-ACAAGTATTA------CTCTTCTTAT-------AGAAAAAAAA--TTTTTCAAGGAG--C
TTTTTTTTTTCCCTCATTAGGCTAGTGATGTGG--AATGATTACAGT--TTTCTTGGCACAATATTT-TAAAAATAAAAA
CTTTTAAAAGAATAGAGACTGTTATACAGAGGTAGAAGAGAATGTCTAAATGTCATTGTCCCATGTGGCATTTAGCTTTA
CAGTCAAA-AGACAAGAAGG-TATGGTGGAGA--CTGGATACCTGGAAAATACATGTTGTCTAAAGG-GAAAGC----TT
CAATTTGGCTCAGTAGA----CTGTCATGATATGGAAATGCAGGCCTTGTGTTGCCAACA-------------CTTCTTC
TGTCTCCTTTTTTTATTTTTTCATGAGAAGCTGCAAATCTAG--GTTCTGTGCAAATTTAGTTGATTCTTAAATGCTAGC
AACCAATTTTTAAATCCTATATGAACAAAC----ACTGTATTAGGCAAAATGAAACAGGACTGTGGATCTAATTTGGTCT
GTGTGC---CCCCAATGGATAACT----CCTCAGATAAAGACTATACAGCCTTGT-GGGAAAAGATATTCAAATCAGTGT
CAGAAGTAAAGTATCTTCAAATCTA------TATTAATATATGCATAT--CGATTTTTTTCTT-----------------
----AAA-CCAGGGTCTAAGGAGAGATTA----------TGGATTCTCAGAAGGCAGTCAA-ATCCTACTGCCCATATTC
TTATATTCATCAAAGCTCAGAGAGTTGGATTA----------------GA-CCAAAGAGTGTCTTAAGACAGTTTAGGAA
GATGCGCTGGAACAGTGCTTCTTCTCT-----------GCAGATATGTTTGAGAATCAGATCAAAGGTTGAACTC-TCTC
CCCTGAAATGCACAGACAGCCAGTGTTCAAATAAAGTCACAAAG------------GTTTTCTGAAGCCCTATGCCC-AG
GGTCAAAGACCCCTGACCTAGAAGGATAGTTATATAAGCTGCAAGGGAACATGTAGATTTTCCAAAAGTGTCTCTTGCAC
CCTTAAAATGTTTTAAGCATGAAAAGTAA-GGGAA--ACTTATCAACCCTTCAT---CAGTAAAGCAAAAGCTGGTCTCC
AGTGTAGACCATCCTGTCA----TTCTTACATACACAGTCAGCCTTGGAGGGAATAAAGTAATACCCACCATTGGAGAAC
TAAGGAAA------------ACAAAAGAGACTAACCTCAACTGAACACCAGCATGGCAGAATTGTGAAAA---------A
ATAAAGCCACA-ACTTTACTGGATTTAAAAGGAAATTACAT--AGAGAAAAGCACATTTCTTTTGGTACAGCCGAATAAA
TAACATTTAACTCTATTAGTAACTTCTACTAGTAGTTAATGGCTACTCTCTTCTACTGAAAACACTTAGTTTGCAGACAG
TGTGTATCAGTGCTTATGGGTC--AAGACACCGAC--AAAAACTC--GATTCAAAGTATAACAACTTAGACTCAG----T
TTTTTTGATCACAGATGTC------AGTTTTCATCTTCATCTCTAAAATGGGGACAGTAGCACTTACCCTTGCATGTCAT
TGCAAGCACAGGGTGGGATCATGTATA--AAGTACCCATCAGAATGTTTGATATACAACTGGTGTTTGCTTGATGCAATC
CATGGAAGACAGCAAGTGCAGAAAAC-AGAGTTTGAACTCT---AGAATTAGAAGCTAGCTTA-AA-TCATATCAGCCCC
A--CTGCTTAAA-AAGATGTATGACCTTGGCCAGGTGACTTGGCTTCTCCCAGCCTCAGTTCCATTATCTGTAAAATG--
GGAATGTTAGTATTTACCTTGTAGGGCAGT----TTGGGGATTC-AAATATTCTAATGTATTTAAAATAACTAGTTTATC
ACTTGGCATG-TAGTAGGAGCTCAAAAAATA-----AGTTCTTAGTTTGGTTCCCTTAAGAATAAT-AAAATATTT----
---------GGGG-AAAAATA--------------------------CTTGCA-----------TCAGAATACCTG----
---------GGAC-ACATTGAAATACTGGATTAAACATAAATATATATATTAAATGTATATTAAACATATATAAAATGAT
-AAAGAGAAATAAACAA--GAGAAATTGAATCTACAATTTAAAAATAAAACC-CATTTCAATTACAAAAAAAAATCATCC
TCTATAAAA--AAGAAAGTTATAATAATCATGCAATGTTGCA-------ACTAAAA-TTAGAAACTCT-GTC-AATATAT
CACTTGGTATTGCAATATTGTTTACTAACCTCCGATTCATCACCCTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCTGCCTGAAGCATACAACTTCTAAAAAGAAATATATATGGAAAA

TGTGTGTGTGTGCACACATGTGCGTGCATGCATGTGTGTGTGTGTGTAATGGGG--------------------------
TTTTTTTCTCAAATGATTTTTCTATCTTTGAGCCT-CC----------AGGGTAGAACAGTACTAACCAATCCAGC-TCT
GTTTATTTGCTAGGTCCTAGGATTCAT-TTCAAATTGGTGTTTCAAAGCCTATTTTCAACAAGCTTT-------------
---TTTAGTTAGTCTGCCAATGAGGTT-CAAAGCAATAAAACAG-------------------------AGTAGGAATGC
GTCCTTGAAGGCGGAATTTGCTCCTATACTCTTAATGCTTTAATTGTTC--AGAATAAGGGTGTGGTGAAAGGACATTAA
AAAGAAAG----TTTAGCTTAAAAATGAAAAGATAGAGGGAAGGAAATATAAT------CTGGAGGTAGATTTAGATGAG
ATTTAGCAGTCCAGAAGCCAGGCACCATTCCAAGCCCATCGTCAGCTGACCTCCTT-ACCCCTCTCTCCCTCTGTTCTT-
--------ATTAGTCACTTCCATGAACCCCCAAGCA----------------TTCCA-TTTTTCCC-ACTAGAAAACCAA
ATCCAAAGCAGAACG----AACTCCA-----------GTCTCACTCTTTTACAGTTTT-----ATTTTTAAAGTGTGAAT
CTTGTCGAAATGGCAAAACTTCTTCG--TTAGGTACCTTACA--------------AGTATATTCACTGCATTGAATCGG
AGGGAAAAAAG---T-------GAGGCAGCAGCTATTGCTGGAGCACAACTTCTC------GTATGAATGAGTGGATATT
TACTGAAAAACCTC------------------AGGAAGC--TTCCATCTACTATGCCCACCATGCACAGTCAGCCTCGGG
AAGC-GTAGACACCCCTCTTTCCCCTGCTTGGTGAATGAGATAGATATCTTTTCCTTTAAGGTACGG-TCATGTGCTATT
CACATT--TAATAGT-TTATGTCATAATATGTTTCTATTTAATGAAAAACTTAAAAAGAAAAC---------TTTCACTC
TGTGCCTCTTGCTTTGTGCTTTGTGAGGTAGATGCTTTCCTCATAAA----CTTCCTGAAATGAATTCTGATGGATTTAA
A---TAGAAGAATTCCATGTG--AGAGGGAAAATATAGTACCC--AGAAAGGGAACCCGAGAAGGAAGGCAAGTAAAGAG
AAGGAAAATGTGTGGAAATACCATTTACAGGAAGA--CCCCTTACCCTCCTGTCTAGACTGAGTAATATAACATTGACCA
ATATAGGGTGTCATAGAAATGCTAATGCATAATGGAAGTAACAAAGGGATGGCAAAACTCAATCCTGATTTTTGGATTTC
TGTTTTCCCATCTTACGAACTGATAATTAAAGCTATAGAAAAAAATGAG-----------TTAATGTACAAAAATAAACA
TAGATTGTTCAACCTCAAGGACTCTGAAGCATGTGAGTCATCAAA-TCCTTAGTGA--TAA-----CTTC------TACT
TTTGTCCTGCTATT-AAAAGT-AGGTGAAATGAAAGCTTCAAAAA-TTAAATAATATGTTAGAGTCTATTTT-AGATTTC
TAAAGTTATTC-TATAGAATAACCTCC--------ATCATCTTCATATTTACTTTTTGTCTAAATGAATAAAATTTCAAC
TTAAAGTTT---------------AAAAATATTTATCACAA-TGCCC--ATACATGCAAAAATACTTACA-GTGCT-AAA
AATATGTGCATTCTATTTGCTTGTTTCGGTGCCTACCTCT--GAGTTGCTGTAGAATATTC-----AA----TCATGTT-
CAT-AGACATATGTTTGGCATA--TAGAAATT-GCTCTA-----------------TA--AAAGTTTGATTATTTCCTTC
TCC-ATAC-----------TAATTAAACAGT---AATAA-CTCTGAGCACCC---TTTTTCACTAAACCAGTGTGACAAT
TCAATTAGATTATT---TGAGAATATA-CCATGTTTGGC----------------------AGATAGTGAGTTTTA--TT
TTAGG-CCTTGCCTT-ATTTCTCAGAGATGAACTTGGGCATTCTTGCTCTTTATCCCTTCATCATGGAGCTCTGTAGAAT
AATTTTAGTTGCAAAACTGACCATGC-TTTGC-TTTCCTATGCTTAAGAAAAAACATTCATTGTA-TACTTTAAACTACT
TTGGAGGTACTGTTCGCTGCTGCTTA
>Chiroptera_Sp2
GGTGGGTAGGGGAGCTACAGTTTGAGCAT-TTA----AGTTGACTAAGATTTG---TTGGGGT--TGGAGTA-CCGTTTC
TATGAAATGTGTTGGGTAAACACCTA----TTGCCTGCTCTGCTGTTTCTTCATTGGCCATCCAACTGGTGCTTTGTCAG
TGTTAAATGAGT----------AGAAACAAC--TAACTTA-CATTCATCTTGCTTTCACT-GAGTCAAACA--CTGAGGG
ATATAGTTTATTCTT-GGT-ATAAGTATTA------TCCTTCTTGTTG----AGGAAAAA------ATTCCAAGGAG--T
CCTTTTTTT--TCTCATTAGGCTAATGATATGG--AATGATTATAGT--TATCTTGGCACAATATTT-AAAAAATAAAAA
AATTTAAAGGAGTGGAGGCTACTATACAGAGGCAGAAGACAATGTCTAAATTTCATTGTTCCGTCTGACATTTAGCTTCA
CAGTCAGAAGGACCAGAAGG-AATAATGGATAGTGAGGATACAGGGAGAATACGTGATGGCTAAAACAGAGGCCTTCATT
CAACTCAGCTTAGCAGA----CCATCGTTATGCAGAAATGCAGGCCTGATGTTGCCAACA----------------CTTT
T-----------TATTGTTTTCCTGAAAAGCTGCAAATTTAA--GTTCTATTCAAATCTACTTGATTCATAAATGTTGGC
AAATGGTTTTTTAATCTTATATGGACCAAC----ATTGCATTGGGCAAAATAAAACAGGATTGTGGGTCAAATATGGTCT
GTGGGC---CACCAGTCTG----------------TAAATAATATACAATCTGTT-GGAAAA-GATATTCAAACTGGTAC
CAAAAGTAAAGCATCTTCAAACACG----------------CATATCAACTAAATTT---TTT-----------------
----TAA-CCAGGGTCTATAGAGAAATGG----------TAGACTCTCAGAAGGCAATGAA-ATCCTACTTCCCATGTTT
TTAAATTCATCAAACCTCAGAAAGGTGGGCTG----------------GA-CCAAGGAGTGTCTTAAGACAATTTAGAGA
AATGCTCTAGAACAGTGCTTCTTTCCT-----------TCAGATATGCTTGAGAATCTGATAAAAGCTTAAACTC-TCTC
CCCTGAAATGCACAGACTTCCAGTGTTCAAATACAGTTCCAAAG---AGGTCACAGGTTTTC------------------
-------------TGATCTAGAAAGATAGTTATGTAAATTATAAGGGAGCACATAAATTTTCCAAAAATGTCTCCTGCAC
CCTTAAAATGTTTTAAGCATGAAAAGTAA-GGGAACCACTTTTCAACACCACAT-TTCAGTAAAGCAAAAGTTGATCTAC
AGGGTAAATCATCCTGGAAATCCTCCATATGTAAGTAGTTAGCCTTGGAGATAATCAA-----ACCCACCCTTGTAAGAC
TGTGGGGG------------GAAAAAAGGATCAACCTCAACTGAACACCATCATGGCAGAATAGTAATAAAAAT-----A
ATAAAGCCACG-ACTGGAGTGGATTTAAAGGGAAATTACAT--GAAGAAAAGCACTTTTCTTTTGGTCCATCCAATTAAA
CAACTTTTAGCTGTACCAGTAGCTTTGA---------AATGCCCACTCTCTTCTACTGAAAGCACTTAGTTTGCAGAGAA
TGTTTATCGGTAACTATAGATC--AAGGCACTGAC-AAAAAAATTGGGATTCAAAATCTAATAACTTAGAATTGG-----
TGTTTTGGTCACAGATGTCAT--AGTGTTTTTATTTTCATCTCTGAAATGGGGACAGTAGCACTTACCCTTGCACTTTAC
TGTGAGCCCTGAGTGAAATCATGTATAATAAGTATCCATCAGGGTGTTTGATATGTAACAGATGTTTGCTAAATGAAATC
CATGGGAGAGAGCAGGTGCAGTAAAC-AGAGTTTGAACTCT---GACACTAGGAGCTAGGTTAGAA-TCATATCAGACTC
A-CGTGGTTAAA-AAGTTGTATGCCCTCAGTTAAGCGACTTGACTTCT---AGCCTTTGTTCCTTTATCTGTAAAATG--
GAAATGCTAACATTTACCCTGGATGGTTGT----TTTGGGATTT-AAATAATCAAATATATTTAAAGAAACTAGTTTATT
GCCAGGTATT-AATAGGAGCTCAAAAAAATAAC---AGTTCTGGGTTTAGTTCCCATAA--TTAATTAAAATAATAAAAT
ATTTG----GGGGAGAAAAA----------------------------TGGGTG-----------TCAGAATACCTTAGAA
TCAATCTGAGATA-ATACTCAAACAGAGAATTAAACACACATTGAAATATTGAAA----TAAAATGATAGGTAAAGTCA-
------GAAGTAAACAAAAGAGGAATCGAATCTAGATTTTAAAAATAAAACC-CACTTCAATTACAAAAATA--TCATCC
TTCATAAAAA-----ATATTAT-----T---ACAATGTTATA-------ACTAAAA-TTAAAAATTTC-AGC-AATGTAT
CATTTGGTATTGCAGTATTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC
AGCTTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCTGCCTGAAGCATACAACTTCTAAAAGAAAATATATATGGAAAT
TGAGTGTGTGTGATGGTTTGTTTCATTTTTTT-GT---------TATTTTGGGTCTT-----------------------
TTTTTTTTTTTAAGGATTTTTCTATTGTCGAGCTT-CC----------AGGATAAAGTAGTACTAATCATTCCAAC-TCT
ATTTATTTGCTAGGTTCTAGAATTCCTCTACAAAATGGAACTTCAAGGCCTATCTCCAACAAGCTTT-------------
---ATATTTTTTTTGACCACTGAGGAT-CAAAGTAATAAAACGG-------------------------AATTGGAGCAC
GTCCTTGAA-GAGGGATTTGTTCCTTTAGGCTTAATTCTATAATTGTTC--AGAATAAGGGTGTGGTGAACAGACACTAA
AAGGAAAGTTTATTTAGCCTAAAAATGAGAAGACAGAAGAAAGGAAATATAACACCAATCTGGAGGTAGATCTGGATGAG
GATTAGCATTCTGTGTGCCAGGTACAATTTCAAGTCCATTGTTAGCCGACCTCCCTTATCCCGCTCTCCCTCTGTTCTT-
--------GTTAGTCATTTCCATGAACTCCCAAGTACTCCATGGAGGTGACTCTCCA-TTTTTCCT-ATTGTAAAACCAA
ATCCCAAGCAGGAGAACT-AACTCATATTTCACCCTCATTTGACTCTCTGATAGTTTTAACA-AATTTAAAAGTGTGAAT
CTCATTCAACTGGCAAAACTGATTTT--TTTGGTACCTTACA--------------AGTATATTCACTACATTGAATCAG
A---AGAAAAACAAT-------GAGCTGACAGCTGTTCTGGCAGCACTGCTGCTTCTGAAGGTGTAACTGAGTT------
TACTGAGCAACCTC------------------ATGCAGCTTTCCTACCTACTATTCCCACCATGCACAGCCAGCCTCTGA
AAGTGGTATACGTCCC----TCTTCTGCTTGGTGAATGGAG----TATCTTTTCCTTTACGGTGGGG-TCTTGTGCTAGT

```
CACATTTATAATATT-TTATTTCATAACATG-TTCTACTTAATGAAAAACTT-AAAAAGAAAA---------TGTCACTC
TGTGGTTTTTATTTTGTGTTTTGTGAAGTA--TGCTCTCCTCATAGAA---CTTCCTGAAATAAAGTTTTAAGGAATTAA
A--TAAGAAGAATTCTGTGTG--AGAGGGAAAATTTAGTACCC--CAAAAGGGAACCCAAGAAGGAAGGTAAATAAAGAG
-AGGAAAATGTGTGGAAATACCATTTACAGGAAGA-CCCCCTTTCCCTCCTGTCTAGACTGAGTAATATAACATTGACCA
ATATAAAGTGTCATAGAAATACTAATGCATAATGGAAGTGACAAAGAGATAGCAAAAGTCAATCCTGATTTTTGGATT--
TGTTTTCCCACGTAACTAGTTGATAACTAAAGCTATCAGTGAAAATGA--------------------------------
-------------------------ATACATGTGAGTCATAAAAATTCTTAGTAA--TAA-----CTTC------TACT
TTTGTACTGCTATT-AAAAAT-GAGGGAGATGATAGCTTTAAAAA-TTAAATAGTATGTTACAGTCTGTTTT-AGATTTC
TAAAGTTATTT-TATAAATTAACCTTT--------GTCATCTTCATATTTATTTTCTTTCGAAATAAATT--GTTTCAGT
TTAGCATTT-----------------AAACATTTATCACAA-TGCCT--ATGGATGCAAAAATACTTAAAAGTGCT-AAA
AATATGTGCATTCTATTTGCTTACTAGAGT-------------------TGTAGAATATTCGATAAAA----TAATGTTT
CAT-AAACA--TATTTAACACA--TAGAAATT-----------------------------------------------
-------------------------------GGAAATAATTTCTGACTACC---ATTTTTTATTAAAACATTGTGACAAT
CAAATTAAGTTTTTATTTGGGAATATA-ACAGGTTCAAT----------------------AGATATTAAGTTTTA--TT
TTAGG-CCTTGCCTT--TTTCTCAGAGACTAACTTAGGCATGCTCGCTGTTTACCCCTTCATTGTGTGGATCCATAGAAG
AATTTTAGTTGCAAAATTGACCATGC-TTTGT-TTTCCTATGCTTGAGAGAAAGCCTTCATTGTAGTATTT--AAGTGTG
TTAGACTTACTGTTTGCCACTACTTA
>Equus_caballus
GGGGTATGAAGG--CTTAAGTTTGAGCAC-TTACGTGAGTTGACTAGGATTTG---TGGGGGT--TTGGGTA-CCATTTC
TGTGGGATGGATTGGGTAAACAAAAA---------------CCTGTTTCTTCATCTGCCATCCAGATGATGCCTTGTCAG
TGTGAAATGAGT----------AGAAACAACTGTAACTTA-CATTCATCTTG-ACTCATTTGAGTCAAATA--TTGAGGG
ATATAGTTTATTCTT-GGC-ATAAATATTA------CTCTTCTTATTG----AAGAAAAA-----TTTTTCAAG-----T
TCTTTTT----TCTCGTTAGGCTAATGATATGG--AATGATTACAGT--TTTCTTGGTACAATATTT-TAAAAATAAAAA
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTGATATTCTGCTTCA
GAGTCAGAAAGACGCGAATG-AGTGGTGGGGACTGCGGATCCCTGGAGAATACATGTTGGCTAAAGGAGAAAGC----TT
TAACCCAGCCCGGCAAA----TTATCTGTGTATAA--ATACAGGCCTTGTGTTGCCAATA----------------CCTC
TTTT--------TATTTTTTTTATGAGAAGCTGCAAATTTAA--ACCCTAGCCAA-TCTATTTGAATCTTCAATGCCAGC
AACCAATTTTTTAATCTTATGTGGACCAAT----ACTACCTTGGGCAAAATAAAACAAGATTGCGGGCCAGATTTGGCCT
ATGGGC---CACCAGTGTGTAACCACTGACTCAGATAAAGAAGATACAATCTGGT-GGGAAAAGAAATTCAAATCAGCAC
CGAAAGTAAATTATCCTCAAATACA----------------CATATCACCTGATGTT--TTTA-----------------
----TAA-CCAAATTCTAGGAAGAAATGA----------TGGATTCTCAGAAGGCAATCAA-ATCCTACTGCCCATATTC
TTAAATTCATCAAACCTCAGAAACTT-AACTG----------------GA-CCAAGGTGTGTCTTAAGACAATTTAGGAA
AATGCACTGGAACAGGGCTACTTCCCC-----------TCAGAGGGGTTTGAGAATCTGATAAAAGCTTGAACTC-TCTC
CCCTGAAATGCGCAGACATCCAGTATTCAAATATAGTTTCAAAG---AAGTCACAGGTTTTCTGAAGCCCTACACCC-TA
GGTCAAGGACCCCCAGTCTAGAAAGATAGTTATGTAAACTGCAAAGGAACACATAGATTTTCCAAAAGTGTCTCCTGCAC
CCTTAAAATGTTGTAAACTTGAAAAGTAA-GGAAA--ACTTCTCAACACTTTAT-GTCGGTAAAGCAAAGTCTGGTCTAC
AGCATAGACCATCCTGTAA----TTCATACACACACAGTCAGGCTGGGCGATAATAAAGTAATACCCACCATTGGAGAGC
TTTGGGAA------------AAAAAAGAGCTCAACCTCAACTAAACACCATCATGTTAGAATAA---------------A
ATAAAGCCA-A-ACTGGTTTGGGTTTAAAAGGAAATTACAT--AGAAGAAA----------TTTGGTCCACCCAATTAAA
TAACATTTAGTTCTACTAGTAGTTTTGA---------AATGCCCACTCTCTTCTATTGAAAGCACTTAGTTTGCAGAGTA
TGTGTATCAGTAATTATAGATC--AAGCCACTAAC--AAAAAATCATGGTTCAACATGTAGTAACTCAGAATTGA----T
TGTTTTGATCACAGATGTCAC--AGTGTTTTCATCTTCATCTCTAAAATGCGGATGGTAGCACATACACGTGCATGTTGT
TGCGAGCATTGAGTGAGATCATGCATAATAAGTACCCATGAAAGTGTTTGATATACAATAGGTGTTTACTAAGTGAAATC
CATGGGAGACAGCAGGTGCGGCAAAC-AGAGTTTGAACTCT---GGAATTAGGA-CTAGGTTAGAA-TCATATCAGACTT
CTTGTGGTTAAA-ACAATGTATGACCTCGGTTAGGTGACTTGGCTTCTCCCAGCCACAGTTCCTTTATCTGTGAAATG--
GGAATGCTAATATTTACCTTGTAGGGTGGT----TTTGGGATTT-AAATAATCTAATGTATTTAAAGAACCTAGTTAACT
ACCTGGCATG-TAG-AGGAGCTAAAAAAATAAC---AGTTCTTAGTTTGGTTTCCTTAA-----ATTAAAATATTGTTTT
ATTAT----TTGTTAAAATATTATTTATTAATTAAAATAATAAAATATTGTGGGGAAAAATACATCAGAATACC----TG
TCAATTTT------------------------GGACATATATTCAAATATTGAAT----TAAAATGATAGGTAAAGTCAA
----GAGAAATAAACAAAAGAGAAATTGAATCTAGATTTTACATATAAAACC-CATTTCAATTACAAAAA----TCATCC
TCCATAAA--AAAGAATGTCATAATCAT---ACAATGTTGCA-------ACTAAAG-TTAAAAACTTT-GGC-AATATAT
CATCTGGTATTGCAGTATTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTAGCGATACTGGTCTGAAC
AGCTTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCCGCCTGAAGCATACAGCTTCTAAAATGAAATATATAAGGAAAA
TGTGTGTGTGTG------TGTGTAAAAT------------------------GGATTT------------------------
TTTTTTTCTCAAATGATTTTTCTATCTCTGAGCTT-CC----------AGGATAGAATAGTACTAATCATTCCAAC-TTT
ATTTATTTGCTGGGGTTTAGGACTCCTCTACAAATTGGAGCTTCAAGGCCTATCCCCAACAAGTT---------------
---TTTATTTTATTGACCAATGAGCTT-CAAAGGAATCAAACAG-------------------------AAT--GAGTGC
ATCCTTGAAGGAGGAATTTACTTCTTTGCCGTTAATTCTATAATTGTTC--AGAATAAAGATGTGGTGGACAGACACTAA
AAGGAAAGTTTATTTAGTCTAAAAATGAGAAGACAGAGAGAA-GAAATATAATACCAATCTGGAGGTAGATC-AGATGAG
GATTAGCATTCCATGAGCCAGGCATAATTCCAAGTCCATTCTTAGCTGGCCTCCCTGATTCCTCTCTCCCTCTGTTCTC-
CTG-----GTTAGTCATTTCCATGAATCCCCAAGTACTCCAGGGAGGTGACTCTCCA-TTTTTCCC-ATTGAAAAACCAA
ATCCCAAGCAGAAGAACT-AACCCAG-----------ATTTGATTCTCTCATAGTTTT-----ATTTTTGAAACGTGAAT
CTTGTCCAAATGGCAAAACTTGTTCT--TTAAGGACTTTA-A--------------AGCATATTGACTGCATTGAGTCAG
A---AGAA----GAT-------GAGCAGGCAGTTGTTCTTGGAGCACAGCTACTCTTGGATGTACAACTGAGTGGATGCA
TACTGAGAAATCCC------------------ACGCAGC-TCCCCACCGACTATT-CCACCA-GCACAGCCAGCCGCGGG
AAGTGGTATATGTTCCTCTTTCTTCTGCTTAGTGAATGAGA----TAGCTTTTCCTTGAGGGTGCGA-TTATGTGCTAGT
CACATT--TAACATT-TTATTTCATAACATGTTTCTATGTAACGAAAA-CTT-AAAAAGAAAA---------CTTCACCC
TGTACCTCTTGCTTTGTGCTTTGTGAGGTAGATGCTCTCCTCACAAGACTTCTTCCTGAAATGGATTCTTATGGAATTAA
A--TAAGAAGAATTCTGTGTG--AGAGGGAAAATTTAGTACCC--TAAAAGGGAACCCAAGAAGGAAGGTAAATAAAAAG
-AGGAAAAAGTGTGGAAATACCATTTACAGGAAG--CCCCCTTCTCCTCCTGTCTAGACTGAGTAATGTAACATTGACCA
ATATAGAATGTCATGGCAATGCTAATGCATAATGGGAGTCATAAAGGGATGGCAAAACTCAATCCTCACTTTTGGATTTC
TGTTTTCCCACCTTACCAGCTGATAACTTAAGCTATCAGAGAAAATGAG-----------TTCATGTACAAAAACAAGCA
TATATTGCTCAACATCAAAGACTCT-ACACATGTGAGTCATCAAAATCCTTAGCAA--TAA-----CTTC------CACT
TTTGCCCTGCTATT-AAAAAT-G-----TATGATAACTGCAAAAACTTAAATAATATGTTAGAGTCAATTTT-AGATTTC
TAAAGTTCTTT-TATGGACTAGCCTTT--------GTCATCTTCATATTTATTTTCTGTCTAAGTGAATTAAGTTTCAAC
TTTGCGTGT--------------AAAAAATATTTATCACAG-TGTCA--ATATATGCAAAAATAAGTAAAAGTGAT-AAA
AACATGTGCATTCTATTTGCTCACTTGAGTATCTACTTT--AGAG---TTGTAGAATATTAAGTAAAA------------
--T-AAACA--TGTTTGGCATA--TATATATT-ACACTATC---------------AA----AGTTTTATTAGTTCCTTC
TCTGAATCTCTTTCAATAGTCATTAAATAGAAATAATAATTTCTGACTACCC---TTTTTTACTAAACCA-TGTGACAAT
```

CAAGTTAGATTATTATTTGGGAATATA--AATGTTTAAT----------------------GGATACTAAGTTTTA--TT
TTAGG-CCTTGCCTT--TTTCTCAGAGACTGACTTAGACACTCTTGTTCTTTATCCCTTAGTCATGTGGCTCCATAAAAT
AATTATAGTTGCAAAATTGACCATGC-TTTGC-TTTCATATGCTTGAGAGAAAGCTTTCACTGTAGCATTTAAAAGTGTG
TTAGAGCTACTGTTTGCCACTACTAA
>Myotis_lucifugus
GAGGGCTAGGGGATCTTTAGTTTGAGCAC-TTACGTGAGTTGACTAGGATTTG---TGGGGGT--TGGCATA-CCATTTC
TATGGAATGGGTTGGGTAAACACCTG----TTGT-TACTCTGCTGTTTCTTTAGCTGCCATCCAAATGGTGCTCTTTCAG
TGTTAAATGAGT----------AGAAACAACTGTAACTTAACAGTCAT-TTGCTTTGACT-GAATCACACACCTTGAGGG
ATATAGTTTATTCTT-GGT-ATAGATATTA------CTCTTCTTAT-------GAAAAAT------TTTTCAAGGAG--T
TCTTTTTT---TCTCATTAGGCTAGTGATA-----------TACAGT--TTTCTTGGTACAATATTT-TAAAAATAAAAA
CTT--AAAAGAATGGAGGCTGTTTTACAGAGGCAGAAGGGAATGTCTAAATTTCATTGTTTCACCTGACATTCAGCTTCA
GAGTCGGAAAGACAAGAATG-AATAATGGACATTGC--ATACTTTGAGAATACAAGTTGGTTAAAAGAGAAAGC----TT
CAACTCAACTCAGCAGG----TCCTCCTTATGTGGAAATGGATATG---CAGACCCAATA----------------CCTC
TTTTTCTT----TTATTTTTTCATCAGAAGCTTCCAATTTAA--GTTCTATTAAAGTCTACTTGATTCTTAAATGTAAGT
AAATTATGCTTTAATCTTATATGGACCAACA---ACTGCATTGGGCAAAATAAAACAGGACTGTGGGCCAGATTTGGTCT
GCGGGC---CACCAGTGTTTAAATAATGAGTTGGATATAGAATATGCAATCTGAT-GGGAAAAGATATTCACATCAGTGT
C-----CAAAGGGTCTTAAAACATG----------------CACATCAACTNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCGATGAG-ACCCGACTGCCCATATTA
TTAAATTCATCAAATCTCAGAAAGTTGGACTA----------------GA-CCAAGGAGTGTCTTGGGACATTTTACATA
AATGCTCTGGAACAGTGCTTCTTCCCC-----------TCAGATGTGCTTGAGAACCTGAGAAAAGCTTGAGCTCATCTC
CCCTGAAATGCACAGACATCC-------------AGTTTCAAAG---GGGTCACAGGTTTTCTGAAGCCCTACAGCC-CA
GGTCAGGGACCCTTGATCTAGGAAAATAGTTACATAAATTACAA---AGTATGTAGATTTTCCAAAA-TGTCTCCTGCAC
CCTTAATGTGTTTTAAGCATGAAAAGTAA-GGGAA--GCTTTTCAACACTTCNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAGTCAGCCGTGGAGATAATAAATTAATACTCACCATTGGAGAGC
TATGGGGAGGTGGGGGCGGGGGGTGAGAGACCAACCTCAACTGAATACCATCATGGAAGAATACTGATAA----------
--AAACCCACA-ACTGGATTAGATTTAAAGGGAAATTACAT--AGAGAAAAGCACATTTCTTTTGGTCCATCCAATTAAA
TAACACTGAGCTCCACCAGTAGCTTGGA---------AATGCC--CCCTCTTTGAGTAAAAGCACTTAGTTTGAAGAGAA
TGTGTATCAGTAATTATAGATC--AAGGCACTAGC--ACAAAATCAGAATTCAAAATGTATTAACTTAGAATTGG----T
TTTTGTGATTACAATTGTCAC--AGCATTTGCATCTTCATCTCTGAAATGGGGACAGTAGCACTTACTCTTGCATGTTAT
TGTGAGCCCTGAGTGACATCATATATAATAAATTCCCATCAGAAGGTTGGACATCTAATAGGTGCTTG-----------C
CATGAAAGACAGAAAGTATAATAAAC-AGAGTTTGCACGCT---GGAGTTAGGAGTGGGGTTAGAC-TCAT---------
--TGTGGTTAAA-AAGTTGTATGACCTCAGCCAGATGATTCGGCTTTTCCCAGCCTTATTTTCTTGATCTATAAAATA--
GAAATGCTAACATGTACCTTGTATAGTTGC----ATTGGGAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNN-NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNA--TTAATTAAAATAATAT---
---------TTGGAGGAAATA--------------------------TTTGCA-----------TCAGACCATCTTC-TG
TCAATCTGGGACA-ATATTCAAATACAGAATTAAACATA--TTTAAATATTAAAA----TAAAATGACAGGTAAAGTCAA
----GAGAAGTAAACAAAAGAAAAACTGAGTCTAGATTTTAAAAATAA-----CGTTTCAATTATGAAAAAAA-TCATCC
TCCATAAAAAAAAGAATGTTATAATCAT---ACAAGGTTGCA-------ATTAAAG-TTAAAAACTTT-TGCAAATATAT
CATCTGGTATTGCAGTATTGTTTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGCTTTTTCAGAATCTGCTTGAAGCATACAACTTCTAAAGGGAAATGTGTGTG-----
TGTGTGTGTGTGTGTGTGTATGTGATGGTTTG-CT---------TGGTTTTGGGTTG-----------------------
TGTGTTTTTTTA-TTCTTCTTCTATCTTTGAGCTT-CC----------AGAA-----------TAACCATTCTGAC-TCT
ATTTATCTGCTAGGTTCTAGAAATCCTCTACAAATTGGTGCTTCAAGGCCTAGCTCCAGCAAGCTTT-------------
---TGTATTTTGTTGACCAACGAGGTT-CAACGCAATAAAACAACTGGGGAGATTCAACGCAATAAAACAACTGGGGCAT
GTCC-TGAGGGTGGAATTTGTCCTGTCAGGCTTAATTCTATAATGGTTC--AGAGTAAGGGTGTGGCAGAGAGACACCAA
AAGGAAAGTGTTTTTAGCCTAAAAATGAGAAG--TGGGGGGAGGAAGTGTCATGCCCA-CTGGAAATGGGGTTAGATGAG
GATTCGCATTCCACAAGCCAGGCACGACTTCAAGTCCACTGTGAGCTGACCTCCCTTCCCCTGCTCAGCCTCTGGTCTC-
TTG-----G-TAGTCATTTCCCAAAACTCCCAAGTGCTCCATGGAGGTAACTTTCCA-TTTTTCCC-ATTTTAAAACCAA
ATCCCAACCAGAAGA------------------TTGCCTTTGACTCTCTGATGGCTTT-----CTTTTTAAAATGTAAAT
CTTGTCCAAATGGCAAAACTCGTTCTCCTCAGGTGCCTTACA--------------AG----------------------
----------------------GAGCCGGCAGCTGTTCCTGGAGCATTGCTACTCCTGGAAGCACAACTGAGTA-ATGTT
TACTGAGCAGCCTC------------------ATGTGGCTCTCCCACACACTGTTCCCACCACACACAGCCAGCCTCGTA
GCGTGGTATACGTTCCTCTTTCTTCCGCTTGATGAATGAGA----GATATTTTCCTTCAAGGCGGGG-CCATATGCTATT
CATATT--TAATATT-TTATTTCATAACATGTTTCCATTTAGTGAAAAGCCTAAAAAAGAAAA---------CGTCCCTC
TGCGCTTCTTGCTTTGTGCTTTGTGAGGTAGGTGCTCTCCTCAGAGAA---CTTCCTGCAATGGATTTTTAAGGAATTAA
A--TAAGAAGAATTCTGTGTG--AGAGGGAAAATTTAGTACCC--CGAAAGGGAACCCAAGAAGGAAGGTAAATAAAGAG
-AGGAAAATGTGTGGAAATACCATTTACAGGAAGA-CCCCCTTTCCCTCCTGTCTAGACTGAGTAATATAACATGGACCA
ATACAGGGTGTCACAGAAATGCTCATGCATAATGGAAGTGACAAAAGGATGGCAAAACTTAGTCCTGACTTTTGGATT--
TGTTTTCCCACCTTACTAGTTGATAATGAAAGCTATTAGAAAAAAAAAATAAG-------TCAATGGACAAAAATCAGAA
TATATTGTTCAGCATCAAAGACTCT-ATACATG-GTGTCAACAAAATCCTTAGTGA--TAA-----CTTC------TCCG
TTTGCCCTGCTATTAAAAAAT-GAGTGAGATGATAGCTTTAAAAAAATAAATAATATGCTA--ATCATTTTT-TAATTTT
TAAAGTTATTT---TAGAATAACCATT--------GTCATCTTCATATTTATTTTTTCTCTAAAGGAATTAAATTTCAGC
TTAGCATTT---------------AAGAATATTTATCACAA-TGCCT--ATGGATGCAGAAATACTTAAAAGCGCT-AAA
TATATATGCACTCTATTTGTTTACNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCATACTACATTCTGATCACTC---TTTTTTACTGTACCATTGTGACAAT
CAAATGAGGTTATAATTTGGGAATATA-GCACCTTTAAC----------------------AGATATTAAGTTTTA--TT
TTAGG-CCTTGCCTT--TTCCTCAAAAACTGACTTAGACATTCTGGCCCTTTATACATTAATCATATGGCTCCATAGAAT
AATTTTAGTTGCAAAATTGACCATAT-TTTGC-TTTCCTATGCTTGAGAGAAAGCATTCGTTGCAGTATTTAAAAGTATG
CTCCAGTTACTGTTGGCCACTGCTTA
>Outgroup1
TGGAGGAGAGGAGACTGCAGTTGGAACATTTTATTTATGTTGATTAGGATTTG------TGGGGGTGGGGTG-CTGTTTC
TATGGAAAGGGTTGGGTGAAAATCTG----CTGCCTACTCCGCTGTTTCTTCAGCTGCCATCCAGATGATGCTTTGTCAG
CACTAAATGAGT----------AGAAATAAATGTAACTTG-CCTTCATCTCGCTTTCACTTGAGTCACACA--TTGAGGG
ATATAGTTTATTCTT-AGT-ATAAGCATTAATTTTACTCTTGTT-------AAAGAAAAA-----TTTTTCAAAGAG--T
TATTTTTT----CTCATTAGGC-AGGAATGTGG--AATGATTACAGT--ATTCCTGGCACAATGTTT-TAAAAATAAAGC
CTTTTAAAAGAATGGATGCTATTTTACTGAGGCAGAAGATACTATCTAAATTTCATTGTTTCATCTGACATCCAGCTTCA
GAGTCAGAAAGACAAGAGGA-AGTGGTGAGGACTCTGGCTACCTGGAGAACACATGATGGCTAAAGAGGGTAGC----TT
CAACTTTGATCAACAGA----TTACCAAT--GTGGAAATACACGGCTTGTGTTGCCAATA--------------------

```
---CTTTTTTTCTTTCTTTCCCATGAGAAGGTGCAAATCCAG--ATTCTATGCAAATCCACCTGATACTTAAATGCCGGG
AAAATAAAAAAAGTCTAACGCTGTATGAACCAATAGTGCACTGGGCCAAGTAAAACAAGATTGTGGCCCAAATTTTTGAC
CTGA-------------------------CTTAGAT-AAGAATATGCATTCTGGTAGTGTAAAAATATACAAATAGGTAG
TAAAAGTAAAGTATGTTAAAAATAC-----ATTAATATATGTCTATCATCTGATTTTTTAATTTTTATTTGAGGAGTAAG
GAGAGGG-TCAGGGTCTAAGGATAAATGA-----------CAATTCTCAGAAGGC-------ATCCAAATCCGCA--TCC
TTAAATTTCTCAAACTTCAGAAAGTTGGATTG----------------AA-CCAAGGATTGTCTCAAGGCAGTTTAGGGA
AATGGTCCAGAACAGTGCCTCTTACCCTTTCCTGTATCTCAGATATGTGTGAGAATCTGATAAAAGCTTGAACTG-TCTC
CCCCAAAATAGACACACATCCATTGTCCAAATACAGGTTCAAAG---GGGTCACAGATTTTCTGAAGCCCTATAACC-TA
AGTCAAATACCCCTAACCTAGAAAGGTAATTATGTAAACTATA---AAACAGAG-ATTTTTCTAAAAGTGTCTCTTGAAC
CCTTAAAATGCCTTAAGTATGAAAAGTGAGAGAAG----GTCTCAACACTTCAT---CACTAAGACAACAGCTG------
AGAGTAGACCATCTTGTGA----TTCTTACATACACAGTCAGCCTTGGAGGTGATAAAGTAATATTCACCATTGGACAAC
TGAGGAAA------------ACA---GAGACTAACTTCAGCTGAACACTATCGTGAGAGAATTGTAAAAAATAAAATAAA
ATAAAGCCACA-ACTTCATTGAATTTAAGAGGAAATTAC-------ACAAAGTAAACTTCTTTTTGCTTATCCACTTAAA
TAATATTTAACGCTACTAGTAGCTTTGAAATGT---------CCACTCTTATACTAAAAGCAAACGTAGTTCACAGAGAA
TGTATATCAGTAATAACAGATC--AAGCCACTAACAAAAAAAATCAAAATTCAAAACATAGAAACATAAGA-GGG----T
TTTTTTAATCATAAACATC----AGTGTTTGTTCCTTCATTTCTAAAATGGGGACAGTAGCACTTACCCTTGCATGTTAT
TGTGAGCAATGAGTGGGATGATGTATA--AAGTACTTATCAGAGTGTCTGGTATACATCA-GTGCTTGCTCAATGAAATC
TATGTGAGACAGCAGTTGCGGCAAAC-AGAGCTTGGACTCT---GGAGTGAAGAGCTAGGTCAGAAATTAAATTAGCCCC
A--CTGCCTAAAAAATAC--ATGACTTTTGTTAGTTGACTTGGTTTCTTCCAGTGTCAGTTCCTTTATCTGT-AAATG--
GGAATGCTAATATTTATCTTGAAAGGTTGT----TTTGTGATTT-AAATAATTTAATGTATTTAAAGACCCTAGTTCACC
ACTTGGCATCTAGGAGGAGCT-AAAAAAATGAAAACAGTTCTTAGTCAGGTTCCCCTTTTA-TAATTAACTAAAATGGCA
CAATACTTTTGGGGAAAAACA-------------------------------------CTAACAGGGAAATACCTTATTC
-CGATCTGGTTCATATATTCAAATATT-----AAACATAGATTCACAAATACT------GAAATAAAATGGTAAGTGAAA
TAAAGAGAAATAAACAAAAAAGAAATTAAATCCAGATTTTAAAAATAAAACT-CAATTACATAAAA--------TCATCT
TCCATAACAA-ACGATGCTACATACAGTCATATAACGTTGCA-------ACTAAAA-TCAAGAATTTT-GGC-AATATAT
TATCTGGTATTGCTAATACCTCTACTAACCTCTGATTCATCACCCTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAGCTTTT-CGGAATCTGCCTGGAGCATGCAACTTCTAAAAGGAAATATATATGGAAAA
TAATTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTG-------
TTTTCTTCTCAAATGATTTTTCTACCTCTGAGCTTTCC----------AGGATAGACTAGTAGCAACCGCTATGGCCTCT
ATTAATTTGCTAGGTTGTAGGATTCCTATACAAATTGGGGCCTCAAGGCCTGTATCTAACAAGCTTTTTTTTTTTT----
---TTTAATTAGTCTGCCACTGAGGGTTCAAAGCAGTAAAACAC-------------------------AATAGGAGCTC
ATCCTTGAAGGAGAAAATTGCTCCTTTGCTCTTAATTCCATAATTGTTC--AGAACAAGGGTGTGGTGAATGGACACTAA
GAGGAAAGTTTGCTTAGCCTAAAGATGAGAAGACGGAGGAGAGGAAAGATGATTCCAACTTGAAGGTAGACTTAGATGAG
GATTAGCATTCTGCAGGCCAGGCATAATTCCAAGTCCATTGTCAGCTAGCCTCCCTCTCTCCCTCAGTCTATTCTCCTT-
--------GTTAGTCATTTCCACCAACTCCCAAGGACTTGAAGGAGATGATTCTCCA-GTTCTTCA-AGTGCAAAATAAA
ATCTGAAGCAGAAAATCT-AATTCAT-----------ATTTGAT----------TTTT-----ATTTTTAAAATGTGAAT
CTTGCCCAAAGGGCAAAACTTATTCT--TTAGCTACCTGTATTACTATTATTAACCAGTAAATTCAATGCACTGAATCAA
AAA-AGAAAAAA----------------GTGGCTGTTACTGAAGGAAAGCTATTTCTGAAAACCCAAGTGAGTGGATGTT
TCCTGAGACACTTC-----------------ATGCAGC--------------TTCTCACCATGCACACCCAGCCTCAGG
AAGGCGTCTATGTCCCTCTTTCCTCCACTTGGTAAATAAGA----TATATTTTCCTTTAAGGTAGGG-TGATGTACTGTT
TGTATT--TAATGTTTTTATTTCATAGTGTGTTTCTATTTAATGAAAAACTTAAA-GGAAAAC----------TTCACTG
TGTGCCACCTGCTTTGTGCATTGTAAAATGGATGCTGTCTTCATAGAATTTCTTCCTGAAAGGGATTCTGATGGAACTAA
A--CAAGAAGAATTCTATGTG--AGAGGGAAAATTCAGAACCC--GAAAAGGAAACCCAAAAAAGAA-----GTTAAGAG
-AGGGAAGTGTGTGGAAATACCATTTACTAATACA--CTCCTTTCACTCCCCTATAGACTGAGTAATATAACATTGACCA
ATATAGAGCGTCATGGAAATGCTCATGCATAATGGAAGTAAACAAGGGCTGGCAAAACTCAATCTTGATTTTTGGACCTC
TGCTTTCCCACGTTAAAAGCGGATAACTAAAGCTATCAGAGAAAATGAG-----------ATTTTGTACAAAAATAGGCG
TAGATTGCTCTA-----------------CTCTGGGGTACCAAAAACTCT-ATGCATGTAA--GTCCTCTAAATTCTATT
CATGTCTTGATATTTAAAAAT-GAATGAGATGGAAGTTTCAAAAATTTAAATGGTATATTGGAGTCTACTTT-AGATTTC
TAAATCTTTTT-CATAGAGTAATAGTC--------CTCATTTTTGCATTTATTTTCTGCCTAAA-GTTTTAAGG--CAAC
ATTT-----------------------AATTTTTTTCACTT-TGCCCATATATATACAAGAGGAATATAAAGTGCT--AA
AATATGTGCATTATATTTGCTTATTTGAGTACCTACTTTTTAG-GTTGTTATAGA-----ACATAAAA----TCATGTT-
CATAAAGCATGTGTTTGGCATA--TAGAAATT-GCTCCATA---------------AAAGTTAGTTTTATTATTTCCTTC
TCTGACGCTCTCTTCATATTCAGTCAATAGAAGCAATAGTTTCTGATCACTC---TTTTTCTCTAAACCATTGTGACAAT
CAAATTAGGTTAT-GTTTGGAGGAATA-TTTTGTTTCTATTATCATACTATCTGTCACGTGAGATAGGAAGCTTCA--TT
TTAAT-TTTTACCTT--TTTCTCAGAGATTGACTTAGGCACTCTTAATCTTTATCCCTTAGTCATGTGGCTCCATAGAAA
AATTTTACCTGTAAAATTGACCATGC-TTTGC-TTT-CTATGCTTGAGAGAAAGCATTCATTGTA---TTTAAAG--ACT
TTAGAGCTGCCGTTTGC-AACTACTA
>Outgroup2
AGAAGG---AGGGACTTCAGTTTGAGTGCTTAATATAGTATAATTAATATGTG------------TTGAATA-GGACTTG
TGAGAGAAGGGTGCTGTTTCTTTTGAGTGGGTTTCATGACTACTCTTTCCTCATCTGCCATCCAGATGTTGTTTTGTCAA
TGTTAAATGGAT----------AAAAATAACAGTATCTTG------------CTCTCGCTTGAGAGA--TA--TTGAGGG
GATATGGTTTATTTT-GGT-ATAAGTATTAATTTTACTCTTCCTTCTTACTGAAGAAAAG-----TTCTTCAAGGGG--T
TCTTTTCT------TATTAGGCTAGTGATACGG--AATGATCACAATT-TTACTTG-CACAACATTA---AAAAAATAAG
AAAAAAAAAGAATGAAGGCTGTTATACAGAGATAGAAGAGAATGTCTAAGTTCAACTGTTCAATCTGACATTTGGCTTAA
GAGTCAGAGAGACAAGAGGG-AATGGTGGGGACTGGGGATACTCAACAAATGA----TGGCAAAAGGAAGGAGC----TT
AGACTTCTCAGCTCAGCAGC-TTAAAGTTACATGGAAATGTAGCCCTTGTGTTGCTAAGG--------------CTTTTT
TTTTTTTTTTTTTTTTTTTCCCATGAGAAGATGCAAATCTAGATTCTGTGTACATATCTATTTGATTCTTAATTGCTGGC
AACCAAA-TTTCAACCCTATATGACTTCAC----ACTGTTTTGGGCTATATAAAACAAACTTGTGGACCAGACTTGGCCT
GTGGGT---CACCAGCATATAACCACTAACTCAGAGAAAGAACATAGAATTTGGTGAGGAAAAGACATACAAATCATTAC
CCAAAGTAAAATACTTTAAAAATAT-----GTTAGTGCATACAAATCATCTTATTTTTTTTTTTTTTTTTTTTTTT----
----AAA-CTGGGGCCAAAGAATACATGT----------TGGATTCTCAGATAGCAATCAA-ATCCTATTGCCCAAATTC
TTAAATTCATCAAACCTTTGAAAGTTGGCCTAGGACTATGTTAAAGTTGA-CCAAGCACTATCTTAAAACATTTTAAGGA
AGTGTTCTAAAACTGTACTTCTTACCCTTTCTGGAGTCTCA--TATTTTTGAGAATTCGCTAAAAGATTGAACTC-TCTC
CCCTGCAATGCACAGACACCCGGTATTCATATGCATTTTCAAGG----GGTCATATGTTTTTCAGAATTCCTGCACCGTA
AGTTAAGGACCCCTGATCTGGAGGAGTGGGTACATAAACTACAAGGAAACATGTAATCTTTCCAAAAATTTCTCCTGCAA
CCTTAAA-TGTCTTCA---TGAAAAATTATAGAAG---TTTCTCAACATTTCAT---CACTAAAGCCACAGCTG------
AGATTAGTCCATCCAATAA----TTCTTACATGAACAGTCTGCCTGGGAGGTAATAAAATAATACCCCCCAAAGGGT-AC
TCAGGAAA------------TCAAA-GAGACTAATGTTAACTGAACACTATCAGGGCAGATTTGTGAAAA---------A
ATATAGCCACA-ACTCTATTGGATTTAAAGGGAAATTACAC--AGAGAAAAGAAAATGTCTTTGGGGCCATTCAGTTAAA
```

TAACATTTAATTCTAGTAG---CTTTAAAATAC-------CCAGTCTCTCTTCCTGAAAGCAAACTTGGTTTGTAGAAAA
TGTGTATTGGTAATTATAGATC--AAGGCACTAGCAAAAAAAAT-GGGATTCAAAATGTAACAACTTAGAATCTT--TTT
TTTTTTAATAACAGATGTCACAACATGGTTTCATTTTCATCTCTAAAATGAGGACAGTAACACCTACCTTGGCAGGTCAT
TGTCAGTATTGAATGGGACCATGTATA--AAGTACT-ATCAGAGTGTCTGGTATACACTAGGTGTTTGCCAAACAAAATC
CATGGGAGATAGCAGGTGCAGCAAAC-TGAGCTTGGACTCT---GCGGTGA-GAGCTAGGTTAGAA-GCAAATCAACTCC
A--TTACTTAAA-AAGATGTATGACCT-GGTTAGGTGACTTGGCTTCTCCCAGCCTCAGTTCCTTTATCTGAAAAACG--
GGAATGCTACTATTTACCTTGTAGGATTGTCTGTTTGGGGATTT-AAACAAGCTAATGTGTATGAAGAACCTAGTTCACC
ACTTGCTATG-AGTGGGAATTGACT----TGAC---GGCAATGGGATGGGTTCCCATATCATTAATGAGATAAAATA---
------TTTGGGGGGGAAATG-----------------------------------CTAACATCAGAATACCTTTTTC
-TAATC--------------------------TGAGACATACATTCAAATATT------GAAAATTACAGGTAAAATCAA
GTAAAATAAATTATATCAAGAGAAATTCAATCCAGATTTTTAAAAATAAAAA-TTTATCAATTACAGAGAA---TCATTC
TCCATAAAAA-AGGATGTTATAAATCAC---ATAATGTTGCATTATTAGACTAAAATTTAAAACTACT-GGC-AATATGT
CATTTTGCATTGCAGTGTTGTATACTAACCTCTGACTCATCACCCTTCTCTCGATAAGCAGTGGCAATACTGGTCTGAAC
AGCCTTAATCCATGCCTGGCGCAACTTTT-CAGAATCTGCCTGGAGCATACAACTTCTAAAAGGAAATATATATGGAAAA
TAATGTATGTGTGCATGTGTGTGTATGTGTGCGTGTGTGTATTGCATGTGTGTGTGCATGTGTGTATGTGTGT-------
TTTTTTCCTCCTGTGATTTTTCTACCTCTAAGCTTTCCAGTATAGAGTAGGATTGAGTAGTACTAACCATTCTGGT-GCT
ATTTATTTGCTAGGTTCTAGGATTTCCCTATAAATTGGGGCTTCAGGGCTTATCTCCAACTAATAAGCTTCTTTTTTTTT
TTTTTTAATTATTCTGCCAATGAGGCT-TGAAGCAATCACACAG-------------------------CACAGGGGCAC
ATTCTTGAAGGAGAAATTTGGGCCTTTCCTCTTAATTCTATAATTGTTC--AGAATGAGGGTGTGGTGAATGGACACTAC
AAGGAAAG----TTTGGCCTAAAAATGAGAAGACAGAGGGAAGGAAGTAAAC-ACTGACCTGGAGGTAGATTTAGACTAG
GATTAGCATTCTGTGAGCCAGGCGTAATTCCAAATCCATTGGTA-CTGGCCTCCCCCACCCCTCTCTCCCTGCCTATTCA
CTGCCTCTGTCAATCATCTTCACGCACTCCCAATCCCTCCATGGAGACGATGCTCCA-TTTCTTCC-ACTGTAAAATCAA
ATCCGAAGCAGAAAAACC--------------------------------CAGCTT------AGTTTTAAAATGTGAAT
CTTGCCCAAATGACAAAACTTATTCC--TTAGGTACA--------------------AGTATATTCACTGCTCCGAATTAG
A---AGAAAAA-AAT-------GAGCTAGCAGCTGTTGCTTGAGGACAACTATTCCTGGAAATACCATTCAGTCGCTGTT
TACTGAGAAACTTC------------------ATGAAGC-TTCCCACCACG--------------CTAACTAGC-TGTAG
GAAGTATATATGTGCCTCTCTCCTCTACTTGATGCATGAGG----TATCTTTTCCTTTAAGGTAGAA-TCATGTGCTGTT
CACACT--TCATATT-TTATTTCATGATATGTTTCT-TTTAATGAAAAACTT--AAAGGTAAA---------CTTCAATT
TGTGCCTCTTG-------TTCTGTGAGACAGATGTGCTTGTCATAGAACTTCTTCCTGAAACTGATACTGATGGAATTAA
A--TAAGAA---TTCCATAC---GGGAAGACAATGTAGTACCC--AAAAGGGG--CCCAAGA-GGAAGGTGAGTAAAGAG
-AGGAAAATGCATGAGAAGACCGTTTACAGGAAGA--CTCCTGTCCCTCCTGTCTAGACTGAGTAATA-AACATTGACCA
ATAGGCAGTGTCACAGCAACACTAATGCACGATGGAAATGAACAAAGAGTTGCAAGAC-AGAGCTTGACTTTTGGCCTTT
CACTTGCACACATTACCAGCTAATAAAGGAAGCTATCAGGGAAAAAGAG-----------TTTATAAACAGAAATAAGCA
TGGATTGCTCAACATCAAAAGCTCT-ATACTTGTAAATCCTCCAACTCCTTATAAA-ATAA-----CTTC------TATT
TTCACTCTGCTATTAAAAAATGGGTTGAGATCAAAGCTCCAAAAAATTAAATCATAAGTTTGAGTCCATTTT-AGAATTC
TAAAGCTTGTTTCATAGATTAACAGTC--------CTTAACTTCATATTTATT-----TCTAAATGATTCAAGATTTAAC
ATTT--------------------AAAAATATTAATCATAC-AACTT-TTTATGTCCAAAAGGACT-TAA-GTGCTGGAA
ATTATATGCATTCTGTC----TATTTGAGTACCTATATTCTAGAGATGTTGTAGAGTATTAAATACATACTCTAAAAA--
CATAAATGATATGTATGGC-TA--TCAAAATT-GCTCCATA---------------AA----AGTTTTATTATTTCCTTT
TCCTAATTTCTTTCCACATTCACTAAATAGAAAAAAATACATTTCAGACCAC-------------------TGTGACAAT
CAAATTAAATTA---TTTGAGAGTATA-ACATGCTTGAC----------------------AGATATTT-TATTTAC-TT
TCAGT-CCTTGCTTTTTTTCTCCAAAGATTGACTTACATACACTTAATCTTTATCCTCTGTTCATGTGGCTCTGCAGAAT
AATTTTAGCTGCAACACTGATAATTA-TTTGT-TTTCATATGCTTGAGAGAAAGCATTCGTGATAGCAA--AAGTGTGT-
TAAGAGTTGGTGATCGCCATTTCTTA
>Perissodactyla_Sp2
GGGGGTAGAGGG-ACTTCAGTTTGAGCAC-TTATGTGAGTTGACTAGGATTTG---TCAGAGT--TGGGGTA-CCATTTC
TATGGAGTGAGTTGGGTAAACACCTG----TTGCCTACTCTGCTGTTTCTTCATCTGCCATCCAGA-GATGCTTTGTCAG
TGTTAAATGATT----------AGAAACAACTATAACTTA-CATTCATCTTGCTGTCATTGGAGTCAAATG--TTGAGGG
ATATAGTTTATTCTT-TGT-GTAAATATTA------CTCTTCTCATTGACC-AAGAAAAA-----TTTTTCAAGGAG--C
TCTTTTT----TCTCATTAAGCTAATGATATGG--AATGATTACAGT--TTTCTTGGTACAATATTT-TAAAAATAAAAA
CTTTTGAAAGAATGGAGACTGTTATACAGAGGCAGAAGAGAATGTCTAAATTTCATTGTTTCTTATGACATTCTGCTTCA
GAGTCAGAAAGACGAGAAGG-AATGGTAGCGGCTGTGGATCCCTAGAGAATACATGTTGGCTAAAGGAGAAAGC----TT
CAACTCAGCCCAGCAGA------TTTTCTAGGTAGTAATACAGGACTTGTGTTGCCAATA----------------CTTC
TTTTTATTT---TATTTTTTTTATGAGAAGTTGCAAATCTAA--GTTCTATGCAAATCTACTTGAATCTTAAATGCTAGC
AACTGATTTTTTAATCTTATGTGGACCAAC----ACTACACTGGGCAAAATAAAACAGGATTGTGAGCCAGATTTGACCT
GTGGGC---CACCAGTGTGTAACCACTGACTCAGATAAAGAAGACACAGTCTGGT-GGGAAAAGATATTCAAATCAGCGC
CAAAAGTAAAGTATCTTCAAATAGG----------------TATATCACCTGATTTT---TTT-----------------
----TAA-CTAAGGTCTAAGGAGAAATAA----------TGGATTCTCAGGAGGCAATCAA-ATCCTACTGCCCATATTC
TTACATTCATCAAACCTCGGAAAGTTGAACTG----------------GA-CCAAGGAGTGTCTTAAGACAATTTAGAGA
AATGCTCTGGAACAGGGCTTCTTCCTC-----------TCAAAGATGTTTGAGAATCTGATAAAAGCTTGAACTC-TCTC
CCCTGAAATGCGCAGACATCCAGTGTTCAAATACAGTTTCAAAG---AGGTCACAGGTTTTCTGAAGCCCTGCACCCCTA
GGCCAAGGTCTCCCAATCTAGAAAGATAGTTATGTAAACTGCAAGGGAACACA--GATTTTCCAAAAGTGTCTCCTGTAC
CCTTAAAACATTTTAAGCATGAAAAGTAAAGGAAA---CTTCTCAACACTCTAT-GTCAGTAAAGCAAAGTCTGGTCTAC
AGGGTAGACCATTCTGTAA----TTCTTACATACGTAGTCAGCCTGGGAGATAACAAAGTAATACCCACCGTTGGAGAGC
TATGGGAA-------------AAAAAGAGACCAAACTCAACTGAACACCATCATGTCAGAATAA----------------A
ATAAAGCCACA-ACTGGTTTGGATTTGAAAGGAAATCATAT--AGAGGAAAGTATATTTCTTTTGGTCCACCCAATTAAA
TAAGATTTAGCTCTACTAGTAGTTGCAA---------AATACCCACTCTTTTCTATTGAAAGCACTTAGTTTGCAGAGAA
TGTGTATCAGTAATTATAGATC--AAGCCACTAAG--AAAAAATCAGGATTCAATATGTAACAAATTAAAATTGA----T
TTTTTTGATCACAGACGTCAC--AATGTTTTCATCTTCATCTCTAAAATGGGGACAGTAGCACATACTCGTGCATGTTAT
TGTGAGCACTGAGTGAGATCATGTATAATAAGTACCCAAGAGAGTGTTTGATATACAATAGGTGTTTGCTAAATGAAATC
TATGGGAGACAGTAGGTGCAGTAAAC-AGAGTTTGAATTCT---GGAATTAGGA-CTAGATTAGAA-TCATATCAGACTT
ATTGTGGTTAAA-AAGATGTATAACCTTGGTTAGGTGATTTGCCTTCTCCCAGCCTCAGTTCCTTTATCTGTAAAATG--
GAAATGCTAATATTTACCTTGTAGGGTGGT----TTTGGGATTT-AAATAATCCAATGTATTTAAAGAATGTAGTTTATC
ACCTGGCATG-TAG-AGGAGCTCAAAAAATAAC---AGTTCTTAGTTTGATTCCCTTAA--TTAATTAAAATATTAT---
---------TCATTAAAA-------TGTTAATTAAAATAATAAAATATGGTGGG-AAAAATAAATCAGAATACTT---TG
TCAATTTGGGATATATATTCAAATATTGAATTAAACATATACTGAAATACTGAAA----TAAAATGATAGGTAAAGTCAA
----GAGAAATAAACAAAAAAGAAATTGAATCTAGATTTTTAAAATAAAACC-CATTTCAATTACAAAACA---TCATCC
TCCATAAA--AAAGAATGTTATAATTAT---ACAAAGTTGCA-------AC------TAAAAAACTTT-GGC-AATATAC
CATTTGGTATTGCAGTATTGTTTACTAACCTCTGATTCATCACCTTTCTCTCTATAAGCAGTAGCAATACTGGTCTGAAC

```
AGCTTTAATCCATGCCTGGCGCAGCTTTT-CAGAATCTGCCTGAAGCATACAACTTCTAAAAGGAAATATATAAGGAAGA
CGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTG-TG---------TGTGTGTGTAATGGGTTTTTTTGCTGCTTTTTTTTT
TTTTTTTCTCAAATGATTTTTCTATCTTTGAGCTT-CC----------AGGATAAAGTAGTACTAATCATTCCAAC-TTT
ATTTATTTGCTAGGTTCTAGGATTCCTCTGTAAATTGGAGCTTCAAGGCCTATCTCCAACAAGTTTTT------------
---TTGTTGTTGTTGACAAATGAGGTT-CAAAGCAATAAAACGA-------------------------ACA-GGAGTGT
GTCCTTGAAGGAGGAATTTGCTCCTTTACCGTTAATTCTATAATTGTTC--AGAATAAGGGTGTGGTAAATGGACACTAA
AAGGAAAGTTTATTTAGTCTAAAAATGAGAAGACAGAGGGAA-GAAATGTAATACCCCTCTGGAGGTAGATT-AGACGAG
GATTAGCATTCCATGAGCCAGGTATAATTCCAAGTCCATTGTTAGCTGGCCTCCCTGATTCCTCTCTCCCTCTGTTCTC-
CTG-----GTTAGTCATTTCCACAAATTCTCAAGTACTCCATGGAGGTGACTCTCCA-TTTTTCCC-ATTTAAAAACAAA
ATCCTAAGCAGAAGAACT-AACTCAG-----------ATTTGACTCTCCTATAGTTTT-----ACTTTTAAAATGTGAAC
CTTGTCCAAACGGCAAACCTTATTCT--TTAGGTACTTTATG--------------AGTATATTCACTGCATTGAATCAG
A---AGAAAAACAAC-------GAGCCAGAAGCTGTTCTTGAAGCACAGCTACTCCTGGAAATACAACTGGGTGGATGTT
TACCAAGAAATCTC------------------ATGCAGC-TTCCCACTTGCTATTCCCACCA-GCACAGCCAGCCTCGGA
AAGTGGTATATGTTCCTCTTTCTTCTGCTTGGTGAATGAGA----TATCTTTTCCTTTAAGGCAGGA-TTATGTGCTATT
CCTATT--TAATATT-TTATTTCATAACATGTTTCTATTTAACGAAAAACTT----GAGAA-----------CTTCACTC
TGTTCCTCTTGCTTTGTGCTTTGTGAGGTAGATGCTTTCCTCACAGGACTTCTTCCTGAAATGGATTCTTATGGAATTAA
A--TAAGAA---TTCTGTGTG--AGAGGGAAAATTTAGTACCC--AAAGAGGGAACCCAAGAAGAAAGGTAAATAAAAAG
-GAGAAAACGTGTGGAAATACCATTTACAGGAAG--CCCCCTTTCCCTCCTGTCTAGACTGAGTAATGTAACATTGACCA
ATATAGAATGTCATAGAAATACTAATGCATAGTGGAAGTGATAAAGGGATGGCAAAACTCCATCCTGATTTT--------
TGTTTTCCCACCGTAGCAGCTGATAACTAAAGCTATGAGGGAGAATGAA-----------TTCATATACAAAAACAGGCA
TAGATTGCTTAACAGCAAAGACTCT-GTACATGTGAGTCATCAAAATCCTTAGTGA--TAA-----CTTC------TACT
TTTGCCCTGCTAAT-AAAAAA-GGGTGAGATGATAGCTGCAAAATCTTAAAGAATATATTAGAGACAATTTT-AGATTTC
TAAAATTATTT-TATGGAATAACCTCT--------GTCATCTTCATATTTATTTTCTGTCTAAATGAAGTAAGTTTCAAA
ATTCACATT--------------TAAAAATATTTTTCACAA-TGCCC--ATATATGCAAAAATACTTGAAAGTGCT-AAA
AATATGTGCGTTCTATTTGCTTACTTGAGTACCTTTCTCTTAGAG---TTGTAGAATATTAAATAAAA----TAATGTT-
CAT-AAAAA--TGTTTGGTGTA--TAGAAACT-GCTCTATA---------------AAAGTTAGTTTTATTATTTCCTTC
CCTGAATCTCTTTCAATATTCCTTAAATAGAAATAATCATATCTGACTACCC---TTTTTTACTAAACCA-TATGACAAT
CAAATTAGATTATTATTTGGGAATATA--AATGTTGAAC----------------------AGATATTAAGTTTTA--TT
TTGGC-CCTTGCCTT--TTTCTCAGAGACTGACTTATGGACTCTTGGCCTTTATCCCTTAGTCATGTGGCTCCATAGAAT
AATTATAGTTACAAAATTGACCATGCTTTTGC-TTTCATATGCTTGAGAGAAAGCATTCACTGTAGTATTTAAAAGTGTG
TTAGAGCTACTGTTTGCCACTACTTA
```

6. Perissodactyla+Cetartiodactyla

```
>Bos_taurus
TAACAAC-CAAAAATGTCTCCAGACATTACTAAACATCCACTAGAGGCAAAACCACCCCCAGTTAAGAATCACTACCCTA
AGAG---CATTCAGCAAGTGCCCTTGTATACAGCAGGCCAACAGAAA--GTCTCCTCAAGGGCGAAAATTAACAA-TGCA
GATGATTGTATTGAGAGGACAGAGGTAATTTTATGTGGAA--AGATTGCCTGGAATGAAATATACAAAAATAATCTC---
TTTGGAGTAAGACTC-AGGTCATTTTTT----AAACCATATTTTTA--------------GGGCTAATA--TTGACTACT
T----------AGGTCCTGTGCTAAGCAAGATAAAGTATATCATCTCATCCCATCTTTAC-ATAATTGCATGAGACAGGT
ACTCTTATCTCAATGTTAAG-----AAAAT-TGAGTCTTAGAGACATTTTTTTCATCTAGCTATTTAGGGCATTTTC---
CATGAACTA-GAGCTGGAAATATT--ATCATACACTTGACTTCACAGAAAAAAACAACTCATGGAAC-ATAAAATTTCAT
ATTTAACTAAATTAACTTTTTAACTTCATCAGCTTAGAGCTATATGTTTCACACAGTTGTAGTTTAG-----TTTACTT-
-------TTAAAA--TCTCTTCTAATTTTTACTATCTT-TTATGTGCTATATATTCTTC-----AAAGTGACAAATTTTT
TTTTCTGATGAAAGCAGAGTTTTAATAAATAAACTGTAATAATTTAAAATAGCCTGTACCTTATA-TTTGTAGCTACTTC
GAAAATGAGCAGCATTTTGTATAC-TATTTCCATTTAACCT--------------------------------------
-----------------------ACCAGCATATTTTACATGCTTATAATTTCAATGAACTGGTTAAT-TCAAAAATTACA
TATCTGTGGCAGG-TTGATACGTGACATATTAATTAAATGTGCCCTTTTTTGAT--------CCCCTGTGGCTTCTTGTT
GGGACTCTCCACCAACTGGGAACTAAAAT------CAAAATCATCCATTGAGGCACAGATGCCTCCAGCACTGGCAATAG
A-ACCCCAGACCCCA---------AAGGACACAGCTCTAAGACGGAGACTGGACAGATG--GGTGCAAACGGGTGTCAGG
GGGCAAAGATCAGATTTTCCTTCTGCCTGACTGGAGGAGAGCAGAGCTTAAAGAT-GAGAATGAGAATCCACGTGTTTCA
CTGCACACACACACATC-----------ATCAGCATTATCCTCATCATCACCTTCTCCACCATCACCCTTCACCACCATC
ATCTTCGGAGAGAAGA------------GAAATAGAAACAGGCTCTTCGGGAGGTCTGGGGAGAACCTAAAACTGCTCTA
AAAAATA--G-TCAACTTCAAAGAAAAAAAAATCAACT-AAGGAGCAGCTT-TTTAACCCTCGGTGGAA---AGAAACTT
GCCCAGTAGTTGAAGCACATAATAAATGACTT-GGGAATGTTTTTACAT------GAAATTCTAGTTGCTGTACTTTTAA
GCTTCATGGAAATAACAAAAGCCACACT-GCTTT-C-TGTGCTTCTGAGCACTTGAAAAGACTTTTCCTCTTCTTCTTTG
GAAAACAATTGTTGGTTCAGAGTCTAGAAAGACTGATATACCTCGTTATCTTTCTGAAATGTGTAATCTTTCTAGC-TAA
TAGCCATCATCATTTTCTCAAATGTC----TGTCACTCAATATGACAATGAAAACCACAACTGTGAATG-TTTATTTTAA
TCA-TTTTTACAATGAAACTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
GGTAGATTTTCTTGCTTTCTTAT-TGATAG------------------CAATGCTTTTCTGGCATTGT---ATTTTC-TG
TTA---ACAAACTTGGATGTATAAGACACTAC--------AAATAAAATCAGGTGGTTTGGTTCAGCTAATTTGAATCTA
CTTAGCATACA-GTTTGCT-----AGGTAATGATATGATAATAAATGAAAAAGCATTAGATGTCTTTAGAATTTGGGGGC
ACTTACCTAGGTTTTGCCACATGCTGAAAATTTCACAACCCATTGTTACCCGCATGTCACCATATCTGAAATGGAATAAA
AA-TCAAACCTGATACAAAGGCTCCAGAAAAAAGAAGTTATCTGTGTCTTTTTAGGACACAATCTGTCATTCTGAATTAA
AAGAC-AACATGTTCTTAATTGAAAATGTTTAATGTACACATCTTGATGCCTCTAATTCAAATTCACATATTAACCCTTG
AGTGAAACATATTTGTCTCATA-ATTTTT-GGCTCCTATAGTATTTT-TGAA-TCCTGAAAGACTGAGGACAAAGA----
TTTCTAAATAAGCTCAAAATAGTGAAATTCCCAGAAAAG-TTGCTTGGTTGTCCTCTTGGTCATTGCCCCTCCA--CTTT
GATTT-----CTAGTTA--------TGGCCTCTTATTATATCTTGGTGCAAGG-TTTTTAAATGAAATGAATTCT-----
-GGCTATCATTATCACTGATTCTGAAATATTATATATTTAGTCCAGTTCTTGGTCTTATT----------------TAGA
GTACTTGATCAAGACTTTTCCTTTGTAATTTGCTTTGCTTCTTTTAGCTGGGACTCTGA--------CTTTTTAATTTCT
TTTTTTTTTTTTTACCAACTTGGCATCAAAATCCATTGCAAGTACCTTTCTTCATGTACT----GATTAAAACATTCCAC
TTTGACAGTTCCTGTAT-------TTTAAAGA-----------------------------------------TTTTCTGAT
ATCTTCTTACTCTTCTGCCTATATG-AAACTGAAGCTCACAAATGTCTATT-AGTCTCATGTAAAGTTAACATTGGCATG
CAGTTAA--ATGCAGTCGAAAGAGAGCAATTTTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNAGTCATAACGGG--GTGTTATGTCGTTGATGGCGTCATGAAGA--ATATATA-TATTTCAAG
GCTCTTTATATTCCAA-ACTAAATAGTTTAATTACAGTGGAAAT----TGCAGTTTAAGGCTTGCCTGTGAACTGGATTA
TAAGTATAGATCAGATTGGAAATAAAACACTTTTCTCTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNTGTAGTTTTAATTTGTATATTTTTTGAAACTTTTTAT--GTGT--TTACTATCTATTCTT
TCTTTTTTTCT--GAACTTTTCCCATATTTTCAGGGAAAAACTTCT-------AGTTTAAAATAAA-TTTAGTCATT-GT
CT-GTG---TAAGTTGTATTT----TTAGGCTTGATACCATTCTGTACAAATGATTCAGATTCA------CTGTTATAAT
GCCGTTTT------------GCACAGTTGGCTATGGAATGATAGAGCTAATGTAATGACTTCCTGAATCTCATTTTCTTC
TAATACTTTACTGATAC---------ATGAATATCACTGTGGATGTTCTTCAAGAATCGGAATATTATCTAAAAA--TGT
CCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
CTTTTGGTCCCCACCAATATGATCTTTGATCTTAAGATATCCCTTAAGTGT-GAGGAAGGATAAGATAAGGTC--TCTAA
TTCAGTCCTGGAAAATAATTTGTGATC--------------TCTCTTCC-TTGACCAGTAA------------TGTGCAA
ATAACCCAGGTCTCCCCAAATGAGACATTTACAGAAGTCAGCATGAAGGGTGAAGTGAAATATCCCTATGTGAAT-----
---------------------GAAGAAGGAG-------------------------------CTTTAGTGAAGAGAAAA
>Canis_lupus_familiaris
TGACAGC-CAATATTGTCTCCAGACATTAATAAATGTCCACTGGAAGCAAAATCACCCCTAGTTGAGAACTACTACTCTA
AGAGT--TATTCAGCAAGTCCCCCTGTATACAGTAGACCAACAAAAA-TGTTTCCTTATGGGCAAAAATAAACAATTACA
GAT-ACGGAATTTAGAAGAT--AGAAAATTCTATGTAAAA--AAATTACCTGAAATGAAATACATAAAAGTAGCCTCTTT
TTAGGAGTGTGACCCCAGGTGATTTTTT----AAAAT-TCCTTTAA------------TTTTGCTAATA--TTAACTACC
TGTG-----TTAGGTTCTGTGCTAAACAAT-TTATGTAAATTATCTCATTCCATCTTC---AAAACTGCATGAACTAGGT
ACTATTATCCCAACATTAAGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTTCATGAAACTATTTTGGGCATTTAC---
TA--------TAGCTGAAAACATTTTATTATGTACTTAAATTTACAG-AAAGAACAACTCATGGAAC-ATAAAACTTTAT
ATTTCACGAAATTAACTTCTGAAGTTTGTCAATTTAGACATAAATGTT-TACATAGTTGTACTTTATTTC--TTTACTT-
-------TTAAAG--TTTCTTCTAATTTATACCATCTTGTTATGTGCTCTATAGCCTTC-----AAAGTGACCAAATATT
TTT----TTGAAGGCAGAATTTAAATAAATAAACTATAATAATTTCAAACAGTATATGCACTATATTTTGTAGTTAGTTT
TAAAATGAACACCACTT-------------------------------------------------------------
-----------------------GTTATTATAGTTTACATATTTGTAATTTTAATGAACCAGTTAAC-TTCAAAATGACA
GAACCGTGGCTGA-TTGATATGTGAAATATTGATGAAATGGGTTTTCTTTTGACTCTCCCCCCCCCCATAACTCTTTGTT
GGGTCTGTCTGGCGACTGGACACTAAAAGACACTAAAAGACCATGTATTGTTGCAGAGAGACCCCCAGCACTGGGAGCAA
A-ACCCCTAACCCCAAAGTTGCTAAAGAACACGGCTCCCAGATTGAGAATGAAAGTACT------------GCTGCCAGG
GGACAAA-AGTAGGTTCTCCCTCTGCCTGAAGAGAGGATAGCAGAGTTTAAAGATGCAGAATGAGAAGCCATGTATCCCA
CTGGGTATATACACACT----------------------------CATCACCGTTGTCA----------TCATCATCACC
ACCGTCAGAGTAAGGA--------GCAAGATATAGAAG----------------TTTGGGGAGAACCTAAAACTGTTCTA
```

AAAA-TAG---TCTT-------TTTTTTTAAATCAATT-AAAGAGCAACTT-TACTACCCTCAGTGAAAAGAAGAAAGCT
GTCCCATCATTGGTGCACACTGTAAATGACTTTGGGAATGTTTTTAAATGAAAATGAAATTCTGGTTGATATGACTCTGA
GCCACATGGAAGCATTGAGAGCCAGATTATCTCA-CCTTTGCTTCTGGGCACTTCATG--ACTTCTCC------TCTTTG
GAAAATAATTGCTAGTTCAGAGCCTAGGAAAACTGTTATACAACCTCGTCTTTCTGAGATGGGAAACTTTTCTGACCTAG
TAA-CATCATC-------CAAAAGCC----TATCACTCCATAGGACAATGAGAGCCACAGTTCTGAATGTTTTATTCTAA
TTATTTTTTACCATGAAATTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNAGGAAAATATGTGATTTTT-CTATACATTAAAATAAGTCAATTGC-ATGGTGCACAAGAGA
GTTCATGTCAAGAGTTTATTATTTTTT--------ATCATGAATTTAGTTATAGA-CCTGTAATATCATTAGAT------
-----------TTTCCTGCTTTC-TTATCTATAATACATTGCTATAATCAATGATTTTCTGGCACTAC---ATTTTC-TG
TTA---ACAAACTTGAATCCATGAGACAATAC--------AAATTATATCAGGTCCTCTAGCTTATCCATTTTGAATCTA
CTTAACATACA-GTTTGAC-----AACTCATGGTATTTGATCAATTCTAGAAGAATTGTGTGCCTACAGAAACATGGGGC
ACTTACCTAGGTTTTGCCACATGCTGAAAATTTCACAACCCATTGTGACACGCATATCACCATACCTGAAATAAAACAAA
AA-GCAAACCTGATACAAAACCTCCA--ACAAAGAAG-TATTTGTGTCTCTTTAGGATATAGCCTATCATTCTGAATTAA
GGGAC-ACTATATTTGTAATTAAAGATGTTTAATGTAGATGTCTTGATGCTTCTAATGTAAATCCTTATATAAATCCTTT
GATAATACAGATCTATCCTCTA-ATTTATTTGCTTCTATAATA-TAT-TGAT-TCCTGAAAGACTGAGG-CAAAAAAAAA
AAAAAAAAAAAAAAGGGTAAGTTGAAAATTTCCAGAAAAGAATGCTT-CTTGTCCTCTTGCTCATTGCTTCTCTA--TTGT
CATTT-----CCAGTTA--------TAGCCTCTTACTATATCTTGGTGCTAGG-TTTTTAAATGAAATAAATTCT-----
-AGCTATCATCATCACTGATTCTTAAATATTATGTGTTTATTCTGGTCCTTGACCTCATT----------CACA
GATCTCGATTAGGATTTTTCCTTTGTAGTTCACTCTGCTTCTCTTAACTGGGAATCCA----------
---TTTTTTTAAGACCAACTTTGCATCAAAATCCATCGCAGGTATCTTTCATCATGTGCCATCTAATTAAAATAACCCTT
TT----TTTTCC-ATATTTT----TTAAAAAA----------GGCTTTACCTTAGCCACA-TTATCTGAT
CTCTTCTTACTATGATGCCTGTGTGTTAACTGAAGCCCCCATAAGTCTATT-AGTCTCATGCAAACATGATGTTACCATG
TAGTTAGATATGCAGCCAGAAGGTAAAATTTTCGCATTTACCATTTTTATTTCGCTATGCAGAAACATA----------
----------CATTCACCATGGGCTGTGTGATGCAGTTGACAGTGTAATGGAGA--ATATATC-TTTTTGAAG
GCTATTTATAACTAAACACTAAATAGTTTAATTACAGTGGAAATTCTGTACAATTTAAGGCTTGGCTCTTAACTAGATTG
TANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
TACTAAT----GAAATGGAGTATAGTTTTAATTTGT-----ACTTAAACATCTTTGTAAGTGT--TTACTAACTCTATTT
CCTTTTTTTCT--GAAACTTCTCCATCCGCTTAGGGACAAATTTCCAAGATGAAGTTCAGAATAAA-TTCAGGCATT-AG
CT-GCT---CAAGTTATATTT----TTAGGCGTGACACGTTGACATACACATCACTACAATTCAACTTCTCTGTTGTAAT
GCCACTTT--GTTTCAAGAGGCATAGTTTAGGATAG---AATAGGTCCAATGTACTGATTTCCTAGAGTTCATTTTCT--
----------CAGAGTATCACTATG-AGTTTCCTGAAAAATTAAAGCACTATCTAAAAA--TGT
TTTAAAAATAAAAGTAGCTAGATAGATGACGAGGAGTATAACA-CAATCAAAACAAGCCAG-TTTCATGAAGAAAATATT
TGAGAGCTTCGATATCATTTTT-ATCATGCAGCTGTGGCCTACTATGACCTTTTTTTACTCGATAGCCATTCTGGTCTTT
-----TTCTTCTCTGCAGATAATCTTTGATTTTAAGATATCTCTTGATCTC-CAGG-AGTATAGACTAAGGTCTTTCTAA
TTCAGTCCCAAAATATAATTCATGATCAACCTAAGGCAGGTTCCCTTCCTCTGGCCACTAATTCTCTTAAAGGTATGCAG
TCAACCCATTTCTATTCAAATGAGATATTTATGGAAGTCTGCGTGAGGGGTGCAGTGAA-CATCCCTATGTGAAT-----
----------GAAGAAGACA----------CTATGTGAAAGAGGATTGAAAATAGCAAAGAGAAAA
>Carnivora_Sp2
TGACAGC-CAAAATTGTCTCCAGATATTAATAAATGTCCACTGGAGGCAAAATCACCTATAGTTAAGAACCACTACTCTA
AAAA---TATTCAGCAAGCCCCCTTGTATACAGTAGACCAACAAAAAA-TTTTCCTTAAAGGCAAAAATTAACAA-TACA
GAT-ACTGCATTTAGAGAACAGAGAAAATTCTGTTAAAAAAAAATTTGCCCGAAATGAAATATACAAAAGGAATCTC-TC
TTAAGAGTGGGACCCCAGGTGATTTTTTT---AAATT--ACTTTTA----------TTTTGCTAATA--TTGACTACT
TGTC-----AAT-----GTACTTAAACAAT-TTATGTAATTTATCTCATTCCATCTTC---ATAATTGCATGAAATAGGT
ATTGTTATCCCAACATTAAGAAAATTGAAT-CTT-ACATTCTCA------CTTCATGAAGCTGTTTTGGGCATTTTC---
CATGATCTGTGGTTGAAAAATATTTTATTATGCACTTGACTCTACAG-AAAAAACAATTCATGGAAC-ATAAAACTTTAT
ATTTCACTAAATTATCTTCAGGACTTTATTCGTTTTGATATAAATGTT-CACATAGTTGTACTTTATATCTTTTTACTT-
-------TTTAAAATTTTCTTCTAATTTTTATCATCTTGTTGTGTGCCATA-AGCCTTC-----AAAGTGACCAAATATT
TTT--TGAATAAGGCAG--TTTAAATAAATAAACTGTAATAATTTTCAACAGTATGCACATTGTATTTTGTAGTTACTTT
TAAAATGAACACCATTTTACATACATGTTTGTATTTATAATATTATAAATATTGTAATACATTTAAATGAACACCATTTT
ACATACATGTTTATATTTGTGATATTAACATAGTTTACCTATTTGTAATTTTAATGAACCAGGTAAC-TTCAAAATTACA
TAACTGTGGCCGG-TTTTCATGTGAAGTATTGGGGAAATGTG-----TTTTGAC--TCCCCCCTCCCATAACTATTTGTT
GGGACTCTGCACCAACTGGAAACTAAAAT------CAAGACCATCCATTGTTGCAGAGATACCCCCAGCACCAGGAGCAA
A-ACCCCTGACCCCAAAGTTGCCGAAGAACATGACTCCCAGTTTGGGACTGGATATACT--GATGCAAAGAGGTGCCAGG
GGACAAA-TTCAAGTTCTCCTTGTGCCTGAATAGAGGGCAGCAGAGTTTAAAGATCCAGAATGAGAAGCCATGCATCCCA
CTGTATACACACACACT----------CATCACTA----------TCATCATCATC
ACCATCGGAGTAAAGA--------ACAAGATACAGGAGACGATTCTCCGTGAGGTTTGTGGAGAACCTAAAACTGCTCTA
AAAA-TAGTGTTGTTGTTGTTGTTGTTTTTTAAATC-AAGTAACAACTT-TACTACCTTCAGTGGAAAGAAGAAAGCT
ATCCCATTGTTGGAGCACACAGTAAAGAGCTTTGGGAATGTTTGTAAGTGAAAATGAAATTCTAGTTGATCTTACTTTGA
GCCACATGGAAGCACTGAGAGCCAGAGTATCTTA-CCTTTGCTTCTGGGCACTTTATGG-ACTTGTCC------TCTTTA
GAAAGCAGTTGCTGGTTCAGAGCCTATGAAA-CTGGTAGACAACCTCTTCTTTCTAAAAGGGAAAACTCTTCTGACCTAG
TAACCACCATCTTTTTCCCAAATGCCTATTTATTACTCAATATGACAATGAGAACCACAGTTCTAAATGTTTTATTCTAA
TTATTTTTTACAGTGAAATTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNAGGAAAATATACGACTTTT-CTGTACATTGAAATAAGTCAATTGC-ATGGTGCATGAGAGA
GTTCCTGTCAAGAGAACGTTATTTTTTTTTTTTTTACCATGAATTTGGTTATACA-CCCATAATATCATTAGCT------
-------TTTCCTGTTTTCTTTTATTACAC----------CAATGGTTTTCTGGCATTGT---ATTTTC-TG
TTA---ACAAACTTGAATCCATGAGACAATAC--------AAATAAAATCAGGTACTCTGCTTTATCCAATTTGAATCTC
CTTAGCATACAATTTTGCT-----AAGTCACGATATTCTATCAATTCTAGAAGAACTGTGTGCCTACAGGAACTTGGGGT
ACTTACCTAGGTTTTGCCACATACTGAAAATTTCACAACCCATTGTGACGCGCATGTCACCATACCTGAAATAAAACAAA
AA-GCAAACCTGATACAAAGCCTTCAGAACAAAAGG--TATTTGTGTCTCTTTAAGATATAAACTATCAATGTGAATTAA
AAGAC-ACTATGTTTTTAATTAAAGATGTTTAATGTAGGTGTCGTAATGCTTCTAATGTAAATTCTTGTATAAATCCTTT
AATAAAAAAGATCTGTCCTAGT-ATT----TGCTTCTATAGTACAC--TGAT-TCCTGAAAGACTGAGGACAGTAA----
----------GTAAGTTCAAAATTTCCAGAAAAGACTGATT-CTTGTCCTCTTGTTCATTGCCTCTCCA--TCGT
TGTTT-----CCAGTTA--------TGGCTGCTTACTATATATTGGTGCTAGG-TTTTTAAATGAAATGAATTCT-----
-AGATATCATTATCATTGATTCTTAAATATTATGTATTTATTCTGGTCCTTGATCTCATT----------CACA
GACCTTGATTAGGATTTTGCCTTTATAGTTCACTCTGTTTCACTTAGCTGGGAATCCAA----------
--CTTTTTTTTTTTTCAACTTTGCATCAAAATCCATTGCAAGTAACTTTCATCATGTGCCATCTAATTAAAATATCCCCC
TC-----TGTTCCATATTTCT---TTTGTTTT----------GGTGCCCCTCTATCTACA-TTTTCTGGT
CTCTTCTTACTATGATGCCTATGTG-TAATTGAAGCCCACATAGGTCTATT-AGTTTCATGCAAGCATGATGGTACTATG

```
CAGTTAGATATGAAACCAGAAGATAAAATTTTCGCATTTACCATTTTTATTTTGCTATGCAGAAACATA----------
-----------------CATTCACCATGGGCTGTGTGATGCAGTTGACAGTGTAATGGAGA--ATATATC-TTTTTGAAG
GCTATTTATAACTAAACACTAAATACTTTAATTACAGTGGAAATTCTGTACAATTTAAGGCTTGGCTCTGAACTAGATTG
TAAATATGGACCAGATTTGGAAATAAAACGCTTTTTTTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTATTTTAGCCAATT
TACTAAT----TAAATG-AGTAAAGTTTCAATTTGTAT-----TTAAACATCTTTACAAGTGT--TTACTAACTCTACTT
CCTTTTTTTTTTTGAACTTGCTCCATGCTTTTAGGGACAAACTTCCAAGATGAAGTTCAGAATAAA-TTCAGTTGCT-TG
CTTGCGACCCAAGTTATATTT----TTAGGCTAGACCCTTTAATATACACACCACTGAGATACAACTTCTCTGTTGTAAT
GCCATTTT--GTTTCAAGATGCATAGTTTATGATGGAATAATAGATCTAATGTACTGATTTCCTACATCTCATTTTCT--
--------------------------CAGAGTATCACTAATGGAGCTCTTGAAGAATTAAAGCATTATCTAAAAA--TAA
TCTAAGAGCAAAAGTAGTTAGA----TGACCACAAATATAATA-TAATGAAAACAAAC-AGGTTTTAAAAAGAAAAGGTT
TGAGAGCTTTGAT---ATTTTT-ACAATGCAGCTGTGGCTTTCAATGGCCTTTTCTTACTCAGTAGCCATTCTGGTCCTT
TT---CTTCTCTGTCAACATAATCTTTGATCTTAAGATATCCCTTGCTCTC-TAGG-A-----GGATCAGGTC--TCTAA
TTCTGTTCCAAAATTTCATTCCTGGTAAACTTAAGGCAAGTTCTCTTCCTTTGACCAGTAATTGTCTTAAAGGAATGCAT
AGGACCCATTTCTACCCAAATGAGATGTTTGTGGAAGTCAGCTTCAGGGGTGCAGTGAAACATCTCTATGTGAATAACGT
AAGAAACACTCCAATGTGAATGAAGGAGGGAGGAAAAACATCTCTATGCGAAAGAGGCCGGAAAAGAGCAAAGAGAAAA
>Cetartiodactyla_Sp2
TAACAAC-CAAAAATGTCTCCAGACATTAATAAACGTCCGCTAGCGGCGAAACCACCC-CAGTTAAGAACCACTACCCTA
AGAG---TATTCAGCAAGTGCCCCTGTATACAGTAGGCCAACAAAAAA----TTCTCAAGGGCTAAAATTAACAA-TACA
GATAATTGCATTTAGAGGATAGAGAAAATTCTATGTGAAA--AGATTGCCTCAAATGAAATATACAAAAGTAATCTC---
TTAGGAGTGGGACCCCAGGTGATTTTTTTT--TTAAT-TACTTTTTT------------GGCCTTAATG--TTGACTGCT
TATG-----TTAGGTCCTGTGCTAAGCAAT-TTATGTACGTTATCTCATTCCATCTTTACAACAATTGTGTGAAGTAGGT
ACTGTTATCTCAATATTAAGATAAGAAAAT-TGAGTCTTAGAGACATTTTCTTCATGAAGTTATTTTGGGCATTTTC---
CATGAACTATAGCTGAAAA-TATTT-ATTATACACTTGACTTCACAG-AAAAAACAACTCATGGAAC-ATAAAACGTTAT
ACTTCTCTAAATTAACTTCTGAACTTCACCAGCTTAGATATATGTGTTTTACACAGTTGTACTTTATTTTATTTTACTT-
-------TTAAAA--TTTCTTCTAATTTATACTATCTC-TTATGTGTTATATATTCTTC-----AAAGTGACCAATTTTT
TTT-CTGGCAAAAGCAGAGTTTAAGTAAATAAACTGTAATAATTTTAAATAGCATGTACATTATATTTTGCAGTTACTTT
AAAAATGAGCACCATTTTGTATACATATTTCCATTTAAACT---------------------------------------
-----------------------ATTAGTATATTTTACATACTTGTAATTTGAATGAACCAGTTAAC-TCAAAAATTACA
TATCTGTGGCTGG-TTGATACGTGACATATTAATTAAATGTGCTCTTTTTGGAT--------GCCCTGTGGCTTCTTGTT
GGGACTCTCCACCAACTGGGAACTAAAAT------CAAAATCATCCATTGAGGCACAGATGCCTCCAGCACTGGGAATAG
A-ACCCCTGACCCTA---------AAG------------AGACTGAGACTGGACAG-----ACCCCAAAGGGGTGTCAGG
GGGCAAAAACCAGGTTTTCCTTCTGCCTGACTGGAGGAGGGCAGAGTTTAAAGATCAAGAATGAGAAGCCACGTGTTTCA
CTGCCCACACACACATC-----------GTCATCATCATCATGACCATCATCATGACCATCATCA-TCATCATCATCCTC
CTCCTCAGAGAG------------AGGAGAAATAGAAGAGGGTTCTTCATGAGGTTTAGGGATAGCCTAAAACTGCTCTA
AAAAATAAAG-TCAA-------TTTTTTTTAATCAACT-AAGTAGCAACTT-TTTAACCCTCAGGGGAA---AGAAACTT
GCCAAGAAGTTGAAGCACATAATAAATGGCTTTGGGAATGTTTTTAAAGGAAAATGAAATTCTAGTTGCTCTAAGTTTGA
GCTACATGGAAGTATTAAAAGCTACTTT--------CTTTGCTTCTGAGCG---CAAGAGACTTCCGC--------TTTG
GAAAACAATTGCTGGTTCAGAGTCTAGAAAGATTGATATACATCGTCATCTTTCTGAAATGGAAAATCTTTCTAGC-TAA
TAGCCATCATCTTTTTCTCAAATGCC----TATCACTCAATATGACAATGAAAACCACAACTCCAAATG-TTGATTTTAA
TTA-TATTTACAGTGAAACTTAAAGCCTTTCTTTTTATTAAACCAATATATGGTGCTGTGTAATTTTTGTGAATTGGTCC
CAAT---GTCAAAATCCACAAAAATATATTTGATTTTT-CTATATATTTAACTAAATCAATTGC-CTGGTACAGGAGAGA
GTTCATCTCAAGAATATATTATTTTTT----------AATGAATTTGGCTATATA----------CCATTGGAC----GT
GGTAGATTTTCTTGCTTTCTTATATGATAG------------------CAAAGATTTTCTGGCACTGT---AATTTC-TG
TTA---ACAAGCTTGGATATATAAGACAATAA--------AAATAAAATCAGGTGGTCTAGTTTAGCTAATTTGAATCTA
CTTAGCATATA-GTTTGCT-----AAGTAGTGATACTCTTTTAAATCAAGAAGAATTAGGTGCCTTTAGAAATTTGGGGC
ACTCACCTAGGTTCTGCCACATGCTGAAAATTTCACAACCCATCGTTACCCGCATGTCACCATACCTGAAATAGAACAAA
AA-TCAAACCTGTGAAAAAGATTCCAGAACAAAGAAGTTATCTGTGTCTCTTTAGGACACAATCTATCATTCTGAATTAA
AAGGC-AATATGTTTTTAATTGAAGATGTTTAATGCAGGTGACTTGATGCCTCTAATTCAAATCCTCATATAAATCCTTT
AGTAAAACAGATTTGTCTCATA-ATTTTT-TGCTTCTATGGTAATTT-TGAA-TCCTGAAAGATTGAGGACAAAAA----
TGTTTAAATAAGTTCAAAATAGTGAAATTTCCAGAAAGGACTCCTT-GTTGTCCTCTTGGTCAATGCCTCTCCA--CTAT
GATTT-----CTAGTTA--------TGGCCTCTTACTATACCTTGGTGCTAGG-TTTTTAAATGAAATGAACTCT-----
-GGCTGTCATTATCACTGATTCTGAAATATTATGCGTTTATTCCAGTTCTTGGTCTCATT----------------CATA
GACCTTAGTTAGGATTTTTCCTTTATAATTTGCTTTGCTTCTCTTAGCTGGGAATCCAA------------AACTTTGTT
TTGTTTTGTTTTTACCAACTTTGCATCAAAATCCATTGCAGGTACCTTTCTTCATGTGCTGCCTAATTAAAATATTCCAC
TTGGACAGTTCCTATAT-------TTTAAAGATATGTTTATAAATATACTTATATATTTATCCATCCACA-TTTTCTGAT
ATTTTCTTACTATTCTGCCTATGTG-AAATTGAAGCTCACAGATGTCT-----GTCTCATGGAAACTTGACATTGATATG
CAGTTAGATATGCAGTCAAAAGAGAGCAATTTTACTTTTGCCATTTTAATTTTGTCCTGCAGGAGCATA----------
-----------------CATTCACCATGG---ATGTGATGTCACTGACAGTGTCATGGGAA--ATATAAA-TATTTGAAG
GCTCTTTCCATTCCAAAAC-AGATAGTTTAATTACAGTGCAAATTCTGTACAGTTTAAGGCTTGGCTCTGAACTGGATTA
TAACTATGGATCAGATTGGAAATAAAACACATTTTTCCAAGTAAAAAGAAGAAAAAATAAAATTTAAAACACAAGGAAGAA
GA-----AACAAAGAAAGAAAAAGCAAC-------AAAAGCCCAACAGGTTTTTCTAGAGTAACATTATTTTAGCCAATT
TACTAGTTAATTAACAGGTATATAATTTTAATTCATAT-ATTTTTGAAACTTTTTATAAGTGT--TTACTATCTGTACTT
TC-TTTTTTCT--GAACTTTTTCCATGTTTTTAGGGAAAAACTTCTAAGATGAAGTTTAAAATAAA-TTCAGCCATT-AG
CT-CTG---TAAATTGTATTT----TTAGGCTTGACACTATGATGGACAAATCATTGAGATTCAGTTTCTCTGTTATAAT
GCCATTTT--GTTTCAAGATGCACAGTTGGCTATGGAATGATAGGTCTAATGTAATGATTTCCTAAATCTCATTTTCTTC
TAATACTCTACTGATAC---------AAGAATATCACTATGGATGTTCTTNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNAAGAGCAAAAGTAGTCAGATAGATGACATCAAATATAA------TCAAAACAAATCAG-CTTTATGATGAAAATATT
TGAGAGCTTTGGTATCATTTTT-ATAATGTAGCCATGGCTGACAATGGCCTTTTCCTACCCGGTAGCCATTCTGGTCTTT
CTTTTTGTCCCTGCCAATATAACCTTTGGTCTTAAGATATCCCTTAAATGTTGAGGAAGGATAGGATAAGGTC--TCTAA
TTCAGTCCCAGAAAATAATTTGTGATCCATTTAAAGTGGCCTCTCTTCC-TTGACCAGTAATTGTCATGAAAATGTGCAA
ATGACCCAGTTCTACCCAAAGGAGATGTTTATGGAAGTCGGCTTGAGGGGTGCAGTGAAATATGACTATGTGAGT-----
---------------------GAAGACCGAA------------------------------CTTCAGCGAAGAGAAAA
>Chiroptera_Sp2
TGACAAT-CAAAAATGTCTCCAGATATTAATAAGTGTCCCCTGGAGGCAAAATCATCCACAGCTGAGAACCACTACCCTA
AGAG---TATTCACCAAGTCTCCCTCTATACAACAGACCAACAAAAAAAATTTCCTTAAGAGCTAAAATGAACAA-TATA
AATAACTGCATTTAGAGGGCAGAGAAAATTCTATGTAA----AAATTGCCTGAAATGAAATATACAAAAGTAATCGC-TT
TTAGGAGTGGGATGCTAGGTGATTTTTT----AAAAT-TATTTTTATTTTGCTAATAATTTTGCTAATATTTTGACCACT
TATA-----TTAGGTCTTTTGCTAAACAAT-TTATGCACATTATCTCATTCCATCTTTACAACAACTGCTTGAAGTAGGT
```

```
ACTGTTATCCCAACATTAAGATAAGAAAAT-TGAGTCTTAGAGACATTCTCTTTATGAAGCTTTTTGGGGCATTTTC---
CATAAACTGTGGGTGAAAAATATTTTATTATGCAGAAAATTTTGCAG-AAAAAACAACTCAAGGAGC-ATAACACTT--T
ATTTCATTAAATTAACTTCTGATCTTTGTCAGCTTAGATATAAATGTTTTCCACAAGTATCTATTGTTTCCTTTTACTC-
-------TTCAAA--TTTCTTCTAATTTATATTATTATGTTATATGTTATATATCCTTC-----AAAGTAACCAAATATT
TTT--TGAAGAAAGCAGACTCTG----AATAAAC--TAATAAATTTAAACAGCACGTACATTATATTTTACACTTACTTT
AAAAATGAATACTATTTTGTATACATATGTCCATTTACAAT---------------------------------------
-----------------------ATTAGCATAGCTTACAGATTTGTGATTTTAATGAACCAG-------TAAAAGTTACA
TGACTGTGGCTGGTTATGTATGTAAAATAGTAATTAACTGTGCCCTCTTTTGACT-------CCCCCATGGGTTCTTGTT
GGGACTCCCCCAAAACCGCAAACTAAAAT------CAAGACCATCCATTGTGGTAGAGATGTCCCCAGCACTGGGAGCGA
A-AACCCTCCCCCTAAAACTGCTACCAAACACAGCTCTGAGTTTGAGACGGCACACACC--GAGGCAAAGAGGTACCAGG
CGACAAA-ATCAGGTTCTCTTTCTGCCTGACGGAAGGAGAGCGGAATTTAAAGGTCAAGAATGAGAAGCCATGTGTTTCA
TTCGACACACAC-------------------------------------------------------------CATCCTC
ATCATCGGAGGAGGAAGAGAAGGAGCAAGAAACACAAGAAGATTCTTCATGAGGCGTGGGGAGAATCTGAAATTAATTTA
ATAA-TAAAA-T----------GTTTAAAAAAACAAAA-AAAGCACAACTT-AACTACCCTCAGTGGAA-GAAAAAAGTT
GTCCATTAGTTGGAGCACACAGTAAAAGTTTTGGGGAATGTTTTGAAATGAAAATGAAATTCTAATTGATATAAGTTCAA
GCTACATGGAAGCACTGAGAGTTAGAGTATTTTT-CCTTTGTCTCAGGGCCTTTCAAGGTACTTC---------TCTTTG
GAAAACAGTGGCTGATTCAGAGTCT----AGACTGGTATACATCATCATCTTTCTGAAATGGGACAC-TTTCTAACCTAC
TAACCATCACCTTTTTCCCAAATTCC----TATCACTCAA--------------------GTCTGAGTGTTTTACTCTAG
TTA-TTTTTACAGTGAAACTGAAAGCCTTTTTTTTTATTGAGTCAATATGTGATTCTCTATAATTATTGTGACTTGATTC
CAATGTTGTCAAAATCCACAAAAATAAATCTGAGTTTT-CTAAACATTAAACTAAGTCAATCGC-ATTGTGCACAAGAGA
CTTCATCTCAAGAATGTATTGTTTTT---------GCCATGAATTAGGTTATATA-TACATAATATCATTGGAC----TT
TCTTG-----CTTTCTTTT----ATTACAG------------------CAATAATTTTCTGGCATTGC---ATTTTC-TG
CTA---ACAAACTAAGATGCGTGAGACAATTC--------CAATAAATTCAGGTGGTCTAGTTTATCCAATTTGAATCTA
CATAGCATACA-TTTTGCT-----AAGTAATGACAGTCTCTTAAATCTAGAAGAACTGTGTGCTTATTGAA-CTCGGGGC
ACTCACCTAGGTTTTGCCACATGCTGAAAATCTCACACCCCATCGTGACGCGCATGTCACCATACCTGAAACAGAACAAA
AA-CCAAACCTGACACAAAGCCTCCAGGGGAAAGACG-TATTTGTGTCTCTTTGGGATACACTCTATCATTCTGGGTTAA
ATGGCAAATATGTTTTTAATTAAAAGTGTTTAATGTACACGTCTAGATGCTTCTAATTCATATTTTCATATAAATCCTTC
AGCAAAACAGATTTGTCTCATA-ATTTT--CACTTCTGTAGCAATTT-TGAAAGACTGAGGGCCAAAAAAGAAAAATATA
AGTTTAAATAAGTTCAAAATATTGAAATTTCCAGAAAAGATCGCTT-CTCGTTCTCTTGGCCATTACCTCTGCA--TTGC
AACTT-----CCAGTTA--------TGACCTCCTACTATATTTTGGTGCTAGG-TTTTTAAATGAAATGAAATCT-----
-AGCTATTACTATCACTGATTCTTAAATATCATCAATTTATTCTGGTTCTTGATGTCATT----------------TGCA
GACCTTGATTAGGATTTTTCTT-TGTAATTCACTCTACTTTTCTTAGCTGGCAATTTATTTATTTATTTATTTATTTATT
TATTATTTTTTTTAACAGCTTTGCGTCAAAATTCATTGCAGGCACCTTTCTTCACATGCCATCTAATTAGAACACCCTCT
CT-----GTTCTTATATTTATTTTTTTAAAAA--------------------GGCATTGCTTTATCTACA-TTTTCTGAT
CTCTTCTTACTATTGTGCCTATGTG-TAATTGAAGCCCACATAGATTAATT-GGTTTCATG-AAACATGATGTTGTCATG
CAGTTAGATATGCAGTCAAAAGAGAAAACTTTTGCATTTACCATTTTTATTTTGCTATGCAGAAACATT-----------
-----------------CATTCACCATGGGCTGTGTGATGCAGTAGACAGTGTAGTGAAGA--ATATATCTTTTTTGAAG
GCTATTTANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTATTTAGCCAATT
TACTAGT----GAAATTGAGTACAATTTTAGTTTGTAT-TTACTTAAACATTTTTATAAGTGT--TTACTATCTCTTATT
TCTTGTTTTTC--AAACTTTCTCCATGCCTTTAGGGACAAACTTCCAAGATGAAGTTTAGAATAAA-TTCATTCATTCAG
CT-GCT---CAGGTT-TACTT----TTGGGCTTGATACTTTAATGTACAAATCACTGAGATTCAACTTTCCTGTTGTAAT
ACCATTTT--G-TTCAAGATGCACTGT----AATGCACTTAT-TTCCTAC------------------------------
-ACGTCATCATTGATAC---------AAGAGTAACATTATGAAGTTTCTTGAAGAATTAAAGTATTATCTAAAAA--TGT
TCTAAGAGCAAAAGCAGTTAGATAGATGACAACAAATATAAAC--AATAAAAAA---CCAG-TTCTGAGAGCTGTAATAT
-----------------------CTAATGTAGCTGTGGCTCACAATGGCCTTTTCCTACTCAACAGCCATTCTGGTCCTT
CTTTTCTTCCA--TCAATTTGATCTTTTATCTTAAGATATCCCATGGCCT--CAGAGA---TAAGATAAGGTC--TTTCA
TTCAGTCCCAGAAAATAATTCATGATCCCTTTAAAGTAGTCTCTCTTCCTTTAACCAGTAATTGTTTTAAAGG-------
----------------------AGATGTTTGTGGAAGTCAGCTTGAGGAGTGCAGCGAAACACCCCTTTGTGAAT-----
-----------------------------------------------------GAAGGCTGAACTTAGCAAAGGAGAAA
>Equus_caballus
GGATAACGCAAAAATGTCTCCAGACATTAATAAATGTCCACTGGAGGCACAATTACCC-CATTGAAGAACCACTACCCTA
AGAGTGATATTCAGCAAGTCCCCCTGTACACAGTAGACCAACAAAAAC-TTTTCTTTAAGGGCTAAAATTAACAA-TACA
GAAAACTGCACTTAGAGGACAGAGAACATTCTACGTAAAA--AGATTGCCTGAAATGAAATATACAAAAGTAATCTC-TT
TTGGGAGTGAGATCCCAGGTGATTTTTT----AAAAT-TAGTTTTA-------------TTTGCTAATA--TTGACTACT
TATG-----TCAGGTGCTGTGCTAAACAAT-TTATGTATATTATCTCATTCCATCTTTACAAAAATTGCATGAAGTAGGT
ACTGTTATCCCAACATTAAGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTTCATGAAGCTATTGTGGTCATTCTC---
CATAAACTA-TGGTGACAAATATTTTATTATGCACTTGACTTCACAG--AAAAACATCTCATAGAACAATAAAACTT--T
GTTTCACTAAATTTACGTCTTAACTTCGTCAGCTTATATATAAATGTTATACATAGCTGTACTTTATTTCTCTTTCCTT-
-------GTAAAA--TTTCTTCTAGTTTATGTTATCTTGTTCTGTGTTACATATCCTTC-----AAAGTGACCAAATATT
TTT---GAAGAAAGCAGAGTTTAAATAAATAAATTGTGGTCATTTTAAACAGCATGTACACCATATTTTGCAGTTACTTT
TGAAATGAACACCATTTTATTCACTTGTTTTCATTTACAAT---------------------------------------
-----------------------GTCAGCATATTTTACCTATTTGT-ATTTTAGTGAACCAGTTAAC-TTAAAAATTACA
TAACTGTCGCTGG-TTGATATGTGAAATATTGAGTAAATGTGCCCTCTTTTGAT--------CCCCTATGACTTCCTTTT
GGGACTCCCTACCAACTGGAAACTAAAAT------CAACACCATCCATTGTGACAGAGATGCCACCAGCACTGGGAACAA
A-ACCTCTTACCCTAAAGTTGCTAAAGAACACAGCTCTAAGTTTGAGACTGGACAGATT--GAGGCAAAGAGGTGTCCAG
AGACAAA-ATCAAGCTTTCCTTCTGCCTGACTGGAGGAGAACAGAGTTTAAAGATCAAGAGTGAGAAGCCCTGTGTTCCA
TTGTACACACACCCACATCATCATCACCATCATCGTCATCATCACCATCATCGTCATCATCATCA----TCGTCATCATC
ACCATTAGAGGTAGGA--------GCAAGAACTAGAAGA-GGTTCTTCATGAGGTTTGGGGAGAACCTAAGACTGCTCTA
AAAAATAAAG-TCTATTTT---TTTTAAAAAATCAAGT-AAGGAGCAACTG-TTTTACCCTCAGTGGAAAGAAGAAAGCT
GTCCAGTAGTTGAAGCACAGGAT-AATGGCTTTGGGAATGTTTTTACATGAAAAAGAAATTCTGGTTGGTATAAGTCTGA
GCCACGTGGAAGCATTGAGAACCAGAGCATCTTT-CTTTTGCTTCTGAGTACTTCAACGAAGTTATCC------TCCTTG
GAAAACAATTGCTAGTGAAGAGTCTAGAAAGACTGGTATACATCATCATCTTTCTGAAATGGGAAACTTTTCTAGCCTAA
TAGCCATCATCTTTTCCCCAAATGTC----TGTCACTCAATGTGACAGTAAGAACCACAAGTCTGAATG-TTTATTCTGA
TTA-TTTTTACAGTAAAACTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNAAGAATACATCTGATTTCTCTCCATATTAAAGTAAATCAATTGC-ATGGTAAATAAGAGA
ATTCATCCTAAGAATATATTATTTTT--------AACCACGAATTTGTTTATATA-CCCAGAATAAAATTGGAC----GT
GGTGGA----CTTTCTTGCCTTC-TTATAG------------------CAATGACTTTCTGGCACTGT---ATTTTC-TG
```

```
TTA---ACAAACTTGGATATATGAGACAATAC--------AAATAAAGTCAGGTGGTCCTGTTTATCCAATTTGAATTTA
CTTAGCATGCA-GTCTGCTTTGCCGAGTAATGATACTATCTTAAATCTAGAAGAATTCTGTGCCTTTAGAAGCTAAGGAC
ACTTACCTAGGTTTTGCCACATGCTGAAAATTTCACAACCCATTGTTACCCGCATGTCACCATACCTAAAATAGAACAAA
AA-TCAAACCTGACACAAAAGCTCCAGAACAAAGAAG-TATTTGTGTCTC-TTAGGATACCATCTACCATTCTGAATCAA
AAGGC-AGTATGTTTCTAATTAAAGATATTTAATGTACATCTTTTGATGCCTCTAATTAAAATTCTCATATAAATCCTTC
AGTAAAATAGATTTGTCTCATA-ATTTTT-CGCTTCTATATTAATTT-TGAA-TCCTGAAAGATTGAGGACAAAAA----
TGTGCGAATAAGTTCGAAATATGGAAATTTCCAGAAAAGATTGCTT-ATTGTCCTCTTGGTTATTGCCTCTCCA--CTGT
GATTT-----CCAGTTA--------CAGCTTCTTACTATATCTTGGTGCTATG-TTTTTAAATGAAATCAACTC------
-------AATTATCACTGATTCTAAAATATTATGCATTTATTCTGGTCCTTGATCTCATT----------------CACA
GACCTTGATTAGGATTTTTCCTTTGTAATTCACTCTGCTGCTCTTAGCTAGGAATCCAA--------------AGATTTT
CTTTTTGTTCTTTACCAACTTTGCATCAAAATACATTGCAGGTACCTTTCTTCATGTACCATCGAATTAAATTATCCCTC
TTTGACTTTTTCTGTAT-------TTTAAAAA--------------------GGCTTTACTTTATCCACA-TTTCCTGAT
CTCTTCTTAGTATTTTGCTTATGTG-TGACTGAAGCTCACACAAGTT--TT-AGTCTCATGTAAACATGGTGCTGTCATG
CAATTAGATATGCAGTCTACAGAAAGCAATTTTGCTTTTACCCTTTTTATCTTGCTGTGCAGAAACATA-----------
-----------------CATTCACCATGTGCTGTGCTAT--AGTTGACAGTGTAATGGAGA--ATATTTT-TTTTTGAAG
GCTCTTTATACCCAAACACTGAACAGTTGAATTACAGTGGAAATTCTGTACAGTTTGAGGCCTGGCTCTGAACTAAATTG
TANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTACTTTAACCAATT
TACTAGTTAATGAAATGGTATGTAATTCTAATTTGTAT-TTACTTAAAACTTTTTATACGTGT--TTACTATCTGTAC-T
TTCTTTTTCCT--GAATTGTCTCCATGTCTTTAGGGACAAACATCTAAGATGAAGTTTAGGATAAA-TTAGGTCATT-AG
CT-GTG---CAAAGTGTATTT----TTAGACTTGAAACCGTGATGTACAAATTATTGAGATTCAATTTCACTGTTGTAAT
GCCGTTTT--CTTTCAAAATACACAGTTGGCTATGGAATGATAAGTCTAATGTAATGATTTCCTAAATCACGTTTTCTTC
TAATACTCTACCGATGC---------AAGAGTATCACTGTGGAGTTTCTTGAAGAATTAGAATGTTATCTAAAAA--TAT
TCTAAGAGCAAAAGTACTTAGACAGATGACAACAAATATAAAAATAATCAAAACAAACCAG-TTTTATGAAGGAAGTATT
T--GAGTTTTGATATCATTTTT-ATAATGTAGCTGTGGATGACAAGGGCCTTTTCCTATCCAATAGCCATTCTGGTCTGT
CTTTTCTTCTCTGTCGATGTAATCTTTGATTTTAAGATATCCCTTGGATGT-GAGGGAGGATGGGATAAGGTC--TCTAA
TTTAGTCCCAGAAAATAATTCATGATCGATTTAAATCAGTTTCTCTTTCC-----------CTGGTTTGAAAGGTGTCCAT
ATGACCCAGCTCCACCCAAATGAGCTGTTTGTGGAAGTCAGTTTGAGGGGTGCAGTAAAACATGCCTATGTGAAT-----
---------------------GAAGGAGGAATGAAAAGCATCCCTATGCAAATGA-GACTGAACTTAGCAAAGAGAGAA
>Myotis_lucifugus
TGACGAC-CAAAAATGTCTCCAGACATTAATAAATGTTCACTGGAGTCAGAATCACCC-CAGTTGAGAACC-TTACTCTA
AGAA---TAGTCACCACAT-CCCCTGTATAAAATAGACGAACCAAAAAAATTTCTTTAAGGACTAAAATTAACAA-TATA
GTTAATTACATTTAGAGGACAGAGAAAATTCTATGTAA----AAATTGCTTGAAACGAAATATACAAAAGTAAGCTC-TT
TTCAAAGTAGGATTCCAGGAGATTTTTT----AAATT--ACTTTTA------------TTTTGCTAATA--TTGACTACT
TATA-----TTAGGTTCTGTGCTAAACAAT-TTATGTACTTTATCTCATTCCATCTTTACAACACCTGCATGAAATACGT
ACTGTTATCGAAGCATTAAGGTAAGAAAAT-TTTAACAAACTGAGTCTTTNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNATTTTGCACTTGACTTTACAGAAAAAAACAACTCAGGGAAC-ATAACACTT--T
ATTTCATT-AATTAACTTCTGAATTTCATTAGCTTAGATATTAATGTTTTTCATAGTTATAATTTATTTCCTTTTACTT-
-------TTAAAA--TTTCTTCTAATTTATATT-TCATGTTATGTTTTATATATCCTTC-----AAAGTGACCAAATATA
TTT--TGATGAAAGCAGACTTCAAATAAATAAAC--TAATAATTTTAAACAG-ATGCACATTATATTTTGCAGTTACTTT
TAAAATGAACACCATTTTGT-TACATGTTTCCATATACAAT-------------------------------------
-----------------------ATTA--ACAGTTTACCTACTTTTTATTTTAATG-ACCAGTTAACTTTAAAAATAACG
TGACCGTGGCAGG-TGGGTATGTGAAATATTGATTAGCTGCACCCTCTTTTAAC--------CCCCCGTGGCTTCTTGTT
GGGAATCCCCACCCACTGCCAATGGAAAT------GAAGACCATA-GTTGTTGTAGAGACGATCCCAGCACTGGGAGCAG
A-ACCCTTGACCCTGAAGTTGCTAAAGAGCACAGCTCCGAGGTTGAGACTGCACAGTCC--AATACAGA--GGTGCCAGG
GCACAAA-ACCAGGTTTTCCTTCTGCCTGACTGAAGGAGAGCAGAGTTAAACGGTCAAGAATGGGAAGCCATGTGTTCCA
CTGTACACACACACACA--------------------CACACACACCATCACCATTGCCACCACCA----GCATCATCATC
ACCATCAGAGGAGGAA---------TGGGAAAGGGAAGAGGGTTTTGCATGAGATTTGA-GAGAAACTAAAACTAATCTA
AGAA-T---G-ACATTTGT---TTTTTTTTAATGAACT-AAGAAGCAACTT-TACAACCCTCAGTGGAA-GAAGAAAGTG
GTCCAGTCATTGGAGCACATAATCAAGGGCTTTGGAAAGGTTTTCAAATGAAAATGAAATTCTAGTTGCTCTAAGTTGGA
GCCACATGGAAGCCCTGGGAGCCAGAGTCTCTCT-CCTTTGCTTC-GGGCCCTTCAAGGCACTTCTCC------TCCTTG
GTAAACATTTGCTGGCTAAGCATCTAAAAAGACTGGGATGCATCATCATCTTTCTGAAATGGAATGC-TTTCTAGCATAA
TAGCCATCATCTTTTCCCCAAATTCC----TATCATTCAATGTGAC---GAGAGCCATACGTCTGAATGTTTTATTCGAA
TTA-TTTTTACAGCGAAGTTAGAAGTCTTTCTTCTTATTGACGCAGTATATGGTTCTCTATATTT-TCGTGACTTGGCCT
CAATCTTGTAAAAATCCACAAAGATAAATCTGATTTTTTCTAAACATTGAAGT----CAATTGC-ATTGTTCATGAGAGA
GTTCATCTTAAGAATATATTATTTTTTT------TACCATGG-TTAGGTCATACA-CCTGTAATATTATTGGAC----TT
TTTGG-----CTTTCTTAT----ATCATAG------------------CAATGATTTTT-GACACTGTACTATTTTTTTG
TTA---ACAAAGTTGGATACATGAGACAATAC--------AAGTAAGATCAGCTAGTCTAGTTTATCCAATTTGAATCAA
TTTAGCATAAA-GTTTGCT-----AAGTAATGATTCTCTCTTAAATCTAGAAGGATTGTGTGCCTATAGAAACTTGGGGC
ACTTACCCAGGTTTTGCCACATGCTGAAGATCTCACAGCCCATTGTCACCCGCATGTCGCCATACCTGAAACAGAACAAA
CA-CCAGACCTGATACAGGGCCTTCGGAACAAAGACA-GATCTGTGTCTC--TAGGATA----CTATCAGTCTGAGTTAA
AAGTC-AGTATGTGTTTAAT-GAAAGATTTCAATGTGCATGCCTTGATGCCTCTAATTCAAATCTTCATATAAAT-CTTT
AATAAAACAGATTTGCCTCATA-ATGTT--CACTTTGGTAGTAATTT-TGAA-TCCTGAAAGACTGAGGACAAATAAAAA
AGTTTAAATAAGTTCAAAATATTGAAATTCCCAGAAAAGACTGCTT-CTTGTCCTCTTGGTCATCTCCTCTCCA--TTGT
AATTT-----CCGG-CA--------TGAC---TTAGTTCATTTTGGTGCTAGGTTTTTTAAATGAACT------------
---CTATAATTATCACTGATTCTTAAATATTATGCATTTATTGTGGTCATTGATTTCATT----------------CACA
GATCCTGATTAGGATTTTTCTTCTGCAATTAACTCTATTTTCCTTAGCTGAGAATCCAT-------------------TT
TTTTTCTTTTTATACAAACTTTGCAGTGAAATCCGTTTCAGGTACCTTTCTTCATATGCCATCTAATTAAATTATCTGCT
TT--ACTGCTCCTATATTTTA---TTTTTAAA--------------------AGCTTTACCTTATTCAAATTTTTCTGAT
CTTTTCTTACTATTCTGCCTATGTG----------------TAAATTTATT-AGTCTCATGTAAACATGACATTAGCATG
TAATTATATATGCAGTCAAAAGAGAAAACTTTTGCATTTACCATTTTTATTTCACTATGCAGAAACATA-----------
-----------------CATTCACCATGGGCTGAGTGATGCAATAGACAGTGTAATGGAGA--ATATATC-TTTTTGAAG
TCTATTTANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTAGCCCATT
TTCTAAT----GAAATGGGCTATAGTTAAAATTTGTAT-TTAGTTATACATTTTTATAAGTGT--TTAG---CTCTA---
------TTTCT--GAACTTTCCCCATGCCTATAGAGACAAACTTCCAAGGTGAAGTTCAGAACAAA-TTCAATCA----G
CC-ACT---CAAGTTATACTT----TTAGGCTTGACA--TTGATGTACAAATTACTGATATTCAACTTTCCTGTTGTAGT
GCCATTTA--GTTTCAAGATGCACAGTTTATGATGG---GATAGACCTAATGCACTGACTTCCTAAATCTCATTTTCTTC
```

```
TG------TATTGATATGAGTATTATATGAGTATTACTATGAAGCTTCTTGAAAA-TTAAAGTTTTATCTAAAAANNNNN
NNNAG--CCA-----AGTTAGTTAGATGACAACAAATAGGAAA-CAATAAAAACAGAGCAG-TTTTGA------------
---GAGTTTTAGTATCATTTTTTCTAATATAACTGTGGCTCTCAATAGCCTTTTCCTACTGAATAGCTACTCTGGTTCTT
TTTTTCTTTTCTGCCAATATAATCTTTGATCTTAAGATATCCCTTGATTT--TAGGGAGGATAGTATCAGGTC--TCGCT
--CAGTCCCAGAACATAATTCATGATCAATTTAATGCAATTTCTCTTCCTTTTGTCAGTAATCCTCTTAAAGATGTGTTT
ATGATCCAGCACTACC-AAAGGAGATGTTTGTGGAAGTCAGCTTGAGAGGTACAGAGAAACATCCCTATGAGAAT-----
---------------------AATGTAAAAA-------CATCCCTGTGTGAATGAATACTGAACTTAGCAAAGAGAAAA
>Outgroup1
TGACAAC-CAAAAATGTCTACAGACATTGCCAAATACCCACTGGGGATAAAATTGCCTGTGAACGAGAATCACTGCCTTA
AGAG---TCTTCAGCGAGTCCCCTTGTATACAGGAGACCCACAAAA-CTTTTTGCTTAAGTGCTAAAATGAACAA-TTCA
TTGAAGTGCATTTAGAGGGCAGAGAAAGTTCTACACAAAA--AGATTGCCTGAAATGAAATATGCAAAAATAATCTC-TT
TCAGGAGTAGGACTCCAGGTATTTTTTT--TTTAATT--AATTTTA------------TTTTGGTAGTG--TTGAGTACT
TATAATACGTTAGGTCCTGTGCTAAATAAT-TTATGTACATTATCTCATTTCATCTTCAAAACAACTACATGGAACAGGT
CCTATTCTCCCAAAATTAAGAAAATTGAGT-CTTAAAGA-----TATTCTCTTCATGGAGCTGTTTTGGCTGGTGATTTT
CATGATCTATGGCTGGAAGATACCTTATTATCCACTTGACTGTACAGAAGAAAACAACGAATAAAAT-ATAAAACTTTAT
GTTTTGCTAAATTAACATCTGATCTTTATCAGCATCAATATAAAAGTTTTTCATAGCCATCCTTGATTTCTTTTTGTTT-
---------TAAATTTTTTCCCTAATTTACATTATCTTGTTATATGTTATATATCCTTCTGAAAAAAGTGGCCAATTTAT
TTATTTTAAGAAAGTAGAGCTTAAATAAATTAAT--TACTAA-TTTAAACAGCATGTACATTATATTTTGCAGTTCTTTT
----ATGAACATCATTTTGTATACATG---TCATTTACAAT-------------------------------------
-----------------------ATTAGCATAGTTTCCATCTCTGTAATTTTAATGAACCAGTCAAT-TTTAAAATGATG
AAAC--TGGCAGG-TTGATAAGTGAGATATTAATTAAATGTGCCCCTTCATGAT--------CCCTGGTGGCTTCTTGTT
GGGACTCTCCACCAAATAGAAACTAAAAT------CAAGATCATCCATTTCTGCAGACATCCCCCCAGCACTGAGAGCAG
AGACTCCTAACACTAAAGTTGCTAAAGAACACAGCTCTGAGTTTGAGACTAGACAGACC-TGATGCAAAGAGGTAGCAAG
AGAC-------AGGTTTTCCCTCTGCCT-----GAGGAGAGAAGAGTTTAAAGATCAAGAATGAGGAGCGATATATTCCA
TCGTACACACACAGAGG-------------------TTGTCATCATCACCATCATCATCATCATCATCATCATTATCATC
ATCATCAAAGGAAGGAGC--------AAGAAGTGGGAGAGGGTTCCTCATGAGGGCTGAGGAGAACCTAAAACTGCTCTA
ACAA-TAAAG-TCTAT------TTTTAAAAATCAACC-AAAGAGCAACTT-TACTAGCCTCAATGGAAAGAAGAAAGTT
GTCCAGTAATTGGGGCACACAGTGAAGGGCTTTCAGAATGTTTTAAAATGAGAACAGAATTCTAATTGCTGTAAGTTTGA
GCCACATGGAAGCATAAAGGCCCAAAGTATCTTTTCC-TTGTTTCTGGGCACTTCAGGGAGCTTTGTC------TCTTTG
GAAAACAATTGCTGGTTCAGAGTCTTGAAAGACTGGTATACATCATCATCTTTCTGAAATAGGAAATTTTTCTAGCCTAA
TAGCCATCATCTTTTGCCCAAAAGCC----TATCATTCAATATGGCAATGAGATCCATAAGTCTGAATGTTTTATTCTAC
TTA-TTTTTACAATGAAATTGAAACCC--TCTCTTTATTAAACCAATATGTGACTTTCTATAATTTTTGTAAATAGGTCC
CAGTGTTTTCAAAATCCACAAGAATAAATCTGATTCTT-CTGTACATT-AAATAAGTCTATTGTAATGGTGCATGAGAGA
GTTCAACTCCAAAAAAAGAATTTTTT--------TACCATAAATTTAGTTATATA-CCTATGCAATCATTGGAT----TT
TCTTG-----CTTTCTTAT----AACATAG------------------CAATGATTTTGTAGCACTGT---ATTTTC-TA
TTA---ACGGAATTGGATACATGAGACAATACCAAACAAAAAAAAAAATCAAGTGGTCCAATTTATTCA-GCTGGATCTG
TTTAGCATGCA-GTTTGCTTGGCTAAGTGATGATGCTCTGTTAAATCCCAAAGAGATGTGTGCCTTTAGAAACTTGGGGC
ACTTACCTAGGTTTTGCCACATGCTGAAAATTTCACAACCCATTGTTACCCGCATGTCACCATACCTGAAATAGAACAAA
AAACCAAACCTGATACAATGCCTCCAGAACAAGGAAG-TATTTGTGTGTCTTTAGGATACAATCTATCATTCTGAATTAC
AAGGCAAGGAGTTT-TTAATTAAAGACATTTAATATACATGTCACGATGCCTCTAAGTCAAATTCTGGTGTAAACCTTTT
AGTAAAAGAGATCTGTTTCATA-ATTTT-TTGCATCTATAGAAATTT-TGAA-TCCTGAAAGAGCCAGGTCAAAACAA--
TGTGCAAACATGTTTGAAATATCAAAACATCCAGAAAAGACTGCTT-CTTGACCCCTTGGTCACTGGTTCTTCACTGTGT
GATTT-----CCAGTTA--------TGCCCTCTTAGTGTATGTTGGTGCTAAA-TTTTTAAGTAAAATGAACTTTGGCTA
CAGCTATCATTATTACTGATTCTTAAATATTATGCATTTATTCTGATAACTGATCTCTTT----------------CACA
CACCCTGATTAGGATTTTCCAACTGTGATTTGTCCTGCTTCTCTTAGTTGGGAGTCCAT---------------------
----ATAGTTTTTACCAACTTTTCATCAAAAGCCATTGCGGGTAGCTTTCTTCATGTATCATCTAATTAAAATATCACTC
TGAGACTGTTCCTACAT--------TTAAAAA--------------ACCTTTACTTTTATCT-CTCCACA-TTTTCCGAT
CTCTTCTTACTATTCTGCTTACATG-TAACTGAAGCCCGCAGGAGTCTATT-AGCCTTGTGTAAGCATACCGTTGGCTTG
TAATTAGATATGCAGTTGAAACAAAGCAGTTTTGCATTTGCCATTTTTATTTCGCTATGCAGAAACATA-----------
-----------------CATTCACCATGGGCTG--TGATGCAGGTGATCGTGTAATGGAGA--ATCTCTC-TTTTTGAAG
GCTATTTATAACTAACACTAAATAGTTTTAATTACAGTGGAAATTCTGTACAGTTTAAGGCTTGGCTCTGAACTAGAATG
TAAATATGGACCAGATTTGAAAATAAAACACTTTCTTTTCAAGTAAAAGAAGAAAAATCAATTAAAAAATACACGGCACG
GA----AAAAGTAACTAAGAAAAC--AAAGCCACAGGAAGCCCAGCAGTTTCTCCTGAAGTGAAATTATTTTAGCTAATT
TACTAAT----GAAATGGTATTTACTT--CATTTGTAT-TTACTTGAATATTTTTATATAAGTGTTTACTAGCTTTATTT
CCTTTTT-CCT--GAAATTTCTCCAATTCTTCAGGGACCAACTTCCAAGATGAAGTTCTGAGTAAA-TTCAGTCATT-AA
CT-GCT---TAAATTGTATTT----TTAGGCTGGACACTCTGAGGTACAAATCATTGAGATTTAACTTCTCTGTTGTAAA
GTTATTTT--GTTTCAAGATGCACA---ACTGACT--ATGGAATATCTAACGTACTGATTTCCTACATCTCATTTT----
TACT--TCTACTGATAC---------AAGAGTATCACTACGGTGCTCCTTGAAGAATTAAA-TTTTATCTAAATA----T
TCAAAGGGCAAA---AGATAGATAGATGGTAACAATTATAAGA-CAAACAAAACAAACCAGTTTCATGAAGGAAA-TATT
TGAGAGCTTTGATGTCATTTTT-GTAATATGCCTGTGGCTGACAATCGCCTGTTCCTACCCAGTAGCCATT---GCCCTT
CTTTCCTTCCCAGCTAACATTACCTTTGATCTGAAGATATCCCCTGATCT--CAGAGAAGACAGGATTAGCTC--TCTAA
TTTAGTGGTAAAAAATAATTCATGATCAATTTAAAGTAGTCTCTTTTCCTTTGGCCAGTAATGGTCTTAAAGATGTTCAT
ATAACCCAGTTCTAGCCAA-TGAGATGTTTGTGGAAGTCAGCTTGAGAAGAGGAATGAAATACCCCCGTATGAAT-----
-------------------------------------------------------GAAGACTGAAGTTAGCAAAGAGAAAA
>Outgroup2
TAACAAC-CAAAAATATCTCCAGGCATTGC--------CAATGGGAGCAAAAC--CCTGTGCTTGAGAACCACTACCCTA
TGAT---TATTCAGCAACTACCTTTGAATACAGCAGACCAACAAAAAAATTTTGCTTACATGCTAAAATTAATAT-----
----AGCTAATTTAGAGGACAAAGAAAGTTCTACATAAAA--AGATTGCCTGAAACGAAATTTACAAAAATAAACTGTTT
TCAGGAGTGGGAATCTAGGTGATACTTTCTTAAAATT--AATTTTA------------TTGTGCTAATA--TTGAGTACT
TGTGATG--TTAGGTCTTGTGCTAAACAAT-TTATTTACATCATCTCACTTCATCTTCACAACAATTGCATTGAGTACTG
TT----AACCCAAAGTTAAGATAAGAAAAT-T----GAGTGTTAGATTTGCTTCATGACACTGTTTTGGGCAGTGAATTT
CATGAACTGTGGCTGAAAAATATTTTCTTATGCACTAGACTTTACAG-AAAAAGCAGCTTATGGAAA--TAAAACTTTAT
ATTTCACTAAATTAACTTTTGATCTTCGACAGCTTAAATATAAGCATTTTACACAGCTGGGCTTTATTTTATTTTATTTC
TTTTTACTTTAAATGTATACCCTAATTTATATAATCTTGTTATATGTTGTACATCCTTA------TGGTGACCAAATATT
TTT---GAAGAAGGCAGAATTTAAATAAATAACTTTTAATAA-TTTAAACAGCACATACATTATATTTTGCAATTATTTT
AAAAATTAACA-CATTT-GTACACCTATTTCTATTTACAAT-------------------------------------
-----------------------ATTAGCATAGTTTGCATATTGGTAATTTTAATGAACCAGTTGAC-TTAAAAAGTATG
TAATTGTGGCAGG-TTGATATGTAAAATATTAATTAAATGTACCTCTTCTTCCT---------CCCACAGGCTACTTGTT
GGGACTGTCCACCAACCGGAAACTCAAAT------CAAGACTGCTCATT---GCAGAGATG-CCCCAGCACTGACAGCAA
```

```
AGACCCTAGGCCCTAAAATTGCTAAAAAAAGCAGCTTCAAGTTTGAGATTGGGGCGGACTTGATGCAAAGAAGTGCCAGG
AGACAAA-ACCAGGTTTTGCC-CTGCTTGACCAGAGGAGACCAGAGTTTAAAGATCAGCAATGAGGAGCTACGAGCTCCA
TTCCACCTACACAACCC-----------------------------------------------------------ACA
CACCCTCCAGGGAGGAGC--------AAGAAATAGGAGGGGGTTTCTCATGAGATTTGGAGANNNNNNNNNNNNNNNNTT
AGAT-TCAGAAATCAT------TCTTTAAAAATCAGTTGAAAGAGCAACTT-CACTACCCTCAGCATAAAGAAGAAAGTT
GTCTAGGA-TTGGGG--------------------GGAATGTTTTTAAATGCAAATAAAATTCTAGTTGACATAAGTTTGA
GCCACATGGAAGCGTGGATGGCTAGGGTGTCCCT-CCTTTGCTTCTGGGCACTTCAAGGGGCC-CTTC------------
------------------AGTGTCTAGAAAGACACGTGATCATC------TTTCTGAAGCAGGAAATTTTTCTAGTCTAA
TAGCTATTATCTTTTCCCCAAAAGCC----ATG--------GTGACAGTGAGAGCCACAAACCTAAATGCTGGATTTAAA
TTA-TTTTTGCAACAAAATCTAAACACTTTCTTTTTGTTGAATTAAAATGTGGCTCTCTTTATTTTTTGTGAATTTGTCC
CAGTATTTTCAAAATCCACAAGAATAAATCTGATTC-------------AAACAAGTCAATTGCAATGGTGCATGAGAGA
GTTCAA---GAATATGTATATATTG---------TACCATAAATGTGTTTATAAGTCAAAAGAAAATCCTTGTGTTTTTT
TTCCT----TCTTTCTTAT----TTTTT--------------------------TTTTATGGCACTGTC--ATTTCTGTT
AAAAAAAAAAACT-GGATACATGACAAAATACA-------ATGGAAAATCAGGGAGTTCAATTTACCCAAACTGAAACTA
TTTGGCATGCA-GTGCATTTTGGTAAGTAATAATACTGTCTTAAACCCAAAAGAGACATTTTCCTATAGAAACCTGGGAT
ACTTACCCAGGTTTTGCCACATGCTGAAAATTTCACAACCCATCGTTACCCGCATGTCACCATACCTGAAATAGAACAAA
AA-TAAAATGTGACACAAAGTCTCCAGAACAAATGAG-TATTTATGTCTCATTGAGATACAATCTATCAATCTGAA----
---------------ATCTTTAAAGAAGTTTAATCTATGTGTCTTGATGCCTCTAATTCAAATCCTCTTACAAATCCTTT
AGTAAAACACATTTGT-TTATATATTTTTTGTCTTCTATAATAATTT-TGAA-TC-TGAAAGACACACGACAAAA-----
-AATATAAATATTTCAAAATATTGAAATTTCCAGAAAAAATTGCTT-CTTGTCTCCTTGCTTATTGCCTCTCTACCATGT
GACTCTTTTACCATAAAATTAATTGTGGCCTCTTAGTATATCTTTGTGCTAGG-TTATTAAATAAAATGAACTGTAGTCA
CAGCTATCATTATCACTGATTCTTAAGTATTACGCATTTATTCTGTCCCTTGATCTCATT----------------CATA
GCCCTTGATTAGGAGTTTTCTTTTGTG-----------------------------------------------------
-------------ATTCATTCTGCATCAAAAGCTATTGCAGGTAGCTTTCTGCATGCGCCATCTAAGTAAAATATCCCTC
TTTGACTGTTCCTGTAT-------TTTTTTA-------------AAAGGCCTTAATTTATCT-CTTCACA-TTTTCTGAT
CTCTTTTTACTA-TTTGCCTACATG-TAACAGAAGCCCGCAGAAATCTATT-AGTCTCGT--AAACATAATGTTGGC-TG
CAATTAGATATGCAGCCAAGAGAGTGATTTTTCGCATTTACCATTTTTATTTTGCTATGCAGAAATGCA-----------
-----------------CATTCACCATGGGCTG--CAAAGCACT-GACAATGGAATGGAGAATATAGATC-TTCTTGAAG
GCTATTTATAACTAAACACAGAATAGTTTAATTACAGTGGAAATTCTGTACAGTTTAAGGCTTGGCTCTGAACTAGACTG
TAAAAATGGACCAGATTTGGAAAAAAAAC---CTCTTTCAAGAAAAAGAAA-----TCAATTAAAAAAAAAAAAACATGAA
G-----AAAAAGAAAGAAAA------CCAAGCAACAAAATCCCATCAGGTATTTCTTGAGTCAAATTTTAAAATTTAATT
TACTAGTGAATGAAATGACATATGTTCATCTTCTGCAT-TTATTTGAAAATT-----AAATGT--CTGCTAGCTCTAATT
CATTTTTTCT---AAACTTTCTCCATGCTTTTAAGGACAAATTTCTAACATGCAGTTTAAGAAAAAATTGAGTCACT-AG
CT-ATA---CAAAGTATATTT----TTAGGACTGAT-----GATATAAAAATCATTGAATTTCAGTTTTTCTGTTGAAAT
GTCATTTCTTGTTTCAAGATGTACAGTTGATTACAGAATGACAGGTCTAATGTATTGTTACTCTATATTTCATTTTCTGT
T-------------------------AATACTCTGA-TATAATTCTTCTTGAAGAATTAAAATGTTACCTAAAAA--TGT
TGAAAGAGAAAAAGTACACAGATA---GATAATAAATATAAAA-CAAACAAAATAAACCTGTTTTATGATAGAAA-TAAT
TGCAAAGTTTGATATCATTTTT-ACAATGTAGCTGTGACAGACAATGGCGTTTTCCTATCCAATAGTCATTCTGGTCTCA
TTTTTCTTCCCTGCTAACATAACCTTTGATCTCAAGACACCCCTTAATCT--CAGGGAGGATAGGGTAAAGAC--TCTAG
TTCAGTCGCAGAAAATAATCCATGATGAATTTAAAGTATTCTCTATT--TTTGGTCAGTAATTATCTTAAGGGCGGGCAT
ATGACCGGACTCTAGCCGA-TGAGATGTTTGTAGAAGTTGGCTTGAG---GACAGTGAAACATCCCTATGTGAAT-----
-----------------------------------------------------GAAGACTGAACTTAGCAC--AGAAAA
>Perissodactyla_Sp2
TGATAAC-CAGAAGTGTCTCCAGATATTAATAAATGCCCACTGGAGGCAAAATCACCC-CAGTGGAGAAGCACTACCCTA
AGAG---TATTCAGCAAGTCTCCCTGCATATAGTAGACCAACCAAAAA-TTTTCCTTAAGGGCTAAAATTAACAA-TACA
GAAAACTGCATTTAGAGGACAGAGAACATTCTATGTAAAA--AGATTGCCTGAAATGAAATATACAAAAGTAATCTC-TT
TTAGGAGTAGGACCCCAGGGGATTTCTTTA--AAAAT-TAATTTTA-------------TTTGCTAATA--TTGACTTCT
TATG-----TC-----CTGTACTAAATAAT-TTATATATATTATCTCATTCCATCTT--CAAAAAAATTGCAAAGTAGTT
ACTGTTATCCCAACATTAAGATAAGAAAAT-TGAGTCTTAGAGACATTCTCTTCATGAAGCTATTTTGAGCATTTTC---
CATGAACTATGGCTGAAAAATATTTTGTTATGCACTTAACTTCACAG-AAAAAACAACTCACGGAAC-ATAAAACTTTGT
ATTTCACTAAATTAACTTCTGAAATTCATTAGCTTATACATAAATGTTTTACATAGTTGTACTTTATTTTTCTTTACTT-
-------TTTAAA--TTTCTTCTAATTTATATTATCTTGTTATGTGTTACATAGCCTTC-----AAAGTGACCAAATATT
TTT---GAAGAAAGCAGAGTTTAAATAAGTCAATAGTAATAATTTTAAACAGCATATACATTATATTTTGCAGTTACTTT
TAAAATGAACACCATTTTGTATACATATTTCCATTTATACT-------------------------------------
------------------------GTTAGCATATTTTACATATTTGT-ACTTCAGTGAACCAGTTAAC-TTAAAAATTACA
TAACTGTGGCTGG-TTGATATTTAAAATATTAATTAAATGTGCCCTTTTTTGAT--------CCCCTGTGGCTTCTTTTT
GGGACTCCTCGCTTACTGGAAACTAAAAT------CAAGACCATCCATTGTAGCAGAGAGGCCCTCAGCACTGGGATCAA
A-ACCCCTGACCCTAAAGTTGCTGAAGAACACAGCTCTGAGTTTGAGATTGGACAGACT--GAAGCAAAGAGGTGTTAGG
AGACAAA-ATCAAGTTTTCCTTCTGCCT--------------------TAAAGATCAAGAATGAAAAGCCATGTGTTCCA
TTGTCCACACACACACA---------------CCATCATCACCATCATCATCATAATCACCATCA---------------
-------GAGGTAGGA--------GCAAGAAATAGAAGAGAGTTCTTCATGAGATTTAGG-AGAACCTAAAACTGCTCTA
AAAAATAAAG-TCTATTT----TTAAAAAAAATCAAGT-AAGGAGCAACTCTTTTAACCCTCAGTGGAAAGAAGAAAGCT
TACCAGTAGTTGAAGCACAGAGT-AATGACTTTGGGAATGTTTTTATGTGAAAAAGAAATTCTAGTTGGTATAAGTTTGA
GCCACATGGAAGCACTGAGAGCCAGAGTATCTTT-CTTTTGCTTCTGACCACTTCAAGGGACTTTTCC------TCCTTG
GAAAACAATTGTTGGTTTGGAGTCTAGAAATACTGGTATACACCATCATCTTTCTGAAATGGGAAATTTTTCTAGTCTAA
TAGGCATCATCTTTTTTCCAAATGTC----TATCACTCACA-TGACAATGAGAACCACAAGTCTGAATG-TTTATGCTGA
TTA-TTTTTACAGTGAAAGTTAAAGCCTTTCTTTTTATTGAACCAACGCATGGGGCTCTATAGTTTTTGTGAATTGGTCC
CATTGTTTTCAAAATCCACAAAAACACGTCTGATATTT-CTATACATTAAAGTAAATCAATTGC-ATTCTACGTGAGAGA
GTTAATCTCAAGAATATATTATTTTTT-------AACCATGAATTT----ATACA-CCCAGAATATCATTGGAC----GT
GGTAGACTTTCTTGCTTTCTT-----ATAG------------------CAATGATTTTCTGGCACTGT---ATTTTC-TG
TTA---ACAAACTTGAATACATGAGACAATAC--------AAATAAAATCAGGTGGTCTGGTTTATCCAATTTGAATTTA
CTTAGCATACT-GTTTGCTTTGCTAAGTAATGATACTCTCTTAAATCCAGAAGAACTGTGTGTTTATAGAAACTTGGGGC
ACTTACCTAGGTTTTGCCACATGCTGAAAATTTCACAACCCATTGTTACCCGCATGTCACCATACCTGAAAAAGAACAAA
AA-TCATACCTGATACAAAGCCTCCAGGACAAAGAAG-TATTTGTATCTC-TTAGGATACAATCTATCATTCTGAATTAA
AAGGC-AGTACGTTTTTAATTAAAGATGTTTAATGCATATGTCTTGATGTCTCTAATTCAAATTCTCATATAAATCCTTT
AGTAAAATAGATTTGTCTCATA-ATTTTT-CGCTTCTATATTAATTT-TGAA-TCCTGAAAGACTGAGGAAAAAAT----
-GTGTAAAAAAGTTCAAAATATTGAAATTTCCAGCAAAGATTGCTT-GTTGTTCTCTTGGTCATTGCCTCTCCA--CTGT
GATTT-----CCAGTTA--------TAGCCTCTTACTATATCTTGGTGCCATG-TTTTTAAATAAAATAAACTCT-----
-AGTTATCATTATCACTGATTCTGAAATATTATGCATTTATTCTGGTCCTTGATCTCATTGATCAAGGACCTTGATCTTG
```

```
AAACTTGATTAGGATTTTTCCTTTGTAATTCACTCTGCTGCTCTTAGCTAGGAATCCAA---------ACAGTTTTGTTT
GTTTGTTTGTTTTAGCAACTTTGCATCTAAATCCATTGCAGATACCTTTCTTCATGTGCCACCTAATTAAAATATCCCTC
TTTGACTGTTTCTATAT-------TTTAAAAA--------------------GGCTTTACTTTATCCACA-TTTTCTGAT
CTCATCTTAC-ATTCTGCTTATGTG-TAACTGAAGCCCACAGAAGTTTATTAAGTCTCATGT-AACATGACGTTGGCATA
CAATTAGATATGCAGTCAAAAGAGAGCAATTTTGCTTTTACCGCTTTTATCTTGCTGTGCGGAAACTGTTTTTATCTTGC
ACAAATTCGATTTATCCAGTTTACTTTGG-CTGTGCTGT--AAGTGACAGTGTAATGGAGA--ATAT-TT-TTTTTGAAA
GCTCTTTATACCCAAACACTAAACAATTCAATTACAGTGGAAATTCTGTAGCGTTTGAGGCTTGGCTCTGAACTAGATTG
TAACCATGGATCAGATTGGAAATAAAACCCTTTTTTTTTTCAAGTAAAAAGAAGAAAAATAGATTTAAAAATACAAGGAA
AA-----CGAAACAAAGAAAGAAAATGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTGTTGTAGCCAATT
TAATAGTTAATAAAGTGGTATATAATTTTAATCTGTAT-TTATTTAAACCTTTTTATATGCGT--TTACTATCAGTACTT
TCTTTTTTTG---GAACTTTCTCCATGTCTTTAGGAACAAACATCTAAGATGAAGTTTAGAATAAA-TTCAGTCATT-AG
TT-GTA---CAAGTTGTATTT----TTAGACTTGACGCCATTATGGACAAATTATTCAGATTCGATTTCACTGTTGTAAT
GCCATTTT--GTTTTAAAATACTCAATTGGCTATGGAATGATAGGTCTAATGTAATGATTTCCTAAATCTCATTTTCTTC
TAATACTCTATTGATAC---------AAGATTATTGCTGTAGAGTTTCTTGAAGAATTAGAATATTATCTAAAAA--TGT
TCTAAGAGAAAAAGTAGTTAGATAGATGACAACAAATATAAAAATAATCAAAACAAACCAG-TTTTATGAAGAAAATATG
T--GAGCCTTGATATCATTTTT-ATAATGTAGCTGTGGAGGACAATGGCCTTTTCCTATCCAATAGCCATTCTGGTCTGT
CTTTACTTCCCTGTCAATGTAATCTTTGATTTTAAGATATCCCTTGGATGT-GAGGGAGGTTAGGATAAGGTC--TCTAA
CTTAGTCCCAGAAAATAATTCATGATCAGTTTAAAGCAGTTTCTCTTCC-TTGGCCAGTAATTGTCTTAAAGGTGTACAT
ACGACCCAGCTCTACCCAAATGAGACATTTGTG-AAGTCAGTTTGAGGGGTGCAGTAAAACATGCCTATGTGAAT-----
---------------------GAAGGAGGAATGAAGAACATCCCTATGCGAATGAAGACTGAACTTAGCAAAGAGAAAA
```

7. Chiroptera+Cetartiodactyla+Carnivora

```
>Bos_taurus
TTAACCAGGAGGCCCATCCAATTACCCAG-AAGAGACCACCC--TAAGACAATTTCATCAACAAAAG-TAATCTATTTGA
GTTGCCGAATCTTTTTATTCCTCAACTAA-GTGCCTT---AGCTATAGAGTTAAA-TTCTGCATGG--CTTTTCT---GT
GAGAATAATAATTTCA-----AACCAAGTTGAAGTGCTCCCCAAAAGACAGCTA-TTATAACAGGTCTG-GAAATGGAAT
ATATGA--AGAGTAGGGAG-GGAACTGCTTGA--TTTATGCTTGCTTCTTGGTCTTT--ATTCCGAATTTGCTTAAAATG
TGATTGCTACAG-TCC----CCTGCATTTGTATAGAAC--ATTCTAGTTAACCAGGTGGATTTTCA--------------
----------------TTTACTGGTTAAACTGACTCCAGTAAACTGACCCCATGGGTGAGTCTTAC-AGAGGAGGAAACC
AAGG-TGAAGTTGTTTTTTA---------------AAAT----AACTCAGCTGTTTTAGTTGTTTTCA-AGGTAAGGGTT
ATAAATCATTACTGCCAAAA-TGGAATTCATGGTATTT---CTTTATTGTTGTTTTTGTTTTCATTCATTTTAGC-TTTA
CCAAAAGG-GGGAAATGCTT-TAT-------TTTCTTTTCTAAACAAATAATCACCAGACATATATAAAAGTGGAGCTTT
T-ATTTCAGTCCCAAC--------------------------ATATATCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN---------
------------------------------------CAGTTTACACATATG----------TGGAAGTTGAGTTTGATAT
TTGACTTTTT-ATAATATT--ACA------------------TTTTCTGCATTACTTTAGTACAGGAGAATATATATTCC
TTTAGGAGACTGA-TTCTAAGAACAGTCTCACATGATGGTG-TTTTCCCATTTTTATTGAGT-GGTTCTC--AGTCTAGG
AAAGG----GAATGGCAAA-CATTGCCTGCTGTCCAAATTCAGTCTGTCACTTGTTTG--------TTTTTTTAAGTTTT
ATTGGGACATAGC-CACACTCATTTATTTATTTATTATATATTTCATGCTACATNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTCAAGACCTT-----AATACACA-----AGAGCAA----TC
CATAAA--------TGTTCCCAGAGAAG------AAAACAAAAAGTCATGAGGAA---ATTGG--CAGAGCTTAACAGCT
GGT---TGTCCCAAAG-GAAAAGGCCTTATTCTCCTGACAGTA---------ACAAGCATGTTTTATCACTATAACATAG
CTTGTTTTCAAGCGCTTTATACATAATTGTATTACT-TACCTTGCTCTATTTTTCTTCATAGCACTTTACCACCTCCTTG
AAA-TTTACTATATA-TTTACAT-CTACCTTTTTTTGCTATCTTTCTCCCTCAAGAGGAGA--ATGAGTTCCACAAGGAC
TGGGAACTGTCTGACT-----GTAACATTCTATTCAC---AGCCTCCAGCACACAGTAAG----TCTTCAACAAATACTC
ACTGGATGAATAAAACTTAACCACTGG-ACAGTCAGGGAAGGCC--------CTGCATACTT-GCATTTTGCTCAACATC
TATTC---CTGTCTTTCTTGCCAACAGTATCCTAATTCTGTTGATTG----TAGTAAATACGTAT-----TAATACTTTT
TCTTGCAATTAACTG-TGGCTTTGTGAC--AATTATAAAGGGAGAGAGAAA--GTA----TGAAGAAGGAAAAGGCAA
AAGATTTAATAAAGAAGAAGGAAGAGGAAGAGA----AAGAATTAGAGAAGGGAGGGGAGGAGGAAGTAGAAGAAATGAG
AAAGAGAATGAGA-------------------CAGAAAGTTTGCCCATCCAGG-------AATACTGAGAGTAATCAGAC
CACAATGGTTAGGGTACGTG-----TTTAGATTCTTACTTAGAATTTTATCATTT-----ATGTTGGG-AAATGAAAGTG
ATTAAAGCAATGGAAACA---GCTTTATTGCCTCAACTTGTTCAATTACAAGTGTGTTCCTGATAGTCTGTGGCT-GAGG
GCATTG---ATTTATGTAATGGATATTTAGAGTCCAATGACCATGTGGATTTTCCACAACTCTGCTCCATACTGTTA---
GTGAGGATATTTG-------AAAATGGCCATACTGTAAAGTACAAAAGTCCCTTACACATTATTATGTGC-----AGTTT
AAGACAATATTTTATGTAAAGGTTA--GATACTGAACGGAATAATGGATANNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTCATGTTATCACTGGACAAACATTA
C-AAAGGAAAACCTGTTCC-AGGGCCAGGATTCAGTGAATGTGCTTCCGTGTGGGCTCCTTGAATGCACAG----GAGAG
CAGAGGGCCTGCTTCACAGGTCATGGGA-GCCGAGAACC-AAAGAAGA--GCTAG--TTTATCCCACTTGTGTTCATGCA
TCCATCCTT---TGAGGGGCTTT-ATCTTTGATTACTAGGGGCTGGATTCAATACTGCAGCAGAGGCAAAGATGAACCGG
ACACAATGTCTGCTCAAGAGA-----------CTGGACTAGGAATTTATCTTGTTGGCGCGGGAATCTGACCACCTGCAT
CTGAATCCCAGCTTTCACATTTCCT-AGCTCTGTGACCTTGGGCAAGGA-TTTAGTTAGACCTCTGAGCCCCAG------
-TCTCCAGAACTGGAAAAAACTAAATCACGCCTTCTGATGATAGCCTAAGAAAGACACTGTAA-CTGAAACATACCAGGA
GTCTGAACTGAAGCAATACTAATCAAT-----------------------------------------TCAATCAACCA
ACAACCTGTAGGGAATTTTCTCAAGGATA---------------TCTGTCTGTCCTCACTACA-CCCTCATAGCTT----
-------------------GTTAAGTTGTATATTCATATAA----TAAAAAAAGAGATGCTCTATACTAATTCAACAGGT
GG---------TTTGAATTACCT--GATGATTTTGACTAAATTGCATTTTAAACACTTTTCTTAAAAAAAGAATTCTGCT
ATATATAATCTCAGCATTCAGAA-TTATATTGAATAACTACCTACATGATAAAGTTAATTGTATCAATGAGCTGTAG
>Canis_lupus_familiaris
TTTA------------TCCAGTTACCCAG-AAGACACCACCCC-TAAA---ATTACATCAACAGAAG-TAATCTATTTGG
GATACCCAATCTTTCTGTTTGTCTACTCT-GTGCTTTTTGCCTTCTAAGGATAAAATTCTGCTTGATTCTTTTCT---GT
GAGAATGATCATTGTA----AAAGCACATTGAAGCCCTCTCAAAA------------TCAGCCAGTCTG-AATATAGTAT
ATATGAACAGAGGAGGGAGAAGATTTATTTGA--TTTATGCTTGCTTCTTGTCCTCT--GTTCTGAATTTTCTGAAAACT
CAATTTCTATAT-TACATGTCTTCCATTTGTACAGACT--ACTTCATTTAACCAAGTGGA--------------------
-------------------------------------------------------------------AGGAAGCAACC
AAGG-TGAAGTTGTTTTTAA---------------AAAC--TGTATTCAGCATTTTT-GTTATTTTCA-AGTTAAGAGTC
ATATGTCAT-ATTGCTAAAAATAAAAAT-ATTGT------------------TTTTTGCTTTCATTAATTTTGAT-TTTT
AAAAATGG-GGGAAACATTG--AG-------TTTTTTTCCTAAAGAAATAATCATTAGCCTTA-ATAAAAATAAG-CTCT
T-ATTTTAATCCCAAC--ATACATACATTTGTTCCTGTGTACACATATCTTCATTGAAATGGGCCCAGAAAATACTCATT
ATGATTGCTTCTGAGTGAGTCC-TTTCCATCTTATTTTCTTGACTTTATA-TTCCATAGTGAGTATACATTGCTTT-TGT
AATAAGAGAAAACAATGCAATCACTGTGGAAAAAAGA--------TTTTAGAATAAAAATAAAACTGAACTTAGAGAAAT
AGCC--ATAGAGACTTGACACAACTATGTTGTACCACAGTTTACATGTAGGCATCCA-----------TGAGGTGTATAT
TTGACGTTTT-ATAATAT-----------------------GTTTTTTATATTACTTCAGAACAGGAAAATAA---TTCT
TTGGGGAGAATGA-TCCCAAGAACAATTTCACATGGTATT---TTCTCCCATTTAATTGAGT-GGTTCGT--AATCCAGG
ACAGG----GGTTGTCAAA-TGTTGCCTTCTGTTCAAATTAAGCCTGCCACTTGTTTG------------TTTAAGTTTT
ACTGAGGCAGAAC-TATGCTCATTCATTTATGTATTATCTATTCCATGCTGC-AAGGTAGAGTTGAGTGATTACAGCAGA
GACT---GTATCCCTGCCC---ACCCAAGCCTAAAATATTTAAGGCCTTAATAAAATACACA-----AGAACAA----TC
CATAAATGTTTCTTTGTTCCCAGAGAAG------AAAACAAAAACTCATGAGGAT---GTTGG--CAGAATTGTGCTGCT
---------------GTGAAAAGGCCTTATTCTCCTGCCAGAG---------ACTAGAATGTTTTA-CACTACAGTATAG
TTTGTTTTCAGGTGCTTTACACACAACTGCATTACC-GATCTTGTTTTATTTTTCTTTATACCAACTTGC-ACC-CCTTC
AA-TTTTACTGCATA-TTTAAGCACTGCCTTTT-CCGCTGCCTTTGTCCTTCATGACAAT---GTAAGCTCTGTAAAGGC
TGGGACCTGTCTGGCTGTTGTGCA----TTTGTCCAT---ACCCCCTTGCACATAGTAGGGGTATGTGTAACAAGTATTT
GTCAGATGAATGAAAGATAAGTATAAT-ACAGTAAA-ATAATGTATG-----CATCACACTCAGTATTTTGTTCAACATG
CATTT---CCTTCTCTCTTTCCAATAGAATCC----TTTGTTATTTGGAACAACTAAATAC---------TCTTTTTCTC
TTATACAACTAGGTA-TGGTCATGTGACATAAATCTAAAGAGAGAGAAAGAGAAAATGAGA-AGAAACAGGAAGAGGAAA
ACAATT-AAAAAAAAAAAGGAAGAGGAGGAAGAGGAGAAGGTGGAGGTGGGCGAGAAGAGGAAGAGGAAGAAGAAGTGAT
AAA-AGAGAAAAA-------------------GTAACAGTCTGCTCAACCAGGAAAAAAAAAAAGTGGGAATAATCAGAT
```

AATAATTGATGGGGTCTACA-----TTTAGAGTCTTGTTTGAAATTTTATTATTT-----ATATTAAA-GAATAAGAGTA
ATTCAAGCAATAGAAACA-----TTTATTGGCCCAATTTGTTTAATTGCAAGTGTATTCCTGGGGGTCTCTGGCTGGAAG
GCACTGCACTGGTTTGTAATGGATATTTAGAGTCCAGTGACCACTTGGATTATCCATGACTTTGCTCCATACTGTTA---
GTGGAAATATTTGA-----AAAAATAACCATACTGTAAAGTCTTAAAGTCCCTAAAACATTATTATATG------CATTT
AAGACAAAATTTTATGTAAATGTTG--GATACCAAATGGAATAATATATAGAATATAAAATCCTGAAGCTACAACAAAAT
CTAAGGGCATCTTACTGAGCTGGATACTGGCTGGCTGGTGGCTGAGTTTCTACAAATTGTGAGTCTGGCATTCAATTCTT
CTGCAAGATGAGTCTGAACATCCAAGTTATTTGATGCTGGAGGTGATGGGAAGGTTTGTGTTATCACTGGCCAAACATTA
T-AAAAGAAAACTCATTCC-AGGCCCAGGATTCAGCAAATGCACTTCATTATGGGCTCCAGTGACGCACAG----AAGAG
CAAAGGGCCTGCTTCACAGGTCATGGGA-GCCAAGCGCT-GAAGAAGA--GCTAGTCTTTACCCCACTTGTGTTCATTCC
TTT-TTGTTATATTTTGTTTTGGGGGTTTTGATGACTAGGTGCTGAATTTAATGCTGCCACTGAGGCAGAGATGAACCGG
ACACGTTCCCCACTCAAGACAGGG---GCAGCCTGGACTAAGCATT-------------------TCTGACTACGTGCAT
CTGAAACCGAGCTTTCACATCGATG-AGCTCTGTGACTGTGGGCAAGGA-TGTAGC----CCTCTGGGCCTCAG------
-TCTTCAGGACTGT-GAAAGCTAAATAATGCCTTCTGAACATAGCATAAGAACGATACTATAA-TTGAAACATATCAATA
ATAGTTGAACAGACAATACCAATAAACTAATCAATCAACT-ACTATTC--------------TAACTGCT-AATCAACTA
GAAACCTGTAGGGAAGTTCCTTAAGAATT---------------TCTGACTATTCCCACTATATCTCTCTTTGCTT----
-------------------GCCAAACTCTACGTTCATCTGATAAGTAAGGAAAGAAATGATCTGTGCAAATTCAGTAGGT
AAGCTGTCTCTTGTGGATTGCCTCTGAAG-TTTTTGCT-AAGTGCATTTTAGATGCTCCTCT-AAAAATAGAATCCTACT
ATATGTAATTT--GTGTTCAAAAATTATACTGAACAACTACATACATCATAAAGCTAATCACATCAATAAACTGTAA
>Carnivora_Sp2
TTGA------------TCCAGTTGCCCAG-AAGATACCACCCC--AAAACAGTCTCATCAACGGACA-TAATCTCTTGGG
GTTACCTAACCTTTCTATTTGTCCTGTCT-ATGCTTTTTGTTTTCTAAGGATAAAATTCTGCATGATTCTTTTCT---GT
GAGAAAGATCGCTTCA----AAAGCAAAGTGAAGTCCTCTCAAAA------------TCAGCTGGTCCG-AATCGAGTAT
ATATGAACAAAGTAGGGAGAAGAATTGCCTTA--TTTATGCTTGTTTCTTGCCCCC---ATCCTGAATTTTCTGAAGACT
CGATTGCTATAT-TATATCTCCTACATTTGTACAGACT--ATTTCATTTAATCAAGTGAATTTTCA--------------
----------------TTTACTGGTTAAACTGAAGCCATGA-------------GGTATGTGAAAC-AGAGGAAGAAACC
AAG--TGAAGTTGTTTTAAACTTTATTCAGGAAAAAAAAAATG-ACTCAACATTTTCAGTTGTTTTCA-AGGTAAAAGTT
AGATTTCAT-ACTGCCAGAAATGGAATTCATTGCATTT-TTCATTATTG---TTTTGGGTTTTATTAACTTTAAC-TTTA
AAAAATG--GGGAAACATAT--TT-------TTTTATTCCTAAAGAAGTAATCATCAGACTTA-ACAAAAATAAG-CTCT
T-ACTTTAATCCCAGC--ATATATACATTTGTTCCTATACACACATATCTTCATACAAATGGGCCCAGAAAGTATTACTT
GTGATTGCTTCTGAGTGAGTCC-TTTCTATGTTTTTTTCTTGACTTTATA-TTCCATAGTGAGTATATATTGATTT-TGT
AATAAGCAAAAACAATGTAATCACTATGGAGAAAAGACA------TTTTAGAATAAAAATAAAATCAGACCTTAAGAAAT
AGCC--ATGGAGACTTGACACAACTATATTGTGCCACCACTTACACACAGGCTTCCA-----------TGAGGTATATAT
TTGACTTTTT-TTAATATT--ATG-------------------TTTTTATATTACTTCAGTACAGGAAAAAATA--TACT
TTGGGGAAAGTGA-TCCTAAGAATAATTTCACATAATGATT-TTTTTCCAGTTTAATTGAGC-GGTTCTC--AATCTAGG
ACAGG----GATCAGCAAA-TGTTGCCTGCTGAGCAAATTCAGCCTGCCTCTT-TTTG-----TCTGTTTTTTAAGTTTT
ACTGAGGCATAGC-TACATTCATTCCCTTATGTGTTGTCTATTTCATGCTACAAAGGCAGAGCTGAGCAATTGCAACAGA
GACT---GTATGCCCTACC---CCCCAAGCCTAAAGTATTTAAGGCCTTAATAAAATACACA-----AGTGCAA----TC
CATAAATGTCTCTTTGTTCCCAGAGAAG------AAAACAAAAA-TCATGAGGAT---GTTGG--CAGAGTTGTCCTGCT
---------------GTGAAAAGGCCTTATTCTCCTGCCAGAG---------ACAAAAATGTTTTA-CACTATAGTACAG
CTTGTTTTCAAGTGCTTTACACACAACTGCATTACC-TACCTTA--TTTTTTTTCTTTATACTATTTTGC-ACC-CCTTG
AAATTTTACTGTACA-GTTAAGCACTACCTTTTTTGGTTATCTTTCTCCTTCACAAGAAT---GTAAGCTCCATAAAGGC
TGGGACCTGCCTGGTTCTTGTGGAACATTTTAACCAC---ATCCTCTAGCACACAGGTCT--------CAACAAATATTT
GTGAGATGAACAAAA----------------GTGAACATAA--TGTG-----TAGCACACTCAGTATTTTTCTCAACATC
CATTT---CCTTCTTTTTTGCCAAGAGAATCCGAACTT----GGTTGGAACAACTAAATAC---------TAATTTT--C
TCTTGCAAATA-CTC-TGGCCATGTGACATAAATCTAAAGAGAGAGAGAGAGAAAATGAGA-AGAAGCAGGAAGAGGAAA
AAAATA--AACCAAAGGAGAGGAAAAGGAGGAGAAGGTGAAGAGGAAGAAATGAAGAAGGNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
ATTCAAGCAATAGGAACA-----TTTATTGCCCCAAACTGTT-AATTACAAGTGTGTTCCTGGGAGTCTCTGGCTGGAAG
GGACTA---TTTTATGTAATGGACATTTAGACTCCAATGACTATTTGGATTATCCATGACTCTGCTCCATACTATTA---
GTAGAGATATTTGA-----AACA-TGACCATACTATAAAGTCCGAAAGTCCCTAACACGTTATTACATGC-----CATTT
AAGACAACATTTTACATAAATGTTC--GATACTGAACTGAATAACACATATTTTATAAAATCCTGAAGCTACAACAAAAT
CTAAGAGCATCTTACTGAGCTGGATACTGGCTGTCCGGTGGCTGAATTTCTACACATAGTGAGTCTGGCATTCAATTCTT
CTGCAAGATGAGTTTGAACATCCAAGTTATTTGATGCCGGAGGTGATGGGAAGGTTCGTGTTATCACTGGCCAAACATTA
T-AGAAG-----TCATTCC-AGGCCCAGGACTCAGTGAATGTGCATCACTATAGGCACACTCAATGTACAG----GAGAG
CAGAG-------------GGCCATGGGA-GCCAAGAGCT-AAAGAAGA--GCTAGTCTTCACCCTACTTGTGCTCATTAA
TTCATTTTTATTGTGTTTTGTTTTGGGGGTGGTTACTAGGTGCCGAACT----------------------------GG
ACACATTCCCCACTCAAGACAGGG---GCAGCCTGGACTAAGGATTTCACTTGTTCGCACTGGAATCTGACTGCATGTAT
TTTAATCCTAGCTTTCACATTTACT-AGCTCTGTGACCCTGGGCAAGGA-CTTAGC----CCTCTGGGTCTCCA------
-CCTTCAGGACTGT-AAAAGCTAAATCATGCCTTCCGAACACAGTGTAAAAAAGATACTGTAA-TCGAAACATACCAATA
ATGATTGAACAGATAATACTGATAAACGAATCAATCAACTAACTACT-------------ACTAACTACT-AATCAACTA
GCAACCTGTAGGGAACTTTCTCAAGAATC---------------TCC--CTCTCCCCATTGTATTCCTCTTAGCTT----
-------------------GCCAGACTGTCTATTCATCTGA----TAATGAAGAAAATGATCTGTACAAATTCGGCAGGT
AAACTGTCTCTTGTGGATTGCCTCCGAAG-TTCTCACTAATGTGGATTTTAGATGCTTTTCT-AAAAATAGAATTCCACT
ATATGTAATCT--GTGTTCACAA-TCATCCTGAACAACTACATACATCGTAAAGCTAATCACATCAGTGAGCTGTAA
>Cetartiodactyla_Sp2
TTGACCAGGAGGCCAATCCAATTACCCAG-AGGAGACCAGCC--TAAGACAATCTCATCAACAGAAGTTAATCTATTTGA
ATTACCCAATCTTTTTATTTCTGTACTAT-GTGCTTT-TGCTTTTTAGAGTTAAA-TTCTGCAAGG--CTTTTCT---AT
GAGAATAATCATTTCA----AAACCAAGTTGAAGTCCTCTCAAAA--ACAGCTGTTTTTAACAGGTCTG-GAAATGGAAT
ATATGAACACAGTAGGGAGAGGAATTATTTGA--TTTATGTTTGCTTCTTACTCTTT--ATTCTGAATTTTCTGAAAATG
TGATTACTACAA-TCC----CCTGTGCTTGCATAGAGC--ATTCCAGTTAACCAGGTGGATTTTCA--------------
----------------TTTACTGGTTAAACTGATTTCATGA-------------GGTATGTAAAAC-AGAGGAGGAAACC
AAGG-TGAAGTTATTTTTTG----------------AATGACTTATGCAGCAGTTTTACTTGTTTTCA-AGGTAAGGGTT
GTATATTAT-ACTGCCAAAA-TGGAATTCATTGTATTT---CTTTATTATAGTTTTTGTTTTCATTAATTTTAGC-TTTA
AAAAAGAGGGGGAAACGCCT-TGT-------TTTGTTTTCTAAAGAAGTAATCATTAGACATATA--AAAGTAAGGCTCT
T-ATTTCAATCCCAAC--------------------------ATATATCTTCATAGGATTGGGCCTAGAAAGTATTAATT
ATGATTGTTTCTGAGTG----C-TTTTTATATTATTTTCTTGACTTTATAATTCCATAATAAGTATATATTGCTTT-TGT
AATAGGAGAAAACAATACAATTGCTATGAAACAGAGGACA---T-TTTTAGAATAAAAATAAAATTGAACCTACAGAAAT
AATC--ATAGAGACTTGACGCAAGTACGTTTTGCCATAGTTTACACATAGGCTTCCTTGTGTGGAAGTTGAGTTTGATAT

```
TTGACTTTTT-ATAATATT--ACA------------------TTTTCTGTATTACTTTAGCACAGGAAAAAATA--TTCC
TTGGGGAGATTGA-TTCTAAGAATAGCTTCACATGATGATT-TTTCCCAGTTTTTATTGACT-GGTTCTC--GGTCTAGG
ACAGGCAAACATCTGCAAA-CATTTCCTGCTGTCCAAATTCAGTCTGCCTCTTGTTTG---------TTTTTCAAGTTCT
GTTGGAACATAGC-CACGCTCATTTGTTTATGTATTTTCTATTTCATGCTACGGGGGCAGAGTTGAGTAATTGCAAAAGA
GACTT--GTCTGTCCCCCTTTACCCCAAGCCTAA-ATATTTAAGGCCTTAATAAAATACACA-----AATGAAAT---CC
CATAAATG--TCTTTGTTCCCAGAGAAG------AAAACAGAAAGTCATGAGGAT---GCTGG--CAGAGTTTAACAGCT
GG---GTGACCTACTGTGAAAAGGCCTTATTCTCCTGACAGTG---------ACAGGA-TGTTTTATCACTATAGTATAG
CTTATTTTCAAGTGCTTCATACACAATTGTTTTACC-TCCCTTGCTTTATTTTTCTTTATAGCACTTTACCACC-TCTTG
AAA-TTTACTGTGTA-TTTACAT-GTACCTTTTT-TGCTTTCTTTCTCCTTCACGAGGAGAATGTGAGCTCCACAAGGGT
TGGGACCTGTCTGACTC-TGTGTAACGTTTTATCCAC---AGCCTCCAGCACACAGTACG----TCTTCAACAAGTATTT
GTTAGATGAATAAAAAATAACTACAGC-ATAGTGAACATAATATGTG-----CAGCACACT-AGTGTTTTGTTCAACATC
TATTC---CTGTCTTTCTTGCCAACAGGATCCTAATTTTGTTGGCTGGAGCAACTAAATAC---------TCATTT--TC
TCTTACAACTAGCTG-TGGCTATGTGACATAATTATAAAGAGAAAGAGACAATAAGAAGAAGAAGAAGAAGGAAGAGAGA
AAGATTTAAAAAAAAAAAAAGATAGAAAAAGAA-----GGAAGAGAAGGAAGGGGAGGAGGAAGTAGAAGAAATGAGAAG
GGAAGAGA-GAGA-------------------GTGAAAGTTTGTCCATGCAGG-------GAAACTGAGAATAATCAGAC
GACAAT-GTCGGCATTCATG-----TTTAGATTCTTGCTTAGAATTTTACAATATTATTTATGTTGGG-AAATGAAAGTA
ATTCAAGCAATACAAACATTAACTTTATTGCCCCAACTTGTTCAATTACAGGTGTGTTCCTGGCAGCCTTTGGCTGGAGG
GCACTG---ATTTATGTAATGGACATTTAGACTCCAATGACCATTTGGATTTTCCATGACTCTGCTTCATACTATTATTA
GTGGGGATATTTG-------AAAACGGCCGTGCTGTGAAGTACCAAAGTCCCTAACACATTATTACATGT-----AACTT
AAGACAATTTTTT----AGTCTTTA--GAGACTGAATGGAATAATATA--TAATACAAAATCCTGAAGCTCCAACAAAAT
CTAAGACCATCTTACTGAGCTGGATACTGGCTGGCCAGTGGCTGAATTTCCATAAACAGTGAGTCTGGCATTCAATTCTT
CTGCAAGATGAGTCTGGACATCCAAGTTATTTGATGGTGGAGATGAGGGGAAGGTTCACGTTATCACTGGACAAACATTA
T-AAAAGAAGACCCATTCC-AGGCCCAGGACTCAGTGAATGTGCTTGCCTATGGGCTCCTTGGACGCCCAG----GAGAG
CAAAGGGCCTGCTTTGCAGGTCATGGGA-GCCAAGAGC--AAAGACGA--GCGAG-TTTTATCGCACTTGTGTTCATTCA
TTCATTGTT---TGGGGGGTTTT-GTTTTTGATAACTAGGGGCTGAATTTAATGCT------AAGGCAAAGATGATCTGG
ACACAGTGTCTGCTCAAGAGAGAG---GCAGCCTGGACAAGGGGTTTATTTTGGTGGCGCTGGAATCCAACTGCCTGCAT
CTGAGTCCCAGCTTTCACATTTCCT-AGC-CTATGACCTTGGGCGAGGA-TTTAGC----CCACTGAGCCTCAG------
-TCTCCAGGGCTGT-AAAGGATAAATCATGCCTTCTGATCATAGCCTAAGAAAGACACTGTAA-CTGAAACACACCAATA
ATGGTCAAACAAGCAATACTAATGAACTAA--------------------------------------TCAATCAA-CA
ACAACCTGTAGAGAATTTTCTCAAGGATT---------------ATTGGCTGTCCCTGCTGTATCCCTCTTAGCTT----
-------------------GTCAAGCGGTATATTCATCTGA----TAAAGAAAGAGATGATCTGTACTAATTCAGCAGGT
GGATTGTCTCTTGTGGATTGCCTGTGAAG-TTTTGACTAAATTGCATTTTAAATGCATTTCT-AAAATGAAAATTCTACT
ACATGTAATCTCAGTGTTCAAAA-TTATACTGAACAGCTACGTACATGATAAAGTTAATCATATCAATGAGCTGTAA
>Chiroptera_Sp2
TTGAACAGAAAGCCAATCCAATTACTAAG-GAGAGACCACC---TTAAACAATCCTATCAACAGAAG-TAATCTAATGGT
GTTATCCAATCTTTCCATTTCTCTATTAT-GTATCTTTTGATTTTTAGAACTAAAATTCTGCATGTTTTTTTTCCCCAAC
AAGAATGATCATTTCA----AAACCAAGGTGAAGTCTCCTCAAGA------------ACAGCTGGTCTG-GAAATGGTAT
ATATGAACACAGTAGGTTGAAGCATTGTTTGA--TGAATGCTTGCTTCTTGCCCTTA--ATTCAAAATTTTCTGAAAACT
TGATTGCTATATCCCCACCCCCTGCATTTGTGTAGACC--ATTTCAGTTAACTAAGTTAATCTTTAATTTTGACATTAGA
ATCTTAAGATTTTAATCTGTTTGTTTAAACTGATCCTATGA-------------GGTATGTAAAACTTGAGAAGGAAACC
AAGGTTGAGGTTCTTCTAAA---------------AAATAATTTATTCAGCATTTTTA---GTTGT--------------
---TTTCAT-ACTGGCAAAAAAAAAA---AAGGAA-TT---CTTTA------TTTTTGTTTTCGTTAATTTTAAC-TTTA
AAAAGGGGAGAGAAACA----------------TTTTTTTTAAAGAAGTAATTATTAGAA--AAATAAAAATAAGGCTCT
TTATTTTAATCCCACT--ATATATACATATGTTTCTATACACACATAGCTTCATAGAAATAGGCCCAGGAAGTATTAGTT
GTGATTGTTTCTGAGTGAGTTC-TTTCTGTGTTATTTTCTTGACTTTATA-TTCCATGATGACTACATATTGCTTT-TGT
AATAAGAGAAAACAAT--AATCACTATGAAAAAAATACAT-----TTTTAGAATAAAAAT---ATTGAACCTAAAGAAAT
AACC--ATGGGGACTTGATATA-GTATGTCGTACTACAGTTT--AGATAGGCTTCCATGTATGGAGGTTAAGTTTGAAAT
TTGACGTTTT-ATGATATT--ATAGGTTTTTTAAGTCTTATTTTTTTCATACTATTTAAGCACAGGAAAATATA--TTCC
TTGGAGAGAATGA-TCCTAAGAATAGTCTCACATGATATT--TCCCCCCAGTTTTATTGAGT-AATTCTC--AGTTTAGG
ACAGG----GACTGGGAAA-CAGTGCCTGCCATCCATATTCAGCCTGACACTTGTTTG-TTTGTTTGTTTTTTAAGTCTT
ATTGAAGCATAGC-CACACTCATTCATTTA-----TGTCAATTTCATGCTACAAAGTCAGAGTTCAGCAATTTCAACA--
-----------------------------ACCTAAAATATTTAACGCCTTAATAAAATATTCA-----TTAGCAA----TT
CATAAATGTCTC--TGTTCCCAGAAGGGGGAAAAAAAACAGAAAATCATAGGGAC---ATTGA--CATAGTTGAACAGCT
CGTG----------------------------TCCTGCCAGAG---------ACAAGAATGCTTGACCACTATAGTACAG
CTCATTTTCAAGTGCTTTACACACAACTGCATTACC-TACTTTGTTTTATTTTTCTTCATAGCACTGTACTATC-CCTTG
AAATTTTACTGTATA-TTTACCTGCTACCTTTT--TGCTGTCTCTCTCCTTCATGAGAAT---GTAAGCTCCATAAGG-C
TG--ACTTTTCCAACTCGTGTGTGTGTGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNAATAATTGCAAA-ATAGTGAATATA---TGTG-----CAGCACACTCAGTATTTTGTTCAACGTC
CAGTC---TCTTCTTTCTTGTCAAAAGAATTTTGATTTTGTTGGTTGGAGTGACTAAATAA---------TCAT----TT
TTGTGCAACTAGCTG-TGGTCATGTGACATAATTCTAAAGAGAGAGAAAGAGAAAGT-------AAAAAGGAG--GGAAA
AAATTGTAAATAAGGAGGAGCAAGAGAAGGAGG----AAGAAGAGG---------------------------------
-------------------------------------------------------------AGGAGGAATAACAATCGGAC
CACAAT-GGTGGAGTCCACA-----TTTAAATTCTTGGTTGGAATTTTATTATTT-----ATGTTGGG-AAATAAAAGTA
ATTCAAGCAATAGAAACATTAACTTTATTTCNNNNNNNNNNNNNNNNNNGTGCTCCTGGCAGTGGGTTCGCTCGCTGAAGG
GAACTG--------CATAATGGATATTTGGACTCCAATGACCATTTGGATTATCCAAGATTCTGCTCCATACTATTA---
GTGGGAATAGTTC------AAAAATGACCATGCTGTAAAATCCCAAAGTCCCTAACACATTACTATATGC-----CATTT
AAGACAAAGTTTTATGTAAAAATTA--GACACCAAATGGAATAGCATACATAATATAAAATCCTGAAGCTACAACAAAAT
CTAAGAGCATCTTACTGAGCTGGATACTGGCTGGCCAGTGGCTGAATTTCCACAAACAGTGAGTAAGGCATTTAACTCTT
CTGCAAGACGAGGGTGAACATCCAAGCTGTTTGATGGTGGAGGTGATGGGAAGGTTTGCGTTACCACGGGACAGATGCGA
C-TGAAGGAAACCC-TTCT-GGGTCCAGGACTCAGTGAGTGTGCTTTAATCTGGACCCCTTCGGTGCACAGGAGAGAGAG
CAGATGGC--ACCTCAGGGGTCATGGGA-CCCAAGAGCT-AAAGAATA--GCTAGTCTTTATCCCACTTGTGTTCATTGT
TTTGGTTTT----GGGTTTTGGGTTAGGAATACTACTAGGTGCTGAATTTAATGCTGCCACTGAGGCAAAGAAGAATCCG
ACACATTCTCGTCTCAAGGGTGGGTGGGCAGCCTGGACTAGGGATTTAGCTTGTTGGCACTGAGATC-GAAGGTTTGCAT
TTGAATCCGAGCTTTCACATTAACT-AGCTCTGTGACACTGAGCAAGGA-CCGTGC----CCTTGGAGCCTCGGTCTCCA
CTCTCCAGGACTGT---GAGCTAAACCATGCCTTCTGATCACAGCATAAGAAAGACAACATAA-CTCAAACATACAAATA
ATGGTTGAACCAATAATACTAATCAACTAATCAATAAACTAACTACTATTCTAACTACTAAGCAACTAATCAATCAACTA
ACAATCTATAGGAAAGTTCCCCCCAAATT-------------------------CCTAG-CTGCCCCTCTTAGTTT----
-------------------GTTAAACTGGATATTTATCTCG----TAAGGAAAGAAATGATCTGCACTAATCTGGCAGAT
AGATTGACTCTTGCAGGTTGACTCTGACA-TTTGTACTGAAGTGCATTTTAAATGCTTTTCT-AAAAATAGAATTCTACT
```

ATATGTAACATCAGTGTACAAAA-TTATACTGAACAACTGCACACATCTTATAGCTGATCATGTCGATAAACTGTAG
>Equus_caballus
TTGAGCAGGAAGCCGATGCAATAACCCAG-AAGAGACCACCC--TAAAACGATCCCATCAGCAGAAG-GAATCTATAAGG
ATTACCCGGTCTTTGTCTTTCCCTACTATGGGGCCATTTGCTTTTTAGAGCTAAAATTCTGCATGCTTCTTTTCT---AC
AAGAATGATCATTTCA----AAGCCAAGTTGAAGTCCTCTCAAAA----------ATAGCTGGTCTG-GAAATGATAT
GTGTAAATACAGCAGAGAGAGGAACGGTTTGACTTGTATGCTCGCTTCTTGTTCTTG--ATTCTGAAGTTTATGAAAACT
TGACTGGTAGGG-TCT----CGTGCATGTGTATAGGTC--ATTTTAGTTAACCAAGTGGATTTTCA----------
----------TCAACTGGTGAAATTGATCCTGTGA----------GGTAGGTAAATC-AGAGGAGGAAACC
AAGG-TAAAGATAGTTTTTT----------AAATAATTTATTCAGCATTCTTT---GTTTTCA-AGGTAAGGGTT
GTATATCAT-ATTGCCAAAAATGGAATGCATTGTATTTCTTCTTTATTG---TTTTTGTTTTCATTAATTTTAAC-TTTA
AAAAAGAGGGAGAAACTTGGGTGG-------TTTTTTCCCTAAAGAAGTAATGTTTAGACTTATATAAAAATAAGGCTCG
--ATGTTTATCCCAAC--ATATATACGTCTGTTCCTGTATACACATATCTTCATAGAAAT-GGCCCAGTAAGTCTTAGTT
GTGGTTGTTTCTGTGTGTCTGCTTTTTTATGTTATTTTTTTGACTTTATA-TACCATAATGAGTATTAATTGCTTT-TGT
AATAAGAGAAAATAATCCAATCACTATGGAAAAAAGATGGGACA-TTTTAGAATAAAAATAAAATTGAACCGGAAGAAAT
GACC--ATGGAGACTTGAGACCCGTATAT-GAGCCTCAGTCCACACACAGGCTTCCACGTGTGCGGGTCAGGCTTGATAG
TTGACGTTGT-GTCATGTT--ATG----------TTTTTGTTTTACTTCGGCACAGGAA-AAATA--TTCC
TTGGGGAGGGGGGCTCTTAAGAACAGTTTCACACGATGATTTTTTTTTAACTTTTCATCAGT-GGTTCTTAAAACCTGGA
ACAGA----GATCGGCAAACCGCTGCCTGCCAACCAAATTCAGCCTGTCGCTTGTCTG---------TTTTCTGAGTTTT
ATTCAAGAATAGC-TATGCTCGTTCGTTTATGCATTGTCTATTTCATGCTGC-CAGGCGGAGTTGGGTCACTGAAGGACA
GGCG---GTCTGCCTCCCC-CTCCCCACGCCTAAAATATTTAAGGCCTTAATAAAATACACAAGAGCAGAGCAA----TT
CATAAATGTCTCTTTGTTCCCAGAGAAG------AAAACGAAAAATCATGGGGAT---GTTGG--CAGAGTTGAAGAGCT
GG---GTGTCCTACTGTGAAAAGGCCTTATTCTCCTGGCAGAG---------ACAAAAATGGTGTACCACTGTAGTATGG
CTTGTTTTCAAGGG----------CATTACT-AACCTTGCTTTATTTTTCTTTATGGCACTTTACCAGC-CCTTG
AAATGTTACTGTATATTTTATGTGCCGCCTTTTT-TGCTGTCTTTCTCCTTCATGAGAAC---ATAAGCTCCCTAAGGGT
TGGGACTTGTCCCACTCTTGAGCAATGTTTTATCCAC---ACTCTGTAGCACACAGTAGG----CCTTCAACAAATATTT
GTGAGAGGAACGAAAAATAATTACAAC-ATAGTGAACATAATATGTG-----CAACACACTCAGTATTTTACTCAACATC
TATTC---CCTTCTTTCTTGCCAACAGAGTCCTGATTTTGTTGGCTGGAGCAACTAAATAT---------TCATTT--TT
TCTTACGGCTAGCTC-TGGCCATGTGACATAATTCTAAAGAGATACGAAGAGAAAGG-------AAAAAGAAAGTGATGG
AGGAGGAAATGGAGGAGGTGAAGGAGGAAGAGA----AGAGAGAGAAGGAAGGAGAAGAGGAGGAAGAAGCTAGGAGAAG
AGA-AGAGAGAAA----------TCGAAAGTCTGCCCAGCCAGA-------GAAATCGGGAATAATCAGAC
CATAAT-AGCAGGAGCCATG-----TTTAGATTCTTGTTTGGAATTCTATTATTT-----ATGTTGGC-ACATAAAAGTA
ATTCAAGCAATAGAAGGACTAATTTTATTGCCCCAACTTGTTCAACTACAGGTGTGTTCCTGGTGGTCTTTAGCTAGAGA
GCATTC-------ACATAATGGACAT-TAGACTCTA-TGACCGTTTGGGTTATCCACAACTCTGCTCCATACTATTA---
GTGGGAATATTCG------ATAAATGAACATGCTATAAAGTCCTAAAGTCCCTAACACCTTATTACATGC-----CATTT
AAGACAAGATTTTATGAAAAAGTTA--GTTATTGAATGGAATAACATACAGAACATAAAATCCTCAAGCTACAACAAAAT
CTAAGAGCATCTTACTGAGCTGGATACTGGCTGGCTGGTGGCTGAATTTCCACAAGTAGTGAGTCTGGCATTCAAATCTT
CTGCAAGATGAGTCTGAGCATCCAAGTTACTTGACGGTGGAAGTGATGGGAAGGGTCGTGTTCTCACCAGACCAACATTA
T-AATAGAAAACTCATTGC-AGTTTCAGGCCGCAGTGAATGTGCTCTGCTACGGGCTCCTCTGATGCACGG----GAGAG
GAGAGCGCCTGCTTCAGGCGTTG-GGGA-GCCAAGAGCT-GAAGAAGA--GCTGGTCTTTATCTGAC-TGTGTTCCCTCA
TTCATTGTTTA-TCCAGATGTTTTCTGGGTGATT----------ACCACAATGCTGCAGCTGAGGTAAAGATGAATCAG
ACACATTCTCCACTCAAGACACGG---GCAGCCCGGCCTAGGGATTCAGCATGTTGGCACCAGAATTCAACTGCCTGCAT
TTGAATCCCAGCCACCACATTTACT-AGTTCTGTGACGTTGGGCAAGGA-CTTAGT----GCTCTGAGCCTG--------
-TCTCCATGAGTGT-GAAAGCTAAATCACGCCTTCTGATCATAGCATAAGGAAGACACTGTAA-TTGAAACATATCAGTG
ATGGTTGAACAGACAATACTAATCAACTAATCAATCAACTAACTACTGTTCTAAGTACTAATCAACTAATCAATCAGCTA
ACGACTTGTAGGGAAGTTTCTGAAGAATC----------TCTGGCTGTCCTTGTGGCATCCGTTTTGGCTGTCCT
TGTGGCATCCGTTTTAGCTGTCCAACTGTGTATTCATCTGA----TAAAGAAAGAGACGATCTGTACTAATTCAGCAGGC
GGATTATCTCTTGTGGATTGCCTCTGGAG-CTTTTTCTGAAGTGCGTTTTTAATGCTTTTCT-AAAAACAGAATTCTACT
ATACGTAATCTCAGCGTTCACAA-TTATATTGAACAACTACATACATCACAAAGCTAATCACATCAATGAACTGAAA
>Myotis_lucifugus
TTGAGCAGAAAGCCAGTCCAATTACTCAG-GAAACCCCCCCCCTTAAAACAATCTTATCAACAGACA-TCATCTATGCAG
GTTACCCAACCTTTCTATTTCTCTACCAT-GGGCCATTTGCTTTTTAGAGCTAAAATTCTGCATGGTTCTCTTCT---CT
AAAAATGATCATTTCATTCTTAACCAAGTTGAAGTCCTCCTAAA----------CCAGCATGCCTG-TACATGGTAT
ATCTGAACACAGTAAGGAGAAGAACTGATTGA--TTTGTGCTTGCTTCTTGTCCTTT--ATTCTGACTCTTCTGAAAATT
TGTTTTCTATGT-TCC----CCTGCATTTGTAGAGACC--ACTTCCGTTAACCAAGTGGGTTTTCA----------
----------TGATCCCAGGA----------GGTATTTAAAAC--AAGGAGGAAATC
AAGG-TGAAGTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNT
ATATATCAT-GCTGCCAAAAATGGAATTCATTGTATTT---CTTTA------TTTTTGTTTTCATTAATTTTAAC-TTTT
AAAAAGAGGGGGAAACATGGGTGT-------GCTTTTCCCTAACAAAGCAATTATTAGACTTATATAAAAATAAGGCTCT
T-ATTTTAATCCCAACT-GAACATACATAT-TTTCTGAGCACGCCTATCTTCATAGAAAT----------
GTGATTGTTTCTGAGTAAATGG-TTTCTATGTTATTTTCTTGACTTTATA-TTTCATAATGAGTATATATTGTTTT-TAT
ACTAAGAGAAAATAATATAGTCA--ATAGAAAAA----------ATTGAACCTAAAGAAAT
AACC--ATGGAGACTTGACACA-GTATGTTGTGCCTCAGTTTACAGATAGGATTCCATGAATGGAAGTTGAGTTTGATAC
TTGGTATTTT-ATAATATT--GTGGTGTTTTTA--------TTTTATTTTATTGCTACAGCACAGGAAAATATA--TTCC
TCGGGGAGAATGA-GCCTAAGAATAGACTCACATGATATT--TTAGCCCAGTTTTATTGAGTAAGTTCTC--AATCTAGG
ACAGA----GATCAGC----------CTGCCTGCCACTTATTTG----------TTTTTTGTTTT
ATTGAAGCATAGC-TACACTCATTCATTTATATATTGTCTATTTCATGCTAT-AGGCCTTAGTTGAATAATTGCAACA--
-------GACTGTATACCC-ACTCCCAAGCCTAAAATATTTAAGCCCTTAATAAAATATACA-----AGAGCAG----CC
TATAAATGTCTC--TGTTTCCAGAGGAAAGACATAACAAAAAAAATCATG-GAAT---GTTTG--CATAATTGAGTAACT
GGTAGGTATCTTACTGTGAAAAGGCCCTTACTCCCTGGCAGAGATAAACGAAACAATAATGTTTTACCACCAAAGCACAG
CTCATTTTCAGGTGCTTTACACACAACTATATTACC-TACATTG-CTTAGTTTTCTTCATAGTATTTTACCACT-CCTTG
AAATTTTACTGAATA-TTTACCTGCTAGCTTTT--TGCTGTCTCTCTCCTTCACGAGAAT---GTAAGCTCCATAAGGG-
TGGGACCTGTCTGACTCTTGTGCAATGTTTTATTCAC---ATCCTCCAGCACACAGTAGG--------CCCACAGTATTT
ATTAAATGAATGAAAAATAATTACAAC-ATAGTGAACATAATATGTA-----TAGCACACTCAG---TTTGCTCAACATC
CATTC---CATTCTTTCTTGGCAATAGAATTCTGATTTTGTTGTTTGGAGCAGCTAAATAC---------TAATTTT-TC
TCTTACAACTAGCTA-TGGCCATGTGACAAAATTCTAAAGACAGAGAAA------GT-------AAGAAGTAGGAGGAAA
AATATTTAACTTAATAAAAAAAGAAAAAAGAGA----TGAAGGAGG----------
----------GGGAGGAGGATTAATCAGAC
CACAAA-GATGAAGCTCGTG-----TTCAGGTT-TTGTTTTGAATT---TTATTT-----ATTTTGGG-AAATAAAAGTA
ATTCAAGCAATAGAAAAATTAACTTTATTGCCCCAACTTGTTCAATTACAGGTGTGTTCATGGCGGTCTCTGGCTGAAGG

```
GCATTG-------ACATAATGAACATGTGGACTCCAATGACCATTTAGATTATCCAAGACTCTGTTCCATACCATTA---
GTGGGACTATTTGG-----AAAAATGATCACACTGTAAAGTCCCAAAGTCCCTAACACATTGTTGCATGC-----CATTT
A-GACAAAGTTGTATGTGAAAGTTA--GATACTGAATGGACAAATATGTATAATATAAAATCCTGACACTACAACAAAAT
CTAAGAGCATCTTACTGAGCTGGATACTGGCTGGCCAGTGGCTGCATTTCCACTAACAGTAAGTAAGGCGTTCAACTCTT
CTGCAAGGTGAGTCTGAACATCTGAGCTGCTTGATGGTGGAGGTGATGAGAAGGTCCGTGTTATCACTAGACAAACGTCA
G-AAGAGAAACCCTATTCC-AGGCCCAGGACCCGGCCAATGTGCTCCGCTCCGGGCAAC-GTGGTGCGCAG----GAC-G
GGGAGTGCCTGGCCCCCG-GTCATGGGA-GCTGAGAGTG-AAGGAAGA--GTTCATCTTTCTCCCAC-TATCTTCATTCG
CTGTTCTGT---GTCTGTCTGGGGGGAGTT-CGG---------------TGATGCTGCCAAGGAGGCAAAGGTGAATGGG
ACACATTCTCTGCTCAAGAGAGGG---GCAGCCCCGAGGAGGGATTTAGCCTGT-------GGAACCCGGAGGTCTGCAT
TTGGATCCCAGCTCTCATGCTTACA-AGCGCCGTGACCTTGAGCAAGGA-CTTTGC----CCAGTGAGACTCAG------
-TCTCCTGGACTAT-GAAAGTTAAAACAAGCTTTCTTGTCAAAACATAAGAAAGGCACTGTAAATTGAAACTTACCAATG
ATAGCTGAACACA--GTACTAATCAACTAATCAATGAACTAACTACTAATCTAACCACTAGTCTACCAATCAATCAACTA
ACAACCTGTAGTGAAGTTTTTCAAGAATT---------------TCAG-GTGTCCCTATCATAACCCTCTTAATTT----
-------------------GTCAAACTGTATATTCATTTGA----TAAGAAAAGGAAAGATCTGCTCTAATCTAGCAGAT
AAATTGACTCTGGTGGATTGACTCTGAAT-TTTTTACTGAAGTGCATGTTAGGCGCTTTTCT-AAAGATAGACTTCNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
>Outgroup1
TTGCACAGGAAGCCAAACCAATTACCCAGGAAGAGACGATTC--TCAAACAATCTCATCAACAAAAG-CAACCTATTGGA
GTTACCCAATCTAATTCTCT----CCTAT-GTGCCTGTTACTCTTTAGAACTAAAATTCTGTGTGTATCTTCTCT---AT
AAAAATGATCATTTCA----AAACCAGGTTGAAATCTTCTCCAGA------------AGAGCTGGTCTG-GAAATGGTAT
AGGTAATCATAGTAAGGAGAGGAACAATTTGA--TTTAGGCTGGAGTTTTGCACTTT--GTTCTGAACTTTCTGAAAATG
TTACTATTCTAA-GCC----CTTTCATTTGTATAGAAC--ATTTCAGTTACCCAAGTGGGATTTTA--------------
----------------TCTAGTGGTTAGACTTATCCTGTGA-------------GGTAGGCGACAC-AGAGGAGGAAACC
AAGG-CCAGGTTATTTTTAAA--------------AAATGATTTGTTCACCATTTTTAGCTGTTTTCA-TGGGAAAGATT
GTAAATTAT-TCTGCCAAAAATGGAATTCATTCTATTTCTTCTTTATTG---TTTTTGTTTTCATTCATTAAAACTTTTA
AAAAGGAGAAGAAAACATTGTTATTGTTATGGTTTTTTCCTAAAGAAGTAATGATTGGACATGTATAAAAATAAG-GTTA
A-ATTTTTATTTCAAA--GGATATACATGTATGTACTCAGACACATACCCACATAGGAATAGGTCTGGTAGGTGTTAATT
GTGATTGTTTCTGAGTGTGTTT-----TATATTATTTGTTTTACTTTATT-TTCCATAGTGAGTATATATTGCTTTTTGT
AATAAGAGAAAG---TAAAATCATTATGGAAAAGTGACAAGACATTTTTAGAATAAGAATATATTTGAACCTAAAGAAAT
AACC--TTAGAGACTTGAGATCAATATGTTTTGCCGCAGTTCACACATATGCTTCCATGTGTGGAAGTTGAACTTGATAT
TTGACTTTTTTATAATATTTTATC--------------------TTTTGTATCACTTCATCACAGGAACAAATA--TTCC
CTGAGGGGAGTGA-TCCTAAGACTGGTCTCTCAAGATGATTTGTTTAAAC--CTCTATCAGT-GCGTATC--AATCTAGG
ACAGA----GACAGGCAAACTTCTACTCACTGGTCAAATAGAGACGGCCACCTGGTTT-TCATTTTAAATAAGGTTTTTT
TTTTAAGCATAGC-CACATTCATTCATTTAGGTATTGTCTATTTCATGCTACAATAACAAAGTCAAGTAATTGCAACAGA
AACT---GTATGGCCCCTC-T--GCAAAGCCTAACATATTTAAGGCCTTAATAAAACACACA-----AGAGCAG----TC
CATAAATGTCTCTTTGTTCCCAAAGAAG------AAAACAAAAAATCATGAGGATTCAGTCGG--CAGAACTGAACAACT
GG---GTATCCTACTGTGAGAAGGCCTTATTTTCCTGGCAGAA---------ACAAAAATATTTCACCACTGTGGTACGG
CATGTTTTCAGGTGCTTTACACACAGCCACATAACCTTACCTTGCTTTATTTTTCTTTATAGCACTTTATCACC-CTTTG
AAATTTTACTGTATA-CTTATGTGCTATCTTTGT-TGCCGTGTTTCTCCTTCATGAGAAC---AGAAGTCCCACAAGGAC
TGGGATTTGTCCCACTCTTGTGCAGCATTTTATCCACTCTAGCCTTCAGTGAAGGCTAGGTCAACGAAAAAGACATACTT
GCTAAATGGATGGAAACTAATTACAAT-ACAGTGAACATACTATGTT-CGGCATACCCGGTTAGCATCTTGCTTAATACC
CATTC---CCTCCTTTCTTGCCAACAGAATCCTGATTTTGTTGCTTGAAATGATGAGTGCACC-------TAAATATCAC
TATCGCAGTTTCCCTGTGGTCAAGTAATAAAATTCTGAAGAAA-AAAAGGAGAGAAT-----GAGAGTCAGAAGTGAAAG
T-CAGCT-----------------------------------------------------------------------
--------------------------------GGGAAGTTCTACCCTGCCATG-------GGAATAGGGAATGACCTAAC
ATCATT-GGTGGGCACGCTGGGTTGAATAATATCTATTTTATTATTTTATTATTC-----ATGTTGTT-AAATAAAAGTA
ATTGGTACAATAGAAAAAGTGACTTTATCATCCCAACTTGTTCAATGACAAATGTGTCCCTAGTGATTTTTGACTGGAGG
GCACTG-------ACATAATGGAAAT------------------TTGGAT--GCCATGACTCTGGTCCATACTACTA---
ATGAGGATATTTG------AAAAATGACCATGTTGTAAAGTCCCAAGGTCCCTAATGTATTATTACATATTATTGCATTT
AAGACAAAATTTTACATAAAAGTTA--GTTGTTGAATAGTATAATATGCATAATATAAACTACTGAAGCCGTAACAAAAT
CTAAGAGCATCTTACTGAGCTCGATGCTGGCTGGCTCACGGCTGAATTTCCAAAAATGGTGAGTCTGGCATTCAATTCTT
CTGCAAGATGAGTTGGAACATCCAAGTTACTTGACGGTGGAGGTGATGGGAAGGTTTGCGTTATCATTGGATGAACATTA
T-AATAGAAAAATCATTCC-AG-CCCAGGACTCAGTGAATGTGCTTTTCTCCAGGCTGCTTTAATACACAG----GAGAG
CAGCAGGCCTGCTTTGTGGGTCACTGGA-GCCAATAGCT-AAGAAGAACTATTCTTCTTTATCTTGGTTGAGTTCT-TCG
CTAATTGTTTA-TCCAAACATTCTCTGGACGCTTAGTA----CTGAATT-AGTGCTGCAGCTGAGGCAAAGATAAATTGA
ACACATTCTCTGCTCTAGAGAGGG---GCAGCCTGGACTGGGGATTTAGCTTGTTCACATCAGAATCTAACCACTTGCAT
TAAAATCCCAGTTTTTACATTTACATAGCTCCATGACCTTGGACAAGGAACTTAGC----CCTCTAAGCCTCAG------
-TCTCCACAACTGT-AAAATCTAAACCATGCCTTCTGGTAATAACATAAGA----CACTGGAA-TGGAAGAATACCAACA
AT-GTCAGGCAGGCAATACCCTTG-------------------------------------------CCAACCAGCTA
ACGACCCCTACAGAAGTTTTTCAGGAGGATCCGGCTATTAAAAACTACTCTGTCCCTGGTGTATCCCTCTTAGCTT----
-------------------GTCAAACTGTATATTGATCTGATAAATGAAGAAAGAAATCATCTGTACTAATTCAGCAGGA
GGGTTGCTTCTT--------------AAA-TTTTTACTAAAGTGCAGTCCAAATGCTTTTCT-AAAAATAAAATTCTACT
ATATTTAATCTCAGTGTTCAAAA-TTATATGGAAC---CACATACATCGTAAAGTTGATCAGGTCAATGAGCTATAA
>Outgroup2
TTGAGCAGGAAGCCAATCCAGTGTCCCAG-GAGAGACCACCC--CCAATCAATCCCATCAACAGGAG-CAATCTATTTGG
GTTATCCAATTTCTCTAAATCTGCTAGAT-G--CCACTTGCTTTGTAGAGCTAAAATT--TCATGTGATTCTTCT-----
--------------CA----AAACCAAGTTGAAGTCTCCTCATGAA-----------AAAGCTGGTCTG-TAAAAGGTAT
ATAAAAACACAGTAGAGAGAGAAACAGTTTGA--TTCATGCTGACTTCTTCCCCTTTTTCCCCAGAGCTTTCTGAAAACT
TGATTGTTATAC-TCT----CTTGCATTGGTGTAGATC--ATTTTTGTTAATCAAGGGGATTTTCA--------------
----------------TCTACTGGTGAAATGGATCCTGTAA-------------GGTACATAACAT---GAGAGGAAACC
AAGG-CCAGGTTATTTTAAA--------------AAATAATTTATTCAGCATTTGTACTTATTTTTA-AGATAAGGATT
GTATATTATACTGCCCAAAA-TGGAATTCATTGTATTTCTTCTTCATTTATTTTTTTGTTTTCATTAATTTAAAC-CACA
AAAAAGCAGGAGAAAATGGTGTGGGC-----TCTTTTTTCTAAAGAAGTAATCATTGGACTTATAAAAATAACA--CTTG
--ATATTTATCTGTCTGTATACACACACATACACTCATAAACACGTATCTTCATA-AAATGGGTTAAGCAAGTATTAATT
GAGGTTGTTTCTTAGTG-------TTTTTTGTAATTTGCTTCACTTTATT-TTCTATAATGAGTATATATTGCTTT-TTC
AATAAGAGAAAC---TAAAATCATTGTGGGAAAAA----GGACTTTTTTGGAATAAAAATACAATTGAACCTGATCAAAT
AAAC----AGATGCTTGAGACCAATATGTTGTGCCATGGTTCACACCTAGGCTTCCATGTGTGGAAGTTGAGCTTGATAT
TTAAGTTTTC-TTAGTATT--AAG--------------------GGCTTTTTTATATATCCCTTGAA-------------
---------------------AATAGTTTCACATAATGATTTTTCAAAAACTCTTTATCACT-GATTCTC--AGTCTAGG
```

GCAGG----GATTGGCCAACCACTGCTTGTTGGCCAAATTCAGCCTGCCACATGTTGTTATTGTTGTTTTTTAAAGTTTT
GTTGAAGATAATG-TGTGTGTAT--ATATATTTAGTGTCTATTTCATGCTACAATGGCAGAGTCAAGTAATTGCAACAGA
GATTGTATTCTCCCCCCACCCCCATAAAGCCTAAAATATTTAAGGACTTAATAAAACACATA---TAAGAGCAATCAATC
CATAAATGACTCTTTGTTCCCAGGGAAG------AAAACAAAATCTAAAGAGGAT---GTTGTAGAATAGTTGAACAGCT
AG---ATACCCTACTGAGAGAAGGTCTTATTTTCCTGGAAGAC---------ACAAAAATGTTTTACCACTATAGTACAG
CAATATTTCAAGGGTTTGACTCATGACTAAATTATC-TACCTTGCTTTATT---TTTTATAACACGTTACCAC--CCTTG
AAATTTTACTGTATA-TTTATGTGCTACCTTGTC-TGCTGTCTTTTTCCTTCATGAGAAT---GTAAGCTCCTAAAATG-
------TTATCCAACCCTTGTGCAACATTTTGTCCCC---ATCATCTAGCATAGGGTAAG---CCTTCAATAAATATTTT
GTTAAATGAATGAAAACTAATTACAAC-ACTCTGAACATA-CATGTG--CGGCACACCTAGTTAGTTTTATCTCATTAGG
TTTTCCCTCTTTCTTTGTTGCCATTGGAATCCTGATTTTATTGATTGGAATAACGTGTACTCTTACTAGCTCAGTC--TC
CCTTGCAGATAGCTG-TGGCAA--TATGAAAATTCTGAAGAAAGAAATAAAGAAATA---------ATGGAAGGAAGAGG
GGAAGGA-GGGAGGGAGGGAGGAAAGAAACTTCTGCTGGGAATCTCTGTGCTCTGCATA----------
----------GCCGGGGCAGGGGTGGGGGTG-----GTGGTGCTGGAAATAATC-CAC
CACATTGGCAGGGCTTCATG-----TTTAGATTCTTGCTCAGGATTTTATTATTC-----ACGTTGGG-AAATAAAAGTA
ATTCAAGGAATAGAAAAATTAACATTAATGCCCAACG--TGCCCATTACAGGTGTGTTCCTG-TGGTCGTTGGCTGGAGG
ACAGTT----------AGACTCTAACAACCATCTGCATCATCCATGACTCTGCTCCATACTATCT---
GTGGAGATCTTTGAAAAATATCAATCACAATGCTGTAAAGTCCCAAATTCCCTAAGACATTATTACATGC-----CATTT
AAGACAAAATTTTATGTAAAAGTCACACCTATTGAATGGAATAACATGTATAGTATAAA-TCCTGAAGCCATAGCAAAAT
TTGAGAGCATCTTACTGAGCTGGATACTGGCTGGCTGGTGGCTGAATTTCCACAAGTCGCGAGTCTGGCATTCAATTCTT
CTGCAAGATGAGTCTGAACATCCAAGTTACTTGATGATGGAAGCGAGGGGAAGGTTCACATGATCATTGGACAAACATGA
CGAAATACAAAAACATTGTAAGGCTCAAGACTCAGGAAATGTTCTTAAGTATAGTCCCCTTTAATGCACAG----GAAAC
AGAAGGATTTGGTTTCATGGGTAATGGTTGCCAATAGCTGAAGGAGAGTTATTTCTCTTTATCCCTATTGTTTTCT-TCT
TTCATTCTTTA-CACAGATAATTCCTGAGTGATTTCTAGGTGTTGAATCTGGTGTTATAGCTGAGGCAAATATGAATCAG
ACAAATTCTCTGTTCAAGAGAAGG---GTAGCCTGGACTACAGATTTAGCATGTTCACATCGGAATCCTACTGCTCACAC
TCAAATCTCAGCTTTCACATTTACA-AGCTCTGTGACCTGAGGCAAGGTACATGAC----CCTCTGAGCCTCAG------
-TCTCCACGTCTGT-AAAATTTAAACCATGCCTTCTGAACTCTGCTTAAGAAAGACACTGGAA-TTGAAACACACCGATA
TG-GTCAAACAGAAAATACCCTTG----------TCAATCAGCTA
AAAACTCTTAGCGAACTTTCTCAAAAAGA----------TGTTGCATTCTTCCTAGCTT----
----------GTCAAACTGTATATTGATCTAAT---AAAAGAAAGAGATGATCTGTACTAATTCAGCTGTG
G----------GTTGCCTCTTAA--ATTTTAATAAAGTGCATTTTAAATGGTTTTCT-AAAAATCAAATTTTACT
ATATGTAAGCTCAGTTTTCAAAC-TTATTTTGGATAACTACATATATCATAAATCTAATAAGGTCAATGAGCTATAA
>Perissodactyla_Sp2
TTGAGCGAGAAGCCAAGGCAATCACCCAG-AAGTGACCACCC--TAAAACAATCTCATTGACAGAAG-GAATCTATTTGG
CTTACCCAATCTTTGTCTTTCCCTACTATGGGGCCATTTGCTTTTT-GAGCTAAACTTCTTCATGGTTCTTTTCT---AT
GAGAATGATCATTTCA----AAACCAAGCTGAAGTCCTCTCAAAA----------ATAGCTGGTCTG-GAAATGGTGT
ATGTAA--ACAGTAGGGAGAGGAACCATTTGA--TTTATGCTTGCTTCTTGCCCTTT--ATTCCGAATTTTCTGAAAACT
TGATGGCTATAG-TCC----GCTGCATGTGTAGAGATC--ATTTCAGTTAACCAAG-----TTTCC----------
----------TCTACTGGTTAATCTGATCCTGGGA----------GGTAGGTAAAAC-AGAGATGGAAACC
AA----GAAGTTAGTTTTT----------AAATAATTTATTTAGCATTTTTA---GTTTTCA-AGGTAAGGGTT
GTATATCAT-ACTGCCAAAAATGGAGTGCATTGTATTT---CTTTATTC---TTTTTGTTTTCATTAATTTTACC-CTTA
AAAAAGAGAGGGAAATATGGGTGTG------TTTTTTTCCTAAAGAAGTAATCTTTAGACTTATATAAAAATAA-GCTGG
--ATGTTTATCCCAAC--ATGTATACTTATGCTTCTGTATACACGTATCTTCATAGAAATGGGCCCAGAATGTATTAATT
GTGGTTGTTACTGAGTGTGTGC-TTTTGATGTTATTTTCTTGACTTTATA-TACCATAATGAGTATATATT-CTTT-TGT
AATAAAAGAAAATAATATAATCACTATGGAAAAAAGATGGGACG-TTTTAGAATAAAAATAAAATTGAGCCTGAAGAAAT
AAAC--AGAGACCCAAGACAA--GTATGT-GAGCCACAGTTTACACACAGGCTTCCACGTGTGGAAGTTGAGCTGGGTAT
TTGATGTTTT-ATAAGGTT--ATG----------TTTCTGTTTTACTTCAGCACAGGAAA-AATA--CTCC
TTGCGGAGAGTGG-TCCGAAGAACAATCTCACACGATGAT-CTTTTTTAACTCTTTGTCAGT-GGTTCTC--AGTCTAGA
ACAGG----GGTCGGCAAACTGCTG-------ACCAAATTCAGCCAGTCACTTGTCTG----------TTTTTTGTTTT
ATTCAAGTATAGC-TATGCTCATTCGTTTAAGTACTGTCTATTTCATGCTGCCAGGGCGGAGTTGGGTAATTGAAGGAAA
GACG---GTATGCCTCTCC-CTCCCCACGCCTAAAATATGAAAACTCTTAATAAAATACACA-----AGCACAA----TC
CCTAAATGTCTCTTTCTTCCCAGAGAAG------AAAACAAAAAATCATGAGGAT---GTTGG--CAGAGCTGAAGAGTT
GG---GTCTCCTACTGTGAAAAGGCCTTTTTCTCCTGGCAGAG---------ACAAAAATGTTGTACCACTACAGTGTGG
CTCGTTTTCAAGGGCTTTACACATAACTGCATTATC-AACCTTGCTTTATTTTTCTTTATAGCACTTTACCAGC-CCTTG
AAATTTTACTGTTTA-TTTACGTTCAGTCTTTTT-TGCTGTCTTTCTCCTTCATGAGAAC---ATAAGCTCTCTAAGGG-
------CTGTCCCACTCTTGTGCAACGTTTTATCCAC---ACCCTCTAGCACACAGTAGG----CCTTCAACAAGTATTT
GTTAGATGAAAGAAAAATAATTAGAAC-ATAGTGAACATAACATGTT-----CAGCACATTCAGTATCTTACTCAACACC
CATTC---CCTTCTTTCTCGCCAAGAGAATCCTGATTTTGTTGGTTGGAACAACTAAATGT---------TCATTT--TC
TCTTACAACTAGCTC-TGGCCGTGGGACATAATTCTAAAGACACAGAAGGAGAAAGG-------AAGAAGAAGGTGAAGG
AGGAGGAAATGGAGGAGGCAAAGGAGGAGGAGGCGAAGGAGGAGGAGGAGGAGAGGGAGAAGGAGGAGAAGAAAGGGGAG
AAGGAGGAAGAAATGAGAAGAAAAGAGACAAAGCGAAAGTTTGCCCAGCTTGG-------GAAACCGGGAATAATCAGAC
CACAG----------TG-----CTTAGATTCTTGTTTGGAATTTTTTT---------ATGTTGGG-ATATAAAAGTA
ATTCAAGCAATAGAAACATTAATTTTATTGCCCCAACTTGTTCAAATACAGGTATGTTCCTGGCAGTCTTTGGCTGGAGA
GCATTC-------ACAGAATGGACAT-TAGATTCCAATGACCATTGGGATTATCCATAACCCTGTTCCATACTATCA---
GTGGGAATATTTG------ATAACTGAACATGCTGTAAAGTCCTAAAGTCCCTAACACCTTATTACAGGC-----CATTT
AAGACAAAATTTTATGAAAAAGTTA--GTTATTGAATGGAATAACATACATAATATAAAATTCTGAAGCTACAACAAAAG
CTAAGAGCATCTTACTGAGCTGGACACTGGCTGGCTGGTGGCTGAATTTCCACAAAGAGTGAGTCTGGCATTCAAATCTT
CTGCAAGATGAGTCTGAGCATCCAAGTTATTTGATGGTGGAAGTGATGGGAAGGCCCATGTTATCACCAGACAAACATTA
T-AATAGAAAATTCATTGC-AGGCCCAGGACTCAGTGAACGTGCTTTACTACGAGCTCCTTTGATGTACAG----GAGAG
CAGAGGGCCTGCTTCCAGGCTTG-GGGA-GCCAAGAGCT-GAAGAGGA--GCTGGTCTTTATCCCAC-TGTGTTCACTCA
TTCATTATTTA-TCCAGATGTTTTCTGGGTGATTACTAGGTGCTGAATTCAATGCTGCAGCTGAGGCAAAGATGAATCAG
ACACGTTCTCCACTCAAGAAGGG----GCTGCCTGGCCTAGGGATTCAGCATGTTGGCACCGGAATCCAACTGCTTGTAT
TTGAATCCCAGCCACCACATTTACC-AGTTCTGTGACCTTGGGCAAGGA-CTTAGC----CCTCTGAGCCTCAG------
-TCCCCACGACTAT-AAAAGCTAAATCATACTTTCTGATCATAACATAAGAAAGACACCGTAA-TTGAAACATATCGGTA
ATGGTCGAACAGCCTATACTAATCAACTAATCAATCAACTAACTACTAA----------TCAACTAATCAATCAACTA
ATAACTTGTAGTGAAGTTTCTCAAGAATT----------TCTGGCTATCTCTATTGTATCCATCTTAGCTT----
----------GTCAAACCGTATATTCATCTGA----TAAAGAAAGAGATGATCTGTACTAATTCAGCAGGT
GGATTGTCTCTTACAGATTGCCTCTGGAG-TTTTTACTAAAGTACATTTTTAATGCTTTTCT-AAAAATAGAATTCTACT
ATATGTAATCTCAGCGTTCAAAA-TTATACTGAATAACTACATACATCCTAAAGCTAATCACATCAATGAACTGTAA

8. Chiroptera+Perissodactyla+Carnivora

```
>Bos_taurus
GTGTGTAAAATC-TGCATG-AGCTATCTATCCAACAGCACAATGATTCCTATGAAAAGCCATAAAAATATTTAACATATT
CCTTAGAATT---------AGATCCTACTGCCCCCCACAC--AATTGT----ACTAAAACTCATCTTTAAAT-AACAGTT
ATTA------AATAGTTGAACATACGGTAGAA-TTTTTATAAATCA---TTTCTTTAAAGAC-TACTAGTCCAAAG-AGG
CTTCATTTTCAA--------ACATAGATGCTATTCTCTTTCAAGGCAAGTTCGTCAGAACAAATTCAGAAGGCAGTTTTT
CCTTCTCTCATTCAGCCTAAATTAAATATTTGAAGGATGATGGAAGTAGA--------AAAGGAAAAAAAAATTTTTTCT
GGAAGTATC-CATACAA--GAATGCTGAAGTCAGTGTGTCCAGCTGG-AGGGAGTACGGGGGGTCTGGG---AAAAGAGG
TG------GGC-CT---GGGATTA-TATCCT--GAGA------------------CCAGGTTCCCAGCTGAGGTTGGGG
AGA---GGGATGATCAAGGCCTGGGAGCC--CGCAAGTTCCCTCTCTCC---ATGCCTTGGTGAGAGA-TGTCTGTGTCC
TGTT-GGGCAGAGGGTAGACTGTAGTT-----GGGGAAGGTAAACT------GGGGAAGGTAAACTAGAGAGAGCAAAAG
TGGGAATCAGGAACCCA----GCTCT-AGTTCCAGAGGAGGCCCTGTATT-GAGAGT-----AACCCCTCTACCATGCGG
CACAGGGTGGGGGTGGGGTGGGGGCTTACACTGCTGTCTTGGTTCTCATCATTG------------------TCTGAGCA
G-CCTGGTGACAAAGCAGAGAGCTGGGGGATGGTTAGGCAGTTAGGCTGGGGCCTCTGCTCCAGCTTGTTTTTAATTCAC
TGGAAACCTAATATCATTTTAAAACAATAAACAAC--------TATTTTGCCTGACAATAGAAAACAAATCTGAGAAAC-
----AACAACAAACAACAAAAAAAAGGCA-AAAGCCTAAGTTAGGAAAAGCACTG-AAAGGTG-CCCTCATGGAAGAGAG
AGAGTAACACAAGTGAACTAAGGTAGTTAC--AGTGAGATTTCT---AAAGCCCAGCAATAAAATGACACTCTCTGAGCA
GGTAAAG-GGGTGAAATTCCATTGGAATGAAGCAAAGA--------ATGACTACCTATC---CATGTTCATCTTCTGAAT
TA---AAAAAAATAAA-GGATGGTAC------AAAACGGAATTAAAAAAAAATTACTGGCAATATTTAAAATCCAAGAAT
CCTTCT--AAGTAACAAGATCCTCAGAATATCTGA--GGGAAGGAAATCATNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTTTTCAGCAACTGTCATGAGAGTG--
-------------------------------TTTTCTCAGCC-CGTGGACACCAGCCTGAAGA-AAGGCCACCCAGTTGCA
GGTGAGTCTGAACA-------------CCTTTTCTCCATTGGTAAGGAAGGCACTAGAACG--CCCTCCATAAATGTCAG
GGGCACAGGAGAAGGAAGCTATTTATTTACTCAAGATAAT--------TCACATGAAGACCTCAAAACCACC-GCCCAAA
GAAAATCCGGATGTCTCCCTCATGAGGCATTCCTAAAATGCCTCCTCTGAATAACGATGTCCAGCTCTAAGCACAGTGCC
AAGGTCAGTCAAGGTTATTTTCAGCCCCTTCTTCCTTTTTAAAAATTAGAATATCTTTTCTCTTTTTTGAATT-------
-TGCTTTCTTAA-TTCAA-ATGTATTGAAATGTTTTACCCATCATAAT-AAAGTGCCCTCAGTAAAATCAAACTTCAATT
TTTTAGGAAAT---CCTAAGGACTGGGATTAAGAAAATTTGCCATTTTAAAACTGTGAGAACTTTTCCATTTCTCACAGA
AATAGTGGATTA-CTTCACTTTTAACACACTGGTTGTTTTGACAAAAACATTC--TGGT-----------GGGGCAAAGA
GCCTATTCTGAAAAAGGAAATGTTGAGAAAATGAAAAGCT--AAAATTGCTCAGTAAGGAAGCAA---------------
------------GAAAATGAGAT-ACACCTGATTTAATCTGATTTAGTCACTNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNTAAGTATTTTTAAAAAAAACTGTATCCGTAGCATGATTTCAAATGTCTTTATACAAGAAAATGGAATTCT
GGAAATGAAATACGCTAGTATTAGTGGA--ATATTAGTTATAAAATAATAAGGGCTTTTATGCTTTTACTTTAAAC-TTT
TTTCTTTTTTTAGTCTTTCAAAGTTTCTGTAGCATATATTGATATCTCTTATTATCAGGTTAA-------AAATTTAGAA
GATAAAATCAATCCAAATCTAAAAAATAGACCATCACACACTT-CAGTTACAAAG--CTGACATAGTCACTATAGTCTTA
CCTTTAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCACACACA-TTATA
TTCAATCCATGTGCATACATTTAAATAGGATTCTGTGTGGGCTTAGTGTTCATTTCCAATCCCTCGGGGCTCTGCTGCAT
CCCATGCCTCATGCTATCTGTGTGGCCAATGGATCTGCATCAGAGTCCTGAATCCTGCTCTTTTTGTATTTTTGCCATGT
TGGTTTTCAAGCTGCTATACTTTT-ATATTATTATTTGACAGCAAACACTACTTTTCCTAATTTGTCATGGCTAAATTTC
TG---------------------------AAAAGTGTGCTCCCAATCCACTGCTGCTTCATCACATCATGTGAGAATTCT
TGG--AATTGTACTACTTTTATAACTAT--------------------------------ACCACTTTATTCTGTATTT
TTTTTTTT---ACCATTTTTGTACT-TTTTTGTTTACAGTTATTTATTGCTGTATTACTTTTTTCACTCTGCTAGAACTT
CTGCACTAACCATGGCAGAGGAATTTTAC---------TGTCCATTTGATTCA--AAGACATTTAAGATGATGCTAAGGA
TATAGAGATTAATAGCTCTCCTTAGAAGGAGCAGCATTCCAGT-AACACTTTTGTCCAGCAAAA-CTGCTCTTGCCAGAA
ATAAAA-CTGACAGCA-------GCATAGGCAAGGAGGCACT--CATAGGCAGATGGTGATGGAGTC----CTCAAATTT
AGGACTTCCCACT-----------TCAACAAGATGCTTCTG---TTTTCTTAATTCTTTGGGAACTTTGACTCTCCAGG
TCAGTGTTCCATATGGGACTCAGACTCCCGTGGCTGCTACCCAGATGACCTCCCT--------CACCCTCCCAGTGACCA
GCTC--TTAGAGTCCTCAGA-TAC---ATCCCTTCCCTCAGTAAGAACCACAGGCCAAGCTCTGCAGAGAGTCCACAGCA
CTT------CCTGGGTACCAATGGGGGCATATTGCACA-GTATGTAGAAACCCATGATCTTCC-CTCAACTCAACTCTTC
CCCAGCCTTTTCAATTGTAAAATA---AAACACTGT-CATCCATTTCTTTCTTTATGAAATCCTGAACCAGTCTCCCTTA
TCTACTCTATCTAATTCATCACCAAATCCTACCACGCCCACCAAGAGTATAGCT----CAAAACCATCTACTTCTTTCCA
GTATTTCTGCTACCATCCTAGGCTAAACGGTC-----------------------AATAGCTTTCTAAGTGGG-TCCTCA
GTCCCATTTTCACCT----CTTCTAATCCATTCTTCACACTGCTAATGTTATCTTTTT-AAACACGTG-ATCATGTTCC
>Canis_lupus_familiaris
GTGTATAAAACC-TGGATG-AGATATATATCCAATAGTATAATGACTGCTATGAGACATCACAAAAATATTTAACATAGT
CCTTCAAATTAAA-----TAGATACTA-CTTTCCCTACATGTAACTAT----ACTGAAATTCCTTCTTAAAT-AATAATT
ACTGATCATTAATAGTTAAATAATATAATTAA-TTTTTATAAATCATCCTT------------TAACAGCCTAAGG-AGT
CCTCACTTTCAAACCTGCAAACACAAATACCATTCTCTCTCAAGGCAAGTTCTCCAA--CAAACTTAGAAAGCAGTTTTT
CCTATTCTCATTCAGCCT-AACTAAATGTTTGAAAGATCACAGAAGTGGA----------AAAGAAAAAAAAATGTTTTT
GAAAGTATC-CATACAA--GAATGTCAAAGTCAGTGTGTCCAGCTGG-AGGGAGGACAGGGGGCGGATGAGGGGCAGAAA
TGCCAGAAGGGGCTGGGGACACTGTCATCTT-GGAGAAGCTAGAGAAGATGATCCCTGAGGTCCCCAGCTGGGGGTGGGG
GGCATGGGGGAGATCAAGGCCCTGGAGCTCTCCCACACTCTCTCTCT----------------CACTGGGG----AGTCC
GGTT-GGGCAGGGGGTGGCCTGGGGAG--------GGGTG-----GGGAGAGGACACTAGTGGGCTAAAGAGGGCGAGAG
TGGGAATGGGGAAGCCG----GGTCC-AGATCCAGATGAGGCCCTGTGAT-GAGAGCACCCCAGCCCCTCCACCCTGCGT
CACTGGG--------------------------------CTGCTTCACATCATTG------------------CCTGAGCA
G-CCTAGTGACAAAGCAGAG--CTGGGGGATGGTGGGGCCG------TGGGGCCTCGGCTCCGGCTGGTTTCTAAT-CAG
TGGAAATTTAATATAACTTGAAAATAATGACAAGC--------TTCTCTGCCTTAAAACAGAAAATACATCTGGGAACC-
--------AGAAA----AAAAAAATTACA-GAAATCTAACTCATAAA------------GGTGTCCCTCATGAGAGAAA-
AGAATGACATGAGTGAACGAAGGTAGCTCTGCAGTGAGACTTAT---AAAGCCCAATGACAAAAGGATATTCTCTACGCA
GTTGAAGAGGGCAAAAGTCCACCAGACCAAAGGAAAGA--------ATTACTGCCAATC---TAAGTTCATTTTCAGATT
TTTT-AAAGACTAAAAAAAACGATATGGTACAAAAACAAAATTTTAAAAAA-TTCCTGACAACATTTGAAATTAAGGAGT
CCTTCTCTAAGGACTAGATTTCGCAGCTCTTCTGA--GGGAAGGAAATCATNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTTTTCAGCCACTGTGAGAAGATGG--
-------------------------------TTTTTTAAGCCACAGAGACACTGGCCTGAAGA-AAGTCCACTCAGTTGCA
AGTGAGTCTGAACA-------------CCTTTCCTACTCTGGTAAGGAGGGAACTAAAACA--TCCACTATAAACATCAG
GGGTAGAGGAGAGGGAGGC----TATTTACTCAAAGAAGT--------TTACAAGCAGATCTTAATACCACCTACCCAAA
```

```
GGAAACCATAATGTCTCCCTGATGTGGCATTTCTAAAATGCCTCACCTTGATAACCAGGACCAGCTCT----ATAGCTGT
GAGGTCAGTCAAGATTGTTTTCAATCCCTTCTGTGTTTTTT-CAGTTGGG----TTTTTTCTTTTTTT------------
-------------CTTAATATGTATCTTAACATTTTATCCATCATAAT-AGAATTC------TAAAATTAAACTTCAATT
TTTTGGAAAA----CTTTAGGACTAG----AAGGAAATTGGCCATTTTAAAACTGCAAGCAGTTTTCTTATTTCTCTAAA
AATAGAGAGTTTAATTCACTTTTAACAC----AATGTTTGGGCAAAAATACTCTTTGGTTCTGCAAA---GAAGCAAAGA
TCCTATTCTGAAAAAAAG--------------------------AAATACTCAGGAAGGAGGTAA---------------
------------GAAAAGCAGAT-ATACTTTATTTAACCTAACTCAACTANNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNATAGCAT------ACAAAATTATATCCATGGCATGATTCCAAATGTCTTCATGCAAGGAAATAAAAATCT
GGGAACAAAATACACTGGTACTGGTGGG--ATATT----------------GAGCTTTTGTATTTTCACCTGAAAC----
-TTCTTTTTTTTGTCTTTCAAATTCTTTGTGGCATTTATGAATATCTCTTATTATCATGTT-A-----AAAATGTTGTAA
TATAAAAT-ATTTTAAATCT-AAGCTCATACAATCACATATTT-CAGATACAAAA--CTAACATCTTCACCATGATCTTT
TATCTAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAACACATG-CATTT
GTGTGTGTGTATATATATATATATATATGTGATTCTATGTGGTTTTGGTGTTAATTTACAATCCCTCAGGCCTCTGTTGCAT
CTCATACT-------ATGTGTATGGCCAATGGGTCTGCATCAGAGTCCTAAACCCTGCCCCCTTTGTATCCATATCATCT
TGGTTTTCAAACAGCCATGCTTTT-ATATTATCATTTGACACCAAACACTACTTTTCCTTGTCGGTCACAACTCAGCTTA
CA---------------------------GAATGAGTATACCCCACCCA---CTGCTTCATCACTTTCCATCAGAATTCT
TGC--AGTAGTACTACTCATATTATTAT--------------------------------ATTACTCTCTTCAGTATTT
TTTCT-TT---ACTTTCTCTGTAGT-TGTTTGCTTATTGTTATTTATTACTATATTACTTTTATCACTTGGCGAGAATTT
GTGCACTCTCCATGGCAAAAGAGTTT-ACTAAGTTTGCTGTCAGTTTGACTCAAAGATATATTTAAGATAATGCTAAGAC
--TAGAGGGCAGTAGCTTTACTAAGAAGGGGCTGCATTCCAGTTAATACTATTCTCCATCAAAA-CTGTTCTTGCCAGAA
ATAAAA-TTAATGGAA-------ACATAGTGCAGAAAGCAGTCACATAGGTTGGTAGTGATAGGGCCCCC-TTGCAATTT
AAGACTTCTGACT-----------TCAACAAGATATTCTTA---TCCTTTTACTTACTTAGAAACTTTGACCCTCTTGGG
TC--TGTTTCATATGGGACCCAGACT-TCCTGGCTGTTACCCA-GTGGCTCCCCT--------CACCTTCCCAGTGATCA
GCTC--TTAGAGCCCTGAGAATAATATATCCCTCTCCTCAGGAAGGGCCACTGCCCAAAGTTTGGAAGGAGCCCACAGGG
CTCATAATCCTTGGGTACCCATGCAGGCATA--------ATGCATAGAAACCCATTATTTTTCTCCCATTCCTACTCTTC
CTCTGACTTTCCAATTGTAAAATAAAGCATCACCATC----CATTTCTTCACATCTGAAACCGGGGACCAATCTCCCTCA
CTTTTGCTACCCAATTCATCACCAAATCCTGCCGATCCCACCAAGTTTCAATAGATCTCAGAGCCATGTGCTTCATCCCA
GTACTAC-ACTAGCATCTTAGGCT-AATGGTCATCATCTCTCACCTGACCAGGGCAATAGCTTCCTAGGAGAGCTCTTCC
CTTCCGCATTCACCTCTCCATCCCAATCCATTTACCACTCTGCAAATGTTATCTTTTTAAAAGATTTT-ATCATGCTCC
>Carnivora_Sp2
GAGTATAAAAAC-TGGATG-AGATATATTTCCAACAGTATAATGATTGCTATGAGACATCATCAAAATATTTAACATAGT
CCTTAAAATTAAA-----TACATATT----TTCCTTACATATAATCAT----ACTGAAACTCCTTATTAAT------AGT
TATGACCATTAATAGTCAAACTTATGGTAGAA-TTTTTATAAATCATCATTTCT------------------AAAG-AGG
CCCCATTTTCAAACCCACAAAAACAAATACCATTCTCTCTGAAGACAAGTTCTCCAA--TAAACTCAGAGAGCAGTCTTT
CCTATTCTCATTCAGCCT-AATTAAATGTTTGAAGGATCACGGAAGTGGAAA--------AGAAAAAAAAAATTGTTTTT
GAAAGTATC-CATACAA--GAACGTTGAAGTCAGTGTGTCCAGCTGGGAGGGAGGATAG---ATGGGGGGAGGGCAGGAG
TGCCAGGAGGGGCTGAGGAGACCTTCGTCTT-GCAAAGGCTGGAGGAGGTGATCCCTGAGGTCTCCAGCTGAGGTGAGGG
AAG---GGGAAGATCAAGGCCTGGGAGCT--CCCACCCTCTCTCT------------------CACTGGTG----AGTCC
AGTT-GGGCAGGGGGCGGACTGTAGTG---------GGTCGGAGGGGGAG----GGAGAGTGA---AAAGAGGGCAACAG
TGGGAATCGGGAAGACT----GGTCG-AGTCCCAGACGAGGCCTTGTGTTTGAGAAGACCCCAGCCCCTCCACCCTGCGT
CACTGGG-------------------------------CTGCTTCACATCATCG------------------CCTAAGCA
G-CCTGGTGACAAAGCAGAG--CTGGGGGATGGTTGGGCTG--------GGGCCTCTGCTCCAGCTTGTTTTTAATTCAG
CGGAAATTTAACATAATTTGAAAAGAGCGATCAGCTTTTTTTTTTTTTTGCCTTTAAATAGAAAATGAATCTGGAAACC-
-------CAAAAAAAAAAAAAAAAGTTACA-CAAGTCTTACTGATAAA------------GGTGCCCCTCATGAAAGAAA-
AGAGTAACACAAGTGAACGAAGGTAGCTCTATAATGAGAGGTAC---ACAGCCCCGTGGCCAAAGGATATTCTCTAAGCA
GTTAAGA-GGGCAAAAGTCCACTGGACCAATGGAAAGA--------ATTACTACCAATC---CAAGATCATCTTCAGATT
TTTTTTAAACAATAAA---TAGACATGATACAAAAACAGAATTTCAAAAAA-TTACTGACAATATTTGAAACTAAAGAGT
CCTTCT--AAGGACT-GAATTCTCAGCTATTCTGA--GGGAGGGAAACCATGGGATCTCCTCATCAGGGAAA--CAGATT
TACCTGGTAGGTAAAAAAGTGCCACACACTCCTGGGTAACATCCAAAGCTTCTCTTTTCAGCCACTGTGGTGGAATATGA
AATTTATTGTCGAATTGGTTTCTGTGGTGGTTTTCTAAGTCAAATAGACATAGACCTGAAGG-GAGGCCACTCAGCTGCA
GGTGAATCTGAATA-------------CCTTGCCTCCCCTGGTAAGGAAGGAACCAAAACA--CCCACCGTAAATGTCAA
GGGCATAGGAGAAGGAAGC----TATTTACTCAAATAAGT--------TTATAAGCAGATCTTAAAACCACCTATCCAAA
GAAAACCATAATGTCTCCCCGATACTGCATT-------------TACTG-ATAACTGGGACTAGGTCTAGGCATAGTTGT
GAGGTCAGTCAAAATTGTAGAAAAAAACTTCTCCATTTTTA--AATCGGA----TTTTT---------------------
-------------TTAAACCTGTATCATAACACTTTAGCCATCATAAT-AGAGTACCCTTACTATAA-TAAACGTCAATT
TTTTGGAAAC----CTTGAGGAATGG----AAGGAAATTTGTAATTTTAAAACATCAAGCAGTTATTCTATTTCTCTAGA
AACAGAGGGTT-AATTCACT------------AATGATTGGGCAAACACACTCTTTGGTTTTGCAAA---AAGACAAAGG
TCCTATTTTGAAAAAAAGACA---GAAAAAATGGAAAACTATAAAATTGCTCAGGCGGGAGAAAACTGAACTGAAACAAG
AAAACTGAACAAGAAAACTGAAC-ATACTTGACCTAATCTAATTCAACCACC-----ATCCCCAGACTGACTTGAGGAAA
CTAGTATTTTATACTGC------ACAAAATTATATCCATGGCATGAATCCAAATGTCTTCATACAGGGAAATACAAATCT
GGGAATAAAATGCACCAGTATTGGTGGG--ATTTTGGTGATAAAGTAACAAAAGCTTTTGTATTTTCCCTTGAAAT----
---TTTTTTTAGTCTTTTTAGATTTTCTGTGGCATATATGAACATC---TTTTATCAGGTT-------AAAAAGTTGTAA
TATAAAATAAGTTCAAATCT-AATCTCATACATTGTATACTTT--AGATACAAAA--CTAACATCCTCATTGTGGTCTTT
TCATTGTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTACAGGAG------
--------------------------------TCTATGTGGGATTGTTGTTAATTTACAATCCTTCAGATCTCTGTTGCAT
C---------------TCTGTGGGGCCAATGGGTCTGCATCAGAGTCTTAAACCCCGCCCCTTTTGTGTCCATATTATTT
TGGTTTTCAAGCAGCCATACCTTT-ATATTATCATTTGACAGCAAATACTACTTTTCCTTATGAATCACAACTAAACCTA
CA---------------------------GAACGAGGGTTCCCCATCCA---CTGCTTT-TCACCTCATATCAGAATTCT
TAC--AACAGTACTGCTTTTATTCCTAT--------------------------------AGTACTCTCTTCAGTATTT
TTATTTTTTTTACTTTCTCGGTGCA-TGTTTGTTTCTTGTTATTTAGTATTGTATTACTTTCACCACTCGGCAAGAATTT
GTGTACTCTCCATGGCAAAAGAGTTTTAC---------TGTCCGTTTGACTC--AGATACATTTAAGGTGGGGCCAAGGC
--CGAAGGGCAGTAGCTCTACTAAGAAGGGGCTATATTCCGGTGAACACTGTTCTCCATCAAAA-CCGTTCTTGCCAGAA
ATAAAA-CTAATGGAA-------GCATAGGGAGGAAGGCAGTTACATAGATAGACAGTGGTGTGACCGCC-TTCAAATTT
AAGACTTCTGACT-----------TCAACAAGATAGTCTTAACCTCCTTTTCATTCCTTGGAAACTTTGACCCTCTTGGG
TCAGTGTTACATACGGGACTCAGGCT-TCCCGTCTGTTACTCAGGTGGCTTCCCT--------CACCTTCCCAGTGACCC
ACTG--TTAGAGCCCTGCGAATAC---ATCCCTTTCCTCAGTAAGGACCATGGCCCAGATTTTGGAT-GAGCCCACAGGG
CTCATAACTCTTGGATACCCATGAGGGTATA--------TAGCACAGACACCCATGATTTTT--CCCCAAACTTTTCTTC
```

```
CCTTGCTTTTTCAATTGTAAAATAAAGCACCGCCATC----CATTTCTTCACATATGAAAC-------------------
---------------------------------TGTCCCACCAAGTTTCAATAGATCTCAAAACCACGTGCTTCTTTCCA
GTACCACTGCTAGCACCTCAGGTT-GATGGTCATTATCTCTCTCCTAAGCAGGGCAATAGCTTCCTATGAGAGGTCCTTA
CTTCCATATTCACCTCTCCCTTCCAACCCATTCACCACACTGCAAATGTCATCTTTTTAAAAGATTTT-ATCAAGCCCC
>Cetartiodactyla_Sp2
GTATATAAAACC-TGCATG-AGATATCTATCCAAGAGCATAATGATTCCTATGAAAAGTCATAAAAATATTTAACATATT
CCTTAAAAATTAAATAAATAGATATTA--TTTCCCCACATACAATTGT----ACTAAAACTCAACATTAAAT-AATAGTT
GCTG------AATAGTTGAACTTATGGTGGAA-TTTTTATAAATCATCATTTCTTTAAAC---TAATAGTCCAAAGGAGG
CCTCATTTTCAAACCCACAAACACAGATACCATTCTCTCTCAAGGCAAGTTCATCAGAGCAAACTCAGAAGGCAGTTTTT
CCTTCTCTCACTCAGCCTAAATTAAATGTTTGAAGGATGATGGAAGTAGAAAA-GGAAAAAAAAAAAAAAAGAATTTTTCT
GGAAGTATC-CATACAA--GAATGTTGAGGTCAGTGTGTCCAGCTGG-AGGGAGGACACGGGGTCAGGG--GAGAAGAGG
TG------GGGGCT---GAGATCACCATCCT-GGAGAGGCCGCAGGAGGTCGTCCCTGAGGTTTCCAGCTGAGG-TCGGG
AGT---GGGAAGGTCAAGGCCTGGGAGCT--CCCACTTTCCCTATTTCC---ACCTCTTGGCTAGTGAGTGTCTGTGTCC
TGTC-GGGCAGAGGGTGGACTGTAGTT-------------------------GGGGAAGGTGAACAAGAGGGGGCGAAAG
TGGGAATCAGGAACCCG----GGTCT-AGTGCCAGAGGAGGCCTCGTGTT-GAGAGTACCCCAACCCCTCCACCCTGGGG
CACTGGGCTGGGGGC------------ACACCGCTCTCCTGGTTCACCGCGTTG------------------TCTGAGCA
G-CCTGGTGACAAAGCAGAGAGCGAGGGGATGGTTAGGC-----GGGACCTCTGCTTGCTCCAGCTTGTTTTTAATCCAC
TGGAAATCTAATAAAATTTGA---AAGTAATAAGC--------TAGTTTCCCTGACAATAGAAAACAAAGCTGGGAAAC-
----AACAACAAAC-----AAAAAATGCA-GAAAACTAACTTAGGAAA-GCACTG-AGAGGTA-CCCCCATGAGAGAAA-
AGAATAACACAAGTGAACTAAGGTAGTTAC--AGTGAGATTTCT---AAAGCCCAATGATACAATGATATTCTCTGAGCA
GTTACGA-GGGTAAAATTCCATTGGACCGAAGGAAAGA--------ATGACTACCTATCTTTCTTCTTCATCTTCCGATT
TTT--TAAAGAATAAA--AGAGGTATAATATGAAAATAGAATTTAAAAAAA-TTACTGGCAACATTTAACATCCAAGAAT
CCTTCA--AAGTACCAAGATTCTCAGAATATCTGAGAGGGAAGGATATCATGGAGTCTCCTCATCAGAGAAACAGCGATT
TACCTGGAAGGTAGAA--GTGCCACCTATTCCTGGGGTGCATATAAAGCTTCTCTTTTCAACAACTGTAGTGAGAGTG--
-----------------------------TTTTCTCAGTCCAGTGGACACCAGCCTGAAGA-AAGGCCACCCAGTTGCA
GATGAGTCTGAACA-------------CCTTTCCTCTTCTGGTAAGGAAGGAACTAAAACA--CCCCCCATAAATGTCAG
GGGCATAGAAGAAGGAGGCTATTTATTTACTCAAGAAAATAAATAGGTCAACATGCAGACCTCAAAACCACC-GCCCAGA
GAAAACTCCAATGTCTCCCTGATGTGGCATTCCTAAAATGCCTCCTCTGAATAACCAGGACCAGCACTAAGCAAAGTGGT
GAGGTCAGTCGAGGTTGTTTTCGGCCCCTTCTCCCTTTTTAAAAATTGGAATATTTGTTTTGT-----------------
-AAATTTTTTAA-TTCAA-ATGTATCATAATGTTTTACCCACTGTAAT-AGAGTGCCCTCAATAAAATTAAACTTCAATT
TTTTAGGGACT-------------AGGAATAAGAAAATCTGCCATTTTAAAACTGTAAGAACTTTTTCCATTTCTCCAGA
AATAGAGGATTA-CTTCTCTTTTAACACACTGACTGTTTTGACAAAAACACTCTTTGGTTTTGCAAAGATGGGGCAAAGA
CCCTATTCTGGAAAAGGAAATATTGAGAAAATGAAAAGCT--AAGATTGCTCAGTAAGGAGGCAA---------------
------------GAAAACTAGAA-ACACTTGATCTAATCTAATCTGATTTAANNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNATAGCAT----TAATAATCACATATCCATGGCATGATTTCAAATGTCTTTATACAAGAAAATAAAATTCT
GGGAATAAAATACACCAGTATTGGTGAG--ATATTGGTGATAGAATAACAAGGGCTTTTGTGTTTTCACTGGAAAC--TT
TTTTTTTTTTAAGTCTTTTAAATTTTCTGTAGCATATATGGCTATCTCTTACTATCAGGTTTA-------AAATTTATAA
AATAA-----ATTCAAATCTAAAAC----ATAATCGCATACTT-CAGATACATAA--CTAACATCATCATTGTGGTCTTC
CCTTTAATTACCTCTCTAAGATTTCTAAAGTTGTTATAGAACATTTGACTGNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCATACAC----ATA
TTATACTTGTGTGTATATATTTAAATAGGATTCTGTGTGGGCTTGGTGTTCTTTTCCAATCCCTTAGGGCTCTGCTGCAT
CCCATAC-TCATGCCATCTGTGTGGCCAGTGGATCTCCATCAGAGTCCTAAATCCTGCCCCTTTTGTATTCGTGCCATCT
TGGTTTTCAAGCTGCCGTACTTTT-ATATTATCATTTGACACCAAACACTACTTTTCCTAATTTGTCATGGCTAAACTTC
TGGGGAATGGCTAAACTTTTTGTCATGGGGAATGCGTGCTCCCCATCCA---CTGCTTCATCACGTCACATCAGAATTCT
TGGGAAAAAGTACTACTTTTATTACTAC-------------------------------ATTACTTTCTTCTGTAATT
TTTTTT-----ACTATTTTTGTACT-ATTTTGTTTACAGTTATTTATTGCTGTATTACTTATTTCACTCTGCTAGAATTT
CTTCACTAACCATGGCAGAGGAATTTTAC---------TGTCCATTTGATTCAAAGAAACATTTAAGATGGTGCTAAGGA
T--AAGGAACAATAGCTCTACTGAGAAGGGGCTGCATTCTAGT-AACACTGTTCTCCATCAAAA-CTGTTCTTGCCAGAA
ATAAAA-CTAATAGAA-------GCACAGGCAAGAAGGCAATCACATAGATAGATAGTGATGGGGCCCCC-CTCAAATTT
AGGACTTCGGACT-----------TCAGCAAGACACTCCTA---TCTTTTTAATTCCGTGGGAACTTTGACCCTCCTAGG
TCAGTGTTCCATATGGGACTCAGATTCCCATGGCTATTACCCAGGTGGCCTCCCT--------CACCCTCCCAGTGACCA
GCTA--TTAGAGCCCTGAGAATAC---ATCCCTTCCCTCAGTAAGCACCACAGGCCAAGTTCTGCAGGGAGCCCACAGCA
CACATAACCCTTGGGCACCCATGGGGGTATATTGCACA-GTATGTAGGAACCCATGATCTTTC-CTCAGTCTGACGCTTC
CCCTGCCTTTTCAGCTGTAAAATAAAGCACGATCATCTACCCATTTCTTCATGTACAAAATCCTGGACCAATCTCCC-TA
ACCATTCTATCTAATTCATCACCAAATCCTGCCAAGCCTGCCAGGTGTATATCT----CAAAACCATCGACTTGTTTCTA
GTACTACTGCTACCATCCTAGGCTAAATTGTCATAATTTCTCACCTGACCTGGACAACAGCTTCCTAAGTGGG-TCCTCA
GTTCCATTTTCACCT----TTCCTAATCCATTCTCTACACTGCTAATGTTATCTTTTCAAAAGATTTG-ATCATGTTCC
>Chiroptera_Sp2
GTGTATAAAACC-TGGATG-AGATATGTATCCAATAGCATAATAATTCCTATGAAAAGTCATAAAAATATTTAACAGATT
CCTTAAAATTAAA-TAAACAGATATTATTTTTTCCTACATAAAACTGT----ACTGAAACTCATT------------ATT
ACTGATGATTAATA----AACTTATAGTGGAA-TGCTTGTAAGTCATGATTTCTGTAAAGAT-TAA--GTCTAAAG-AGG
CCTCAGTTTCAAGCCTACAAACACAGATGCCATTCTCTCCCAAGGCAAGTTCTCCAGGCCAAACTCAGAAAGCAGTTTTT
CCTACTCTTATTCAGCCTAAATTAAATGTTTGAAGGATGATGG--------------------------AGAATTTTTCT
GAAAATATC-CATACAA--GAATGTTGCAGTCAGTGTGTCCAGCTGG-AGGGAGGATA---------------------G
TGCCGGGAGGGGCTGAGGAGCTCACCATCCT-GGAGAGGACGCAGGAAGTGGTCCCCGAGGTCCCCAGCTGAGGTCGGGG
GGT---GGGAATATCAGGGCCTGGGAGCT--CCCAGGTTCTCTCTCACT--------------GGTGTCTG----TGTCC
AGTT-GGGCAGGGGACGAGCTGTAGTG------------GCTGAAAGGTGGGGACGACAGTTGGCAAGAGAGGGCAA-AG
CAGCATCGAGAACTCTG----GGTCT-AGCTCCGGAGGAGGCTT-ACGTT-GACAG------GACCCCTCCACCCTGGGC
CCCTGAGCTGGGG------------CCACACCTCT-CCCTGGCTCACCTCATTG------------------CCTGAGCA
G-CCTGGTGACAAAGCAGAGAGCTGGGGGATGGTTGGGC--------CGGGGCCGCTGCTCCAGTGTGTTTCCGATCCAG
TGGAAATCTAATATAATTTAAAAATAATATATTTC--------TATTTT-CCTTAAAATAGAAGATGAATCTGGGACCC-
---CCCCCCCAAA----AAAAAAACTGTACAAAACTTAACTTATGAAA-GCACTG-AGCGGTGTTCCTCATGAGAGAAA-
---ATAACACAAGTGAACTAAGGTAGCTAT--AGTGAGACTTAT---AAAAACCAATGATAAAAGGATATTCTCTAAGCA
GTTAAGAAGGGTAAAATTCCATTAGACTGAAAGAAAGA--------ATTGTTACCTCTC---CATGTTCATCTTCAGATT
TTTT-AAATAAATAAA---TAGATAGTAT---ACAATAGAATTTT-AAAAA-TTACTGATAATATTTGAAATTAAAGAAT
CCTTCT--AAATACTGGAATTCTCGGATATTCTGA------AAGAAATAATCGAGTCCGCTCACCAGAG-AATAGCAATT
TACCTGATGGGTGAAG--GTGCC-CACATTCC-----------------------------------------------
-------------------------------------------------TGACCTGAAGA-AAGGTCACTAGGTTGCA
GGTGAATTTGAACA-------------CCTTTCCTCCTCAAATAAAGGGGGAACAAAGACA-CCCCACCATAAGTGTCAG
```

```
AGACATAGG---AGGAGTC----TATTAACTCAAGAAAGT--------TTATATGCAGACCTCAAAATCACC-ACCTCCA
AAAAAGTGTAATGTTTCCCTGATGTGGCATTCCTAAAATGCCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTTAAAATTGGGATACCTTTTTCTGTTGTTG-----------
-----TTTTTAA-TTAAAAATATGCCATAACATTTTATTTATTATAAT-AGGCTGCCCTTGCTAAAATTAAACTTCAATT
TTTTGGGGAAAC--TTTGAGGACTAAAAGTAAGGAAATTTGCCATTTTAAATCTGCAAGCAGTTTTTCTATTTCTCTAGA
AATTGAGGATCGAATTCACTTTTAACA----AACTGATTGGGCAAAAACACCC--CGGTTTTGCAAA---GAAGCAAAGA
TTCTATTCTGAAAAAGAAAATATCGAGAAAATGAAAAG-----------------------------------------
-------------------------------------CTAAACTTGCTCAG-----TAAGGAGGAAAGACTAGAGGAAA
GTGGTATTTGATAGCAT------GCAAAACTCTATACATGGCAAGATTCCAAAAGTTTTTATTCAAGAAAATAAAAATTT
GGGTACAAAATATACCAATAT-GATGAG--ATAGTGGTGATAGAATAACAAGGGCTTTTGCATTTTCACTGGGAACTTTT
TTTTTTTTTTGAGTCTTTCAAGTTTTCTGTAGCATACGTGAATATCTCTTATTATCAGATTTT-----TTAAAGCTGTAA
AATAA-----TTTCAAACCT-AAGCTCATACAATCACATGCTT-CAGATACAAAA--CTAACACCATCATTGTGGTCTTA
CCTTTACTTATCTCTCTAATATTTCTAAAGTATTTATAGAACATTAGACCATTAGGTTTATCATTGTC------CTCAGA
GAAGCACTGCTTCTACTTTGTAAGGCAAATTATATACCTATTCTCAATTTAGGGAGCCTAGCCGGGGACACATA-TATGG
C-----TTGTGTGTATATATTTAAAAAGG-TTCTGTATGGGCTTGATGTTAATTTAAAATCCCTTAGGGCTCTGCTGCAT
CTCATGCC-------ATCTATGTGGCCAACAGGTCTGCAACAAAGACCTAAACCCT------TTTGTATCCAAACCATCT
TGGTTTTTAAGCAGCTATACTTCT-ACATTATCATTTGACACTAAATATGACTTTTC---ATTTATCACAGCTAAACTTC
TG---------------------------GAATGGGTGTTCCCCATCCA---TTGCTTCATCACCTCACATCAAAATTCT
CAG--AATTGAACTATTTTTATTACTGT--------------------------------ATTACTTTCTTCTGTATTT
TTTTT------ACTTTTTCTGTACTGTTTTTGTTTATCGTTATTTATTACCATATTACATTTATCACTCTGTTAGAATTT
GTGCACTCTCCACAGCAAAGGAGTTTTAC---------TGTTCATTTGATTCAAAGAAACATTTAAGGTGGTGCTAAGGT
G-CAGAGAGCGGTAG-TCCACTAAGAAGAGGCTATATTCCAGT-AACACTGTTCTCCCTCAAAA-CTGTTCTTCCCAGAA
ATAAAA-CTGATAGAA-------GGATAGAGCAGAAGGCAATCACATAGATT----GTGGTGGAGCCAACTCTCAAATTT
AGAACTACTGATT-----------TCGACAAGACACTCCTA---CCCTTTTAATTCCTTAGTAACTTTGACCCTCTTAGG
TCAGTGTTCTAAATGGGACCCAGGCTCCCATGGCTGTTAACCAGATGGGCTCCCT--------CACTCTCCCAGTGACTA
GCTC--TTAG-GCCCTGAGAATAC---ATCTCTACCCTCAGTAAGCGTCACAGCCCAAGTTCTGCAAGGAACACACGGGG
TTCATAAGCCTTGGGTATGCATGGGGGTATATTGCACATGTGCATAGGAACCCATGATCTTTC-CCCAATCCTACTCTAC
CCCTGCCTTTCCAATTGCAAAATAAAGCACCACCATCCATCCATATCTTCTCATATGAAA-CCTGGACAAATCTCCCTTA
CCATTTCTATCCAGTTGATCACCAAATCCTGACTACGCTGCCAAGTCTCAATATATTTC-AAAACATCTACTTCTTTTCA
GTATCACTGCTACCATCCTAATCTAAATGGTGATTATCTCTCACCTGACCTGGGCAATAGTTTCTTACGTGGGGTCCTTA
GTTCTATTTTCACCCACC-CTTCCAGTCCATTCACCACACTGCTAGTGTCATCTTTTTAAAAGATTGT-ATCATGTTTC
>Equus_caballus
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAA-TTTTTATAAATCATCATTTCTCTAAAGAT-TAATGGCCTACAG-GGA
CCTCATTTTGAAACGCACAGACATAAACACCATTCTCTCT-GAGGCAAGTTTTCCAGA-CAAACTTGGAAAGCAGTTCTT
CCTACTCTCGTCCACCCTAAACTAAGTGTGTGAAGGACGATGGGAGCGGAAGTGGAAAAGGAAAAAAAAGGAATTTTTCT
GTTAGTATC-CATACAA--GAATGTTGAAGT---------CAGCTGG-AGGCAGGACAAGGGATAGGATGGGGGCAGAAG
TGCCAGGAGGGGCTGAGGAGATTGTCACCCTGGGAGAGGTCAGAGTAGGTAATTCCATAGGTCCCCAGCAGA------GG
AGT---GGGCTGGTCAAGGCCGGGCAGCT--CCCAGGTTCTCTCTCGCT--------------GGTGTCTG----TGTGC
GGTT-GGGCAGGAG-TGGACTATAGTGTGTGTATGGGGTGTTAATAAGCCAGGACAACAGTGGGCCAGAGAGGGCAACAG
TGGGAGTCAAGACCCTG----GGTCT-AGTTCCAGAGAAGGCCC-AGGTT-GA--GTTCCCCAGCCCCTCTCCCTGTCGT
CAGGTGGAGGGG---------------ACACCTCT-CCCTGGTTCATGTCGTTG------------------CCTAAGCA
G-CCTGGTGACAGTGCGGGGAGCT-GGGGCTGGTGGGGC--------TGAGCCGTCTGCTCCAGCTTCTTTTTAATCCAC
TGGAAACTTAATATAATTTGAAAATAATGACAAGC--------TATTTTGTCTTAAAATAGAAAATAAATCTGGGAACC-
------------A----AAAAAAATTGCA-GAAATCTAACTTGTGAAA-GCACTG-AAAGGCGCCCCTCATGGGAGAAA-
AGAATAAGACAAGTGAAATAAGATAGCTAT--AGTGAGGTTTAT---AAAGCCCAGTGATA-AAGGACAGTCTCTAAGCA
GTTAAGA-GAGTAAAATTCCAATGGATTGAAGGAAAGA--------CTTTCTACCTATC---CA------TCTTCAAATT
TTTT-AAAGAA-AAAA-AATAGATACAGTTCAAAAATAGAATTTTTAAAAA-TTACTGACAATATTGGAAATTAAAGAAT
TCGTCT--CAGGACTGGAATTCTCAGGTATTCTGA--GGGAAGGAAATCATGGGGTCTCCTCCTCACGGAAATAGTGATT
TACCTGGGAGGTAAAA--GTGCCACATGTTCCTGGGTAGCATCTAAAGC--ATCTTTTCAGCCACTATCATGAGAGTA--
-------------------------------TTTTCTAAGCCAAATGGGCAGTGGCCTGAAGA-AAGGCCACCCAGTTGCA
GGTGAGTCTGAACA-------------CCTTTCCTCCTCTGGTAAGGAGGGAACAAAAGTA--CCCACCGTAAATGTCAC
AGGTATAGGAGAAGGAGGC----TATTTACTCAAGAAAGT--------TTA-AAGCAGACCTCAAAACCACCTACCCAAA
GAGAACAATAATGTCTCCCTGATGTGGCATTCCTAAAATGCCTCATCTTAATAACCAGGACCAGCTCCAGGCAAAGTTGT
GAGGTCAGTCAAGGTTGTTTTCAGACCCTTCTCCATTTTTAAAAATTGAGATACTTTTTTGTTTTTTTAATTC-------
--TTTTTTTCAA-TTCAAAATATATCCTAACATTTTCTCCATTATAAT-AGAGTGCCCTTGGTAAAGTTAAACTTCGCTT
TTTTGGAAAC----CTTGAGAACTACAAGTAAGGAAATCTGCCATTTTAAAACTGCAAGAAATTTTTCTAATTCTCTAGA
AACAGAGGATTGAATTCACTTTTAACATATTGACTGTCTGGGCAAAAACACTCTTCAGTTTTGCAAA---GGGGTAAAGA
TCCTATTCTGAAAAAGGAAATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNATATCAT------ACAAAACTGTATCCACGGCATGATTGCAAACATCTTTATACAAGACAATATACTAAT
TTTGG--AAATATAACAATATTGGTGGG--ATATTGGTGATAGAATAAGAAGGGCTTTTGTATTTTCACTTGAAAC----
-ATTCTTTTTAAGTCTTTCAAATTTTTTGTAGCATATATGACTATCTCTTATTGTCAGGTTAA-----AAAAGCTTGTAA
AATAAAATAAATTCACATCT-AAGCTCATACAATCATATCCTT-CAGACACAAAA--CCAGCATCGTTGTTGTGGTCTTA
CTTTTAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
------CTGTGTGTATATATTTAAATAGGATTCAGGGTAGGATTGGTGCTGATTTACAATTCCTTAGGGCTCTGCTGCAT
CCCATGCC-------ATCTGTGTGGCCAACGCATCTGAATCAGAGTCCTAAACCCTGCCACTTTTGTATCCGTACCATCT
TGGTTTTCAAGAAGCCACTCTTTC-ATATTATCATTTGACACCAAATACCACTTTTCCTTACAGATCATAGCTAAATTTC
TG---------------------------GAGTGGGTGCTCCTCAGC-----CTACTTCACCACTTCATGTCAGAACTCT
TGG---ATTGTACTACTTTTATTACTAT--------------------------------ACTACTTTATTCTGTATTT
TTTTT-----------------ACTTTTTCTGTTCACTGTTATT----ACTGTATTATTTTCATCACTCCGCTAGAATTT
GTGCACTCTCCATGGTAATGGAGTTTTAC---------CATCCATTTGATTC-AAGAAACATTTAAAATGATGCTAAGGC
A-CAAGATAGAGAGCAGTAACTACTAAGGGGCTCCATTCCAGT-AACACTGTTCCCCATCAAAA-CTGTTCTTGCCAGGA
ATAAAA-CTCACAGAG-------GCATGGGG-GGAAGGCAGTCACAGAGATGGAGAGTGGTAGGGCCAACCCACAAATAC
AGGACTTCTGACT-----------AAAACCAGACAGTCTTA---TGCTTTTAATTCCTTGGAAACCATGACCCTCTTAGG
TCAGTGTT----AGGTTA---GGCGTCTAA-GGCTATTACCCAGATGGCCTTCCT--------CACCCTCCCAGTGACCA
GCTA--TCAGAGCCCTGAGAATGA---ATCCCTCCCTTCAGTAAGCACCATGGCCCAAGTTCTGCATGGAGCCCACCAGG
```

```
CTCATAACGCTTAGGTACCTCTGGGGATATACTGCACATGCGCATAGGAACCCATGATCCTTC-CTCAATTCTACTCTTC
CCCTGCCTTTCCAACTGCAAAATAAGGCACCACTGTCCACCCATTTCTTCACATAGGAAACTCTGGA-------------
-CCTTTCTACCCCATTCATCACCAAATCCTGCCTACACCACTAAGTCTCAACATATTTCACAACCATTTCCTTTTTTCCA
GTACTCCTGCTACCACCCTAGGCTAAATGGTCATTGGCTCTCACCTGACCTGGGCAATAGCTGCCTAAGTGGGGTCCTCA
GTTCCATGGCCACCTCTCCCTTCCAATACATTTACCTCACTGTCAATGTCACCTTTTTCAAAGATTTA-ATCATGCTCC
>Myotis_lucifugus
ATGTATAAAATC-TAGATGAAGATATCTATCTAATAGCATAATGATTCCTGGGAAGAGTCATAAAAATATTTAACATATT
CCTTAAAATTTAA-----TAGATACTATTTTTTCCTACATAAAACTGTACTTATTGAAACTCATTATTGAAT-AATAGTT
ACTGATCATTAAAAGTTAAACTTATGATGGAA-TATTTATAAATCATAATTTCTTTAGAGAT-TAATAATCTAAAG-AGG
CCTCATTTTCAAACCCATACACACAGATACCATTCTCTCTTAAGGCAAGTTCACTAGAGCAAACTCAGAAAGCAG-TATT
CCTGCTCTCATTCAGCCTAAATTAAATGTTTGAAGGATGATGGACATGGA----------GAGGAAAAAAGAATTTTTCT
GAAAAT-----ATGTAA--GAATGTTGAAGTCAGTGTGTCCAGCTGG-AGGGAGGATANNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTGAGGTCCCGAGTGGAGGTGGGGG
GGT---GGGAAGACCAGGGCTTGGGAGCT--TCCGGGGTCTCTTGCTGG--------------TGTGTCCG----CATCC
GGTT-GGGCAGGGG-TGGA-TGTAGTG-----GGGGAGGGTGGATACGTGAGGACAGCAGTGGGCTAGAGAGGACAATAG
TGGGAATCGGGAACCTGGCCAGGCCT-AGTTCCACAGGCGGCTC-GTGTT-GAGCGGATCCCA-CCCGTCCACCCTATGT
CCCTGGG-----------------------------------------------------------------CTTGGACA
G-CCCGGTGACAAAGCAGGGCACTGGGGGATAGTGGGTC--------------------TCCAGCGTGTGTTCAGTCCAC
TGGAAATCTAATATGATTTGAAAATAATAATAAGC--------TATTTTGCCTTAAAATATAAAATAAACCTGGGAACA-
-----ACAACACA----CCCAACCCTGTA-CAAAACTAACTTATGAGA-GCACTG-AAGGGTGCCCCTCAC-AGAGACA-
AGAATAACACAAGTAAACTAAGATGGCCGT--AGCGAGATTTATGAAAAAGCCCGAGAACAGAA----------------
--------GGGTAAAATTCCATTGGACTGAAGGAAAGA--------ATTGCTAT-TATC---CATGTTCTCCTTCATATT
TTTTTAAAGGAGTAAA---TAGGTGACAC---AAAATAGAATTTAAAGAAA----CTGACAATATTTGAAATTAAAAAAT
CCTTCT--AACTACTAGAATTTTCA--CATTCTGA--AAGAAGGAAATCATGGGGTCTCCTCATCAGGGAAAAAGCAATT
TACCTAGTAGGTCAAT--ATGCC-CACAGTCCTGGGTAGCATCTAAGCC--TTCTTTTCAGCCACTGTCATGAGCGCA--
-------------------------------TTTTCTAAGCCGAATAGACTTTGGCCTGAAGACAAGGTCATTCCGTTGCA
GGTGAATCTGAATA-------------CCTGTCTTCCTCTGGGATCGAATGAACTAAGACA-CACCCCCATAAATGTCAG
GAGCATAGGAGAAGGAGTC---TTATTAACTCATGAAAGT--------GTACATCCAGACCTCAAAATCACC-ACCCAAA
-AACTCCATAGTACCTTTCTGATGTGTCATTTCTAAAATTCCTCATCTTAATAGTCAGGATCAG------GCAAAGTTGC
AAGGTTATTCAAGATTCTTTTCAGTCCCTTCTCCATTTTTT-AAATTGGGGT-CTTTTTACTATTTTTGTTTTAT-----
-AATCTTTTCAA-TTCAAAAAGTATCATAACATTTTATTCATTATAATAAAAGTACCCTAGTTAAAATTAAACTTCAATT
TTTTTGGAAATCTTCTTGAGTACTAGAAGTAAGGAAATTTGCCATTTTTAAACTACAAGCAGTTTTTCTGTTTCTCTGAA
AACAGAGGATTAAATTCAGTTTTAACACACTGATTGTTTGGGCAAAACCACACTTTCATTTTGCAAA---GAGGCAAAGA
TCC-ATTTTGTCAAAGAAAATATTGACAAAATGAAAAG-----------------AATATTGCTG---------------
------------GAAAACTGACG-ACACTTCATCTAATCTGATTTCATCACT-----GTCCCAAGGCTGACTTGAGGAAA
GTGGTATTTTACAGCAT------ACAAAACTATATCCATGGCATGATTCCAAAAGTCTTCATATAAGAAAACAAAAATCT
GG-TACCAAATATACTAATATCGATGGA--ATATTGCTGACTGGATAACAAGGGCTTTTGTATATTCATGTGAGAC----
-----TTTTTTTGTCTTTCAAATTTTCTGTAGTATATATAAATATCTCTTATAAACAAGTTTT-----AAAAAGTTATAA
AGTAAA-TAAATT-----CT-AAGCTCATACAATGACATACTT-CAGACACAAAA--CTAATATC---ACTGTGGTCTTA
CCTTTAT----CTCTGTAATATTTCTAAAATATTTATAGAACATTAGATTGTTAGGCTTGTCATTGCT------CTCAGA
GAGGCACTTTGTCTACTTTGTAATGCAAATTATGTACCTATTCTCAATTCTGGGAGCTTGGGGGGGNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCAGAGACCTAAATCCTGCCCC---TATATCTATACTATCT
TGGTTTTCAAGCAGCCATGTTTTTGACATTATCATTTGACACCAAACACTACTTTTTCTTACTTATCACGGCGAAACTTC
TG---------------------------CTATGGGTTTTCCCCAGCCA---CTGCTTCCTCACCTCCTATCAGAAGTCT
TGG--AATTGTGCTACTTTTATTATTATTTTAACAATAATAAAATAATTATTAAGATAATAATTATTTTCTTCTTTTTTT
TCTTTCTT---CCATTTTCTGTACTTTTTTTGTTTGTGGCTATTTATTACCGTATTACTTTGATCACTCCACTAAAATTT
GTGCACTCTGCATAGCAAAGGAGTTC------------TGTCCTTTTGATTCAAAGAAACATTTACGATTGTGCTAAGGT
G-CAGAGATCAGTAGCTCTACT---AACGGGCTGCATTCCAGT-AACACTGTTCTCCATCGAAA-CTGTCCTTGCTGGAA
ATACAA-GTAGTAGAA-------GGATAGGGTAGAAGGCAATCGCGTAGATAAGTGGTGATGGTGCCAACCCTCCAATTT
AGGATTTCCAACT-----------TCAACAAGACACTCCTA---TCCTTTTAATTCCTTGGTAACTTTAACCCTCTTAGT
TTAGTGTTCCAAATGGGATCCAGGCTCCCATGGCTATTTCCCAGACAACCTCTGT--------CACC-TCCCAGTGACCA
GCTG--TTAGAGCCCTGAGAATAC---ATCTCTATCTGCAGTAAGCACCGTGGCCCAAGTTCTGCAAGGAACCCACAGGG
CTCATAACCCTTGGGTACCCATAGGGGTACAT-------GTGCCTAGGAATGCATGATTTTTC-CCTAATCCTACTCTTC
CCTTGTCTTTCCATTTGCAAAATAAAGCACCCC-ATCCACCTGTTTCTTCACATATGAAACCCTAGACCAATATCCCTTA
CCCTTTCTGTACAATTAATCACCAGATCCTGCTTTCACTGCCAAGTGTCAATACGTCTCA-AAACATCTACTTCTTTCCA
GCACCACTGCTA-------------GATGGTCATCATCTCTCTCTTGACCTGGGCAACAGTTTGCTAAGTGGAGTCCTCA
GTTCCATTTTCATCTCTCCCCTCCTATCCACTCACCACACTGCTAATGTCAGCTTTCTAAAAGATTTTTATCATACTCC
>Outgroup1
GTATATAAAACC-TAGATA-AGACACATAACCACCAGCATA--GATTCCTATGAAAAGTCATATT-------------TT
CCTTACAATTAAA-----TAGATG-TA-TTTTCCCTACACATGACGGT----ATTAAAACTCATTATTAAATGAAAAGTC
AGTGATCATTTATAGTTAAACTTTATGGTGAAATCTTTATAAACTATCATTTCCTTAAAGGATTAATAATCTGAAA-GAG
TCTCATTTACAAACACACAAACACAGATACCATTCTCTCTCCAGGCAACTTCACCACAACAAACTCAGAAAGCAGTTTTT
CCTACTCTCATTCTGCCTGAATTAAATATTTGAAGGATGATGGAAGTGAAAAA---------GGAAGAAAAATATTTTCT
GGAAATATCTCTTACAAAAGAAT--TAACACCAGTATGTCCAGATGG-AGGGAGGATAGGGGTGGCGGTGGGGACAGGAG
TGCCAGGAGAGGCTAA-GAGATTC-TGCCCT-GGAGAGGCTGGATAAGGTG--------GTCCTCGAGCTGAGG-TGGGG
CGT---GGGAAGGCAAAGGCCCGGG-GCT--CCCAGGCACGCTCTCTAA---ACTTCGGAGCTAGTCAGCATCTATGTCC
ATTTTGTGCAGGGCGTGGACTATACCGTGGTTGG------------------CGGGAGGGTGAAG-AGAGAGGGCAACAA
TGGAAGTCAAGGACCCT----GGGTC-TGTTCCAGAGGAGGTCCCCTGTT-GAGAGTGCCTCAACCCCTCCACC-TGCGT
CACTCACTTGGGG-------------CACACCCTTCTCCTGGTTCACATCATTG------------------CTGGAGCA
G-CCTGGTGACAACTCAGGGAGCTGG-GTTGGGAGGGGGC-------TGGGGCCACTGCTCCTGCTTGTTTGTAATCCAC
TAAAAATCTGGTATAATTTGAAGACAATCATAAGCT-------ATTCTGTCCAAAAATAAGAAAATAAATCTGAGAACC-
----------ACC----ACCAAAGTTACA-GACAACCAGTTTGTGGAG-GCCCTG-AAAGACGCCCCTCATACAAGAAA-
AGAACGG--CATGAGAACTAAGGTGCCTTT--AGTGAGATTTAT---AAAACCTA--CAGAAAGGGATACTCTCTAAGCA
GTTAAGA-GGGTAGAATTCCACTGGACCCAAGGAAAAA-----AACTGTACTACCTGTC---CA-GTTCAATCTC-AATT
TTTTTAAATGAATAAA--ATAGATATACTACAAAAACAGAATTTTCTAGAT--TACTGAGAATATTAGAAACT--AGAGG
CCTTCA-ACAGCACTGGAATTCCCAGATATTCTGGGAGGGAACAAAATCATGGG-TCTCTTCATCAGGGAAATAGCAATT
TACCCAGTAGATAAAA--GTGTCAGACATTCCTGGATAGCATCTAAAGCTTCTCTCTTCACTCGATGTCATGGGGACG--
------------------------------TTTTTAAAG----ATAGACACTAGCATGAAGA-AAGATTACCCAGTAGTA
```

GATGTGTCTGAACAGGGCATAGGAACACTTTTCCGTCTCTGCTAAGAAGGAAACTAAAACA-CCCCACCATAAATGTCAG
GAGCATAGAAGAAGGAGCC----TATTTACGCAAGAAACT--------TTACATACAGACCTCAAAACCACTTACCCAAG
GAAAACAATAATGTCTCCCTGATGTGGCATTCCCAAAATGCCTCATTTTAATAACCAGGACAAGCTCTAGGCAAAGTTGT
GAGGCCAGTCAAGATTCTTTTCAGCCCCCTCTCCATTTTTGAAAATTGAGATATTTTTCTGTTTCTT----------
-GTTTTTTATAAACTCACAGTGTATCACAACGTTTTATCCATTATAAA-GGAATGCCCTAGCGAAAAGTAAATTCCAATT
TTTTGGAAATC----TTGAGAACTAGAAGTAAGGAAATTTGTTATTTAGAAACTACATGTAGTTTTTATTCTTCTCTAGA
AATAGATGATTGAAATCACC-TTAACACACTGATTATTGTGGCAAAAACACTCTTTCATGTTGCAAAGATGAAGCAAAGA
ACTTATTCTCAAAAAGGAAATGTTGAGAAAATCAAAAGC----AATTTTCTCAGCAAGGAGGCAA----------
----------GAAAACTGGAT-AAGCTTGATCTAATCTAATCTGATTTAATCACTATCCCAAGACTGACTTGGGGAAA
GCGGTATTTGATAGCAT------ACAATACTATATCCATGGCATGATTCCAGTGGTGGATCTTTAAGAAAATAGAGGA--
----------TATACCAATACTGGTGGGAAATA-TGGTGTTAGAATGACAAAGGATTTTGTATTTCCACTTGAAAC----
----TTTTTTGAGTCTC---AGTTGTTTGTAGTATATATGAATATCTGATATTATCAGATTTA------AAAAGTTGTAA
AATATAAAAAATTCAAATAA-AAGAATAGACAATCCCCTATTGGCAGGTACAAAA--CTAACGTTATCATTGTGATCTTA
CTTTTAATTACCTCTCTAATATTTCTAAAGTATTTGTGGAACATGAGACTGGTAGGCATGTCGT----------GTCC-T
CAGGCACTGTGTCTACCTTGTAACACAAATTATCTACCTGTTCTCAATTCAGGGGAGCTTGGGAAACATGCATG-T-ATG
TATTATATGTGTGTGTGCGTTTAAATAGGA-TCTGTGTGGGTATGGGGTTGATTTACAATCCCCTGTGACTTGGTTGCAG
CCCATGTC-------GTCTGTGTGGATAATGGGTCTGCATCAGAACCCTAAACCCTGCTCCTTTTGTAGTTACAGCATCT
TGGTTTTCAAGCTGCCATTATTTT-TTATTATCATTAGACACCACATCCTACTTTTCTTTCTTTATCACAGCTCAACTTC
TG----------GAATGGGTATTCCCCGTCCA---CTGCTTCATCATCTCACATCAGAATTGT
TGA--AATTGTACTTTTATTACTGTACT----------ACTTTCTTCTCTTTTTTTTT
CTTTCTCTGTACTTTTTTGTTTACTGCTATTTATT----------ATTATATTACTTTTCTCACTCTTCTAGAAGTT
GTGCACTCTCCATGGCAGAGGAGTTTTAC---------TGTTCATTTACTTCAGAGAAACATTTAAGGTGGTACTAAGGA
T--AGAGAGCAGTAGCTCTGCTAAGAATGGACTTCATTCCAAT-AACACTGCTCTTAATTAAAA-CT--TGTTGCCAAAA
ATAAAA-CGGATAGAAATAATAGTGACTGGGGAGAAGCCAGTCATATAGCCCAAAAGGAATGGAGCCAGCCCTCAAACTG
AGGGCATCTGACTTGACACCAGCCTCAACAAGAGACTCCTGG--CCTTTTTAATTACTTGGGAA-TTTTACCCTCCTAAA
TCAGTTTTCCATATGGAACCCAAGCTCCCATAGCTGTAACCTGGATGGTCTCCCTACCTGCCTCCGCATCCC-GTGACCA
TGTGTGTTAGAACCCTAAGAATAC---ATCTCTTCCCTCAGTAACTACCACGGCCCAAGTTCTGCAGGGAGTCCACAGGG
CTCACAACCTTTGGACACCAATGAAGGTATACTACACATGTGCATAGGAACTCATGATCTTTT-TCCAAACCTACTCTTC
CCTAACCTTTCTAATTGCAAAATAAAGCACCACCATCTATCCATTTTCTAAAGTGGGAAGTCCTGGACAAATCTCCTTTA
TCCATTATATTCACTTTATCACCAAGTCCTGCCAAGTCTGCCTAGCCTCAATATATCACGAAACCATCTATTTCTTTCCA
GGTCTACTGCCACCACCCTAGGCTAAGTGGTCATCATCTCTAACCTAACCTGGGCAATAGCTTCCTACCTGGGGTCCTAA
GTTCCACTTTCACCTCTCCTTTCCAGTCCATTTTCCACACTGCTAATGTCATCATTTTAGAAGATTCT-ATCATGTTTC
>Outgroup2
ATACATGAAACCATAGACA-AGATATATATCTATAGC----ATGATTCCTACAAAAAGTCATAAAATTATTTGACACATT
TCTTAAAATTAAG-CAAATGAACACTA-TTTTCCATATATAAAA--GT--ATACTGATAC---TTATTAAAT-AGTAGTC
AATTATCATTAATATTTATTATTATTTATTAAATTAAATTTCTATGAATTTTCATTCCCT---TGAAGAT--TAAT-AGT
TCTCATTTTCAAACATGGAAACACAGACACTGTTCTCTCAGCTGGCAAGTTCACCAGGGCAAACTTGAAAATAAGTTTTT
CCAACTCTTGCTCAGCCTGAATTAAATGCCTGAAGGATGAGAGAAGTCAAAAA-----GTAAAGAAAAAAAAGTTTTTCT
GGAAGTATC-CATAAAA--GAATGTTGATGTCAGTAAGTCCAGCTGG-AGGGAGGATAGGGGTGGCGG----------
----------TGACCT-GGACAGGATGGACCCTGCT--------GTCC-CCAGCTGAGGCGGGGG
AGC---AGGAAGACAAAGGCCCAAGAGTTCCCGGGTTCTGGCTCTCAAACTAGCTGCGGAGCTGGGGAGTGTCTGTGTCC
CGCT-GGGCAGGGGGTGGTTTGTACCATGTGGGG----------GGAGCGTGAGCAC-AGAGAGGGCACCCA
TGGGAACCAAGAACCCT----GGGCCCAGTTCCAGAGGCAGCACAGTGCA-GAGCTCCCACCTGCCCCATATCC-TT---
----------GCCCGGGCA
G-CCTGGTGGCAAACCCGAGAGTTGGGGGTGGGAAGGGCT------GGGGCCTCTCTGCTCCAGCTTACTTTGAATCCAC
CGGAAATGACAAGCTATT----------CTTTCCT----AAAGAAAATAAATGTGGAGACAA
AAACAAAAAAAACAAAAAACAAAAACGCAGAAAAATTAACTTATGAAA-GCACTG-AAAAGTGTCCCTTATGTGAGAAA-
AGAAGACACCGAGTGGACTGAAGTTGCTAT--AGAGAAATTTAT---AAAGCCCAATTATAAAAGGATATTTTCTAAGCA
GTTAAGA-GGGCAAGATTTCATTGGACTGAAGGAAAAA----------TTATTAGTC---TATGTTCAACCTCAGATT
TTT--AAATGAATAAA--CCAGATGTGATACAAAAATAGAATTTTAAAAAAATTATTGATAATGTTAGAAATGAAAGAGG
CCTTCA-ACAGTACTAGAATTCTCAGATATTTTGAAAGGAAATAAAATCATTGGGTCTCCTTATTGGGGAAATAACCATT
TACCCGGTAGGTAGAA-AGTCCCACAAATTCCTGGGTAGCATCTAAAGCTTCT-GTTTCAGGCACTGTCATGACAGGA--
----------TTTTCTCAGCCAAATGGACGCTAGCCTGAAGA--AGGCCACTCAGTGGCA
GATGAGCCTGAATGGGGCATAGGAACA--TCGTTTTTTAGTAGAAGAAGGAAACTAGAACGGTCCCACCACAAATGTCAG
GTGTATAGGAGAGGAAAGC----TATTTACTCAAGAAATT--------TTACATACAGACCTCAAAACCACCTGATTGAG
GAGAATAATAATGTCTCCCTCATCTGGTGTTCCTAAAATTTCCCATCTTAATAACCA---CGAGATCTAGGCAAAGCTGT
GAGTTCAGTCAAGGTTGCACTCAACCTCCTCTCCATTTTAAAAAACTGAGATCATACTTTTTTCCTATTTTTTGCTTTTT
TTTTTTTTTCAA-TTAACAATGTATCATAATCCTTTATCCATTACAAT-GAAGTCTCCTAGCTAAAATT-------AATT
TTTTGGAAATG----GTGATGACCGGAAGTAAGAAAATTTGCCATTTTAAAACTATAAGCAGATTTTCTATTTCTCTAAA
--TAGGGAGTTGAATTCATCTTTAATACACTGCTGGTTTTGGCAAAAACATGCTTTGGTTTTGCAAAGATGAGGCAAAGA
TCCCATTGTGGAAAAGGAAATACTGAGAAAACAAAAAGGT--AAAACTGCTCAGCAAGGAATCAA----------
----------GAAAAGTGGATCTAATCTAATGTAATCAGAT-----ATAATCACTATCCCAAGACTGACTTGGAAAAA
-TGGTATTTTCAAGGG----------
----------ATGTTGTATTTTATTTTTAAAT----
----TTTTTTGCATCTTTTAAATTTTCCATAGTATATATGAATATCTCTTATTATCAGGTAAATTAAAAAAAAGTTTTGA
AATAAAATAAATTCAAATCT-AAAA--ATA-----ACCTAATTACAGGTACCAAA--CTAACATCATCATTGCTATCTTA
CCCTTAATCGTCTCTCTAATATTTCTAAAGTATTCTTAGTATGTGAGACTAGAATTTAGAGGTATGCCATTGCCCTCAGA
GAGGCACTGTGTCTACTTTGTAACGCAAATTGTATAC---TGGTACCTATTCTCAATTCAGGTGAGTGTATATTTACATA
TTATAGTTGTGTGTATATATTTAAATAGGATTCTGAGTGGATTTGATATCAATTTACAATCTCTTATGCTTCTACTGTAT
TCCATGCC-------ATCTGTGTGG----------AACATACCCTGTCCTTTTTGTAGTCATGTCATCT
TGGTTTTCAAGAAGCCATATTTTT-TGATCGTCACTTAACACCAGATACTACTTCTCTTTGTTTATCACAGGTAAACGTC
TA----------GAATGGCTGTTCTCCATCTA---CTGCTTCATCACTTTGCATTAGAATTCC
TGG--AATTGTACTACTTTTATTACTGT----------
----------ACT--CATCACTCAGCTAGAATTT
GT--ATTCTCCATAGCAAAGGGGTTTTAT---------TGTCTATTTGATTCC-AAAAACATTTAAGGTGATGCTAAGGC
T--AAAGAGAAGTAGTTTTGCTAAGAATGGGCTGCATTCTAGT---GGCTGTTCTTTATCAAAG-TTGTTCTTACC-AAA
ATAAAA-CTAATACAA-------GAATATCACAGAAGACAGCCAGATAGC--------GATGAAGCCAGCTCTCAATCTG
AGAGCTTCTAATATCAGTCCATCCTCAACAGGACACTCCTAGTTTTTTTTTTATTCCATAGGATCTTCAACCCTTTCAGA
TCAATGTTCTATAAGGGACCCAGGCTCCCATGGCTGTTATCCAAATTGTTTCATT--------TACCTTCCGAGTGACCA

TGTG--TTAGAACCCTGGAAATAT---ATCCCTCTTCTCAGTCAGCACCATGCCCCAATTTGTGCAGGGAAGACAGGGAA
CCCAC-AGAATTCAAAACCCATGGGAGTATATTGCAAATTTGCATAGTAATCCATGATCTTTC-CCCAATCCTACTCTTC
CCTGACCTTTCCAATT-AAAAAAAAAAAATTACCATCCATCC---------------ATTTCCATGACCAATCTCCTTTA
CCCTCTCTATCCAATTCATC-----ATCCTGCCAATTCTGCCAAGTTTCAATGTATCTCAAAACCATTTTGTTCTTTCCA
GTTTCACTGCCACCATCCTAAAATAAGTGCTCATTATGTCTTACTTGGCCTG-------------------GGACTCCCCA
GTTCCACTCTCATCTCTCTTCTTCAATCCATTTT-CACACTGCTTATATCAACTTTTAAAATGATTATNNNNNNNNNNN
>Perissodactyla_Sp2
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNGTGGAA-TTTTTACAAATTATCCTTTCTTTAAAGAT-TAACAGTCTGAAG-AGG
CCTCATTTTGAAACCCACAAACACAAATACCATTCTCTCTTAAGGCAAGTTCGCCAGAGCAAACTCTGAGAGCAGTTTTT
CCTACTCTCATCCAGCCTAAATTAAATGTTTGAAGGATGATGAAAGTGGAAAA-------GAAAAAGAAAGAATTTTTCT
GTTAGTATC-CATACAG--GAATGTTGAAGTCAGTGTGTCCAGCTGG-AGGGAGGATAAGGGCTGGGAGGGGGGCAGAAG
TGCCAGGAGGGGCTGAGGAGATTATTGCTCTGAGAGAGGCCAGAGCAGGTGAT---------CCCCAGCTGAGGCGGGGG
AGT---GGGAAGGTCAAGCCCGGGCAGCT--CTCAGGTGCTCTCTCGCT--------------GGTGAGTGTCTGTGTCT
AGTT-GGGCAGGGG-TGGACTGAAGTG-----GGGGGAGGTTAACAAGACAGGACAACAGCGGGCTAGAGAGGGCAACAG
GGGGAATCAAGACCCCG----GGTCT-AGTTCCAGAGGAGGTGCCATGTT-GAGAGTTCCCCAGCCCCTCCACCCCGCGT
CACCGGGCGGGGGGCG------------CACCTCTCCCCTGGTTCACATCGTTG------------------CCTAAGCA
GGCCAGAGCGGGGAGCTGGGGGCT-GATGGGGCTGGGGG-------------CCTCTGCTCCAGCTTGTTTTTAATCCAG
TGGAAATCTAATATAATGTGAAAATAATGACAAAC--------TATTTTGTCTTCAAACAGAAAATAAATCTGGAAACA-
---AAAAAAAAAAAAAAAAAAAAAATTTCA-CAAATCTAACTTATGACA-GCACTGAAAAGGTGCCCCTCGTGGGAGAAA-
AGAATAACACATGTGAAATAAGGTAGCTAT--AGTGAGGTTTAT---AAAGCCCAATGATA-AATGATATTCTCTAAGCA
GTTAAGA-GGGTAAAATTCCATTGGATTGAAGGAAAGATGCATGTATCTTATACCTATC---CATCTTCATCTTTAGATT
TTTT-AAAGAA-TAAA--ATAGATATGATCCAAAAAAAGAATTTTTAAAAA-TTACTGACAATATTTGAAATTAAAGAAT
CCTTCT--AAGGACTAGAA-TCTCAGATATTCTGA--GGGAAGGAAATCATGGGGTCTCCTCATCAGGGAAACAGTGATT
TACCTGGTAGGTAAAA--GTACCACATGTTCGTGGGTAGCATCTAAAGCTTCTCTTTTCAGCCACTGTCATGAGAGCA--
-------------------------------TTTTCTAAGCCAAATGGGCCCTGGCCTGAAGA-AAGGCCACCCGGTTATA
GGTGAGTCTGAACA-------------CCATTCCTCCTCTGATGAGGAGGGAACTAAAATAGCCCCCCCATAAATGTCAG
AGGTATAGGAGAAGGAGGC----TATTTACTCAAGAAAGT--------TTATATGCAGACCTCAAAACCCCCTACCCAAA
GAAAATTATAGTGTTTCCCCGATGCAGCATTCCTAAAATGCCTCATCTTAATAAACAGGACCAGCTCTAGGCAAAGTTGT
GAGGTCAATCAAGGTTGTCTTAAGCCCCTTTC---TTTTTAAAAATTGGGATACTTTTTTCTGTTGCTTTT---------
--TTTTTTCCAA-TTCAAAATGTATCATAACATTTTATCCATTACAAT-AAAGTACCCTTGCTAAAATTAAACTTCAAGT
TTTTGGAAAC----CTTGAGAACTAGAAGTAAGGAAATTTGCCATTTTAAAACTGCAAGCAATTTTTCTATTTCTCTAGA
AATAGAGGATTGAATTCACCTTTAACACATTGAGTGTTTGGGCAAAAACACCCTTCGGTTTTGCAAA---GAGGTAAAGA
TCCTATTCTGAAAAAGGAAATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNGTAGCAT------ACAAAACTGCATCCATGGCATGATTTCAAATGTCTTTGTACAAGAAAATATACTAAT
TTTGG--AAATATACCAATATTGGTGGG--ATATTGGTGATAGAATAATAAGGGCTTTTGTATTTTCACTTGAAAC----
--TTTTTTTTGAGTCTTTCAAATTTTTTGTAGCATATATGAATATCTCTTATTATCAGGTTAA-----AAAAAGTTGTAA
AATAAAATAAATTCAAATCT-AAGCTCATACAATCACATTCTT-CAGATACAAAA--CTAACATCAT---TCTGGTCTTA
CTTTTAATTATCTCGCTAATATTTTTAAAGTATTTATAGAACATTAGACTGTTAGGCTTGTCATCGCC------CTCAGA
GAGGCACTATGTCTACTTTGTAATGGAAATTATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTACATATA-TTATA
C-----TTGTGTATATATATTTAAATAACATTCTGTGTAGGCTTGGTGCTAATTTACAATTCCTTAGGGCTCTGCTGCAT
CCCATGCC-------ATCTGCTTGGCCAATGCGTCAGCATCAGAGACCTAAACCCTGCACCTTTTGTATCCGTACCATCT
TGGTTTTCAAGAAGCCACACTTTT-ATATTACCATTTGACACCAACTACCACTTTTCCTTACAGATCATAGCTAGATTTC
CG----------------------------GAACAGGTGCTCCTCATCCT-----GCTTCATCACTTCACATCAGAATTTT
TGG--AATTGTACTACTTTTATTACTAT--------------------------------GTTACTTTCTTCTGTATTT
TTTTT---------------TTACTTTTTCTGCTTACGGTTATTTATTATTGTATTACTTTTATCACTCAGCTAGAATTT
GTGAACTCTCCATGGCAAAGGAGTTTTAC---------CATCCATTTGATTCAAAGAAACATTTAAGATGATGCTAAGGT
A-TAAAGAGCAGTATCTCTACTAAGAAGGGACTCCATTCCAGT-AACACTGTTCTCCATCAAAA-CTGTTCTTGCCAGAA
ATAAAA-CTCATAGAG-------GCATAGGGAAGAATGCAGTCACATAGATAGAGAGTAGTGGGGCCAATCCTCAAATAT
GGGACTTCTGACT-----------TCAACAAGACAGTCCTA---TCCTTTTAATTCCTTGGGAACTGTGACCCTCTTACG
TCAGTGTTCCATATGGGACCGAGGCTCCCATGACTGTTACCCAGATGCCCCCCCT--------CACCCTCCCAGTGACCT
GCTG--TTAGAGCCCTGAGAATAC---ATCCCTCCCTTCAGTAAGCACCATGGCCCAGGTTGTGCATGGAGCCCACCAGG
CTCATAACGCTTGGGTACTCATGGAGGTATATGGCACATGTGCATAGGAACCCATGATCCTTC-CCCAAGCCTACTCTTC
CCTTGCCTTTCCAATTGCAAAATAAAGCACCACCATCCATCCATTTCCTCACATAGGAAACCCTGGACCAATCTCCCTTA
CCCCTCCTATCCAATTCATCACCAAATCCTGCCTACACCACTCAGTGTCAATGTATTTCAAAACCATCTGCCTCTTTCCA
GCACTCTCGCTACCACCCCAGACTAAAGGGTCATTA-CCCTCACCCGGCCTGGGCAACAGCTTCCTAAGTGGGGTCCTCA
GCTCCACTGTCACCTCTGCCTTCCAATCTATTTACGACATTGCCGATGTCATCTTTGTACAAGATTTT-ATCACGCTCC

9. Perissodactyla+Cetartiodactyla+Carnivora

```
>Bos_taurus
AAGTTGAT-ATTGTGTAAATCCTTTAAAGAAAAACATAACTAAAAGAAACAAAAAAAAGCAGGCCCCAAATTTGTTGTTT
TA------AAAAATAAGTGTGCATGGCCTTTTGTCTTTCTTTTAGTG--------TGGGGGAGTCTGGAGGAATTGAGAG
AT---TTCAGCAGTGCATCATCTAGCTGCCAGCCTGCCTTGGCCATTTCATACAGT---TCTCTTTTACTTGACACTTCC
TGAG---TCCTC-ACTTACTGTTTTCTTTGGGTAGAGACAAGCAAGCTAGTTTGCATTTTTACT-TGTTTGAAATTCACT
GCCCTGTTCTGTATC-TGAA-GAGAACTAATCAC---TTCTTTGTGACAATGTATGATCATTAATGATAATAATGTACAC
TTGATCTGTTGGAAACTTGTTCACTACAGTAATTAATTTATGGACTACATGGTT--------------------------
CTCACAGATTGTCTTCAGACAACCAGTAGTTTCAAGAAGTTGTGAGAAGCAGAAAATGAGAGAGGAAAAGT---GTGTAA
ATAGCTTCTG----CAAAGAACTTTTCTCTTGAGACATACA-TTTTTGAGAACAAAATCACTATATTTGTACCAGTTAT-
ACTGAATATTTTGAA--AAATTAGTGTTTTGTATGAAAAGACTCTTGGTTCCTGGGTAT---TTTT----GTACAGTATA
CCTT-TCTATTTGATTGACACATTACTTGGATATAAGGTTCC---TCATATGTTATCATGAAGTCTCAGT----GTTGAT
TCTTTA-TAGCCACTAGAAGTTATCCCAAAAGTCTTGTGACTCATTATGGATGG-ACATGTATTTTACACTGTAAATATT
TCATACAGTAGTCAAACAAATAAAGTTCTCAC--ATGGACCAGGACACCATTGAGC----------TCATTAATAA----
CCCATCGCTTTCCACCACTTGATGCTTTTGAGTCATCCATGTCCTAATGACT-GTATTTGGTCATAGACAGGCTTTCAGT
TACAGCTTATGGAATCAGGCACATGATTTTCTATTTGCTTTCAAACTAGTATTGATTAT-ATTTGCTGAAGCATTT--GT
CCCAAAGAATTTCTTGCATTTTGCCCCCATGAGTTTAGATTGTCTATGCTCAATTCCCCATGGTCAACTTTTTCTGT-AA
TTACTCACT------TCTTAGTATTGCTTATCATGTGCTGTGCTGTGCTTAGTCGCTTAGTCGTGTCTGACTCTTNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTATAAAAATGTG---------------CA
TTAAGTTAAGAAATCTATAAG---CTTCTTCGTTGCCTTCCTCATTCTT----------TATATT-TTTT------AAAG
AAAGTCA----GTAATGAACATTTA-------TTT------------------TTTGTAGTTTAGCAATTGTTATTGCAC
TATGATAAAATG---TGTGTTCT----CTTTATATT-CTTTC----GTGGTCTACAGAAGA-TAGTAAGAACACAGACTC
CAGAA-TGAGCCTTTCAT-TTTTATCAGAGGACAGTAAAACCACT-----------------AATTAAGAGGAA----AA
AAGCGGGTGGGGGCAAAAAGTCTTAAGTTTACCATCAGTGGACATGTTCAATGTTCATA-ACTCT-TAAATA-CCTGAAA
AAAAAAAAGAAGAAGAAACTGAATTAAACTAGCTAATCGACTAGCTAGCTGAGGTCCTGTTGTGTAATCAATAGG-TACA
TCACCCAT--ACCAAGGAAGGAAA-GC-AAAAAGGGAAATGTT---GCAATTAGAACACTATCAGATCTCAGC-AAAGTT
-----GTAATCAGAATGTTCTTCCCTGTG-T-TCCTCCTTTGGCTCAGTTGCATTCGTCTTGAGATCTACTCC-AGTTTC
TACCTCTTTTGGTATTCTGAGCACCCTATTTCAGTCCTCGGGCTGCTTTGGTAAGTTCTGTCTTCAGAACTCTCCTCTTT
TCAGAA-CTTTCCCCTGCTCTTCTCAAAAGA-TATTTGTCTCCCTTCTTCTGCAAGGATGAC---ACTCTCCTTGTACCT
TCAGTAAGAA---------GAGGTCAATGAAATAAAA--TCTTTCACAAGCAAAA-ATTCAGGCTGGTAGAGAGAAGTGG
TGCTGAAATAGATGTTGACC--GACTTTATAGTCTCAG-ATCCCTT----CTCTGTGTTTTCC-AGGTAACCACAGCTGA
TCAA-CAGGGGATAAATTGTACA-------ATATTTGCTATATCTGGACTAGATTATCCTCAAGTATTCTACAAACTA--
AA-TTTTATACTTAATATTCCAGAGATGAGTCACAAACACATAGCCCTTCTAAGAAAAGCCAGT-CAAATTGTGTTTGTT
ATATAGACTTTCTTTGGCTCTTGTCATGTGCAGGGA-TGATGGCAACCAGCCACACTGGTCACAACTGATCCTCAGGGTA
GAGAGCATAAATCAGAAGTAATTACATACAAGTTGGTCGCT-GG-AAGA----CAACCACCTCTGAAACCCCTCTCTCAG
GAATTGAATCTTCTCTCTTGGCACATGTATTTCCAAGAGATACATG-CAGTGAGAGGTAAGTACATTTTGTGAGGACACT
TTTCTTAAATCATAGGAGGAGAAAAGG-TACTAACAAGCAAGTCACCCCTAACTTCTCATATCCAGAG--GATTTGATGA
CTTT-------TAAAATGACAAAGCAAATTTTAGGGTTGGAAGACCAACTTCAGTATCAGTAAGATCTTCG-GACTGAAG
TCTCATTTAAAGAAGAGGGCCTTTCACAGAGGAGTAAATATTTCAAGCATATGAATTCAAGGAATTTTAAGGGCCTGAAA
CTACAGGAAGGGAGAGAAA----TGCAATTTGCTTTTAGGCAATA-AGACTGTGTGAAAATCTGAATGT--AAGTAT---
-------CTGAACATGAATTCAAAATCAAGATGAAGAATTTGACTAGTCTCAA----CTGGTGCCATCCAATTAATTTTC
CC---CCAACAAAGCCTGGAACCTGGTAAGCATGTTAACAAGTGTGAGCTGCTACTATTGGCATTATGATTATTATTA--
-GAAATATTTTTCCTTGCTTATGTCATCTTATTT-----GAGGGGTTAAAACACATACATA-CTCCAAAGAAGCAA-AGA
TGACTTGCATATGGTTTGTTATAATCAC---TAATCTGGTTTCATATGAA---TTTCCAGATTTTGACAAGTGAAATGGA
AAAGTTC-CATTGGGTTTAATCCCAAGTCTTCCTCATACTCATTTTATAGCTTCAAGAAAATGGCTATTTCACAGCTCCA
GGTCTGGTTTTCTACTTG-GTTCTCTGAAAGGATTTATTGAAAACCCCAAGTGGGCTGGAACATTCCTGCTGGTTACCTT
TCAGGAGAGCAACTTTGTAT---GAGCACAGAGAATGTTTCACTGATTTGTGAGTTTTT---------------------
-----TCCTTCTTGTTTTGACAGAACAAAAGCCCTTGTCTTAGAGCTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATATTCTC-ATCTT-AAAAAGTATGTTCACATAAGCAC
CTTATGTTTGGACATCTTTGAACAGAATGGTTTA--CTTTTTATTTATTCTAGGGCCCAA-AGATATAATTGTTAATTTT
CTCAAATGTCACTCAGGGAGAA------------GTCTAAA-TATCTTAAATGGAAGCATTAAGCTTTCTTGGCTGTCCC
ATTTCCAAGAAGAGTTAAAAAC--TCTTTGTAGCACTGCTTTTCCTATGGAGAATATGAACTAGCCAAATCTGAAAACAG
CTTCTG--ACTGAC--------------------------------------------------------GTGGTTCCTGT
AATCCTCATTATTTCGGT--GGGGGCGCTGGGATTGATCCTCTTCGCAGACGAGGAAACCGAAGCAAATCCCT----TTG
CCCTCTCTCAGCCCACTTCCACATCTGTAAG---------AATGGAATT-GGAAGTCACATGTTTTGAAC-TCCTGAACC
CAAGCTCTTAAAAACCATGCCCTCTTGCTTTCATACAAGTAAGTGTTTTCAGGTAATTAAGGGTATTCATTAAGTATTGC
ATAACGCTGCAGTAAACATGGAAGTGAAGATGTGTCAATAGTAATTTTTTTTTTAATTAGCTGCAATGAT------GCCA
GTGATGATGGAGACAC-GTGATGAATGTCAGGTTCCCGGAGCCGTTCCAGAACAGTGA-TGCTGTTTGTGTGTAGTTCAC
ATTTACCCTCACAATAC-CGCATCTCTTAGGCTGAACCCAATTTAC--------CTGTATATATGTTTCTTTCATTTGAC
AAATGTCTGTTGAATAAAAAAAAGTAAGGAAGGAAGCCCAAAGGAAAATTACATTTGCTTCAGAGAAATAGTTTGA----
----------------CCTTTTTTTATAGCAACCACCATACCAAGTGACTTTAAACTACTGTATTG-----TTTTTTTCT
TAAACTATTTAAAGGAGAATTTTTGAATCCTGCTAGGTGAGCCTAA-CTTT-CCAGTTTCTTAAATAGATTTATTTTACC
TTGTTGTAGTGTTCT-GCAG-AAG-CTGCTCCTTCAGATAAAAGTTGATTTTCCAGTTTCTGA-TTTGTTGCCAGTGTTA
AAAGGAAGGAGTGAAGTAAATAGGGGCACTGAAGTAAATAGGTGCACTGCTGATGGTGC-TTAGTGCCCTTGGGCG----
TTGTTTTGTATGAT-GGCATGTTTT--GTTTCAGATGCAGCAGTACCAGCAGGCTAATGAAAAG-GATGAGTGCAAAA--
-TTTTTTAATGGGAAAGGTTAGGAAAACATTCATATTTTATGCTACTGTTTTTATTTTGATATGCAAATGAAAGAATAGT
GGATAACCAACA----GAAAAGTAGAAAGAATGATAATGCAAGATGAGAAGGCAACAT---------------------
-------------------------------------------------------------TATGAAAGATGTTAA
AGGTCTTAGGAGGG-GGGTTGCTATTTATATCCA--------AATTATAATCCACAAACTACTTAGTGGGCAGAAGGGTA
GTAATGTTA-TGTTTTCTCTCGATATTATATAGAAAAGGTAA---------------------------TTAAAGCTGGA
GGTACATGAA-ATCTTGGCTTGATTACATGATTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTCTTTACCAACTGA
GCCACCAGAGAAGCCAC-TGAGTCAGGTTTATTGGCAGAGATCCCTTGATTG-TATCCCTTTGTAGA-ATTTGCGCAATT
TAACCATGGAGCAAGTGCAATGGCA------------------TCACTATTTATTAACTAAATAGTGTATTTAGGGTTAA
------------TACAATGAATTTGCAATACCACTCCTTTGCAATGAAGAGTAGAGTGAATGTGGCCACCC----ACATC
TCATTACACTGCAGGGCAAA-CGCTGATTTCAATATATGTGGCTTTCATTTGCTTGTAATTAATTTTTTT-CATTAAAAC
GATAGATTTATCTCTA-CTTAAAACTCTTATTTTCCTAGATTCCATCACTATGGAATGTTAAGGGAAGGAAAAGACTGAA
```

```
GTCATAGTTCACTTA-TACAGA-CTTTCGGCTGC-A----A-CTGAACAGCTGTAAGATTTTTTTCAATCGCTATTTAGA
A-A-------GGACAATAGATGTGTTATCAGCCAAAATATACATCTTTATTACGTCATT-GAAGACTGTGTTCTACATTT
TATATGTACACAATTGACCTTTCATT-CAATACTGA----ATATTCA----TTCTACTCACTCATCCTA---CAAAAACT
TATTGAACATGTGT-AATAACTACCATGCTGGGGTG-CAGTACAGAACAACAGACACAG
>Canis_lupus_familiaris
AAGTTGAT-ATTGTGTAAATCCTTTAAAGGAAAACGTAACTAAAATAAAAAAAGC----CAGCCCCTAA----------T
TAA-AAGGAAAAATAACTGTGCATGACTTACTGTTTTCCTTCTCGTGGCGGGGGTGGGGGGAGCCTGGAGGAGTTGAGAG
CC---TGTAGCACCGACTCATCTCCCTGACTGCCTGCACTGACCAATACATAGATTTTCTCTCTTTTACCTGACATTTTC
TGAA---TCCTC-AATCACTGCTTTCATTGCGTAGAGACGCGCAAGCCGGTTTGCATTTTTGCT-TCTTTGAAATGCCAT
GTCCTGTTTCACGTC-TGGAAAAAAAAAAATCGCTTTTTCTTTGTGACTACTTATGACTATTAATGATAATAACGTACGC
TCGATGTGTTGGAAACTTGTTTGCTGCAGTTTTTAATTTATAGAGCGCATAGTT--------------------------
CTAAGGGATTGTCTTCAGAGAAT---TAGCTTCCAGAAATTGTGAGAAGGAGAAAATGAGAAGGGAAAAG----GTGTAA
ATAGCTTCTG----TAAAGGATTCTTCTCTCGAGACATACA--TTTTTAGAACAAAATCACCACAGTGGCG-----TAC-
TTTGTTTATTTCAAATAAGATGTACATTTCTCACTGGAAGACT-TTGATTACTGGGTTT-TGTTTA----GCACAA-ATT
TCTG-TCCATTTGATGGACACATTGCTTGGAAATGAGGTTCT---TCATGTGTTATCATGAAGTCTCCTT----ATCAAT
TTTTTT-CAGCCAATCATTGTTCTCCCAAGAATCATTTGGCTCATCATAGAGGGGGCTTGCATTCTACACAGTAGGCATC
GTATTTAATAGCCAAACAAATAAAGCACTCACAGATGGACATGGACACCATCATGCCCTCATCATGCCCTCCACAATTAG
TGCGTCACTTACTAACACCTGATACTCCC-AATCCTCCATG-CCCAATAGTTGCTGTTTTGTCATAGACAGGATTTTGGC
CACAGCTTATGGAATTAGTTACATATTTTCATATCTGCTTTCAAAATAGTATTGACTAT-ACTTTT-GAACTCTTT--GT
CCCGAAGAATTTCTTGTGTTTTGCCCCAT-GAGCTTAGATGACCTTTGCTCAATTTACCAATGTCATCTTTTTCTCT-AA
TGATTCATT--TCACTCTTTCTATTGCTCATCACATCTCTCAATAAAAGGAATCAAATCACCTGCCTATAGAACAAAGTG
AGTGTAGGACTGAG--AAA-------GAGCCTGAGGCTTTTATATGAGCCCTATTGAAATATG-----CAATTATTAGCT
CCAAATTAAGAGAGCTGTGGAATTTTTCTCCATCCCTTTCCTTCTTCTT--------AATATATT-TTTT------AAAG
GAAGGAA----CTAATGAATACTTAG------GTTTTCTGATTTTTT------CTCTTACTTTAGTAATTATTGCTCTAC
TATGATAAAA-----TGTGTCATGTACCTTTATGGT-CCTTA----GTAGTCTACAGAAGA-TGGTAGCAACACAGGCTC
CAGAAATAAGCCTCTCAT-TTTTACTGGAGGACAGTAAAACCACG---------------GTAATGAAGAGAAATTTTAA
AAA----AAGTGGT-ATAATTTTGAATATTATCATATTTGTACATGTGCAATGTTCATATATTTT-CAAGTA-CCTAAAG
AA----------ATGGAACTGAATTAAACGAG--------CTGGCTACCTGAGGCTCCGTGGTGTAATCAATAGG-CATA
TCA-CCATTCACCAAGGAAGGAAA-G--AAAAAGGGAAATGTTTAAATGATTAGAACACTGTCAGCCCTCAGC-AGAGTT
GTAAAGTAATCCGAATGTTCTTTGATGTGTT-ACCTCTTTTGAGTCAGTCGTCTCTCTCTGGAGTTCCATTCTTAATTCC
TGTCTCTTTTGGTGTTCTGAG----CAATTTCAATGCTCAGGCTTCCGTGGAAAGCAGTCTTT----AAGTTTTCTCAGA
----------CTCCTGCCTTTCTTAAAAGA-CATCTGTTTCTTT---TTTCTAAGGATGAC---ACTCTACTTATACCT
TCAGTAAAAAA--------GAGACCAATGAAATAAAATTTTTTTGCAACTAATA-ACTTAGTTTGGTTGGCAGAAGTGG
T-CTGGAAGGGATCTCCACC----CCTAATAGTCTCAA-AATCCTT----CTCTCTGTTTTCC-AAGAAACCACATCCAA
TCAGTTTAGGGACAGATCATAAGTTATAAG-CATTTGCTCTATCTGAACAAGATGATCTCCAAGTACTCTACAAACAC-T
AAATTTTATGAATGATATATTGGAGAGGAGTCACAAACATAGAACCTTTCTAAGAAGTGCCAGTGTAAACTGTATGTTTT
ATATAGACCTCCTTTGG-TCATGCCATTTGCAAGGGGTGATGCCACGCAG-CACCCTGGCCACAAATGGTTATCAGGGTA
AAGATCCTAATTCAAAAGTAGTTCCATACAAGCTGGGCACG-GG-AAGA----CAAGCACCTCTGAGAGCT-TCTCTTAG
GAAGCAGA---TCTCTCCTGGGACATATG--AACAAGAGATACGTG-CGGCAAAGCGGGTGTACCTTTTATGAGGGAATT
TTTCTTAAGTCATAG--------GAGA-AACTAACAAATAAGTCACTTCTAACTTCTACCATATAAGG--GGTTTGTCAC
CTTGGGCACTTTAAAATGACAA-----ATGTTGGGG-TGGAGGATTGGCTTCAGGTTCAGTAAGATGTTCA-TAATAGAG
TCCCATTGAAAGGGGAGGGCGTTTCACAAAGGAGTCCATCTTGAAGACATGTGGCTTCAAGGACTTTTAAGTA----AAG
CTCCAGAAAGGGAGAGAAATAACTGCTAT----TTTTAGATGATA--AA--TTCAGATTTTCATATATTCTAAGTAT---
-------TTTAACGTTAATACAAAATCAAGATGTGGAATGACACTAGATTCAG----CTGGTGCCATCCACCTAATTTTT
TTC--CCAACAGAGCCTAAAACTTGATAAGCAT-TTTGTAAGTGTG---TTATCTCACTGGCATTATAATTATTATTA--
-T-CCTAGTTTTCCTCAC-TACCTCATCTTATTTAATTGGAGTGGTTAAAACACATCCATA-TTCTAAA----CAA-AGA
TACTTTGAATTTGGTCTGTTA---CTGGTCATAATCTGGTTTCATACAAA---TTTCCCGATACTGACAAGTAAAATGGA
AGAGCTC-CATTGGGTTTAATTATAATTCTTTGTCCTGCTCAGTTTAAAGCTTCAAGAAAATGGCTATTTCAA--TTCCA
GATCTGGTTTTCTACTTA-GTTCTCTGAAAGGATTTATTGAAAACCCC-AGTCGGCTGGAACATTCCTGCTGCTTACCTT
TCAGGAGAGTAACTTTGTATACAGAATACAGAGGATGTTTCACTGATTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTG
CTTGGTTCTTCTTGTTTCGACAGAACAAAAGCCCTTGTCTTAAAACTGTTGGCAGCTGTTTGTCTCGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGTTACTTTGTAGTTT----------GCTCACACAAACA-
----TATTTGGAAGTCTTTGAACAGAATGGCTTA-CCTTTTTATTTATTCTGGGGCCTAAGGGGTATAATAGTTAATTTT
CTAAGATGTCAACGAGGGAGAAGTGATGTACCTAGTCTAAATTATCTTAAATGGATGCGTTAAGCTTTCTTTGGTGTCTC
GTTTCCAAGAAAAGTTAAAAACTTTTTTTGTGGGATCCATTTTACTTTGGAGAACATGGAATTGCC-AGTTTGAAAGCAG
CATTTT--ACTGAC-------------------------------------------------------TTGGGTCCTGT
AATCCTCACTATGAGGG---GGTATCTCTGGGATGAGTTCCACTTGCAGATGAGGAAACCAAGACTAGTCCCT----TTC
TCTGCTCTCAGCCTTGTGCCTCATCCCCAA----------AATGGAATCGGG-AGTCACATCTTTTTAAC-TCCTGAACC
CAAGCTCTTGAAAACAACGCACTCCTGCTTTCATA-----------------------------------------TGA
ATAACACTGCAAGAACCATGGAGTCACAGATATCCTAAGGGTAATCATTT---TTATTATTAGCAATGAT---GATGACA
ATGAA----GAGGCAC-ATAATGCTTTCTGCGTTTCAGGAGCTGTTC-GGAACAGAAAGTGCTTTTCGTGTGTAATTCAC
GTTTACCCTCACAATACCCTAATCTCTTTGGCTAAGCCCTATTTATTTATTTATTTTTATATATGTCTCTTTCATTTGGC
ACATGTCTGTTGAATAAAAAAAA---------GAAACCCAAAGGGAAATTGCATTTGTTTCAGAA-AATAGTGTGA--TT
TTAAAAGGTGTGATTTTTTTTTTAAATAGCAACC-CTGTATT-AGTGACTGTCAGCTACTCTCTTGGTTTTTTTTCTTCT
TAAACTATTCATAGGAGGAGTTTTGAATTCTGTCAAGTGAGCCTAG-CTTC-ACAATTTTTTAAATAGACTTATTTTATC
TTGCTATGGTATTCTGGTAGCAAG-CTGC-TCTTCATGCATAAATTATTTTTCA-GCTTCTGT-TTTGTTGCCAGTGTGA
AAAGGAAAGAA------------------CATAGTAAACAGGTGTGATACTGACTGTGCTTTAGTGACACTGAGCA----
TTGTTT-GTGTAAC-GGCATTTCTT--GTTTTAGATGCAGCAGTACCAGCAGGCTAAGCAAAAA-GTTGAATATAGAACA
A-TTTTAAGTGGGAAAGAGTAGGAAAACATTCACATTT-ACGGTA---TTTTTATTTTGATATTCAAATGAAAGAATAAT
A-ATAACCAACCATTGGAAATGTAGAAAGAATGATAATGCAAGATAA---GGCAACACATTTCTTAGAATCTTAAAAATA
TATTTAT----GATCCTGGGATATTTTTCTAATAAAA-GTCTATAAAGATGGATGTAATA---TAAATGAAAGATGTTAA
AAGTCTTAGGAAGA-GAGTTGCTATCAGCATTCA--------AATTGCAACTCCT-----GCCTAGTAAACATAAGGGTG
GAAATGT---------CCCTTTATAGAGTATAGGAAAGGTAAATTTTTTTTTTTTTGAAGGAAAGGTAATTAAAAC--AA
TGTGCATTAAGATCTTGGCT-----CAATTAAACCCCCTCTGATAGTTCTTACCTATCAGAGACACAGGTCTTGGAAAGA
GAGTGAACTAAATTTCAGAACAATATTTTCTTGCCCAGGAAAT-ACCCATTTACAAGATTCAAAGTATTTTCCAGGAAGG
CTTTTGACAGTCACCAC-TAAGTTGAGCTTAGTTGCAAAGGTCTCTTAGTTG-TATCTTTTTGCAGAGGTACATATAATT
AATACATGGGGGAAATGTGGTGGGA------------------TCACTACAT-TTGACTTGGGAGTATATCCTGCCTTAC
------------AATGAGGAATGAAGT----ACAGTAAA---------------CCTATTTCTGGCCATCC----ATATC
TCAGGACACAACAAGGCAAA-CATTGATTCAAATATATGTGGCTCTCATTTGCCTGTAATTATTTTTTT--TGTGAAAAT
```

```
GATAGATTTATCTANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTG-ATGGACAGAA
GTAATAGTTCACTTA-TACAGA-CTTTCTGCTGCTA----AAATGAACAGCTAGAAGATCTTTTTAAGTCACCATTTAGA
ATA-------GGATAATAGATGTGTTATCAGCCAAAATACATATCTTTATTAAGTCATTAAAAGAACATGTTCTACGTTT
TATATATTCATGACTGACCTCTGATT-CCAGACTGATTGACTATTCA----TTCTACTCACTATTTCCA---CAAAAATT
TACTGAA------GACATA-CTACCATGCTGGAGATCCAGTAGAGAACAAGAGATATAG
>Carnivora_Sp2
AAGTTGAT-ATTGTGTAAATCCTTTAAAGGAAAACATAGCTAAAATAAACAAAAAA-GCCAGCCCCTAATTTTTTTTTTT
TAA---------ATAACCGTGCATGACTTTTTGTTTTCCTTTTTGTG--------TGGGGGAGTCCGGAGGAGTTGAGAG
AC---GATAGCACTGAGTCGTCTAGCTGACTGCCTGCACTGACCAGTTCATATATGCACTCTCTTTTACCTGACATTTCC
AGAA---TCCTC-ACTCATTACTTTCTTTGGGTGGAGACGAGCAAGCTGGTTTGCATTTTTACT-TGTTTGAAATGCCCT
GTCCTGTTTCGTGTC-TGGA-AGCAACAAATCACTTTTTCTTTGTGACTACTTATGATTATTAATGGCAATAATGTACAC
TTGATCTACTGGAAACTTGTTCGCTGAAGTTTTTTACTTGTAGA-CTACTGGTT--------------------------
CTAAGGGATTGCCTTCAGAGAATTAGTAACTTCAAGAAATTGTGAGAAGCAGAAAATGAGAAAGGTAAAT----GTGTAA
ATAGCTTCCG----TAAAGGATTTTTCTCTGGAGACGTACA--TTTTTAGAACAGAATCACTACATTTGCA-----TAC-
TTT--ATATTTCAAACAAGATTTGCATTTCTCACTAGAAGCCTCTTGGTTACTGGGT---TGTTTT----GCACCA-ATT
TCTG-TCCATTTGATTGACACATTTCTTGGAAATGAGGTTCT---TTATGTGTTGTCATGAAGTCTCCCT----ATCATT
TCTTTT-C--CCA-TAGTAGTTCTCCCAAGAGTCATGTGGCTCATTATGGAGAGGGCTTGCATTTTTCATAGCAAGTGTC
TTA----ATAGCCAAACA-------------------GACCTGGACAACATGGTAC-----------ACTCTACAATCAG
TTT-TCACTTACAAGTGCTTGATTGCCCT-AGTCGTCCATG-CCCAATGATTACTGTTTGGCCAGAGTGAGGATTTC---
---AGCTTATGGAATCAATTACACAATTTCACACCTGCCTTCAAACTAGCATTGACTAT-ATTTTTTGAAATCCCTCTGT
CTTGAAGAATTTCTTGTGTTTTGACCCAAAGGGTTTAGACGCCCTTTGCCCAATTTACCAATGTCATCTTTTCCTCT-AA
TGATTCATT--TCACTCTTTCTATTGCTCATCATCTCCCTCAATAAAAGGAATCAAATCACTTGCC--TAGAACCAAGTG
AGCGTAAGACTGA-------------GAGCCTGAGGCTTTTGCATGAGCCTTACTGAAACATG-----CAGTTATTGGCT
CCAAATTAAGAAATTTGTGGGATTTTTCTCCATTCTCTTCCTCCTTCTC----------TTTATTTTTTT------AAAG
GAAGAAAGTTTCTAATAAATATTTAG------TGGGTTTGTTTTT--------CTTTTACTTTAGTAATTAATAATCTAC
TATGATAAAG-----TATGTTACGTACCCTTAGAGC-CCTTATTT-GTTGGCTACGGAAAA-TAGTAGGAACACAGGCTC
CGGAAACGAGCCTCTCAT-TTTTATTGGAGGACAGTAAAACTACT---------------ATAACTAAGAGACATGAAGAA
AAAAA-GAGGTGGT-AAAATTCTGAGTATTACTGCCCTGGGACATGAGCAATGTTCATGTATTTTTCAAGTA-CCTACA-
--------------GAAAGAGAACTGAACCAAA-------CTAGCTAGCTGAGGCCCGGTGGTGTAATCAATAGGGTACA
TCA-CCATTCACCAAGGAAGGAAA-C--ACAAAGGGAAATGTT---ACCATTAAAACATTGTCAGTCCTCAGC-AAAGTT
ATAAAGTA-CCAGAATGTTCTTTGATGTGTT-ACCTCCTTTGGGTCAGTCATGTGTCTCTTGAGGTCCACTCC-AGTTCC
TATCTCTTTTGATGTTCTGAGCACCCAATTTCAATGTTCAGGCTTCTCTGGAAAGCTATCTGC--AAAACTTTTCTCCCT
-------CTTCCCCCTGTGTTCCTTAAGAGA-CATTTGTTTCCCT--------------------------CTTATAACT
TCAGTAAAAA---------GAGACCAATGAAATAAAATTT--TTTGCAACCAATA-ATTTAGATTGATAGGTAGAAGTGG
T-GTGGAAGGGATCTCTACC----CTTAATAGTCTCAG-AGCCCTTTCTTCTCTCTGTTTTCC-AAGAAACCACATCTAA
TCAA-TTACGGACAGAGTATAAGTTATAAGGTATTTACTGCATCTGGACTAGATGATCTCTAAGTATTCCACAAACTC-T
AAGTTTTATGAATGATATCCTGGAGACGAGTCACAAACATATAACCTTTCT-----TTGCCAGTGCAAATTGTATTTTTT
ATATAGACTTCCTTTGG-TCTTTCCATGTGCAGGGAGTGATGCCAAGCAG-TCCCCAGGCCACAAGTGATAATCAGGGTA
AGGTGTATAAATCAAAAGTAGTTACATACAAGCCACATACAAGG-AA------CACAGCCACATGAGACCTCTCTCTTAG
GAATCAGATCTTCTCTCTTGGGACGCATG--AACTGGTGATACATG-CAGTAATGGGGGAGTACATTTTGTGAGGGAACT
TTTCTTAAATCATAG--------GAGG-TACCAACAAACAAGTCACTTCTAACTTCTGTCCTATAGAGACGATTTGTCAA
CTTTGGTACTTTAAAGTGACAA-----ATGTTGAGGGTGAAAGATTGACTTCAGTTTCATTAAGATATTAA-TAGTGGAG
TCTCATTTAACGGAGAGGGCCTTTCATGAAGGAGTACCTCTTTAAAACTCATGGATTCAAGGGCTTTTAAGTGCTTAAAG
CTCCATGAAGGGAGAAAAATAACTGCTATCGGTTTTTAGAAGATA--AG--TTCAAACTCTCATATGTTCCAAGAAG---
-------CGTGACATTAATGCAAAATCAAGGTGAAGAATGACACTAGATTCAG----CTGGTGCCATCCACCTAATTTTT
TCC--CCAACAGAGCCCGGAACTTGGTAAGCAT-TTTGTAAGTGTGAGGTGCTATCATCAGCATTATAATTATTATTA--
-G-GATAGTTTTCCTCAC-CATCTCA-----TTTAATTGGAGTGGTTAAAACATACACATA-ATCTACA----CAA-AGA
AAATTTGAATCTGGTTTGTTA---TCACTCACAATCCGGTCTCATACCAA---TCTCCAGATTCTGACAAGTAAAATGGA
AGAGCTT-CATTGGCTTTAATTACAATTCTTTCTCCTCCTCAGTTTAAAGCTCCAAGAAAATGGCTACTTCAA--CTCCA
GGTCTGGTTTTCTACTTA-GTTC-CTGAAAGGATTTATTGAAAACCCC-AGCCTGCTGGAACATTCCTGCTGCTTACCTT
TCAGTAGAGTAACTTTGTATACACAGTACAGAGGATGTTTCACTGATTTTTTTATTTTT----------TATTTTTTTTG
CCTGTTTCTTCTCGTTTCGACAGAACAAAAGCCCTTGTCTTAGAACTGTTGGCAGCTGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTCAAGGAGGTAGGATACTTTGGAGTTC----------GCTCACACAAACA-
----TATTTGGACATCTTTGAACAGAATGGTTTA-CCTTTTTATTTATTTTGGGGCCTACGGGGTAGACTAGTTAATTTT
CTAAGACGTCACTGAAGGAGAAGTAGTGAACTTAGTCTAAA-TATCTTAAATGGATGCATTAAATTTTCTTTGATGTCTC
ATTTCCAAGAAAAGTTAAAAAC--TATTTGCAGGATCTATTTCCATTTGGAGAACATGGAAATGCC-AGTTTGCAAACAG
CATTTT-TACTGAC-------------------------------------------------------TTGGGTCCCCC
AAGCCTCGCTATGAGGG---GCTGTCTCTGGGATGCATCCTGTTTACAGATGAGGAAACCAAGGCGAATCCTT----TTC
TCTGTTCTCAGCCTGGGAGCTCATTCATGA----------AATGGAATTGGG-AGTTACTTCTTTTTAAT-TCTTCAACC
CAAGCTCTTGAAAGCAATGTACTCCTGCTTTTCCA-----------------------------------------TGA
ATAACACTGCAATAAACACAGGGGTACGGGTATCTTCATAGTAATCACCT---TTATTATTAGCAATGAT---AATGACA
GTGAG----GAGGTGC-ATAACACTTTCTGTGTTTCAG------TTCAGGAGTGGCAAGTGTTGTTC-GTGGGTAATCAC
ATTTATCTGCACATTACCCCTATCTCTTAGGCTGAGCCCAATTTAT-------TCTTCATATATGTCTCTTTCATTTGGC
ACATATCTGTTGAATAAAAAAA----------GAAACCCAAAGGAAAATTGCATTTACTTCAGAG-AATAGTGTGA--CT
TTTTAA----------AAAATTTTTATAGCAACTGCTGTTCT-AGTGACTGTAAGCTACTCCATTG-----TCTTTTTCT
TAAACTATTCAAATGAGGAA-TTTGAATCCTGCCAAGAGAGCCAGGTCTTTTACAGTTTTCTAAATAGACTTATTTTATC
TTGCTGAGGTATTCCAGTAGCAAG-CTGCTCCTTCATATATAAATTGTTTTTCAGGCTTCTGATTTTGTTGCCAACGTGA
AAAGGAAGGAG------------------CAGAGTAACTAGGTGCGATGCTGACTGTGCTTTAGTGACCTGGAGCAAGTG
CTGTTTTGTGTAACAGGCGTTTCTT--GTTTCAGATGCAGCAGTACCAGCAGGCTAAGCAAAAAAGTTGAGTGCAGAGAA
A--TTTAAATGGGAAAGATTAAGAAAACATTCACATTTTACAGTA---TTTTTATTTTGATATTCAAATGAAAGAATAGT
A-ATAACCAACA----GAAATGTGGGAAGAATGATAATGCAAGATAA-------------------GGAATTTAAATATG
TATTTAT----GACCTTTGAATGTTTTTCTAATAAAAAGTCTATAAAGCTAGATGTAATAATATATATAAAAGATGTTAA
AAATCTTAGGAGGA-GAGTTGCTATCAGTATTCA--------AATTACAATCCACTA--------CTTAACAGAAGGGTA
GAAATGTT--GTTTTTCTTTATATATGGTTTAGGAAAAATTA---------------------------TTAAAACTGGA
TGTTCATCAGGATCTTGGCTCTT------AATTCCCCTTCTGATAGTCCTCACCTAGTAGAGACACAAATCTTGGAAAGG
CAGTGGACCAAAATCCAGAATGGGCTTTTCTTGCCCAGGAAAT-ACTGAGTTACAAGATTCAAAGTATTTTCCAGGAAGG
CTCTTGACAGGCGTGAC-TGAGTTGAGTTTAGCCGCAAAGATCGCTGAGTTG-TATT--TTTGTGGAGGTGTGCATAATT
TAACAATGGGAAAAATGTGGTGGAA------------------TCACTACATTTTCACTTGGGAGCGTCTCCTGCCTTCC
------------AGTGAGGAAGAACGTGCTGTCAACC-------------------TGTTT--------CC----AAGTC
```

```
TCAGGACACAGCAAGGCAAA-CGCGGATTTGAATACATGTGGCTCTCATTTGCTTGTAATTAATTTTTTTGCATTACAGT
GATAGATTTATCTACA-CTAAAAACC---ATTTTCCAACATCACAT---TATGTAATGTTATGAGAAGG-AAAGACTGAA
GTAACAGTTCACTTA-TACAAA-CTTTCTCCTGCTA----AACTGAACAGCTATAATGTCTTTTTTAATCACCACTTCGA
A----------GAGAATAG-TGTGTTATCAGCCAAAATATG-ACCTTTATTAGGTCATT-AAAGAGTATGTTCTGCGTTT
TATATGTCCACAATTGACCTCCTATG-CAACACTGATTGAATATTCA----TTCTATTCACCCATTCCATCACAAAAATT
TACTGAA------TACATA-CTACCATGCTGAGGATCCAGTAGAGAACAAGAGATATAA
>Cetartiodactyla_Sp2
AAGTTGAT-ACTGTGTAAATCCTTTAAAGAAAAACATAACTAAAATAAACAAAAAAGGCAAGCCCTGAAATTTGTTGTTT
TAA------AGAATATGTGTGCCTGGCTTTTTGTTTTTCTTTTAGTG--------TGGGGAAGTCTGGAGGAGTTGAGAT
TT-----CAGCACTGAGTCATCTAGCTGACTGCCTGCCTTGACCAATTCATATAGT---TCCCTTTTACTTGCCACTTCC
TGAG---TCCTC-ACTCATTGTTTTCCTTGGGTAGAGACAAGCAAGCCAGTTTGCATTTTTACT-TGTTTGAAATTCCCT
GCCCTGTTTTGTATC-TGGA-GAGAACTAATCACTTCTTCCTTGTGTCTCCGTATGATTATTAATGATAATAATGTACAC
TTGATCTGTTGGAAACTTGTTCACTGCAGTTATTAATATATGGACTACATTATT----------
CTCACAGACTGTCCGCAGACAATCAGTAGTTTCAAGAAATTGTGAGAAGCCAAAAATGAGAGAGGAAATGT---GGGTAA
ATACCTTCTA----CAAAGAACTTTTCTCTTGAGACATACATTTTTTTAAAACAAAATCACTATATTTGCACCAGTTATG
TTGGACTATTTTGAATAAGATTTTTGCTTTGCAGTGAAAGACTCTTGGTTGCTGGGTTTTTAATTTTTTTTAATAACATA
CCTG-TCCGTTTGATTGACAAATTTCTTGGAAATAGGGTTCT---TCATCTGTTATCATGGAGATTCCCT----ATTGAT
TCTTTA-AAGCCAATAGTAGTTCTCCCAAAAGTCTTTCGGCTCATTATGGATGGGTCTTGTGCTTTACACTGTAAATGTC
TCATATAGTAGCCAAGCAAATAAAGCACTCACAGATGGACGTGGACACCACTGAGC----------CCCTCTATAA----
TCCATCATTTTCCACCACTTGATGCTTTG-AGTCATCCATGTCCTAATGACTGGTGTTTGGTCATAGGCAGGATGTGAGT
TACAGCTTACGGAATCAGTCACATGATTTTCTATATGCTTTCAAACTGGTACTGATTAT-ATTTTCTGAAGGCTT---GT
CCTGAAGAATTTCTTGTGTTTTGCCCCAT-GAGTTTA-ATTGTCTCTGCTCAATTTACCACTGTCAACTTTTTCTCT-AA
CTACTCATT------TCTTTCTATTGCTCATCACGTCCCTAGATAAAAGGAGTCCAACCACCTGCCCACAGAACCAAGTA
AGCACAAAATTGAGACAGAGTCNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTATTAAAATGTG-----CAGTTATTGGCC
CTAAATTAAGAAATCTATGAGATTCTTCCCCATTCCCTTCCTCCTTCTT----------TACAATTTTTT------AAAG
GAAGAAAGTCTCTAATGAATA----GTGT---TTT----------TTTGTAATTTAGTAATTGTTATTGCAC
CATGATAAAATG---TGTGTTCT----TTTTATATTCCTTAG----GTGGTCTATAGAAGA-TAGTAAGCACATAGGCTC
CAGAAATGAGCCTTTCAT-TTTTATTAGAGGACATTAAAACCATT----------GTAATTAAGGGAAA---AAA
AAG-GGGAGGGGGCAAAAATTCTGAATTTTACGGTAGGTGGACATGTGCAATGTTCATGTATTCT-CATATA-CCTGAAA
AA----------AAGGAACTGAATTAAACTAG----------CTGGCTGAGGCCCTGTGGTGTAATCAATAGG-TACA
TCACCCAT-CACCAAGGAAGGAAA-GC-AAAATGGGAAATGTT---ACGATGAGAACATTGTCAGCCCTCAGC-AAAGAC
GTAAAGTAATCAGAATGTTCTTCTCTGTG-C-ACCTCCTTTGGCTTAGTTGCGTCCCTCCTGAGGTCCATCC--AGTTTC
TGTCTCTTCTGGTATTCTGAGCACCCAATTTCAATGCTCAGGCTTCTTTGGAAAGTTCTGCCTTCAGAACTTTTCTCTTT
TCAGAGATTTCCCCCTGCTCTTCTCAAAAGA-CATCTGTTTCTCTCCTTCTGCAAGGATGAC---ACTCTTCTTATACCT
TCAGTAAGAA---------GAGACCAATGAAATAAAA--TCTTTCACAAGCAATG-ATTCAGGTTGGTAGGGAGAAGTGG
TGCTGAAGTTGATGTTCACCCCGACCTCATAGTCTCAG-ATCCATT----CTCTCTGTTTTCC-AGGAAACCACATCCAA
TCAG-CTGGGGACAGGTTATACG-------ATATTTGCTATACCTGGACCAGATGATCTTCAAGTATTCTACAAACTA--
AA-TTTTATAAGTAATATACTGAAGAGGAGTCACAAACAAATAGCCCTTCTAAGAAAAGCC-GTTCAAACTGTATTTGTT
ATATAGACTTTCTTTGACTCATGTCATGTTCAGGGAGTGATGTCAACCAGTCACCCTGGTCACAACTGATCATCAGGATA
GAGTGCAGAAATCAAAAGTAATTACATAAAAGTTGGTCACAAGG-AAGA----AAACCACCTCTGAGACCTCTCTCTTGG
GAACTGGATCTTCTCTCTTGGGAAATATG----AATGAGATACATG-CAGTAAGGGGCAAGTACATTTTGTGAGGGAACT
TTTCTTAAATCATAGGAGGATAAAAGG-TACTAACAAGCAATTTACCCCTACCTTCTACCATCCAGAG--GACTTGTCAA
CTTTGGCATTTTAAAATGACAAAACATATTTTGGGGTTGGAAGACCGACTTCAGTTTCAGTAAGATCTTAA-AAGTGGAA
TCTCATTTAAAGAGGAGAGTCTTTAACAGAGGAGTAAATCTTCAAAGCACATGGATTCAAGGAATTTTAAGTGCTTGAAG
CTCCAGGAAGGGAGAGAAATA--TGATC--TGCTTTTAGACAATATAGACTATATGAAAATCTGAATTT--AAGTAT---
-------CTTAACA-----GCAAGATCAAGATGAAGAATTAAATTAGACTCAA----CTGATGCCATCCACTTAATTTTT
TTC--CCAACAAAGCCTGGAACTTGGTAAGCAT-TTAATAAGTGTGAGCTTCTATCACTGGCATTATAATTATTATTA--
-GAAATAGTTTTCCTTGCTTATCTCATCTTATTTAATT-AAGTGGTTGAAACACATACATA-CTCCAAAGAAACAA-AGA
TAGTTTGGATCTGGTTTGTTATAATCACTTATAATCTGGTTTCAGATAAA---CTTCCAGATTTTGACAAGTGAAATGGA
AAAGTGC-CATTGGGTTTAATTACAATTCTTTCTCATATTCATTTCAAAGCTTCAAGAAAATGTCAATTTCAA--CTCCA
GGTCTGGTTTTCTACTTA-GTTCTCTGAAAGGATTTATTGAAAACCCCAAGTTGGCTGGAACTTTCCTGCTGGTTACTTT
TCAGGAGACTAACTTTGTGT---GAGCACAGAGGATATTTCACTCATGTGTGTCTTTTT----------
-----TCCTTCTTGTTTTGACAGAACAAAAGCTCTTGTCTTAGAGCTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATATTCT--AGTTTTAAAAAGAATGCTCACACAAACA-
----TATTTGGACATCTTTGAACAGAATGATTTA-CCTTTTTATTTATTTTAGGGCCTAAGGGGTATAATAGTTAATTTT
CTAAGATGTCACTGAGGGAGAAGTAATGAACCTAGTCTAAA------TAAATGGATGCATTAAGCTGTTTTTGGTGTCTC
ATTTCCAAGAAGAGCTAAAAAC--TATTTGCAGGACTCATTTTCCTTTGGAGAACACAGAACAGCCAAGTCTGAAAACAG
CATTTG--ACTGAC----------GTGGCTCCTAT
AATCCTCATTATGATGGT--GGGGACTCTGAGATTAATCCTCTTTGCAGATGAGGAAACCGAGGCAAATCCCT----TTC
CCCTCTTTCAGCCTGTTTCCTCATCTGTAAA----------AGGGAAGTCCC-AGTCACATCTTTTTAAC-TCCTGAACC
CAAGCTCTTAAAAACGATGCCCTCCTGTATTTAA----------TGA
ATAATGCTGTAACAAACATGGGAGTGCAGATGTGTCAATAGTAATTTTTTT-----TTATTAGCAATGAT---GATGACA
ATGATGATGGAGACAC-ATGATGAATGTTATGTTCCAGGCGAAGTTCCGGAACAGCAATTGCTGTTCATGTGTAATTCAC
ACTTACCCTCACAATACCCCTATCTCTTACGCTAAACCCAATTTAC------CTTGTTATATATGTCTCTCGCATTTGGC
AAATGTCTGTTGAAGAAAAGAAAA--------GAAACCCAAAGGAAAGTTGCATTTGCTTCAGAG-AATAGTTTGA----
----------CCTGTTTTTGCAGCAACCGCTATACCAAGTGACTTTAAACTACCGTATCA------TTTTTTCT
TAAACTATTTAAAGGAGAATTTTTGAATCCTGCCGGGTGACCCTAA-CTTT-CCAGTTCCTTAAATAGATTGATTTCATC
T---TGTAGTTTTCTAGTAGTGAG-CCACTCCTTCAGATAAAAATTGTTTTTCAGGTTCCTGATTTTGTTGCCAGTGTGA
AAAGGAAGGAG----------CGTAGTAAATAGGTGCAACGCTGACAGTGCTTTAGTGACCTTGAGCG----
TTGTTCTGCGTAAC-GGCATTTTTT--GTTTCAGATGCAGCAGTATCAGCAGGCTTGAAGAAAAAGATAAGTACAAAAAA
A-TTTTTAGTGGGAAAGGTTAGGAAAACATTCGCATTTTATGGTACTGTTTTTATTTTGATATTCAAATGAAAGAATAGT
AGGTAACCAACA----GAAATGTGGAAAGAATGATAATGCAAGATGAGAAGGCAACAA----------
----------TGTGAAAGTTGTTGA
AGGTCTTAGGAGGA-GAGTTGCTATCTATATCCA--------AATTACAATCTACAAACTACTTAGTAAGCAGAAGGGTG
GAAATGTTA-TGTTTTCTCTCCATATTGTATAGAAAAGGTAA----------TTAAAACTGGA
GGTACATGAA-ATCTTGGCTTGATTAAACAATTCCCCCTTTGGTAGCTCTTA-CTTACAGCGACACAAATTTTGGAAAGG
GAGTGGATTAAAATCCAAAACAGGTATTTCTTGCCCAGGAAATAACCCATTTACAAGACTCAAATTATTTTCAAGAAAGG
GTCTTGATAGGTACAACTTGAGTCGAGCTTAGTTGCAGTGATCTCTTGTTTG-TATCCTTTTGCAGACGTGTGCGTAATG
TAACCATGGGGGAAGTGCAATGGGG----------TCACTAATTATTAACTTGGGAGCATGTCCT-CCTTTA
```

```
------------------CAGTGAGGAGTGAACAGTCAA---------------CCTATTTCTAAGCGTTC----ACATC
TCAGTACACTGCAAGGCGAA-CGCTGATTTCAATATATGTGGCTCTCACTTGCTTGTAATTAATTTTTTT-CATTAAAGT
GATAGATTTATCTGTA-CTTAAAACT---ATTTTCCTACATCCCATCACTATGGAATGTTACGGGAAGG-AAAGACTGAA
GTCATAGTTCACTTA-TGCAGA-CTTTCTGCTGC-A----A-CTGAACAGCTATAAGATCTTTTTCAGTCGCCATTTAGA
ATA-------AGACAATAGATGTGTTATCAGCCAAAATATGCATATTTATTAGGTCATT-AAAGACTGTGTTCTA-GTCT
TATATGTCCACAATTGACCTCCTATT-CAACACTGATTGAATATTCA----TCCTCCTCACTCATTCTA---CGAAAACT
TACCAAACATGTATCAATAACTACCATGCTGGGGTG-CAGTACAGTACAACAGATACAG
>Chiroptera_Sp2
AAGCTGAT-GTTATGTACATCCTTTAAAGAAGAACTTAATTAAAATAAACAAAACA-ACAAGCCCCTA---------TTT
TAA-----AAAAATAAGTGTGCATGGATTTTTCTTTTTCTTTTGGTG--------TGGGGGAGTCTGGAGGATTTGAGAA
GTTTATTAAGTACTGAATCAGCTAGATAACAGCCCGCATCGACCAAT-CA-ATATA----TCCTCTTACCTGACATTTTC
TGAG---TCCTC-ACTCATTGCTTTCATTGAGTAGAGA----CAAACCAGTTTGCATTTTTACT-TGTTTGAATTTCTAA
GTCCTGTTTTGTATTAAAGA-GAAAACAAATCGCTTCTTCCTTGTGACTACCTATCATTATTAATGATAATAATGTACAC
TTGATCTGTTGGAAATTTGTTTGTTGCAGT-TTTAAATTATGGGTTACGTAGTT--------------------------
CTACCAGATTGCCTTCAGAGAATCAGTAACTTCAAGAAATGGTGAGAAACAGAAATTGAGAGGGAAAAA-----ATGTAA
ATTGCTCCTA----CACATCATTTTTCTCTTGACATGCACA-TTTTTTAGAGCAAAATGACTACATTTGCATCAGTTGT-
ATTGATTATTTTGAACAAGATTTGTGTTTCTGACATAAAGAC--TTGGTTACTGGGTTTATGCTTT----GCACAA-GTA
TCTGTGCAAAGCCATTAACACATGGCTTGCAAGTGAGCTTTT-------------TCATGAAGTGTCCCA----ATCGAT
TCTTTT-CAGCAAACAGTAGTTCTCCCAGGAGTCATATGGCTCAT-ATGGAGGGCACTTATACTTTTTATAGTAGATGTC
TTATCCAGTGGCCAAACAAATAAATCACTCACAGTTGGGTCTGGAGACTATCGAGC----------CTCTCTGTAG----
GTCATCGCTTTCCACCACATGATGTTCCT-TATCATCCATGTCCTAGTGACTGGTGTTTGACCATAGGCAGGAGTTTAGT
TATAACTTCTGAAATAAGTCACATGATTTTATATTTGCTTTT------GTATTGATCATTATTTTCTGAAGTCTTTA-GC
TGTGAATAATTTCTTGTGTTTTGCCCTAC-AGGTTTAGATTATCTCTGCTCAATTTGCCAATGTCATCTTTTTCCTT-AA
CTACTCATT--GTTCTCTTTCTGTTGCTCATCAGGTCCTTAGATAAAAAGAACCAAATCACCTGCTTATAGAACCAAGCA
AACATAAGACTGAAAAAAAAAAAAAAAATGTCTGAGGCTTTTAAGTGAACCTTATTGAAATATTGGCTCCAATTATTGGCT
CCAAATTAAGAAATCTG--AGGTTTTTTTCCATTCCTTT--------------------TATATT-TTTT------AAAG
AAAAAAA-TGTCTAATGAATATTTAGTG----TTTTTTTGGTATAT-------TTTTTACTTTAGTAATTATTATCCTAC
TATGATAGAATAA--TGTGTTATATA-CCTTGTAGTC---ATTTT-GTGATCTACAGAAAA-TAGTAGGAACACAGGTTC
CAAAAATGAGCCTCTCAT-TTTTATGAGAGGACAGTAAAACCACT---------------ATAATTGAGAGAAA---TAA
AAA---GAGGTGGTGAAAGTTCTGAATTTTACGGTACTTTCACATATGCGATTTTCATATATTTT-CAAGTC-CCTAGAG
AA----------AAGAAATTGAATTAAACTAG------------TGAGCTTAGGCCCTGTGGTATAATCAATAGG-TACA
TTACCCATTCAACAAGAAAGGAAA-GC-AAAAAGGGAAATGTT---ACAATTAGAACATTGCCAGTCCTTAGC-AGAGTT
CTAAAGTAATCAGAATGCTCTTCCACGTG-T-ATCTTCTTTGGGTCAGTGGTCTCTCTGTTGATGGCCA-TCT-GGTTCC
TGTTCCTCC---CATT---GCACCCCCA-TCCAGTGCTCAGCCTTCTCTGGAAAGTTCTGCTATCAGAACTTCTCTCCTT
-------CTTCCCCCTGCCCTTTTCAAAAGG-CATCTCTTTCTCAATCTTTGCAAGGATGAC---ACT----------CT
TCAGCGAGAAAAGTAAATGAAGTAAAATGAAGTAAAA--TCTTTTGCAATCAACA-ATTCAGGTTGATACAAAGAAGGGG
TCCTGGAATAGACC--AACTTC--TCTTACAGTCTCAGAAACCCTT-CTTCTCACTGTTTTCC-AAGAAACCAAATCCAG
TCAA-TTGGAGAGAGATTGTACATTATAAGATATTTGCCATCTTTGGACTAGATGACCTCCAAATACTCTACAAACTCTT
AAGTTTTATAAGTGTTACATTGGACAGGAATCACGAACATACAGCCCTTCTAAAAGAAGTCAGTCCAAGCTTTATTTTCC
ATATAGACTTTCTTTGGCCCAAACCATTGGCAGGGATTGAATCCAATCACTCACCCTGGCTACACTTGATAATTAGAGTA
GAACGCATAAATCGAAAGTAATTACATACAAGCTAGACACAAGAAAAGA----CAACCACCTCTGAGACCTCTCTCCTGG
GAATTAGATCTTCTTTCTTAGGAAGTATG--AACAGGAAGTACATGCCAGAAAGGGGTAAGTACATTTTGTGAGGCAACT
TTTCTTAAATCATAG---GATAAAAGG-CACTGACAAGCAAATCATCCCTAATTTCTATCAT---------------CAA
TTTTGGCATTTTTAAATGACAAAACAAACTTTGGAG-TGGAAGATCGACTTTAGTTTCAGTAAGATCTTAA-TAGTAGAG
TCTCATGTAAAAGGGAGGGCCTTTAGCAGAGGAGTAAATCTTTAAAACA--TGAATTTGAGGAATTTTAAGTGTTTGAAA
CTCCAGGAAGGGAGAGAAATAACTGCTATCTACTTTTAGAAGACA--GAATATATGAAAAACTAAACTT--AAGTAT---
-------CTTAACATTAATGCAAAATCAAGATGACAAATTAGACTAGACTCAA----CTGGTACCATCTACCTGACTTCT
TTTTTTTAACAGAGCCTGGAACTTGGTAAGTAT-TTAATAAGTGTGAGCTGCTGTCCTTGGCACTGTAATTATCATTA--
-GACATAGTCTTCCTCAA-TATCTCATCTTACTT-----GA-----TAAAA--------TA-CCCCAAAGAAGCAA-AGA
TACTTTGGATTTGGTTTGTTATAATCAC--ATAATCTGGTTTCATACAAA---TTTCCAGGTTTTGACAA-----ATGGA
AGAGCTC-TACTATGTTTCATTACAATTCTTTCTTATATTCACTTTAAAGCTTCAAGAAAATGGCTA----AA--CTCCA
GCTCTGGTTTTCTACTTA-GTTCTCTGAAAGGATTTATTGAAAACCCCAGGTCGGCTGGAACATTCCTGCTGCTTACCTT
TCAGCGGAGTGACTTTGTAT---GAGTACAGAGGATATTTCGCTGATTTGTGTTTTTCT---------------------
-TT-TCTCTTCTTGTTTTTACAGAACAAAAGCCCTTGTGTTAGAACTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
CGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATATTCTTTAGTTTTAAAAAGA------ACACAAACAT
CTTGTATTTGGACATCTTTGAACAAAAGGTTTTA-CCTTTTTACTTATTCTATGGCCTAAGGGGTATAATAGTTAATTTT
CTAAGATGACACTAAGGGAAAAGTAGTGAACTTAGTCTAAA-TATCTGAAATGAGTACATTAAGCATTCTTTGGTGTCTC
ATTTCCAAGAAGAGATAAAAAT--TATTTGCAGTACTCATTTTCCTTTGGAGAACATGGAATAGCC--ATTTAAAAATAG
CATTTT--ATTGAC-------------------------------------------------------TAGACTCCTGT
ACTCCTCTCTATGACA----AGAGTCTCTGGGATTAACCCCATTTACAGATGAGAAAGTTGAGGCAGCTCCCT----TGA
CCCTTTCTCAGCCCGTTTTCTCATTTGTAA----------AATGGAATTGGGAAGTCACATCTTTTTAAC-TCCTGAACC
CAAGCACCT-AAAACTATATACTCCTGCTTTTATA-----------------------------------------TGA
A-----------TAGCAAT--------------------------CATTT------TTATTCGCAATGAC---GAGAACA
GTGATGATGGAGGCGC-ATATGTTTTTTTATGCTCCAGGAGCAGTGCC--------AACTGCCGTTCACATGTAATTTAC
ATTTCCCCTCACTATACCCATATCTCTTAGGCTAAACCCAATTTAT------CTTGTTGTATACATCCCTTTCACTTAGC
AAATGTCAGTTAAAGAAAAAA-----------TAAACTCAAAGGAAAATTGCATTTGTTTCAGAG-AATAGTTTGA----
-----------------CCTCTCTGATAGTAACCACCATACT-AGAGACTT---ACTACTCTATTG-----TCTTTTTCT
TAATATGTTTAAAGGAGGATTTTTGAGTCCTGCCAAGTGAGCCTAG-CTTC-ACAACTTCTTAAATAGATT--TTTCATC
TTGCTGTAGTTTTCTAGTAGGGAG-CTGCCCCTTCAAATATAAATTATTTTTCAAGTTTATGATTTTGTTGCCAGTATGA
AAA-GAAGGAA------------------CATAGTGAATGGATGTGAGGCTGACAGTGCTTTAGTGACTTTGAGCA----
TTGTTTTATATAAC-AGCATTTCTT--GTTACAGATGCAGCAGTATCAGCAGGCTAAGAAAAAAAGATGAGTGCAAAAAA
GATTTTACATGGGAAAGGTTAGGAAAACATTCACATTTTACAGTACTGTTTTTATTTTAATATTCATGTGAAATAATAGT
AGATGAGTGACA----GAAATGTGGAAAGAATGGACTATGTAAGATAGGAGGCAACAAATTGCTTTGGACTTCAAAAGTA
TATTTAT----CATCCTGGAATATTTTTCTAATAAAAAGTCTATAAAAATAAATACAATAATACATATGAAAGATGTTAA
AAGTCTAAGGGGGAAGAGTTGCTATCTATATCTCAATTACAGAATTACAATCCACCAGCTATTTAGTAAGCTGAAGGGTG
GAAATGTTA-GTTTT-CTCTCCATGTGGTATAGGAAAGGTAA---------------------------TTAAAACTGAA
AGTACTTAAAGATCTTGGCTTGATTAAACAATTCCTCCTTTCATAGTCTTTACCTACTAAAGACATAGGTCTTGGAAAGG
GAATGGACTAAAATTCAAAACAGGTATTTCTTGCCCAGAAAATAACCCATTTATAAGACTCAAAGAATTTTCCAGAAAGG
CTCTTGACAGGCATGAT-TGCCTTGAGATTAGCTATAAAGATCCTTTAGTCG-TAGCTCTTTGCAGAGGTGTGCATAATT
```

```
GATACCTGGTAGAAATGTGATGGGA------------------TCACTC---ATTAATTTGGGAGTATGTCCTGCCTTCT
------------GATGAGGAATGGAGTACAGACAATCAA---------------CCTATTTCTAGCTACCC----ACATT
TCAGCACACAGTCAAGC-AA-CACTGATTTAAATGTGTGTGGCTCCCA--TGCTTGTAATTATTTTTTCTTCATTAAAAT
GATAGCTTTATCTATA-TTTAAAACA--TTTTCCCCTGTGTTATATCACTACGGAATGTTATGAGAAGG-AAAGACTGAC
GCTATGATTCTCTTA-TGCGGT-TTCTGCTGTTATA--ACAACTGGTTAGTTATA-----GTTTTTAGCCAATGTTTTGA
ATAAGGAATTGGATAA-AAATGTGTTAGCAGCCAAAATATACATTTTTACTAAGTAATT-AAAAAGTATGTTCTAGGCTT
AATATATCTACAATTCACTTCCTATT-TAACAGTAATGGCATATATANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
>Equus_caballus
--GTTGTT-ATCGTATAAAT-CTTTAAAGAAAATTATAACTAAAATAAACAAAG-----AAGCCTTTAAATTTGTTTTTT
TAA-----AAAAATAAGTCTGCCTGGCTTTTTGTTTTTCGT-TGATG--------TGGGGGCGTCTGGAGGTATTGAGAG
AT---TTCAGCACTGAGTCACCCAGCTGACCGCCTGCAGTGACCAGTTCATATACT----GTCTTTTACCTGACGTTTCC
TGAG---TCCTC-ACTCATATCTTTCATTGGATAGAGACAAGCAAACCAATTTGCATTTTTACT-TGTTTGAAATGCCAT
GTCCTGTTTTTGTATC-TGGA-GAAAATGGATCACTACTTCTTTGTGACTACCTATGATTATTAATGATAATAATGCACAC
TTGATGTGTTGGAAAC-TGTTCACTGTAGTTTTTAATTTATGGACTACATAGTT--------------------------
CTAACATATTGTCTTCAGAGAATCAGTAGTTTCAAGAAATTGTAAGAAGTAGAAAATGAG-GGGGAAAAT----GTGTAA
GTAGCTTCCA----CAAAGGACTTTTCTCTTGAGTCATATA-TTGTTTAGAACAGAATCACCATATTTGCATCAGTTAT-
GTTGGTTATTTTGAACGATATTTGTGTTTCTCACTA----ACTCTTGGTTACTGGGTTCTTGTTTT----GCACAA-ATA
TCTG-TCTGTCTGATTGATGCATTGCTTGGGAAGGATGTTCT---TCATGTGTTATCATGAAGTCTCCCT----ATGAAT
TCTTTT-CAGCCAACAGTAGTTCTCCT--GAGTCGTATGACTCATTCTAGAGGGGACTTGCACTTTACATAGTAGATGTC
GTATCTGGTAGCCAAACAAATAAAGCGCTCCCTGATGGACCTGGAGACCATTGCGC----------CCCTCTACAATCAG
TCTGTCACTTTCCACCGCTAGGTGCTCCT-AGTCATCCAGGTCCTAGTGACTAGCGTTTGGTCACAGTCAGGATTTCAGG
TATAGCTTATGGAATCAGTCACGTGATTTTCTATTTGCCTTCGAAGTAGTATTGATTAT-ATTGCCTGAAGTCTTTC-GT
CCTGAAGAATTTCTTGTGTTTTGACCCAA-GATTTTAGATTATCTCTGCTCAATTTACCAATATCATCTTATTCTCT-AA
TTACTCATTTCCTTCTCTTTCTATTGCTCATCACATTCTTAGATATAAAAAATCAAATCA----TCTATAGAACCAAGTG
AGCATAAGATTGAGAAAAA-------GAGTCTGAGGCTTCCAAA--AGCCTTATTGAAATAGG-----CAATTATTGACT
CCAAATTAAGAAATCTGTGACGTTTTTCTCCATTCTCTTCTTTCTTCTT----------TATATT-TTTT------AAAG
GACAAAAGTGTCTAATGAATACTTAGTGGAT-TTTTTTGGGTATATGTC----TTTTTACTTTAGTAATTTTTATTCTAC
TATGATAAAATAACATGTG-TATGTACTCTTATAGT-CCTTACTT-GTGGTCTACAGAAAA-TAGTGGGAACACAGTCTT
CAGAAATGAGCCTCTCAT-TTTTATTAGAGGACAGTAAAACCACT---------------GTAATTAAGAGAAA---TAA
AAAC--GAGGTGGTGAAAATTCTCAAGTGTACAGTACTTGAATGTATCCGGTAGTCGTATATTTT-TAAGTA-CCTAAAG
AA----------GTGGAACTGAATTAAACTAG--------TTAGCTAGCTAAGGCCCTGTGGTGTAATCAATAGG-GACA
TCACCCATTCACCAAGGAAGGAAA-AC-AAAGAGGGAAATGTT---GCTATTAGAAGTTTGCCAGCCCTCAGC-AAGGTT
GTAAAGTAATCAGAATGTTCTTTGATGTG-T-ACCTCCTTTGGGTCAGTTGTGTCTCTCTTGAGGTCCACTCT-GGTTCC
TGTCTCTTTTGGCGTTCTGAGTGCCCAATTTCAATGCTCAGGCTTCTCTGGAAAGTTCTGCCTTCAGAACTTTTCTCCTC
-------CTTTCCCATTCCCTTCTCAAAAGA-CATCTGTTTCTCTCCCTCTGCAAGGTCGAC---ACTCTGCTTATGCCT
TCAGTAAAAA---------GAGAACAA------------TCTTCTGCAATCAATA-ATTCAGGTTGGTAGAGAAAAGTGG
TGCTGAAATGGACCTTCACT----CCTAGTAGCCTCAG-AATCCTT-CTCCTCTCTGCTTTCC-GAGAAACCAAATCCAA
TCCA-CTGGGGACAGATTGTAAGCTACAAGATATTTGCCATCCCTGGACTAGACCATCTCCAAGTAGTCTACAAACTC--
-TGTTTTATGGGTGACTTACTGGAGAGGAGTCACAAACACACAGCCCTTCTAAGAAAAGCCAGTTCAAGCTGTATCCCTC
CTATGGACGTTCTTTGGGTGGTGCCATGTGCAGGGAACAATGCCAACCAGTTGCCCCAGCCACAACTGATAATCAAATTG
GAGTGCATAAATAAAAACGAATTACATACAAGCTGAAGACAAGG-AAGA----CAACCACCTCTGCGACATTTCTCTTGG
GAATCAAACTCTCTCTCTTGGGAAATATA--AATAGGAAGTACGTACCAGAAAGGCACAAATACCTTTCATGAGGGAACT
TTTCTTAAATCATAG---GATAAAAGG-TACTAACCAGTAAGTCACCCCTAACTTCTACCATCCAGAA--GACTTGTCAA
CTTTGGCACTTTCACATGACAAAAGACATTTTGGGG-TAGAAGATGAATTTCAGTTTCAGTAAGATCTTAA-AAGTGGAG
TCTCATTTCAAGGAGAGGGCCCTTAACAGAGGAGTAAATCTTCAAAACTCACGGATTCAGGGAATTTTAAGTATTTGAAG
TTCCAGGAAGTGAGAGAAATAACTGCTATCTGCTTTTAGAAGGTA--GAATATATGAAAATCTGAACTTGC--ATAT---
-------CTTAGCATGAATGCAAAATCAAGATGAAGAATTAGACTAGACTCAG----CTGGTGCCATCCACCTCATTTTT
TT---CCAACAGAACCTGGAACCTGGTAAGCAT-TTAGAAA--GTGAGCTGCTATCACTGGCATGATAATTATTATTA--
-GAAATAGTTTCTCTCAC-TATCTCA-CCTATTTAACT-GAGTGGTTAAAACACACACCTA-CTCCAAAGAGGCAA-AGA
TACTTTGGAGCTGGTTTGTTATAATCATTCATAATCTGATTCCATATAAA---TTTCCAGGTTTTGACAAGCAAAATGGA
AGAGTTC-CATTTGGTTTAATTATAATTCTTTATCATATTCATTTTAAAGCTTCAAGAAAATGGCTCTCTCAA--TGCCA
GGTCTGGTTTTCTACTTA-GTTCTCTGAAAGGATTTACTGAAAACCCCAAGTTAGCTGGAACATTCCGGCTGCTTACCTT
TCAGTAGAGTAACTTTGTAT---GA-TACAGAGGATATTTCGTTGATCTGTGTTTTTCT---------------------
-TT-TTTCTTCTTGTTTTGACAGAACAAAAGCTCTTGTTTTAGAACTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATACTCCATAGTTTT-AAAAGAATGCTCAAAGAAACAT
CTT-TATTTGGACATCTTTAAATAGAATGATTTA-CCTTTTTATTTATTCTAGGGCCTAAGGGGTATAATGGTTAATTTT
CTAAGACATCAGTAAGGGAGAAATAATGAACTTTGTCTAAA-TATCTTAAATGGGTGCATTAAGCTTTCTTTGGTGTCTC
ATTTCCAAGGAAAGTTAAAGAC--TATTTGCAGTGCTCATTTTCCTTTGGAGAATATGGACTAGCC-AATTTGAAAACGG
CACTTG--ACTGAC-------------------------------------------------------TTGGCTCCTGT
GACCCTCACAATGT------GGGGTCTCTGGGATGAACTTCATTCACAGACGAAGAAACTGAGGCAGCTCCCA----GGT
ACCTCTCTCCGCCTGTTTTCTCCTGCATGA----------AAGGGAATTGGGAAGTTCCATCCTGTTAAC-TCCTGAATC
CAAGCTCTTAAAAACTACGCACTTCTGCTTTTATA-----------------------------------------TGA
ATAATGCTGCAGTGAACATGG-GGTGTGGGTATCTTAATAGCAGTCCTTT---TTATTATT--------------TAGCA
CTGATGATGGAGGCAC-TTAACACTTTTTGTTTCCCAGGAGAAGTTCCAGAACGGCAAGTGCTGTTCATGCGTAATTCAC
ATTTACCCTC-CAATACGCCTATCTCTTAGGCTAAACTCTATTTAT------CTTGTTAGATATGTCTCTTTTGTTCAGC
AGATCTCTATTGAATAAAAAAA----------GAAACCCAAAGGAAAAGTACATTGGCTTCAGAG-AATAGTTTGA----
--------------CCTTTTTTTTTACAGCAACCGCTGTGTT-AGTGACTTTATGCTACTCTATTG------TCTTTTCT
TAAACCATTCAAAGGAGGATTTATGAATCCTGTCAATGGAACCTAG-CTTC-ACAACTTTTTAAATAGATTTATTTCATC
TTGCTGTAGTTTTCTAGTAGCAAG-CTGCTTCTTCAGATATAAGTTGTTTTTCAGGTTTCTGA-GTTGTTGCCAATGTGA
AAAGGAAAG----------------------GTAGTAAATAGATGCGAGGCTGACACTGCTTTAGCGACTTGGAGCC----
TTCTTTGGTCTAAT-GGCTTTTCTT--GTTTCAGATGCAGCAGTATCAGCAGGCTAAGCAAAAGAGATAAATGCATAAAA
A-TTTTAAATGGAAAAGCTTAGGAAAACATTCATATTTTACAGTACTGTTTTTATTTTGATACTCAAATGAAAGAATAGT
AGATAACCAACA----GAAATGTGGAAAGAATGATAATGCAAGATAAAAAGGCAACAAATTTTTTAGGACTTTAAAAGTA
TATTTGT----CACCGTAGACTGTTTTTCTAATAAAAAGTCTAT-AAGGTAAATGCAATAATATATATCAAAGATGTTAA
AGGTCTTAGGAGGA-GAGTTGCTACTTATATTCA--------AATTACAATCCACAAA-CATTTAGTAAGCAGAAGGGTG
GAAATGTTG-TGTTTTCTCTCCATGTGGTATAGGAAAAGTAA---------------------------TTAAAACTGGA
GTTATGTGAAGATCTTGGCTTGATTAAACAGTTCCCTCTTTAATAATCCTTACCTATTAGAGACGTAGATCTTAGAAAGG
AAGTGGACTAAAATCCCAAATAGGTATTTCTTGTCCAGGAAATAACCCATTTACAAGATTCAAAATATTTTCCAGAAAAG
```

```
CCCTTGACAGGTATGGC-TGTGTTGAGCTTAGTTGCAAAGATCTCTTAGTTG-TATCTCTTTGCAGAAATGTGCATAATT
TAACCACGGGGAGAATGTGATGGGA-----------------TCACTGTTTACTAACTTGGAAGTATGTCTTGCCTTCC
------------AATGACAAATGGAGT-GCAACAGTCAA---------------CCTATTTCTAGAAATCC----ACATC
ACAGTACACAGCAAAGCAAA-GAGTTATTTGAATATATATGGCTCAAATTTGCTT----ATATTTTTCT--CATTAAAAT
GATAGATT-ATCTATA-CTTGAAACTC-TGTTTTCCTATATCACATCACTATGGAATGTTATGGGTAGG-AAAGACTGAA
GTTGCCGTTGACTCA-TACAGA-CTTGCTGCTGCTA----AACTGAACAGCTATAAGATCTTTTTCAGTCTCTACTTAGA
ATA-------GGATAACAGATG---TATCAGCCAAAATATGCATCTTTATTAGGTCATT-AAAGACAGTGTTCTACGTTT
TATATGTCCACAGTTGATCTCCTATT-CAACATTGACTGAATAGTCAGTCATTCTACTCAGTCATTCTA---CAAATGTT
TATTGAG------CACATC-CTACGATGCTGGGGATGCAGCAGAGAACAACAGATACAG
>Myotis_lucifugus
AAGTTGAT-ATTGTGTACATCCTTTAAAGAA---CATAATTAAAGCAGATAAAACA-GCAAGCCCCTAAATTTGTTCTTT
GA------AAAAATAAGTGTGCATGGCTTTTTGTTTTTCCTTTGGTG--------TGGGTGAGTGTGGGTGAGTGTGGAG
TT---TTAAACATCAAGTCACAGAGTTGACTGCCTGCATTGACCAAT-TG-ATGGA----CTCTTATACCTGGCATTTCC
TGAG---TCCCCGGCTCATTGCTTTCATTTGGT--------------CAGTTTGCATTTTTAGTATGTTTCAATTTCTGT
GTCCTTTTTTGTACTGAAGA-GAAAGCAAATCACTTCTTCCTTATGACTACTTGTGATTATTAATGNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTTATGGACTACATCGTT--------------------------
CTACCAGATTGCCTTCAGAGGGTCGGAAGCTTTAAGAAATGGTGAACAGCAGAAATTGAGAGGGGAGAA-----ATGTAA
ATAGCTTCTG----CACAGCATTTTTCTCTTGACA--------TTTTTTGAGCACAATCACTACATTTGCATCCGTTCT-
ATTGATTATTTTGAACAAGATTTGTGTTTCTGATGTAAAGACTCCTGGTTACTGGGTTTTTGTTTC----ACACAC-ACA
TCTG-GCCATCTGATGGGCACATGGCTTAGAAACTCGGGTCT---TCCCGTGTTATCATGAAGT----CG----ATCAAT
TCTTTT--ATCCAGT-GTGGTTCGCCCAGGAGTCATGTGACTCAT-ATGGAGGAGACTTACACTTTTCATGGTAGATGTT
TTATCTAGTGGCCAAAAAAATAAGGCACTCACAGATGGACCAGGAGACCACTGTGC-----------CCTCTGCAC----
TCCACCACCTTCCACCACTCAATGCTCCT-CATCATGCATGGCCTAGTGACTGGTGTTCGGTCAGAGGCAGGATTTCAGT
TATAGTGTGTGAAATCAGTCACTTCATTTTATATTTGCTTTT------GTACTGAT-ATTATTTCCTGAAGTCTTTG-GT
CCTAAATAATTTCTTGTGTTTTGCCCCCC-GAGTTGAGATGATCTCTGCTCAACTTACCAATGTCATCTTTCTCTCT-GA
CAACTCATT----TCACTCTCTATTGCTCATCATATCCCTAGATAAAAGGATTCAACTTACCTGTCTATAGAACTAAGTC
AGTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
CCAAATTAAGAAATTTGTAAAGTTTTTCTCCACCCCCTTTGTCCTCCTT----------TATATTCTTTT------CAAG
GAAGAGAGCATCTAATAAATATTTAATGGGA-TGTTTGTGAT-----------TTTTTTCTTTAGTAA---TTAGTCTAC
AGTGATAAAATAATATGGGCTATGTACCCTTAGAGCCCTTATTTTTGGGTTCTACAGAAAA-TAGTAGGAACACTGGTCC
CAGAAGTTAGCCTCTCATCTTTTACTAGAGAACAATAAAACCACT---------------GTAATGAAGAGAAA---TAA
AAATAAGAGGCGATAAAAATTCTGAATTTTATGGTACTTGGACACATANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
TCACTCATTCACTAAGAAAGGAAA-GC-AAAAAGGGAAAGGTT---ATGATTAGAACATTATCAGCGCTCTGC-AGAGTT
GTAAAGTAATCAGAATGTTC-------------CTCCCTGTGGGTCAGTGGTGTCTCCCATGATGTCCACTCT-GGTTCC
TGTTTCTCC---CATT---GCTTCCCA--TGCAGTGCTCAGTCTTCTCTGGAAAGCTCTCCCTTCAGAACTTTCTCCCTC
---------TTCTCCTGCCCTTCTCAAAAGG-CATCTCTTTCTCTCCACTTGCAAAGACAAC---CCTCTATTTATACCC
TCAGTAAAAAA--------AGGACCAATGAAATAAAG--TCTTTTGTAATCAACA-GTTCAGTTTGG-AGGGAGAAGTGG
TGCTGAAATGGACCTTCACC----TCCAACAGTCTCAC-AGCCCTT-CTTCTCACTATTTCCCAAAGAAACCAAATCTAA
TCAA-TTGCAGACAGATTATAAATTATAAGATATTTGCCAT--CTTGACAAA--TATCTCC-AGTATTCTACAAACTC-T
AAGTTTTGTAAATGTTATAC-GGACAGGAGTCACAAACGCATAGACCTTCTAAGATAAGCCAGTTCAAGCTATATTTTCT
ATATAGACTTTCTTTGGCTCAAGTCATTGGCAGGGAGGGATGCCAACCAGTCACCCCAGTCACAAATGATAATCAGAGTA
GAATGCATAAAACAAAAGTAATTACATACAAGCTGGACACAAGGAAAGACAACCAACCACCTGTGAAACCTCTTTCTTGG
GAGTTGGATCTTCTCTCTTGG-AAATATG--AAGAGGAAGTACATTCCAGAAAGGGGCAAGTACATTTTGTGATGGAACT
TTTCTTAAACCATAGGGAGATAAAAGG-TAGTGGCAAGCAAGTCACCCCTAACTTCTAATATCTAGAG--GACTTGGCA-
---------TTTAAAAAAACACAAAA-ATTTGGGGG-TGGAAGATAGATTTTAGCTTCCTTAAGATCTTAA-TAGTTGAA
GCTCACTTAAAGGGGAGGACCTTTAACAGAAGAGTAAATCTTCAAAACACCCAAATACAAGGAATTTAAAGTGCTTGAAG
CTCCAGGAAAGGAGAGAAATAACTGCTGTCTGCTTTTAGAAAATA--GAATATTTGAAAATGTGAATTT--AAGTATTTA
ATATGAATTTAACATTAATGTAAAATCAAGGTAACGAATTAGACTAGATGCAA----TTGGTACCATCCACTTAACTTTT
TTCC-CCAACAGAGCCTGAAACTTGGTAAGCAT-TTAAGAAGCGTGAGCTGCTATCATTGGCATTATAATTATTATTA--
-AAAATAGTTTCCCCCAC-TACCTCATCCTATTT-----GAGTGGTTAAAACACACACATACCCCCAAAGAAGCAACGGG
TACTTGCGATTCGCTTTGTTATAATCCCTTATAATCTGCTTTCGTATAAA---TGCCCTGGTTT----------------
---TCCC-CATGGTGCTTAATTCCAATTCTTTCTCATACTCACTTTACCGCTTCGAGAAAGTGGCTATTTGAA--CTCCA
GGCCTGGTTTTCGGCTTC-GTCCTCTGAAAGGAGTCATTG-AAACCCCAGGTCAGCTGGAACATTCCTGCCGCTTACCTT
TCAGGGCAGTAACTTTGTAT---GAGTACAGAGGATGTTTCACTGACTTGTGGTTTTTT---------------------
-CTATTTCTTCTTGTTTTGACAGAACAAAAGCCCTTGTGTTAGAACTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATACTTTTCAGTTTTAAAAAGAATCCTCACGCAAACAT
CTTACGTTTGGACATCTTTGAATAGAATGATTTAATTTTTTTATTCATTCTAGGGTGTAAGGGGTATAATAGTTACTTTT
CTAAGACGTCAGTGAGCGGGTAGCAATGAACTTAGTCTACA-TAGCTTAAGTGGAA---------------TGGTGTCTC
ATATCCAAGAAAAGTTAAAAAC--TATTTGCAGTACTCATTTTCCTTTGGAGAACATGGCATAGGC-AGTTTGAAAACAG
CACTTT--TCTGAC-------------------------------------------------------GTGGCTCTTGG
AATCCGCACTGCGATGCC--GGGGTCTCTGGGATCCGTCCTGTTTGCAGACGGGGAAACCGAGGCAGCTCGCT----CT-
-CCCCTCTCAGCCTCTTTGCT-GTCTGTAC----------AAGGGAATGGGGAAGC--CATGTCTCTAAC-TCCTGGACC
AAAGCTC-TGAAAACCATGCACTTCCGGTTTTCTA-----------------------------------------TGA
GTAATGACTTCATCACGAT-------------------------CATGT---CGATGATTCGCAGTGATGAGGATGACA
ATGATGATGGAGGCGC-AGAGCACTTCTTAGGTTCC--------------------AATTGCGGCTCATGTGTATTTCAC
GTTTCCCCTCACTATACCCTTATCTCTGAGGCGAAACCAAATTACT-------TTGTTGCATATGTCTCTTTCACTTGGC
AAATATCAGTTGAAGAAAA-----------------TCCAAAGGAAAATTATGTTTGTTTCAGAG-AATAGTTTGA----
-----------------TCTTTTTTACGGCAACCACTGTATT-ATAAGAACTAACCTACTCTATTA-----------TCT
TAAAATATTTAAAGGATAATTTTTGAATCCTTCCACATTAGCCTAG-CTTC-ATAATTTCTAAACTAGATTTATTTCATT
TTGCTGTATTTTTCTAGTAGCGAA-TTGCTCCTGCAGATATAAATTATTTTTAA-TTTTCTGCTTTTATTGCCAATGTGA
AAA-GAAGGAA------------------CATAGTGAACAGGTGTGGGG-TAACAGTGCATTAGTGAACTCGAGCA----
TTGTTTTGTATAAT-GGCATTTCTT--GTTTCAGGTGCAGCGGTATCAGCAGGCTAAGCAAAAAAGATTAGTGCAAACAA
---TTAAAATGGGGAAGGTTAGGAAAATATTCACATTT-ACAGTGCTGTTTTTATTTTAATACTCACATGAAAGAATAGT
AGCTAACCAACA----GAAATGCAGAAAGAATAATAA----------GAAGGCAACAAATTGCTTAGGACTTTAAAAATA
TATTTGT----CACCCTAGAATATTTTTCTAATAAAAAGTGTATAAAAATAAATGCAATAATATATATGAAAGATGTTAA
AAGTCATAGTAGGA-GAATTGTTATCTATATCCA--------AATTACAGTCCACCAACTACTTAGTAAACAGAAGGGTG
CAAATGTTA-TGTTTCCTGTCCATATGATATAGGAAAGGTAA--------------------------TTAAAATGGGA
AGTACTTAAGGATTTTGGCTTGATTAAATAATTCCCCCTTTGATAGTGTTTACCTACTAGACACATAGATCTCCGAAAGG
```

```
GAATGGACTAAAATCCAACACAGGTATTTCTTGCCCAGGAAATAACCCATTTAGAAGA--CAAAGTATTTTCCAGAAAGG
CCCTTGACAGGCATGAC-TGAGTTGAGATTAGCTGCAAAGATCCCTTAGTTG-TATCTCTTTGCAGAGGTGTGCATGATT
TAACCTTGCGGGAAATGTGATGGGA------------------TCTCAACTTATTAACTTGGGAGTATGTCCTGCCTTCC
------------CATGAGGAATGGGGTGCTAACTGTCAA---------------CCTATGTTCAGCC-TTCTTCTACACC
TCAGGATACAGCAATGAAAA-CACTGATTTGAATATGCATGGCTCCCATTTGCTTGTAATTAATTTTTTTTCATTAAAGT
GATAGCTTTATCTATA-TTTAAAACA--TTTTCCCCTATATTACATCACTATGGAATGTTATGGGGAGG-AAAGACTGAA
TCTATGATTCACTTAATGTAGA-GTTTCAGCTGTTATAACAACTGATTAGTTATA-----TTTTGCAGCCAACATTTTGA
ATAAGGTATTAGCTAA-AGATGGGTTAGCAGCCAAAATATGCATCTTTATTAGTCCATT-AAAAAGTATGTTCTAAGTTT
TATATACCCATAAATGACTTCCTATT-TAACACTGATGGAATANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
>Outgroup1
TGGTTGAT-AC-TTGTAAGTGTTTTAAAGAAGAACCTAACTAACAGAAACAAAAA--GCAAGCTCCTAAATTTT---TTT
TAA----ATAGGTGTGAATAGCCTTTGTGTTTGTTTTGATGTTGGCA-----------------------GGGTTGAGAG
AT--------------GTCAGTA--CTGACTGCCTACATTGACCAATTCATATACT--------TTTACCTGACATTTAC
TAAG---AACTC-ACTCGTTGCTTTCATTGTGTAGATA----CATGCCAGGTTGCATTTTGCCT-TAGTTGAAATTCCAT
GCATTGTTTTATATC-TGGA-GAAAATAAATCATTTCTTCCTTGTGACTGCCTATCATTATTAATGATTATAATGTACAC
TGGACCTATTGGAGACTTCTTCATTGCAGTTTTTAATTAATGGACTACATAATTGTAGTAGTCCATTAATTGCAGACAAA
CTCACAGATTGTCTTTAGAGATCCAGTAGCTTCAAGAGATGGTAAGAAGCAGAAAGTCAGGATGTGTAAGCAATGTGTAA
ATGGCTTTCA----CATATGACTTTTCTCCTGAAACACACA-CCTTTGAGAACAAAATTATTATATTTGCAACAATTAT-
ATTGAGTATTCTGAATAAGACTTGTGTTTCTGACATAAGGGCTCTTGGTTGCTGGGTTTTACTTTG-----CACAC-ATA
TTTG-CCTGTCAGATTGGCACATTGCTTGTAATTGTTTCTCT---CACTGTGTTA---TGAAATCTCCCTTTCTATCAAT
TCCTTTTCAGCCAATAGTAGTTCTCCAATGAGTCATGTGGCTAAATAAAGACAGGGGTTGCATTTTATGTAGCAGATGTC
TTATCTGGTGGCTATACAAATAAAGCACTCACAGGTTTTAACAGAGACCATAG--------------CATCAATTATCAG
TCCATCACTTT-CAGTACTTGATGCTCCT-AGTTATCCATGTCCTAGTGACTGACATTTAGTCATAGACAGGTTTTTAAG
TATAGGTTATGGACT------CATGATTTTATATGTACTTTCAAACTAGCATTCATTGTTATTTTCGGAAGTCTTTA-GT
CCTCAATAATTTATTGTGTTTTGCCCCAT-GGGTTTAGATTATCTTTGCTCAATTTACCAATGTCATCTTT---TTA-AA
CTACTCTTTC-ATTCTCTTTTGACTGATCATCACATTCCCAGACAAAAGAATTCAAATCACCTTTCTTGATAACCAAGTG
AACATAAGCCTAAGGAAAA-------GAGTCAGATGTTTTTATATAAGCCTTGTAGAAATATG-----TAATTATTAGGT
CCAAATTGAGAAATTTGAAGTTTTT------CTCAATTCATTTTACATA-----TATATATATATATATATATATATATA
TATGAAGTTGTTTAATGAATATTTAGCTG---TTTTGTTGAGTGGGTAT----TTTTAACATTAGAAATTATTATTCTAC
TCCAATCAAATAACA----TGTTATACCCCTATAGTCCTTATTTT-GTGGTCTACAGAAAA-TAGTAGGAACACAGGCTC
CAAAACTGAGCCTTTCAT-TTTCATTAGCAGATAGTAAAGCCACT---------------GTAATCAAGAGAAAT--AAA
AAATGAGAGGTGGTGAAAATTCTTGATTTTACAATACTTGAATATATGCAGTGTTCACAGATTTT-CAAGTA-CCTACAG
AGAT----------GAAACTAAGTTAAACTAGCTAG----CTAACCAGCTGAGGCTCTGTGGTGTAATCAATAGG-TCTA
CCA-CCATTCACCAAGGAAGAAAAAGT-AAAAAGGGAAATGTT---ACAATTAGAACGTCATCGGCTCTCTGCAAAAGTT
GCAGAGTTATCAGAATGTGTCTTTGATGCAC-AACTCTTTTGGGTCAGTG-TGTGTCTATTGAAGTTCACTCTCAC-TCC
TG----------------TGCCTCCCAT-TGCA-TGCTTCGGCTTCTCTGGACACCTCTGCCTTCAGAACTTTCCTTCCC
-------CTTCCGTCTCCCCTTCTCAAAGGG-CATCTGTTTCTCTCTCCTTGAAAAGATGAC---ACTCCATTTATACCT
TCAGTAAAAAG---------AGACCAATGAAATAAAA--TCTTTTGCAATAAACA-ATTCAGGTTGGTAGGGAGAATTGG
TGCTGGAATGGACCTTCACT----CCTACTAGTCTCC--AAACCTT-CGCCTCACTGTCTTCC-AAGAAACCCAATC-AA
TCAA-ATGGGGATAGAATATAAGCTACAAGATACTTACCAACACTGAACTACATGATCTCCAGGTATTCCACAAACTC-T
AAGTTTTGTGGGTGATGTACCGGGCAGGAGTCACAAATGCACACTCCTTCTAAGAAAAGCCAGTTCAAGCTACATTCTTT
CTATAGACTTTCT--GGCTCATGCCATGTGCAAG-AGTATTGCCCACCTGGCACCCTGGCCACAT-TGATCATCAGGATA
CATCACATAAATCAATAGGAATTATGTACAGGGTAGATACAGGGAAAGC----CAATCACCTGAGACTTCTCTCTCTTGG
GAATTGGATTTTCTGTCCTGGGAAATATG--AACATGAGGTAAATG-CAGAAATGGGGAAGTACATTTTGTGAGAAAACT
TGTCTTAAATTGCAGGAGAATAAAAAG-TATAAACAAGTAAGTCACCCATTACTTCTACCATTCAGAG--GACCTGTCAA
CTATGATGTTTTAAAATGACAAAACAGAGTTTGAGG-TGGGAGAGTGGTTTCAGTTTCAGTGAGATAGTAATTAGTCGTG
TCTCATTTAAAGAGGAGGACTTTTAACAGAAGAACAAGTCTTCAAAACACATGGACTCTAGAAACTTTCAGTGCTTGAAG
CTCCAGGAAGGGAAGAAAATAATGCATTCCTGATTTTAGAAGATA--AAAGTACTGAAAATTTGAACTTAAAAGTTG---
---------TCACACTAATGCAGAATTAAACTATGAAATTAGGTGAAATTAAACCAGTTCCACCCATCTACCTAATTTTT
TTT--CTGACTGAGCCTGGAACCCGACATATAC-TTAACA-GTGTGAGCTGCTATCATTGACATTATAATAATTACTACT
ACAAATAATTTTCATCAC-TATCTCATCTTATTT-----------------CAG---TATATTTCCAAAGAAGCAA-AGG
TAGTTTAGATTTGGTTTGTTATAATCTCTTATAATCTGGTCTCATATAATATATTTCCACATTTTGACAAGTAAAATGGA
ACAGCTC-TGTTGGGTTTAATTACAATTCCTTCTCACATTCATTTTAAAGCTTCAAGAAAATGGCTGTTTCAA--TACTG
GGTCTGGTTTTCTACTTAAGTGTTCTGAAAGGATTTATTGAAAACGCCAAATTGGCTGGAACATTTCTGCCGCTTACCTT
TCAGCAGAGTAACTGTGAGT---CAGTATGGTGGATATTTCACTGATTTGTGTTTTTCT---------------------
------TCTTCTTGTTTTGGCAGAACAAAAGCCCTTGTCTTAGAACTGTTGGCAGCCGTTTGTCTTGTCAGAGGCGGGCA
TGAAATCATTTTATCAGCATTTGATAACTTTAAAGAGGTAGGCTACACTATAGTTTTCATAAGAAT----ACTCACACAT
CTTACATTTGGACATCTTTGAACGGAATTATTTA-CCTTTTCATTTATCCTAGGGCCTAAGGAATATAATAGTTAATTT-
CTAAGATCTCACTGAGAGGAATGTAATGAACTTAGTCTAAA----------------------------TTTGGTATCTT
ATTTCTAGGATAAGTTAAAAA---TAATCACAGTACTCTTATGTTTTTAGGGAACATGGAATAATCCAGTTTGAAAACAG
CATTTATTATTATTATTGTATCCTTCATTATATCTTTTTCTTTTTTGCCCTGTCTTATGGAGCCAAGCATTG--TCCTGT
ACTCCTCAGTATAAGGAT--GAAGTCTCTGGGATTAACCCCAATTACGGATAAGGAAACTGAAGCAACTCCCTTTCCTTC
CTCTCTCTCAGCCACTTT-CTCATAAAAATGGAAATGTAAGATAAAATT-GGAACTCACATCTTCTTTAC-TCATGAACC
CAGGCTCTTAAAAACTATGCACCCCTGCTTTTTGA-----------------------------------------TCA
ACAAT-------TAATAAT---------------------------AATCATCTTTCTTATTAGCAATGGT---GATGATG
AAGATGATGGAAATACCACAATATTTTTTATGTTGCAGGAGCAATTCC--------AGCTGCTGTTCATGTGCTATTCAC
ATTTATCCTCACAATCCCCCTGTTTCTTAGACTAATCCCAACTTAC------CTTGTTACACATGTCTCTTTCATTCAGC
ACATATCTATTGAGTAAAAAAAT---------GAAACCCAAAGGGAGAGTATATTTTCTTCAGAG-AATAATTTGACCTT
TTTTTTTTTTTTTTTTTTTTTTTTAACAGCAACCACTATATT-AGTGACTTTAAGCTACTCTTTTT------------CT
TAAAATACTTAAAAGAGGATTTTTGATTCTGGCCAAGTGAGCCTAC-CTTT-ACAACTTTTTAAAAAGATTTATTTCATC
TTGCTGTAGTTTTCTAGTAATAGAGCTGCTTCTGTAGATG---ATTGTTTTTTACGTTTCTGATTTTGTCACCAATGTGA
AA-GGAAGGAA------------------CATAGTAAATAGATGCAGTGCTGACAGTGCTTTAG-GAC-TGGAGCA----
TTGTTTTGTATAAT-ATCATTTCTT--TTTTCAGATGCCGCAGTATCAGCAGGCTAAGCAAAAAAGATGAGTGCCAGAAA
AATTTAAAATGGGAAATATTAGGAAAATATTCACGTTTTACAGTACTATTTTTACTTTCGTATTTAAATGAAAG---AAT
AGATAACCAACA----GAAATGTGGAAA--ATGATAATGCAAG-ATA--AAGCAACAAATTTCTCAGGCCTTAAAAAATA
TATTTAT----CATCCTGGAATATTTTTCTAATAAAAATTCTATAAAGATAAATGTGACAATATATTTGAAATATCTTAG
AGCTCTGGGGA----GAATTGCTGTCTATATCCA--------AATTGTAATCTACCAACTATTTTGTAAG-TATAGGAAT
GGAAAGTTA-CATTTTCTCTTCACTTAGCATAGCAA-GGTAA---------------------------TTAAAATGGGA
```

```
GGTACATGAATATCTTGGCTTGATTAAACAATTCCTCCCTTCATAGTCCTTCTCTACCCGAAGCACA-GTTCTGCAAAGA
GAAAGGGCGAAAACACAGAACATATATTTCTTGTCCAGGAGAAAT-CCATTTACAAGATTTAAAGTATTTCCCAGATACT
CCATTACCAGGCATCAT-CGAGTTGAGCTTAGCTATGAAGACGTCTTGATTG-TACCCCTTTGCAGAGGTTTGGATAATT
TATCCATGAGGGAGATATGACAGGGACACTGTTATTAATGTGGAAATATGTTATTAACGTGGGAGTATGTTATTAACATG
GGAGTCATCCCAGAAGAAACGGAGTGCAGAGACAGTCGA---------------CCTATTTCTCGTCATCC----GTATC
TCAGTACATGGCAAGGCAAA-CACTGATTGAAATATATTTGGCTCTCATTTGCTTGTAATTAATATTTTT-CATTACAAT
GATAGATTTATCTATAATTTAAAACT-TTTTTTCCCCACATCACATCACTATAAAATGTTATGGGAAGG-AAAGACTGAA
GCTATGATTCACTTA-CACA-----TTCTACTGCTA----AACTGAATAGTTCTAACATCTTTTTCAGTCAATGTTTTGA
ATA----------CAGTAGATGTGTTAGCAGTCATAATACGCATCCTTATTAAGTCATT-AAAAAGTGTGTTCTAGGTTT
TATATGTCCACAATTCACCTCCTATT-CAATACTAATGGAATATTCA----TTCCACTCATTCATTCTA---CAAAA-CT
TACTGAA------CACCTA-C-ACCATGCTGGGGATGCAATCGAGAACAAAATAGAGTA
>Outgroup2
AAGTTGAT-ACTGTATAAATCCTTTTAAAAAGAACATAA----GACAAATAAAAGA-GCCAGCCCCTAAACTTGATTTTT
TAAATAAATCGGTGTGAATGGCTTTTATTT-ATTTATTTATTGGGTG--------TAGGGAGTTCTGAAGGAGTTGAAAG
AT---TAAAGTATTGAGTCATCCAACTGACTGCCTGTATTGACCATTTCTTGCATT----CTCTT--TCCTGCCATTTAC
TGAG---TATTT-ACTCCTTGTTTTCCTTGGGTATACA----TAAGCCAGTTTGCATTTTCCTT-TAGTTGAAATTCCAT
GTCGTGTTTTGTATC-TGGA-GAAAACAAGTCACTTCTTCCTTGTGACTACCCATGATTATCAGTGA---TAATGTACAC
TCACTCTGTCGGAAACTGGTTCTTTGCAGTTGTTAATTTAT-GACTACATTGTT--------------------------
CTGACAGATTATTTTCAGAGAATAACTTGTCTCAAGAAATGGTAAGAAGCCGCAAGTAGGGGGAAAAAT-----GTGTTA
ACAGCTACCTACCACACAGGATTTTTCTCTT------------------GAACAAAATCCTTACTGTTAGAATAGTTAC-
ATTGATTATTT-GGAAAATATTTGTATTTCTGACATGAAGGCTCTTGGCTACTGAGTTTTTGTTTC----ACACAA-ATA
TCTG-TCCATAAGATTGACATGTTGCTTGGAAATGAGATTCTCCTCGCTGTGTTATCATGAAGTCTCCTTCCCCATCAAT
TCTTTT-CAGCCAACAATAGTTCCCCTGGGAAGCATATGACTCATTAAGGAGGGGGCTTGTACTTTAC-GTATAGATATC
TTCTCTAATGGCCAAACAAATAAAGCACACACAGATAGACGTGGAGACCGCAGCAC-----------CCTCTACAGTCAG
CCCATCACTTTGCAACACTTGGCACTTTT-AGTCTTCCATGTCCTAGTGAGCCTTGTTTGGTCACGGGCTGGTTTTCTGA
TAATGCTCATGGAATAAATCTCATGGTTTTACATTTCTTTTCAAATCAGCATTGATTATCATTTTCCGAAGTTTTTC-GT
CCTGAAGAATTTTTT-TGTTTTACTCCAT-GAATTTGGATCACCTCTGCTCTATTTACCAATGTCATCTTTTTGTTTAA
CTAGTCATTT---------------------CACTCTCCTGAGACAAACGGATCAAATCACCTGCATAAAGAAGCGAGTA
AGCCTAAGTCTGAGAAAAA-------GAGGCTGGTACTTCTATATGAACGTCCACAGGGTGTC-----CAAGCAGCAGCT
GGGGGATTCAAACTGCTGACCTTTTGGT-------------------------------------------------TAG
CAACTGTAGCTCT--TAACCACTGTGCTA---CCAGGGCTCCTTTTCTT----TTTTTACTTTAGTAA----TCTTTTAC
TATGATAA--TAACAA---TTATGTACCCTTATAGCCCTTATTTT-GTGATCTACAAAAAAATAGCAGGGACACAGGCTT
TAGAAATGAGCCTTTCAT-TTTCATTAAAGGACAGTAAGACCACT---------------ATAATTCAGAAAAA---TAG
AAACGAGAAGTGGTGAAAATTCTGAATTTTACAGTACTTACATATATGTGATGTTCATATATCTT-CAAGTATGCTCAAA
AT------------AAACCTGAGTTAAGCCAGCTAA----CTAAATAGCTGAGACCCTGTGATGTAGTCTATAGG-TACA
TCACACTTTCACCAGAAAAGGAAAAGCAAACAAGGGAAATGTT---ACAATTAGAACTTTGTCAGCCCTCAGC-AAAATT
GTGAAGTAATGAG-GTGT-CTT--AGGTGCTCACCTCCTTGGGACCAGTCACATCTTGCCTGAGCCCCATGCTCCCCC-C
AGTCCCTCCTGT------TGCACCCG---TCCAGTGCTCAGGTGTCTACGGACAGCGCTGCCTCCAGAACTTTT------
-------CTTCCCCTTCTTCCTCCTCAATAGACATCTGCTTCTCTCCCTGTGCTATGATATC---ACCCCACCTGCACGT
TCGACAAAAA---------GAGACCAACGAAATAAA----CTC---------------CAATTCAGAAATGGAGAAGGGG
TATGGACATGGACCTTTACC----CCTA-------------------TCCTTCTCCTGTTTTCCAAGAAACCAAATCCAC
TCAA-CTGGGGACAGAATATAAATTATA------TTTCCATTCCAGGACTAAATGATCTT-AAGTATTATTAAATCTC-T
AAGTTTTATGGGTGATACACTGGACAGGAGTCACAAAAACAAC-CTCCTCTAGGGAAAGCCAGTTCAAGCTATATTTC--
------------TGTGGTTCATGCCACATTCAGGCTGTGGTGCCTACCTGTCAGCCTGGCCACAGCTGATAATCTGGGG-
-ACTGCATAAATCAAAAGTAATTTAGCGCAGGTTGGACACAAGGAAAGT----CAACCACCTCTGAGACTTCTTTCTTAG
GAATTGGATATTCTCTATTGGGAAATAAG--AATATGAGGTACAGA-CAGAAAGAGATAAGTACATTTT--GAGGGCA-T
TTTATTAAATCATAGGGGGATGAAAAGATACTGACAAGCAAGTCACCCCTGATTTCTTCTATCCAGAG--GACTTGTCAA
TGTTGGCATTTTAAAATGACAAAACAAGCTTTTGGA-GGAAAGATTGACTTCAGTGTCAGTAAGATCTTAA---------
------------TAGAACCCTACTTAAAGATGGGCAAATCTTTAAAACACATGGATTCAAGGAATTTTAAGTGCTTAGAG
CTCCAGGAAGGGAGAAAAATAA-------CTGC-TTTAAAAAATA--GAATACATGAAAACCTGAACTT--CAGTAC---
-------CTTAATGTTAATGCAAAATCAAGATGCTGAATCAGACTTGACTCAC-----------------CCAGTTTTCT
TT---CTGACAGAGCCAGGAACTTGGTAAACAT-TTAATAAGTGTGA---GCTATCACTGGTGTTATAATCATATCTA--
-GAAATACTTTTCATCAC-TATCTAGTCTTATTTAATCGGGTGCCTTAAAAAGCACACA---CCCCAAAGAAGCAA-AGA
TACCTTGGCTCTGGTTTGTTATAACCTGTTACAACCTGGTTTTGAATAAA---CTGTCACATTTTGACAAGTAAACTGTA
GGCACTC-CATTGGGTTAAGTTACAATTCTGGCTCATACTCATTTTAAAGCTTCAAGAAAACAGCTACTCCAA--CTCTG
GGTCTGGTTTACTACTTA-GTTCTCTGAAAGGGTTCTTTGAAAACCCCAAATGTGCTGAAATGCTTTTGCTGCTTACCTT
TCAGTAGAGTAACTTTGTAT---GAGTACAGTGGATATTGCATTGATTTGTGTTTTTCT---------------------
----GTTTTTCTTGTTTTGACAGAACAAAAGCCCTTGTCTTAGAACTGTTGGCAGCTGTTTGTCTGGTCAGAGGCGGGCA
TGAAATAATTTTATCAGCATTTGATAACTTTAAGGAGGTAAAATACTTTACAGTTTTTTAAAGAATGCTCACACAAGTAT
CTTATATTTGGGCATCTTGGAACAGGATGAGCTA-CCTTTTCATTTATTCTAGGTCCTAAAGAGTAAAATAGTTAATTTT
CTGAGATGCTGCTGAGGGGAAATTTATGAAGTTGGTCTAAA-TATCTTAAATGTATAGGTTAAGCTTTCTTTGGTGTCTC
ATTTCCAGGATAAGTTAAAAAA--TATTTACATTACTCATTTTTCTTTGGAGGA-TTGGAAGAGCC-AGTTTGAAAACAG
CATTTG--ACTGAC-------------------------------------------------------TTGGGTTCTGT
GATCTTCTCTCAGAGGA---GCGGCCTCAGGGTTTAGTCCCACTTACAGATGAG-AAGCTGAGGCTGCTCC-------TC
CCCTCTTCCAGCCCGGTTCCTCTTCTCACA----------GATGGGATCAGGA---CCAATAT--CTAAC-TCCCAAAGT
CAAGCTCTTAGATACTCTTTGCGAGTGATTATTTA-----------------------------------------------
--------------ATAAT--------------------------GAGCACTTTTATTATTAGTGATGAG---GATGACA
A-AATGATGGAGATACATAATTGCTTTTTATATCACTGGAACAGTTAC--------AGATGCCAATCATAGTT--GTCAC
ATTTATCCTCACAACACCCCAGTCACTCAGGCTAGACCTCGTTACC-------CTGTTGCATATGCATCTTTCATTCAGC
AAACATCTGTTGAGTGGAAAAAAAAA------GAAACCCAAAGGAAAATTGCAGTTGCTTCAGAG-AATAGTTTGA----
------ACATATTTTTTTTTTTTTTTACAGTTAC--CACTATCTAGTGATTTTAAACCACTCTATTG-----TCTTTTTCT
TAAAGTATTTAAATGAGGATTTTTTAATTCCGCCAAATTAGCCTAG-CTTC-ACAACTTCTTAAATAGAGTCATTTCATC
TTGCTGAACTTTTCTGGTAGCAGAGCTGCTCCTTCAGATAGAAATTGTTTT-CA---------------------------
-----------------------------------------------GGTGCCGACAGTGCTGTAGTGACTTTGAGCA----
TTGTCTCATATAAT-GGCATTTCTT--GTTTCAGATGCACCAGTATCAGCAGGCTAAGCAAAAACGATGAGTGCCAAAAA
A-TTTAAAATGAGAAAGGTTGGGAAAA----CACATTTTGCACTACAGTTTTTATTTTGATATTCAAATGAAAAAACAGT
AGATAACCAACA----GAAATGTGGAAAGAATAATAATACAAGATGAGATCTCGACAAATTTCTTAGGGCTTTAAAAATA
TATTTATATGTCACCCTGGGATATTTTTCTAATAAAAAGTTTATAAAGATAAATGAGACAATATATATGAAAGATCTTAG
AGTTCTTGGGA----GAATTGCTATATATATCCA--------AATTATAATTCACAAAGTAGT----------AAGCAGA
```

```
AGAGTGGAA-AGTTATGTTTTCATATGGTGTAAGAAAGCTAA---------------------------TTAAAACCAGT
GGTATTTGTAGATCTTGGCTTGATTAAACAATTCCCTGCTTCACAGTCTTTACTCACCAGAGATCCAGGTTTTGGAAAGG
GAGTGAACGAAACTGCACCCAGAATGTTCACTGCTCTAGAAATATCACAAGATT------------------GAGAAAGG
GCATTGACAGGCATGAC-CAAGTTGAGCTTGGCTGCAAACATCTCTTGGTTGTTATCACTTTGCAGAGGTGTAGATAATC
TCACCGTGGGGAAAATATGACAAGA------------------ACACTATTTATTAACATG--------------------
------------------GAATGGACTGCAGAGAGTCAA---------------CCTATTTCTAGTCATCC----ACATC
TCAGTACCCAGCAAGGCAAAACCCTGATTTGAATACATGTGGCTCTCATTTACTTGTAATTAAATTTTTT-CATTAAAAT
GGTAGATTTATATATA-TTTAAAAC--TTTTTTCCCTACATTGCATCATTATGGAATGTTATGGGAAGG-AAAGACTGAA
GCTTTGGTTGGTTCACTTATGCTGTTTCTGCTGCTAAAACAACTGATTAGTTATAAGATCTTTTTCAGCCAAAGCTTTGA
ATA-------------AAGATGTATTAGTAGCCAAAGTATACATTTTTATTAAGTCATT-AAAAAATATGACCTTGGTTT
TATATATCTGTAATAGACCTCCTGTT-CAACACTGATGGAATGTATA----ATGAATTATAGTTG-------CTAAA---
----GAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
>Perissodactyla_Sp2
AAGTTGTT-ACTGTATAAATCCTTTCAAGAAAAACACAAATAAAATAAATAAAAAA-GCAAGCCCTTAAATTTTTTTTTT
TTT-------AAATAAGTGGTAATGGCTTTTTGTTTTTCTTTTGGTG--------TGGGGGAGTCTGGAGGAGCTGAGAG
AT---TTCAGCACTGAGTCATCTAGCTGACTGGCTGCACTGACCAATTCATATACT----GTCTTTTACCAGACCTGTCC
TGAG---TTCTC-ACTCATTGCTTTCGTTGGGTAGAGACAAGCAAACCAGTTTGCATTTTTACT-TGTTTGAAATTCCAT
GTCCTGTTTTGTATC-TGGA-GAAAACAAATCGCTTCTTCCTTGTGACTACCTATGATTATTAATGATAATAATGTACAC
TCGATCTGTTGGAAACTTGTTCACTGCAGTTTTTAATGTATGGACGACATAGTT--------------------------
CTAACAGATTGTCTTCAGAGAATCAGTAGCTTCAAGAAATTGTGAGAGACAGAAAATGAGAGGGGAAAAAT---GTGCAA
GTAGCTTCCA----CAAAGGGTTTTTCTCTTGAGACATACA-TTTTTTAGAACAAAATCACTATATTTGCATTAGTTAT-
GTTGATTATTTTGAATGAGATTTGTGCTTCTCACTAAAAGACTCTTGGTTACTAGGTTTTCGTTTT----GCACAA-ATA
TCTG-TCCGTCTGATTGACACATTGCTTGGAAATGAGGTTCT---TCATGTGTTATCATGAAGTCTCCTT----GCCAAT
TCTTTT-CAGCCAACGGTAGTTCTCCCAAGAGTCATATGGCTCATTATGGAAAGGACTTGCACTTTACATAGTAGATGTC
TTATCTAGTAGCCAAGCAAATAAAGCACTCAAAGATGGACCTGGAGACCATTGTGC----------CCTTCTACAATCGG
TCCATCACTTTCCACCACTTGATGCTCCT-CATCATCCATGTCCTAGTGACTGGTGTTTGGTCATAGGCAGGGTTTCAGG
TGTAGCTTATGGAATCAGTCACATGATTTTATATTTGCTTTCAAAGTAGTATTGATTAT-ATTTCCTGAAGTCTTTC-GT
CCTGAAGAATTTCTTGTGTTTTGCCCCAT-GAGTTTAGATGATCTCTGCTCAATTTACCAATGTCATCTTATTCTCT-AA
CTGCTCATTTCCCTCTCTTTCTATTACTCATCACATTCTTAGACAAAAGGAATCAAATTACCTGCCTATAGAACCAAGTG
AGCATAAGAACGAGACAAA-------GAGTCTGAGGCTTTTATAGGAGCCTCATTGAAATATG-----CAATTGTTGGCT
CCAAATTAAGAAATCTGTGAGGTCTTTCTCCTTTCCTTTCTTTCTTCTT----------TATATTTTTTATAAAATATAG
GACGAAAATGTCTAAGGAATATTTAGTGGAGCTTTTTTTGGTATATGTT----TTTTTACTTTAGTAATTATTATTCTAC
TATGATAAAATAACATGTGTTATGTACCCTTATAGTTCCTTTTTC-GTGGTCTACAGAAAA-TAGTAGGAACACAGGCTT
CAGAAGCGGGCCTTTCAT-TTTTATTAGAGGACAGTAAAACCATTAATTAAGTAAACCATTTAATTAAGAGAAA---TTA
AAATAAGAGGTGGTGAAAATTCTGAAGTTTATGGCACCTGGACATATGCAATGTTTATATATTTT-CAAGTA-CCTAAAG
AA----------ATGGAACTGAGTTAAACTAG--------TTACCT-CCTGAGGCCCTGTGGTGTAATTAATAGG-TACA
TCACGCATTCACCGAGGAAGGAAA-GC-AGAGAGGGAAATGTT---GCCATTAGAACATTGTCAGCCCTCAGC-AAAGTT
GTAAAATAATTGGAATGTTCTTCGATGTG-T-ACCTCCTTTGGGTCAGTTGTGTCTCTCTTGAGGTCCACCCT-GGTTCC
TCTCTCTTTTGGTGTTCTGAGCACCCAATTTCAATGCTCAGGCTTCTCTGGAAAACTCTGCCTTCAGAACTGTTCTCCCT
-------CTTCCCCCTGCCTGTCTCAAAAGA-CATCTGTTTCTCTCCCCCTGGAAGGTGATCGACACTCTCCTTATACCT
TCAGTAAAAA---------GAGACCAGTGAAGAGACCCATCTTTTGCAATCAATA-ATTCAGGTTGATAGGGAAAAGTGG
TGCTGAAATGGACTTTCACC----CCTTATAGTCTCAG-AATCCTT-CTCCTCTCTGCTTTCC-AAGAAACCAAATCCAA
TCAA-TTGAGGACAGAATATAAAGTATAAGATATTTGCCATCCCTGGACTAGATTATCTCCAAGTATTCTACAAACGC-T
AA----TACGGGTGATG-----TGCTGGAGTCACAAACATACAGCCTGTCTAAGAAAAGCCAGTTCAAACTCTATTTTTC
ATACAGACTTTCTTTGGTTCATTCCATGTGCAGGGAATGATGCCAACCAGTTACCCTGGCCACAACTGAGAATCAGGGTA
GAGTGCATATATCAGAAGTAATTACATACAAGCTGAATGCGAGG-AAGA----CAATCACCTCTGAGACCTTTCTCTTGG
GAATCGAATCTTCTCTCTTGGGAAATATA--AACAGGAAGTACATGCCAGAAAGGGGTAGGTACATTTTACAAGGGAACT
TTCCTTAAATTGTAGGAGGATAAAGGC-TGCTAACAAGTAAGTCACTCCTAACTTCTACCATGCAGAG--GACTTGTCAA
CTTTGGCATTTTAAAATGACAAAACACATTTTGGGG-TAGAAGATGGA--TCAGTTTCAGTAAGATCTTAA-TAGTGGAG
TCTCATTTAAAGGAGAAGGCGCTTAACAGAGGAGTAAATCTTCAAAACTCATGGATTCAAGGAATTTTAAGTGTTTGAAG
TTCCAGGAAGGGAGAGAAATAACTGCTATCTGCTTTTAGAAGATA--GAATATATGAAA-TCTGAACTT--GAGTAT---
-------CTTAACGTGAATGCAAAATCAAGATGAAGAATTAGACTAGACTCAA----CTGGTGCCATCTATCTAATTTTT
TT---CCAACAGAATCTGGAACTTGGCAAGCAT-TTAATAAGTGTGAGCTGCTATCAATGGCGTTATAATTATTACTA--
-GAAATAGTTTTCCTCAC-TAACTCATCTTACTT-----GAGTGGTTAAAACATACACATA-CTCCAAAGAAGCAA-AGA
CACTTTGGATCTAGTCTGTTACAATCATTTATAATTTGAATCCATATAAA---TTTCCAGATTTTGACAAGTGAAATAGA
AGAGATC-CATTGGGCTTAATTATAATTCTTTCTCATACTCATTTTAAAGCTTCAAGAAAATAGCTATTTCAC--CTCCA
GGTCTGGTTTTCTACTTA-GTTCTCTGAAAGGATTTATTGAAAACCCCAAGTCGGCTGGAACATTCCTGCTGCTTACCTT
TCAGTAGAGTAACTTTGTAT---GAGTACAGAGGATATTTCACTGATCTGTGTTTTTC----------------------
-TTTTTTCTTCTTGTTTTGGCAGAACAAAAGCTCTTGTCTTAGAACTGTTGGCAGCAGTTTGTCTTGTCAGAGGCGGGCA
TGAAATTATTTTATCAGCATTTGACAACTTTAAGGAGGTAGGATACTCCATAGTTTTAAAAAGAAGGCTCACAGAAACAT
CTTATATTTGGATATCTTTAAAGAGAGTGATTTA-CCTTTTTATTTATTCTAGGGCCTAAGGGGTATAGTAGTTAATTTT
CTAAGACATCACTAAGGGAGAAATAATGAACTTTTGTCTAAATATCTTAAACGGATGCATCAAGCTTTCTTTGGTGTCTC
ATTTTCCAGAGAAGTTAAAAAC--TATTTGCAGTACTGATTTTCCTTTGGAGAATATGGACTAGCC-AATTTGAAAACAG
CCCTGC--ACTGAC-------------------------------------------------------TTGGCTTCTGT
AATCCTTGCGATGATGGGAGGGGGTCTCTGGGATTAATCCTATTTGCAGATAAGGAAACTGAGGCAGCTCCGT----TTT
ACCTCTCTCAGCCTGTTTTCTCATCCATGA----------AACGGAATTGGGAAGTCACATC---TTAAC-TTCTGAACT
CAAGCTCTTAAAAACTTGAGAG--CTGCTTTTATA-----------------------------------------TGA
TTAATGCTTCACTGAACGTGGGAGTGCAGAGATCTTAATAGGAATCATTT---TTATTATTAGCAATGAT---GATGACA
ATGATGATGGAGGCAC-ATAATGCTTTTTATGTCCCGGGATCAATTCCAGAACAGCAAGGACTATTCATGTGTAATTCAC
ATTTACCCTC-CAATACCCCTATCTCTTAGGCTAAACTCGGTTTAC------CTTGTTAGATATGTCTCTTTCATCAAGC
AAATGTCTATTGAATAAAAAAA----------GAAACCCAAAGGAAAATTGCATTTGCTTCAGAG-AATAGTTTGA----
--------------GCTTTTTTATAGCAACCACC---ATGCT-AGTGCCTTTAAGCTACTCTATTG-----------TCT
TAAACTATTTAAAGGAGGATTTTTGAATCCTATCAAGTGAGCCTAG-CCTC-ACAACTTTTTAAATAGATTTATTTCATC
TTGCTGTAGTTTTCTAGTAGCAAG-CTGCTCCTTCAGATATAAATTGTTTTTTGGGTTTCTGA-ATTGTTGCCAATGTAA
AAAGGAAGAA-------------------CATAGTAAATAGATGCGAGGCTGACAGTGCTTTAGTGACTTTGAGCA----
TTGTTTGGTATAAT-GGCATTTCTC--GTTTCAGATGCAGCAGTATCAGCAGGCTAAGCCAAAAAGAGGAATACAGAGAA
A-TTTTATGTGGGAAAGGTTAGGAAAATATTCATATTTTATGGTATCGTTTTTCTTTTGATATTCAAATGAAAGAATAGT
AGATAACCAACA----AAAATGTGGAAAGATTGGTAACACAAGATAA--------------------------------
-CATTTT----AGGCTAGAACATTTTTTCTAGTAAAAAGTCTATAATATAAATGCAAATAATATATATCAAAGATATCGA
```

```
AGGTCTTAGGAGGA-GAGTTACTCTCTATATTCA--------AATTATAATCCACAAACCATTTAGTAAGCAGAAGGGTG
GAAATGTTA-TGTTTTCTCTCCATATGGTATAGGAAAAGTAG---------------------------TTAAAACTGGA
GGTACGTGAAGATCTTGGCTTGATTAAACAATTCCCTCTTTAATAATCCTTCCCTATTAGAGACACAGATCTTGGAAAGG
GAGTGGACTAAAATCCAAAAGGGGTATTTCTTGCCCAGGAAATAACCCAGTTACGAGATTCAAAGTATTTTCCAGAAAAG
CCCTTGACAGGCATGAC-GGAGC------------CAAAGATCTCTTAGTTG-TATATCTTTGCAGAAATGTGCATTATT
TAACCATGAGGGAAATGTGATGGGA------------------TCACT----ATTAACTTGGAAGTGTGTC--GCCTTCC
------------AGTGAGGAATGGAGTGC-GACAGGCAA---------------CCTATTTCTAGCCATCG----ACATC
TCAGTACACAGCAAAGCAAA-CATTCATTTGAATATGTATAGCTCTCATTTGCCT----ATAATTTTTCT-CATTAAAAT
GATAAATTTATCTATA-CTTAAAACTC-TATTTTCCTACATCACATCACTATGGAATGTTACTGGTAGG-AAAGACTGAA
GTTATGTTTCACTCA-TACAGG-CTTGCTGCTGCTA----AACTCAACAGCTATAAGATCTTTTTCAGTAACTATTTAGA
ATA-------GCATAACAGATGTGTTATCAGTCAAAATATGCATCTTTCTTAGGTCATT-AAAGAGTGTGTTCTAGGTTT
TATACGTCCACAATTGACCTCTTATTTCAACACTGATTGAATAGTCA----TTCTACTCACTCATTCTA---CAAAAATT
TACTGAA------CACATC-CTACCATGCTGGGGATGTGGGAAAGAACAACAGATACAG
```

10. Chiroptera+Perissodactyla+Cetartiodactyla

```
>Bos_taurus
CCAGTTGCGGTGC---TTTTGTCTCGGGTTTTAAGCTGCATGTATA------------TTAACAC----AAAAAATT---
ACAGACACCTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGTACGTTTCCTGGATAAAAGAGAAATGACAAA
AAAA----TCAGCCTTAATCAACTTTTCCCT-GCTTTCCGATTTGATGCAAAAAGC-----------CCAGTCAC-CTCC
C---------------AAACTGTTACATGAGATGA--------------------------TTTGAGATTCCTAAGAAGT
TGCGGACCCCGAGACTAAACCCCT----CCCCCTGGGCCTGCACATCCACAATGCAAAGGGCTTTCACTATGGTCTGGGC
ACCTGTCACACA---------------GGCACTGTGGACACTCCCGCATTACCTACTGGCCAG--ATTGACCCC-GAACC
CA--------------GTGTGTCTTCCGGTCTCTG----ACTC-------TGTGTCTCTCAAAAATCATTGTGGTTCCTC
-ATCTGTGTGT--ATTT-GTATTAAATTATTTTA-TTTTA---------------GCCAAAATAATTATTTTGGAGAAAA
AGAAATACAATCACTACTCTT-------CATGAAAGAAATAAATCA-TTACCTAGTATGACTATGTAAC-TTTTAACTCT
ATAATAATACTTTTACTATGCATATTATTG---------------------------GAGTTCTCAGATCTTTTTATTTT
GCACCATAGCTTTCCTCCCTATGCTTCTCCCTTTCTACTTTTTCACCTTGATTCCC--------A-GAAAAGAAAAAA--
---GTACATCTCAAAACTTTGCCTTATCAGCATCAACAACATTAAGTATCTCTTCTACATTTTGGTTCTAAGG-TCAGAT
AGGCAGGGGTCTTAAGTGGAAGTTGGAGGGTCTGGAGCTTTGTTCAGTAATCGGTGGGGACCTA----------------
--CTGAAGATATGTG-AGCAGAATTATGCCCAAGGAA-GATGTATTCAGTAATGATATTCAGGATGGATTCAACTATGGG
GCTGGCAGTTAGGGAGTCTGAATTAGTATCAAA-GTGTGTCAGGAGAGAAGTGCAATGGGTAA-----------------
----------------------------GAAAGAGACT--GGTTTCAGATATGTTCAATTCAAGTACCACAAC-GGGTAC
CT----------------------------------------------------------------CAAAGATACTATAT
GTAATGATACTTT-------TTTTTTTAA-GTGAGTTCTTT-GTTTC-----AGGCTTTCTGACTCTACACTATGAGGGC
TCCTAAATTTTTTTCAGTGACCTTTTGGTTATTAATACATGGTAAGTATTTGGAAAGAAAATATAAATTACAGGGCTATA
CTCCTGCAGTTACCTTTCTTCAG-TTTGTTGTAATAAAATGAGGAGCTTAAAGAGGGATGATTCTAATCTGAGTTTCCTA
ATTTAAAA--------CAATGAAGC---------------------ATCTGTCTATATGGATTTTGATATG-TTGCTGGT
CAAATCATA-CCCCTCAGATGCCTGGTA--ATACAAAATGCATAGCTATGTCATTTCTCCTTCCT-GTTTTCTGCCAGAT
TTAATGGAAATTCTTTTGTATTTTGCTTTCAACTTGAAAAACAAAAAT-TACCA-CACTTAAATGTCC-CTAGGCTAATT
TTATTTAAAGATTCCAAAGAACCTCCTTATACACATTCATACTTCATT-------------TTATGCTGTTTCTTTTCAC
TAGAACTTATATTTGAGGAGATAGTAAGTA-TATGCTACTTGAGT---------TCCTTGTCCTGTCCGATTTTTTAAAT
AGAT-TTTTC-TGATTCGGTAAA-TACTTATATACCATTCTGATAAGTAATAT--TCTTTTGTTCTTT-AAAGCCACTGG
ATGTGGACAAAGATTCATCTCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTTTGGGGACTGCATCC
CACCATATGTCCAGGTAAGGAAGGCATTGCTGTTTTCAGAAACAGAC--TGGGAAGCTCTATAACCAAAATCTGAAAAAT
CTGAAATGGTTTTTAACGGAAGC----ATTCTATGATATGGATTCTTTGGGCAATAGGCATT--TTATAGTAACCATTTG
AACAAAATCACAG-GAAAATAGGAACATACACTTCCACCAACTAATTC-ATGTTTTGTTTATTTCAGCTATCGACAACAA
AAAGATGAGGAATTTTCTCAACAGTCGTAAGTTCCAAAGCCCATGATTAACTGTCTATTTCATAGC-AAAGATAAATAAT
AAAAGCC-CAG-AAAGTTGCAAGTAGAATGTACCACATTCTT-TT-GTTTT--TTCTG---TTGTAAAC----CACTTAA
TCTTTTTATTATGTTTTATTACTG---TTGACATTTTAAGACATTTAAATTTATACA-------------TTTACACCAA
ATACAATTTTTAGTGT-TTTGACTTACAGAATGTGGT--AAAAAA-TTATATAGC--ATTCTTGATATTACATNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNGATCTGG-------GTATATAATGTGAAGCA-AGTGCTCTCAAG-TTTCCCC--ATCGTTTTAAAAGAAAAGA
---TTTGCTACACCTGGGTCTTCTACATGT-AAAGAAATT-CTGACATCTGATAG-----------AAAATCCCATGTCT
TAAACATGCCCTTTTGAAAGAAAAGGAAAGGA----TAAATCA---TAGGAAAGAAATGTGTTCTGAAACTGAC-TTTTG
GAAATAGAATTTTCAGACCATCTCTAGAAGAGACACCAGGAATCA----CCCATATCCATATCTGTTTA-TAGCGTCCAT
ATTAC-TGTTTTCTGTCT----AAGCTATTTCT-C-CTCCATCT--------CTTTATCCTTTGCTCTGTCCC-CAGTTC
CTATAGCCCTGGTTAAGATTTGATTCTCTCAAGGTTCCAGGAAGAAAGTTTATACTCATCCCCATCACCAAGGTATCTTC
TCTGATT--AGTCATGTTT--CCCCCAGGGGTTTAGAAGAGGCATGCAAA--CTT-GAATTCCAGGCAGTATTCCTAAGA
AACAAACGGTACTCTTCT-CCATTCGTAGTAGCCCACT-TGCGTCTTTCTTTCAACCTCTAGGAAGTCAG-CCCCTCTCG
C-AATCCAGCAGATTA--------------------CTTTCCCTCCAC-TGCACCCAGCATTTTAACCACGGGGCACACC
ACTTCGCTATGGAACCATCTACT--ACACTTTGCCTCCACACAGGAAAATAGGATTTGTCACGCTGGATTAGAGCATTGC
TCTATTGCATGTGCAATCCTGATTCCAGAAAGAGTCAAATAGTTCTTGTATCAGAAGCAAGCAAAAGCTTACAAAACAGG
TTGTCAGACTTGCTGTGCTTTCAACAGCAGCCAAAA-GTCCATCTGGAGCTATGCTTCAC---TTACACTCTCATTTTAA
ATAAAAA-GACATTTAAACAC---AGAACTGT-AAGACACCTTGTTTTAT-GANNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNAAGGCTAGTCTACCTGATACAT
ATACAAAGGATGAAAATGAAA-ATTG----AGAAGAAAATAAAAGAAGATGGATGAGTTAGGAACACGTTGG-AAAATTT
AGCCATGTAAAGTCAGGGTTGGGGATAAAGTGAGG-TAGTAGACTTTCTTCTGTCCCA----AAGATGTAAAGGTATGAT
TTC-AAGTCTGGAAAACTAAAAAAGATTTATTGAAAC-CATGCCCACACTCTTA-----CCTTCATCAGGGTACACAACA
AGCATATTCTTTTCACGCAGTTAGAAGAGT-------------AGTTAGTTGGAAAACATGGTCAGTAGTTTAGGGTGCA
GTTCAGTTTCAAGGACTTAGTATATTTCATCCTGTAGTGTAATTTCTTCATCTGGATT--------------------GC
CATTCCCC-TGTTTCAACTCATTCTTCTTATGTTCAATTGGCTCATATCTAATGATCTCAAAATAGCAATCTTTTCTTCT
TCAGTGTGGTGTCAAAACCAATCTTAAATCAAAGTTTAGGGGAAAAAAATCAAGGTTTATGAATTTA--AGACTTGATGA
CAAAAGTAAGCAGTGTTAGT--------------CAAGTTTCAATAGTGACA-TTCTC-------AAAA-----GTGTCT
AAGTCCAGTTTAATTANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCAATAA-
---AATTTTTCTTATCCTTT--TTATTATTAGGGTAATACATTAAGAAAAATCCTCCTGAATCGATACTTTAAAGGTGAT
TACGGAGTCTCTATAAATGGACACCTCTCTGGAACCTACTGCAAAACTGCACAAGGAGGAGGCAAG--ATATCATTTTTC
CCTTTATTTTCAAATTCTAATAACATCTCTGTGTGCCAGTGTTGTTCTAGTGTTTTTCTT--AAAAATAGCACAAATATG
AAAAGGTTCATTTAAAAAGCACCATC---AG-CCAT-AGCAT--GATTTTGGGTTCATGAAACA---AATTTGAGC----
-------------CTTTCAACAANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNN
>Canis_lupus_familiaris
CCAAGA-TCCTGC---TTTTGT------TTTTAAGCAACATACATT------------TTTAAAC----AAAAAATTAAA
AAAGATACTTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGTATATTTCCTGAATAAAGAAGAAATGACAGG
GAAAAAAGTCACCCTTAATAAACTTTTCCTG-GCATTTAGATTTTATTCAAAAGA-----CTCAACATTCTACTCCCCAC
CACCCCCACTTCAC--AAACTGGTATATGAGATCA---CTTCATTTTCTAAACATTTTGCTTCTGAGATTCCTAAGAAGT
CTCAGACTCCTAGACCAAACCCCCCTCCCTACTCAGCTCTGCATATTCACAACAAGTAGGGCTTTGATCATGGCCTGGGC
ACTTGCCAGACAGGCACTTGCCAGATGGGCACTGTGGACATTCCCATATCGCCTACTGGCAAATTTTTGACCTT-GAACA
```

C--------------TGTGTGTCTGCCTGGCTCTGTGTCTTTC-------TACAGCCCTCAGAA-TCCTGCTAGGTTCAC
-ATCTGTGTATGAATTT-ATGTTAAATGGTTTTATTTTTA---------------GCCAAAAGAAATATTTGGGAGGAAG
AGGAATACAATCACTATTCTTTGTTGCTTGTGCGAG-AATAAATCC-TTGTTCGGTGTGGTTATGTAAC-TTTTAACAAT
AGAACACTTCTGTTACTGTACATATTATGAT-TTTTATTATAA--------TTATAAGGGTTCTCAGATCTTTTTATTTT
GCATCATAACTTTCCTCCCCATCCTTCTCCCTTTCTACTTTGTCACCTTGGTCCCCCC-AAAAAAAAAAAAAAAAAAAA
AAAGTGCATGTTGAAA---TCCCTTGTCAGTACCAGTGGCATTAAGTTTCTTTTTTCCATTTGGGTTCCATGATTTAGAT
GATCAGGGGCATTAAGTGGAAGTTTGAGAATCTGAGGCTCTGTTCAGTGATCAATGGAGACCTA----------------
--CTGAGGATTGATG-AACTCAGTTATGCCCAAGGTAGATCAATTTCAATCATGGTATTTAGGATGGATTCAACTAGGGA
GATTGGAGTTAGGCAGTCTGAATTAGCATTGAAAGTATGCTAGAGGAGAAGTACAATGTACACAAG-----------GCA
TTGGCTCAGTAGTGGAGAA--AAGATGAGAGAGCAGGTGGGGTTTCAGACATGCTGAATTCAAGTACCACAACCTAGTAC
TTCAGTGAAGAGGA---CCTGATTTTCAGATCCTTTGTTTATGCATCA------------TTGTACCAAAGATACTATAT
GTAATGATACTTT-------TTTAAAA---GTGCGTTTCTTAATTTCTATTCAGTGTCTCTGATTCAATACTAAGAGGAC
TTTTA---TATTTTCAATGCCCTTTTGGTTATGAATATATGGCAAGTATTTGGAAAGAACATATAAATCCCAAGGCTTTA
TTC---CAAGTACTTTGCTTCAGTTTTGCCATGCTACAATTAGGAGATT-----GAGATAATTCCATGCTGAATTTTCCA
AATTAAAAAAAAAAAAAAACTGGAGGTAACCACTTGTTTTCA-GAGAGTCTCTTTCTATGGAATTTGTTATG-TTTCTGGT
CAATTC-TA-CTCCTCAGATATATGATG--TTATAAAATGTACAGTTGTGTTA----CTCTTCCTNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTT
TTCTTTAAAGGTTTCAAAGAAACTCCTCATATACATTCATACTTCATTTTATACTGAT---TTGTTAAGTTTCTTCTTGT
TAGAAC---TATTTGAAGACCTAGAAAATA-TATGCTAGTTAAG----------TTCTTCATC-CTCTGATTTAT----T
AGCTGTCTTC-TGATTTGTTAAA-TACCT-TTTGCCTTTCTGATAACTATAATA-TTCTTTGTTTTTT-AAAGCCACTGG
ATGTAGACAAAGATTCATCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTTTGGGAACTGCATCC
CACCATATGTCCAGGTAAGGAAGGCATTTCTGTTTCCAGGAAGAGAGTAGGAAAAGCTGTATGACATAAATCTGAAAAAT
CTGAAATAGGTTTTTATGGAAGC----ATTCTATGAGATGGATGCTTTGCATAATAAGCATTTCTTATAGTGACTATTTG
AACAAAATCACATAAAAAACAGGGATATATTCTTCTACCAAGTAATTTAATGTTTTGTTTATTCCAGCTATTGACAGCAA
AAAGATGAGAAATCTTCTCAACAGCCGTAAGTGCCAAAACCCACAATTAACTGTCTGTTTCATAGC-AAAGATAATGAAT
AAAAGCCACAGAAAAGTTAGAAGTAGAATTTAT--AGTCTTT-TTTGCTCATCTTTTGTTTTTGTGAACCAAATACTTGA
TGCTTTTATTATTGCTTATT-------TTTAATATTTCAAGCATTTACATTTATAA--------------TTTACACCAA
ATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNCCGGTCGGCGACGGGTGGAACAGTTAATGGGCC-AAAGGCGGTTGGTCTTCGTTCTAC-AGACATTGCTGTC
GGAAGATCGAAATGGGAGAATT--ACGAACCGCGTTTGGCCAAT-AGGAAG-----ACCACCCTTTGGGAAGATTT-ACT
GGCCGTTTATAGAAGGCCTGTGTATATAATATGAAAAA-GCTGCTCTCAACTTACCCCCCAACCTTTTCAAAAGAAAACT
---TTTGCCACATCTAGGCCTTCTAGATGT-AAAGAGGCTGCCGACATATGATAAAGTAGAGTTAGAAAATCATACGTCT
TGTAAATGCCTGTTTGGTTTTTTGTTTTTTGTTT-TTAAATCA---TAG-----AAATGTCTTTTGGAAATGAC-TTTTT
GAAATGGAATTGTTAGATCACTTCTAGAAGCGACATCAGGAGCAA----CACACGTTCACGTTTGTGCAGTGGGATCCAC
ATTACCTGTTCCTTGTCT----CAGCCTGTTTTCC-CTCCATCCTTCCGCCACTTCATATTTTCCTCTGCCCTGCAATTT
CTACTGCCCAGGTTGAGATCTGATACCCCCTT-ATTTCAGGAAGAAAATTTATACTTATTGCCATTGCCAAGGTTTCTTC
TTTGATC--AGTTATAATT--CTTCCAAGAGTTTAGAAAAAGCAAATAGATTGCTGTCATCCCAGACAGCATTCCCAAGA
A----CTGATACTT-CCTATCATTTGCAACATCCCATT-TTAGTCTTCCCTCTAACCTTGAAGAAGTGAA-CTCCTCTCA
T-AGTCCAGCAAGGTACCATCTGACTTCAGAGGTCTTCTTCAATCCACTTATGCTCCTCATTTTAACAATGGAGCACACT
ATTTCATTTTGGAGTCATTGATT--ACACTTTGCCTCCACATAGGAAAATAGGATTTGTCATGCTGGATTAGAGCATTGC
CCTATTACATGTGCAATGGTGATTCCAGCAAGAGTCAAATAGCTATTACATCATATTGGAAGAAAAACTTTGAAAATAAG
TTGCCATACTTGCTGTGCTTCCAACAGCAGCCAAA--TTCCATATGGAGCTT------A----TTGGACTTTCATTTTGG
ATACAAGATATTTT-ATTCAA----AAACTTT-TACACACATTATTTTAT-AGGGATCTGTGTAAATATGAATATGATCA
CATCTTCCTGCTTCCTTTCTCCCCTTCTCAAATAATTTTTCTTTATTTAACATCTGTACTCAAGTTGAATGTAATGGAAG
ATGGGGGAAACATGAAG---GTAAAGAGCTAGAGAGTTCTATGAA----GTGTGGTCAAAAGCTAGTCTATTGGATATTA
ATGTATAGGATGGGAAAAGAAGACTAAGAAAGAAGAAAATGGAAGAAGATAGGTGGGTTAGAAATATATTGG-AAACTGT
GTTCATGATGAGCCAGGGTTGGGGATAAAGCAAGGGTAGTAGACTTTCTTCTGTCCCAAAGGAAGAGGAAAATGTATGAC
TTCTGAGTCTGAAACACT-AGAAAGATTTGTTGTAAC-CATGCCCATACTCTCAACCTTCCCTCCCCAGAGTGCCCG-TA
GGCATGCTCTTCTCATGCAACGAGAAGGGC-------------AGTTAGTTGGCCAACATGGTTAATAGTTTACAGTGGG
ACCCCATTTCAAGAGCTCAGTATATTCCATACCACGGTGTAATTTCTCCCTCTGGGTT--------------------GG
CATTCCCCTTGTTTTAACTCATTTGTCACTCGTTTGAGTGGCTCATGTCTAATGACCTCAAAATAGAAATCTTTTCTTCT
TCAGTGTGATTTTAAAAGCTTTCTTAAATC---------------------AAGGTTGATGAATTTA--AGACTAGATGA
CAAAAGTAAGCTGTACTAGCTTCTTTGTCATGGCCAAGTTTCAATAACGACT-TTCTTT--ATGTAAAACAGTTCTGTCA
AAGTCCAATTCCATACAGTAGAATCCTTCACTTTTCATCAGCATCATGATGCTGAACCTAG------------TCAGCCA
TTT-AAAAACTTCAGGGTTCT-GTGAGAGGGATAGTAGCACAAAACCCTGGAACCATT-------CATAAATCCATTTCT
TCTTTATCCAGGGCACAAAAAACCCCCCAC---------ATACTGCTAGGTTAAGTATGATCATGTGACTACTCAATAA-
---GAAACATCTTTTCTTATCCTTTCTATTAGGGTAACACTTTAAGAAAAATACTCCTGAATCGCTACTTTAAAGGAGAC
TATGGAGTTGGTATGAATGGACACCTCTCTGGAACCTACTGCAAATCTGCACAAGGGGGAGGTAAGCTTTCTCA-TTTTC
TCATCAATCTAGGATTCTGGTCACATGTCTCCATGCTGGTGTTATGCTACCATTTTACTT---AAAATAGAATAATTG-T
AAAAAATTCACTCAAAAAGCACTGTTAGAAA-CCAT-TGTACAAAATTTTGCATTCACAAAACAACTGATTTGAACACC-
----TAATTTTGCTCTTTGACTCTGG-AAAATAG-TAAACTATGTCATAATTTCTTAATATGTAAATTAAGGAC-AAAAA
TAAAGCTAATGTTATT
>Carnivora_Sp2
CCAGGG-TCGTGT---TTCTGT------TTTTAAGCAACGTATATT------------GCAAAGCAAACGAAAAGTGCAA
AAAGATACCTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGGATATTTCCTGAATAAAAAGGAAATGACGGG
AAAAAA--TCATGCTCAATAAACTTTTCCTC-GCATTTAGATTTTATTCAAAAGA-----GTCAACATTCTACATTTTCC
TCCCTCAG--------AAACTATTATATGAGATAGGTTTTTCATTTTCTAAATATTTAACTTCTGAGATTCCTAAGAAGT
CTCAAACTCCAAGATCAAACCCCC--TCCTCTTAAGCTCTGCAAAGCCACAACAAGGAGGGCTTTGATCATGGCCTGGGC
ACTTGCCAGACA---------------GACACTATGGACATTCCCATATCATCTACTGGCAAAT----------------
----------------------CTGATTCTGTCTCT---TTTC-------TACTGCACTTAAAA-TACTGCTAGGTCCTC
-ATCTGTGTGTGAATTT-ATGTTAAATGGTTTTATTTTTA---------------GCCAAAAGAAATATTTGGGAGGAAG
AGAAATACAATCACTTTTCTTTGTTGCTTGTGTAAA-AATAAATCC-TTGTTCAGTATGGTTATATAAC-TTTTAACAAT
ATAACGCTTCTGTTACTGCACATATTATAAT-TTTTATTGGAA--------TTATAAGGGTTCTCGGATCTTTTTATTTT
ATACCATAACTTTTCTCCCCATCCTTCTCCCTTTCTACTTTTTCATCTTTATTCCC----------ACAAAAGAAAA---
---CTACATGCTGAAA---TGCCTTCTTGGCACCAATAGCATTAAGTTTCTCTTTTCCATTTTGGTTCTATGGTTTAGAT
GGTCAAGGGCCTTAAGTGGCAGTTTGAGAGCCTGAAGCTTTGTGCAGTAATCAAGGGAGACTTA----------------
--CTGAGGATTGATG-AACTGAGTTATGCCCGAGATAGATTAATTTGG-TAATGGGATTTAAGATGGATTCAACTAGGGA
TATTGGAGTTAGGCAGTCTGAACT-GCATTGAAAGTGTGTCAGAAGAGAGGTACAATGAGCTGGAA-----------GCA
CTGGCTCGGGATTGGAGGAGAAAGATGAGAGAGCAGT---TGTTTCAGACATGCTGGATTCAAGTACCACAACCAAGTGC

TTCAATGAAGATGA---CCTAATTTTCAGATACTGTGAATACCCATCA----------TTATGCCAAAGATACTATAT
GTAATGACACTTG-------TCAAAAA---GTGAGTTTCTTAATTTCAATTCAGTGTTTCTGACTCAATACTAAGAGGAC
TTTTA---CATTTTCAGTGCCCTTTTGGTTATTAATATATAGCAAGTATTTGGGAAGAAAATATAAATACCAAGACTTTA
TTC---CAAGTACTTTGCTTTAA-TTTGTCATGCTACAATTAGGATATTAATT-GTTATAATTTCATACTGATTTTTCCA
ATTTAAAAAAA------AATGGAGGTAAGCCCTGGTTTTAAAGACAGTCTCTCTATATGGAATTTGTTATG-TTGCTAGT
CACATCCTA-CTCTTCAAATATATGGTG--GTATAAAATGTGCAGCTGTGTTACTTTTTTTTGTTTGTTTTCTGCCAGAT
TTAACGGAAATTCTTTTGTATTTTGTCTTCTAGTTGAAAAATAAAAATCTGTTATCATGCTTAAGTCCCCTGGGCTGGTT
TTACTTAAAGGTTTCAAAGAGCCTCCTCATACATATTGATACTTCATTTTATACTGAT---TTGCTAAGCTTCTTCTCAT
TAGAAC---TATTTGAAGACATGGAAATTG-TATGCTAGTTGAGT----------TCTTCA---TTCTGATTTGT----T
AAATATCTTC-TGATTTGTTAAAATACCTTTATACCTTTCTGATAACTAATG---TTCTTTGTTTCTT-AAAGCCACTGG
ATGTAGACAAAGATTCATCCCTGGTGACTCTTTGTTATGGACTTTGTGTTCTGGGACGGAGAGCTTTGGGGACTGCATCC
CACCATATGTCCAGGCAAGGAAGGCATTTCTGTTTTCAGGAAAAGAGTAGGGAGAGTTATATAACATAAATCTGAAAAAT
CTGAAATAGCTTTTTA-GAATGC--TTATTCTATGAGATGGAT---------AATAAGCATTTCTTCTAGTGATAATTTG
AACAAAATCACAT--ATAAACAGAACATATTCTTTGACCAACTAATTC-AATTTTTGTTTATTGCAGCTATCGACAGCAA
AAGGATGAGGAATCTTCTCAACAGCCGTAAGTTCCAAAACCCACCA----CTGTCTATTTCATAAC-AAAGATAATGAAT
CAAAGTCACAGAAAAGTTAGAAGAAGAATTCATCAAGTCTTT-TT-GCTCATCTTACGTTTTTGTAAACCACCTAGT---
--GTTTTATTAATGGTTATTATTTATTTTTAATATTTAAAACATTTAAGTTTATAAA----------TTTACACCAA
ATACAGTT--AAGTTT-TATGACTTGCAGAACGTAGTAAAAGAAA-ATTCATAGC--TTA-TTGATATTATGCTTTTTGT
GACTATATCCAGTCCACGACGGGTGAAACGGTTAACGGGCCCTAAGGCGGTTGGTCTTCGTTCTACCAGACGTTGATATT
GGAAGATAGAAATGGGAGAATT--CCGCACCGCATTTGACCAAT-AGGAAG-----GCCACCGTTTGGGAAGATTTTACT
GGCCGTTTATAGAAGGCCTGTGTATATAATATGAAAAA-GCTGCTCTCAACTTACCCCCCAACCTTT-CAAAAGAAAACT
---GTTGCTAAGTCTGGGCTTTCTACATGT-AAAGAGGTTGCCGACATATGATAAAGTAGAGTTAGAAAATCACATGTCT
TGTAAATGCCTATTTGGTTTTTTAAAAATC------GTAGACA----AG-----AAATGTCTTTTGGAAATGACTTTTTT
GAAATGGAATGGTCAGACCACCTCTAGAAGCGACATCAGGAGCGAGCGACACACGTCCACGTCTGTTCAGTGGGATCCAC
ATTATTTGTTCTCGATCT----CAGCTTGTTTTCC-CTCTATCT--------CTTTATCCTTCCCTCTTTC--ATAATTT
CTACCACCCAGGTTGAGATCTGGTACCCTCTA-GTTTCAGGAAGAAAGTTTATACTTATTGCCATTTCCAGGGTTTCTTC
CCTGATT--AGTTATATTT--CTTCCAAGG-TTTAGAAAAGGCAAGTAGATTGCTGTAATCCCAGGCAGCATTCCAAAAA
C----CTGATACTTTCCTATCATTTTCAGTATTCTGTT-TTTGTCTTCCCTTTAATCTTGAAGAAGCAAA-CTCTTCTCA
T-AGTCCAGCAGGGTACTGTCCAACTTC----------CCTCCACTCGTGCCCATCATTTTCACAATGGAGTACAC-
-------TTTGGACCCATTGATTACACACTTTGCCTGCACATAAGAAAATAGGATTTGTCATGCTGGATTAGAGCATCGC
CCTATTACATGTGCAATGGCGATTCCAGCAAGAGTCCGATAGCTATTGCATCATATGAAAGCAAAAATTTCTAAGATGGT
TTGTCATACTCTCTGTGCTTTCAACAGGAGCCAACA-TTCCATGGGGAGCTCTGACTCA----TTGGACTTTCATTTTAG
ATACAAGATATTTT-ATTCAA----GAAACTT-AAGACAACTTGTTTTAT-GAAGTTCTGTGTAAATGTTAATATGGTCA
CATTTTCTGGCCTCCTTTCTCCTCTTCTAAAATAATTTTCCTTTATTTAACATCTGTACTCAAGTTGGGTGTCAGGGAAG
GTGGAGGAGACCTGAAG---GTAAAGAACTAGGGAGCTCCCAGAA----GTGTGGTTGAAAGCTAATCTATTTGATATTA
ACACACAGGATGCAAAAAGAAGATTAAGAGAGGAGAAAATGGGAGACGATAGGTGAGTTAGAAATATATTGG-GAAATTT
GGCCATGATGAGCTAGGTTTGGGGATAAAGTGAGGTTAGTAGACTTTCTTCTGTCCCAAAGGAACAGGAAAGTATATGAC
CTC-AAGTCTGGAAAACT-AGAAAGATTTATTGTAAC-CATTCACG--------------------------------TA
GGTATGCTCTTCTCATGCAACTAGAAGGAC----------AGTTAGTTGGCACACATGCTTACTAGTTTACGGTAGG
ACCTAATTTCAAGGGCTCAGTATATTTCATACCATGGTGTAATTACTTCCTCTGGGTT--------------------GG
CTTCCCCCTTGTTTTAACTCATTTTTCTTTCGTTCAAGCGGTTCATGTCTAATGACCTCAAACTAGAAATCTTTTCTTCT
TCACTGTGGTATCAAAACCGTTCTTAAACC---------------------AAAGTTGATGAATTTA--AGACTAGATGA
CAAAAGTAAGCTGTACCAGTTTCTTTGTCATGGCCAAGTTTCAATAATAACC-TTCTCTTTATGCAAAACTGTTCTGTCA
AAGTCCAATTACATACAGTAGAATCCTTCACTTTTCATCAGAATCATTATGCTTGACCTAG------------ACGGCTG
TTGAAAAAAATTCAGGGTTCT-GTGAGAGGAATAGTAGTACAAAAACCTCAAACCATT-------CACAAATCCATTCCT
TCTTTTCCCAGGGCACAAAAATACACTAC----------CTACTGCCGGGTTCAGTATGACCATGTGACTATTCAATAA-
---GAAA-CACTTTTCTTATCCCTTTTATTAGGGTAACACATTAAGAAAAATACTCCTGAATCGCTACTTTAAAGGAGAC
TATGGAGTTGGTATCAATGGACACCTCTCTGGAACCTACAGCAAATCTGCACAAGGGGGAGGTAAGACTGATCA-TTTGC
CCCTCGTTCTAGGATTCTAGTCACGTGTCTTTCTGCTGGTGCTATGCTGGTATTTAACTT---AAAATAGCATAAATA-T
AAAAAATTCACTTGAAAAGCACTATCAAAAGACCTT-TGTCCAAAATTTTGCATTCATAAAACAAATGATTTGAACATCA
GGACTAGTTTTGCTCTTTGACTCTGG-AAAATAG-TAAACAATGTCATAATTTCTTAATATGTAAATTAAGGAC-AAAAA
TAAAGCTAGTTTTCTT
>Cetartiodactyla_Sp2
CCAGTCGTGGAGT---GTTTGTTTTTGTTTTTAACCAACGTGTATT----------TTAAGAC--AAGAAAATTT--A
AAAGACACCTACCTAAGCTGAATTCTAGAATGGGCTCATCTGGATCTTGTATACTTCCTGGATAAAAAAGAAATGACAGA
AAAAAAAATCACCCTTAATAAACTTTTCCCT-GCTTTCAGATTTGATGCAAAAAAC----------TCAACACAC-CTTT
TCCCT-CAC-------AAACTGTTATAGGAGATGATTTCTTTGTTTGCTAAACATTTTA-TTTTGAGATTCCTAAGAAGT
CTCTGACCCCAAGACCAAATCCCT--TCCCACTCGGGTCTGCACACTCACAACACAAAGGGCTTTTATTACGGTCTGGGC
ACTTGCCAGACA---------------GGCACTGTGGACATTCCCACGTTATCTATTGGCAAATTCTTGACCCT-GAGCA
CT--------------GTGTGTCTGCCTGTCTCTGTCTCTTTC-------TATCTCTGTCAGAAATCCTGCTAGTTCCTC
-GTCTGTGTGTG--TTT-ATATTAAATTATTTTA-TTTTA---------------TCCAAAATAATTATTTGGGAGAAAA
GGAAATACAATCACTACTCTT-------TGTGAAAG-AATAAATCA-TTATCCAGCATGATTATATAAC-TTTTAATGCT
ATAATAATACTGTTACTCTACGTATTATTA---------------------------GAGTTCTCAGACCTTTTTATTTT
GCACCATAGCTTTCCTCCCC-----------TTTCTACTTTTTCACCTTGATTCCC----------GCAAAAGAAAAA--
---GTAGCTCTTGAAA--TCGCCTTGTCAGCGTCAACAGCATTAAGCATCTCCTC--CATTTTGGTTCTAAGG-TCAGAT
AGTCAAGGGTCTTAAGTGGCAGTTTGAGG-TCTGGAGCTTTGTTAAGTAATCAATGGGAACCTA----------------
--CCGAAGATTAGTG-AGCAGAGTTATGCCCAAGGCA-GGTACATTTGGTAATGATATTCAGGATGGATTCAACTATGGG
GATTGGAGTTAGGGAGTCTGAATTAGTATCAGAAGTGTGCCAGGGGAGCACT---TTAGCTAAAAGTGTGCTAAAAATCG
CTGGCTCAGTAGTGGAGGAGAAAGACAAGAGAGAGATT--GGTTTCAGACATGTTGAATTCAAGTACCACA-CCAGGTAC
TTCAATGA---------CCTGATCTCCAGAGCTTTTGATTACCCATTG----------TTATGCCAAAGATACTATAT
GTAATAATACCTT-------TTTTT-CAGTGTGAGTTCTTT-ATTTTNNNNNNNNNNTCTCTGACTCTATACTAAGAGACC
TTTTAGAATTTTTTCAGTGACCTTTTGGTTATTAATATATGGCAAGTATTTGGAAAGAAAATATAAATGCCCGGACTATA
TTC---CACGTACTTTTCTTCAG----------------TTTGGAGCTTAAAGTCGGATAATTCTATACTGCATTTTCCA
ATTAAAAA---------AATGAAGC---------------------ATCTGTCTATATGGATTTTGTTATG-TTGCCAGT
CAAATCATA-TCCCTCAGATATATGGTG--TTCTAAAATGTACAGCTATGTCTCCCCTCCTTCCT-GTTTTCTGCCAGAT
TTAATGGAGATTCTTTTGTATTTTGCTTTTGAATTGAAAAACAAAAATT----ACCACACTTAAACGCCCAGGGGCTATT
TTATTTAAAGATTCCAAAGAACCTCCTCATACACATTCACACTTCATTTTATGCTGTT---TTGTTAAGTTTCTTTTCAT
TAGAACTTTTATCTGGAGAGATAGAAAGTTATGTACTAGTTGAGT---------TCCTTAACTTCTCTGATTTATTAAAT
AGATATCTTC-TGATTTGTTAAA-TACTCATATTCCTTTCTGATAACTAACAT--TCTTTTGTTTTTC-AAAGCCACTGG

ATGTGGACAAAGATTCATCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTTTGGGGACTGCATCC
CACCATATGTCCAGGTAAGGAAGGCATTTCTGTTTTCAGAAAGAGAC--TGGGAAGCTCTATAACTGAAATCTGAAAAAT
CTGAAATAGTTTTTAATGGAAAC----ATTCTGTGATATGGATGTTATA---GATAAGCATTCCCTAGAGTAACCATATG
AACAAAATCACAT-GAAAATAGGAACATATTCTTCCACCAACTAATTC-ATATTTTGTTTATTTCAGCTATTGACCGCAA
AAAGATGAGGAATCTACTCAAGAGCCGTAAGTTCCAAAGCCCGCAATTAACTGTCTAAGTCATAGC-AAAGATAATGAAT
AAAAGCCACAG-AAAGTTAGGA-TAGAATTTACCAAGTTTTT-TT--------TTCTGT--TTGTAAAC----CATTTAG
TATTTTTATTAT--------------TGTTGATATTTAAGACATTTAAATTTTTTAA-------------TTTCCACCAA
ATACAATTTTTAGATT-TGCAACTTACAGAATGTGGT--AAAAAT-TTACATA----ATATTTGTTATAACAT---ATGT
AATTATATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCT
GGAAGAGGGAAATGATACAACA--GGATCCCCCGTTGGGCCCAC-ACGAAGTGCCCACCACCCTCGGGGAAATTTT-GCT
GGCCATTTATAGAAGGCCTGCATATATAATATGAAGCA-GGTGCTTTCAAGTTTCCCCC--ATCGTTTTAAAAGAAAACA
---CTTGGTATGTCTGGGCCTTCTAGATGT-AAAGAAGTT-CTG-------ATAG-----------AAAATCCCACATCT
TAAATGTGCCCTTTTGAAAGAAAAAGGAAGAA---AAAAATCA---TAGGAAAGAAATGTTTTCTGAGAATGAC-TTTGG
GAAATGGAATGTTTAGACCACCACTACAAGAGACACCAGGAATCA----CCCACATCCATGTTTGTTCA-TAGCATCCAT
ATTACTGTTACTCTTCTCTGTCTAAGCTGTTTCCC-CTCCATCT--------CTTTATCCTTCCCTCTGCCCCCCAATTC
CTACAGCCCTGGTTGAGATCTGATTCCCTCAAGTTTCCAGGAAGAAAGTTTATAGTCATTACCATCACCAAGGTAGCTTC
TCTAATT--AGTTACACTT--CTCCCGAGGGTTTAGAACAGGCAAGTAAA--CCTTGAATTCCAAGCAGTATTCCCAAGA
A----CTGACACTTTCCTATCATT---------------TTTGTCTTTCTTTTGATCTCTAGAAAGTAAG-CCTCTCTCA
C-AATCCACCAGGGTACTCTCTGACTTCAGTAGTCCCCTTCCCTCCAC-TGTGCCCATCATTTTAACCATGGAGTACACT
ATTTCACTTTGGAGTCATCTATT--ATACTTTGCTTCCACATAGGAGAAGAGGATTTGTCATGCTGGCTTAGAGCACGGC
TCTATTACATGTGCCATGCTGACTCCAGCAAGAGACAAATAGTTCTTGCATCAGACACAAGCAAAAGCTTCTAAAACAGG
TCATCATATTTGCTGTGCTTTCAACGTCAGCCGAAA-GTCCATCTGGAGCTGTGCTTC-----ACTGACTCCCATGTTAA
ATAAAAATGAGCTT-GAACAA---AGGACTTT-AAGACACCTTATTTTT--GAAGACCTGTGTAAAGGCTTATATGGTCA
CATCTTCCAGTTTCCCTTCTCCTCTTCTTAAATATGTTCTCTTTGTCCAACATCTGTACTCAAGTTGGGTGTCATGGAAG
GCAGGGGA------------------------AGTATTCCATGAG----GTGTGGTTGAAAGCTAGTCTACCTGACATAG
ATACACAGGGTGAAAATGAAAGATTGAGAGAGAAGAAAGTGGAAGAAGATAGATGAGTTAGAAACAT-CTGG-GATATTT
AGCCATGATGAGCCAGGGTTGGGGATAAAGTGAGG-TAGTAGACTTTCTTCTGTCCCA-AAGAAGATATAAAGGTATGAC
TTC-AAGTCTGGAAAACTAAAAGAGATTTATTGTAAC-CATGCCCACACTCTTAACCTTACTTCCTCAGAGTGCATG-CA
GGCCTGTTCTTTTCATGCACTTAGAAGGGC-------------AGTTAGTTGGAAAACATGGTCAATAGTTGAAGGTGCA
ACCCAATTTCAAGAGCTTAGTATATTTCATGCTGTGGTGTAATTTCTTCATCTGGGTT--------------------GG
CATTCTCCTTGTTTTAACTCATTCTTCTTCTGTTCAAGTAGCTCACGTCTAATGACCTCAAAATAGCAATCTTTTCTTCT
TCAGTGTAGTATCAAAACCTATCTTAAATC---------------------AAGGTTTATGAATTTA--AGGCTCGATGA
CAAAAGTAAGCTGTATTAGT--------------CAAGTTTTAATAACAACA-TTCTC-------AAAA-----GTGTCA
AAGTCCAATTACATACAGTCAAATCCTTCACTTTTCATCATACTCGTTATGCTTAACTTAG------------AAAGCTA
GTT-AAAGATGTCGGGTTTCT-GTGAGAGGGACAG-GGGGCAAAGATCCTGAACCATT-------CATAAATCCCTTTTT
TCTTTTTCCAGGGCACAAAATTACTCTACAGTTGCCAGCCTCCTTTGAGGTTCAGTATGGCCTTGTAAATTCTCAATAA-
----CTAACACTTTCCTTATCCTTTTTATTAGGGTACTACATTAAGAAAAATACTCCTGAATCGGTACTTTAGAGGCGAT
TATGGTATCTGTATGAACGGACACCTCTCTGGAGCCTACTGCAAATCTGCACAAGGAGGAGGCAAGACTTATCA-TTTTT
TCCTCATTTTCGGATTTTTAGAGCGTGTCTGCATGC-AGTGCTACTCTAGTATTTTACTT---AACGTAGCACAAA---T
ATAAAAATCATTTAAAGAGCACTATTATCAG-CCAT-AGCAC--AGTTTTGGGTTCATAAAATAATGGATTTGAACATCA
GTATTAATTTTGCCTTCTGACAAAGGNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNN
>Chiroptera_Sp2
CCAGCAGTCATGA---TTTTGT------TTTTGAGCAACACATATT-----------------AA----AAAAAAAATTT
AAAGACACCTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGCAGGTTTCCTGAATAAAAGAGAAATGCCAGA
AAAAAG--TTATCCTTAGTAAACTTTTCCCT-GCATTTAGATTTTATGAAGAAGACGAAAAAAAAACCCTGATACATCCC
TCAAA-----------AACCTGTTGTACAAGATGATTTCTTCATTTTCTAAACATGCCG-TTTCCAAATTCCTAAGAAGT
CTCAGAC-CCATGGCCATATAGCT--TCCTCCTTGGG-CTATACATGCACAACAGGGAGGGTCTGTGCTGTGGTCTGGGC
GCTGGCCAGTCC---------------AGCCCTGTGACCTTTGGCACAGCACCTACTGCAGGATNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCTCAAAAATCTTGTTAGTTCTTC
CATTTGTGTGT--ACTTAACGTTAAATTATTTTA-TTTTA---------------GCCAAAAGAATTATTTGGGAGAAAA
AGAAATGCAATCACTACTCTTTGTTGCTTGTGCAAG-AATAAATCA-TTGCTTAGTACGGTTAGATACC-TTTTTACCAT
ATACCACTACTCTTACTTTGCATATTATAAT--------------------TTAGAAGCGTTCTTAGATCTTTTTATTTT
GCACGATAGCTTTCCTCTCCATGTTTCTCCCTTTCTACTTTTTCACCTTGATTCCC--------A-CAAAAGAAAAAA--
---GTACATCTTGAAT--TTACCTTGTCAGCAT-AAGAGCATTAAGTATCTCTTCTCCGTTTCGGTTCTAGGG-TCAGTT
GGTCAAAGGGCTTAAGTGTCACTTTGAGGGTCTGGGCCTTTGTCCAGTGATCAATGGGAGTTGATTCAGATAGTATGATG
GCCTGAAGATCGAGG-AACATAGATATGTCCAAGGCAAAATAAGCCC---AAAGGTACTCAGGGTGGCTTCATCTAGGGA
TATGGGATGTCGAGAGTCTGGGTTAGTATTAAACATGTGCCAAG-GAGAAGTACAATGGGTGAAAG-----------GCA
CTGGCTCAATAGTAGAGGAGAAATATAAGAGAGCAATT--GGTTTCAG------------------------CAGAGTAC
TTAAATGAAGATGA---CTTAATTTTCAG--TCTTTCATTACTCATCG------------TTATACCAAAGATTCTATAT
GTAATGACACTTT-------TTAAAAA-ATGTGAGTTCCTT-ATTTTAATTCAGTGTCTCTGACTCAGTACTAAGAGGAC
TTTTA---TATTTTCAAAGTCCTTTTGGTTATTAATATATGGCAAGTATTTGAAAAGAAAATATAAATCCCAGGACTATA
TTC---CAAGTACTTTTCTTTAG-TTTGTCATTATAAAGTTAGGAGATTAAAGTGAAATAAATTTGTACTAAGTTTTCCA
ATTAAAAAA-------CAATGCAGCTCAGT-CTTATT---A-TAGAGTCCGTCTATATAAA-TGTGTGAAA-CTGCT-GT
CAAATCATA-ACTCTCAGATATATGGTG--ATATAAAATGTACAGCTATGTTACTCCTTCTTCCT-GTTTTCTGCCAGAT
TTATAGGAGAATCTTTTATATATT-CTTTCTAGTTGAAAAACAAAAATCTATTATCATACTTAACTTCTCTGGGCTGGNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTATGTACTTTTCTGATTATTAATGTGTTTTTTTGTTGTTT-AAAGCCACTGG
ATGTAGACAAAGATTCCTCCCTGGTGACTCTTTGTTATGGATTATGTGTTCTGGGGCGGAGAGCTTTGGGGACTGCATCC
CACCATATGTCCAGGTAAGGAAGACATTTCTGTGTTTAGGAA--GAGTGTGGGAAGCCGTATAACCTAAATCTGAAAAAT
TTGAAATAGTTTTTCATGGAGGT----ATTCTATGATATGTATGCTTTGGATAATAAGCATTTCTTATCGTGATCATTTG
AATAAAATTACAT-GAATATAAGGATATATTCTTCTACTAACTAATTC-ATGTTTTGTTTATTTCAGCTATCGACAGCAA
AAAGATGAGAAATCTTCTCAACAGCCGTAAGTTCCAAAACTCATATTTGACTGTCTCTTTCATAGC-AAAGATAATAAGT
AAAAGCCAAAGAAAAGTTAGAGATAGAATTTACCTAGGTTTT-TTTGTTCA--TTTTGTTTTTGTAAGACAAACACTTAG
TCTTTTTATTATTGTTTATTAT-----------TTTTTAAACATTTAAATTTCTAAA-------------CTTTCACCAA
ATAC-ATTTTAAGTTT-TGTGACTTACATAATGTAA----AAAAA-TTACACAGT--ATTTTTAATATTATAACATATGT
AATTATAT--GAAGTCTTTATTCCTTC-AGACC-TGACACT
GGAAGAGAGAAATGGTAGAACA--GCATCCCATACCGAGCCAAC-AGGGCATGCCTACCACCCTTTGGGAAT--------

```
--------------------TTCATATTATAT-ATACAGGCTGATCTCAAGTTTCTCTC--ATCTTTTTAAAGGAAAACA
---CTTGCTATAGGTGGGCCTTCTAGATAT-AAAGAAGTT-CTGACATGTGATAG-A---------AAAATCCCATGTGT
TGANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNGATCCAT
ATTACTTGTTCTCATTGT------------TTTAC-TTCCATCC--------CTTTATCTTTTCCTCTGC----CAATTC
CTACAGCCCAGTTTGAGATCTGGTTCCCCCGG-TGTCCAGGAAGTAAGTTTATACTAATAGCCATTGCCAAAGTATCTTC
TCTGATT---AGTTCTAGT-TTTCCCAAAGGTTTAGAGAAGGCAAGTAAA--ACTTGCATCTCAGGCAGCATTCTCCCAA
A----CTGCTACTTTCCTACGGTTCCCAGTGTCTGGTT-TTTGTCTTCCCTTTAATTTCTGGGAAGTAAA-GCTCTCTCC
C-AGTCCGCCGCGGTAATGTCTGACGTCAGAAGCCCCCTTCCCTTCACGCGTGCCCATCATTTTAACAGTTGAGTACACG
GCTTCACTTTGGAGTCATCTATT--ACTCCTTGCCTCCACATAGGAAGAAAGGATTTGTCATGCTGGATTAGAGCACTGT
TCTATTACATGTGCAATGCCAATTCCAGCAAGAGTCAAATAGTTCTTTCATCAAATAAAAGCAAAAACTTCCGGAACAGG
CTGTCATACTTGCTGTGCTTTCAATAGCAGCCAAAA-TTTCATCTGGAGCTATACTTTT------GGACTCCAATTTTAA
ATAAAAAATAAATT--AACAAAAAAGAACTCT-AAGACACCTTATTTTAT-GAAAGTCTGTTAGC--------ACTGTCA
CAACTTTCAGCTTCCCTTCTCCCCCTCTAAAATAATTTCTCTTTATCTAATATCTGTACTCAAGTTGAGTGTCATGGAAG
A----GGAAACA-------------------------------------------TGAAAACTAATCTATCTGTTATTG
ATATATAGGATGGAAAAGAAAGATTG----AGAGAGAAAAAAATAGAAAAAGATAAGTTAGAACTATATTGG-ACAATTT
AGCCATGATGAGCCAGGTTTGGGGATAAAGTGAGTTAAATAGACTTTCTAAGATTCCA-AAGAAGAGAAAAAGATATGAC
TTC-GAGTCTGGAAAATGAAAAAATATTTATCGTAAC-CATGCCCACGCTTTCAACCTTCCTTTCCAAGTGTGTATTATA
GGCATGCTCTTCACATGTAGTTAGAAGAGC-------------AGTTAATTGGAAAACATGGTCAACAGTTTGGTGTGGG
TCCCAGTTCCAAGGGCTCAGTATATTTCATGACATGGTGTAATTTCTCCCTCTGAGTT--------------------GG
CATTCTCTTTGTTTTAATTCATTCTTCTTTCATTCAAGTAGTTCATATGTAATGACCCCCAAATAGCAATCTTTT-TTCT
TTATTGTAGTACC-AAACCTTTCTTAAATC---------------------AAAGTTTATGAATTTA--AGACTAAATGA
CAAAAGT-AGTTGTATTAGCTTCTTTGTCATGGCCAAGTTTCAAAAACAACA---CTCT--ATATAAAAGTATTATGTCA
AATTTCAATTACATACAGTAGAATTCTTCACTTTTCGTCAAAATTGTTATGCTTAACCTAG------------GCAGCTG
TTT-AAAAAATTCAGGGTTCT-GTGAGAGGGATAGTTGGGTAAAGACTCTAAACCAGT-------CATAA-TTCAT---T
TCTTTTTCCAGGGTACCAAATTATACTAAACTTGTCAGTTTCCTTTGCGGTTCAGTATGGCCATGTAATTACTCAATAA-
----CAAACACTTTTTGTATTCTTTTTATTAGGGTAGCACATTAAGAAAAATACTCCTGAATCGTACTTTAAAGGTGAT
TATGGAGTTGGTATGAATGGACACCTTTCTGGAACCTACTGCAAGTCTGCACAAGGGGGAGGCAAGCCTTATCA-----T
TTTTCATTTTAAGACTCTCATAACGTACCTTCATGC---TGATACTCTAGGATTTTACTT---AAAATAGCACAGACATT
CAAAAAATCATTTAAAAAGTATTATTATCAG-CCAT-TAGAC--AACTTCAGGTTCGTGGAACAACGGATTTGAACTTTA
GAATTAATTTTGTCTTTTAACTTTGG-AAAATAGTTAAACTAAGTCATAACTTATTAACATATAAATTAAAGAC--AAAA
TAAAGCTAGTTTTTTC
>Equus_caballus
CCAGTAGTCATGT---TTTTGT------TTTAAGCAACATATATT-----------------TA----AAAAAAATCAA
AAAGACACTTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGTATATTTCCTAAATAAAAAAGAAATGACAGG
GAAAAA--TCACCCTTAATAAACTTTTCCCT-GCTTTTAGATTTTATGCAAAAA-------------CCTAACACATCCC
CCGCCCCA--------AAACTGTTACACAAGATGATTTCTTCATTTTCTAAACATTTTGCTTTTGAGATTCCTAAGAAGT
CTTGGACACTAAGACCAAAACCCC--TCTTCCTCAAGTCCATACACCTACAACAGGTGGGGCTTACATTCTGGCCT-GGC
ACTCGTCAGAGA----------------GGCACTGTGGACATTCCCACATCATCTACTGGCAAATTCTTGACCCT-GAACA
C----------------TGTGTCTGCCTTTCTCCGTTTCTGTC-------TTTCTCTCTCAGAAATCCTGCTAGTTCCTC
-ATCTTTATGT--ATTT-ATGTTAAATTATTTTA-TTTTA---------------GCCAAAAGAATTATTCAGGAGAAAA
AGAAATACCATCGTTACTCTTTGTTGCTTGTGCAAG-AATAAATGA-TTATTCATTATGGTTATATCACTTTTTAATGGT
GTACGACTACTCTTACCGTGCATATTATAAT--------------------TTATAAG-GTTCTCAGACCTTTCCATTTT
GCTCCACGGCTTTCCTCCACATGCTTCTCCCTTTCTACTTTTTCACCTTGATTCCC--------A-CAAAAGAGAAAA--
---GTATGTCTTGAAA--TTACCTCATCAGCATCAACAGCATTAGGTATCTCTTCTCCATTTTGGTTCTAGGG-TCAGGT
GGCCAAGGGCTTTAAGTGGCAGTTTGGGGGTCTGGGGTTTTGTCCAGTGATCAGTGGGGACCGA----------------
--CTGAAGATTGATG-AGCAGAGTCATGCCCAAGGCA-ATTAA-TTCGGTAACGATATTCGTGATGGGTTCAGCTATGGA
GATTGGAGTCAGGGAGGATGAATTAGTATTAAAAGTGGACAAGAGAAGAAATACAATGGATAAGAG-----------GCA
CTGGCCCACCTGTGGAGGAGAAAGATGAGACAGCAACT--GGTTTCAGACATGTTGGATTCAAATACCACAACCAAGTGC
TTAAATGAAGATGA---CCTGATTGTCAGAGGCTTTGATTTCCCATCA------------TTATGCCAAAGATCGTATAT
GTTATGACACTTT-------TTAAAAGAATGCGAGTTCTTT-ATTTCAATTCAGTGTCTTTGACTCAATACTGGGAGGAC
TTTTA---TATTTTCAATGTTCTTTTGCTTATTAATACATGGCAAGCGTTTGGAAAGAAAATATAAATCCCAGGACTGTA
TTC---CAAGTACTTTTCTTCAG-TTTTTCATAATAAAATTAGGAAATTAAAGTGATATAATTCCATGCTGAATTTTCCA
GTTTAACAA--------AATGAAGAGAAGTCCTTGTT---A-CAGAGTCTGTCTATATGGATTTTGCTATG-TTGCTGGT
CAAATCCTA-GCTCTCGGATATAAGGTAATATATAAAATGTACATCTATGTGA----CCCTTCCTNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTT
TTATTTAAAGATTCCAAAGAACCTCCTCATGTACACTTATACTTCA-T-------------TTGTTAAGTTTCTTTTCAT
TAGAACTTTTACTTGAAGAGATGA-----------GGAACTCAACTAGTACATAATTCCTCTTTTCTCTGATTTATTAAAT
AGATATCTTC-TGATTTGTTAAA-TACTTACATACTTTTCTGATAACTAGCA---TTTTTTGTTTTTT-AAAGCCGGTGG
ATGTAGACAAGGATTCCTCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTCTGGGGACTGCATCC
CACCATATGTCCAGGTAAGGAAGGCATTTCTGT-TTCAGGAA--GACTGTGGGAAGCTGTATAACCTACATCTAAAAACT
TTGAAATAATTCTCCGTGGAGGC----CTTCTGTGATATGGATGTTTTGGATAATAAGCATCTCTTATAGTGACCATCTG
AACAAAAT--CAT-GAAAACAGAAACACATTTTTCTACCAACTAATTC-ATGTTTTGTTT-TTCTAGCTATCGACAGCAA
AAAGATGAGGAATCTTCTCAACAGCCGTAAGTTC---------------------------AAAGC-AAAGATAATGAGT
AAAAGCCACAGAAAAGTTAGAAGTAGGATTTAGGAAGTTCTT-TTTT---ACCTTATGTTTTTGTAAACCAAACACTTAG
TCTTTTTATTTTTGTTCACTACT----TTTAATATTTAAGACATTTAAATTTATAAA-------------TTTCTACCAA
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNN----------------------------------------GCAGTCTGTTCTAC--C-AGACCTTGACAGT
GGAAGAGAGAAATGGTAAAACA--GCATCCCACATTTGGCGAAC-GTGGAGCACCCCGTATCCTTTGGGAAGATTT-GCT
GACCATTTATAGAAGACTTGTGTAAATAATATGAAACA-GCTCCTTTCAAGTTTCCCTC--ATCTTTTTAAAAGAAAACA
---CTTGCTACATCTGAGCCTTCCAGATGG-GAAGAAGTT-CTGGTGTATGATAG-----------AAAATCCCACATCT
TGAAAATGCACTTTTCAAAGAAGAAGGAAGAA----GAAATCA---TAGGAAAGAAATGTCTTCTGAAAGTGAC-TTTTG
GAAATGGAATTTTTAGACGACCTCTAGAAGAGATGCCAGGAGCCA----CACAGGTCCGCGTTTGTTCAGTTGGATCCAT
ATTGCCTGTTC----CCT----AAGTTTGTTCCCC-CTGTATAC--------GTTTATCCTTCCCTCTGC----CAATTC
CTACAGCCCATGTTGACATCTGGGCCCCTCAG-TTTCCAGGAAGAATGTCTTTAC---TTGCCATTGTCAAGGTATCTTC
TCCACTT--AATTATACTT--CTCCCAAGGGTTTAGAAAAAGCAAGTAAA--CCTTGAAT-CCAGGTAGCATTCTCCAAA
A----CTGGTACTTTCCTACCATTAGCAGTGTCTCATT-TTTGTCTTCCCTTTAATCTCTAGGAAGTAAG-CTCCTCTCA
C-AGTCCGCCTGGCTAGTGTCTGACTT-AGAGGACCCCTTCCCTCCACTTGTGCCCATCACTTTAACAAGGAAGCACACT
ATTTCCCTTGGGAGTTACTTATT--ACACTTGGCCTCCACATAGGAAAATAGGATTTGTCATGCTGGATTAGAGCACCAC
```

TCTGTTATGTGTGCAATGCTGATTCCAGCAAGAGTCAAATAGTCCTCGCACCAGACGAAAGCAAAAACTTCCCAAATAGG
TTGTCATCCTTGCTGTGTTTTCAAAACAAGCCAAAA-TTCCTTCTGGACCTATGCTTCA----CGGGACTGACGGTTTAA
ATAAGAAGTCAATT--TAAAAA--TGGGCTTT-AAAACACCTTATTTTAT-GAGGTTTT----AAGTATTAACATTGTCA
CGTCTTCCAGCTTTGCTTCTCCTCCTCTAAAATAATTCCTCCTTATCTAATGTCTGTACTCAAGTTGGGTGTCATGGAAG
GTAAGGGAGACACAGAG---ATAAAGATCTAGAGCGTTCCATGAG----GTGCCGTTGAAAGGTAGCCTATCTGATATTG
ATCTACAAGGTGGAATAGAAAGATTAAGAAAGAAGAAAACTGAAGAAGATAGATGAGTTAGAAATATATTGG-AAAATTT
AGCTATGATGACCCAGAGTTGGGCATAAAGTGAGGTTCGCAGACTTTCTCCTAAGCCA-AAGAAGAGGAAAAGCTACGAC
TTA-AGGTCTGGAAAACTAAAAAAGGTTTGTTGTAAC-CATGCCCACACTCTGAAACTTCCTTCCTCAAAGTGCATG-CA
GGCATGCTCTTCTAACACAGTAGGAAGGGC-------------AGTTAGTTGGAAAACACGGTCAACACTTTAGGGTGGA
ACCCAATTTCAAGGACTTAGTATATTTCACACCATGGTGTAATTTATCCCTCTGGGTT--------------------GG
CATTCTCCTTGTTTTAATTCATTCTTCTCTCATGCGAGTGGTTCATATTTAATG-CTTCAAAATAGCAATCTTTTCTTCT
TCAGTGTGGTATCAAAACTTTTCTTAAGTC---------------------AAGCTTTATGAATTTA--AGAGTAGATGT
CAAAAGTAAGCTGTATTATCTTCTTTGTCATGGCCAAGTTTCAATAACAACA-TTCTCT-CTACACAAAGGGTTCTGTCA
AAGTCCAATTACATAAAGTAGAATCTTTCACTTTTTATCGGATCGTTATGCTTAACCTAC------------ACAGTTG
TTT-AAAAATTTCAGGGTTCTTGTGAGAGAGATAGTGAGGCAAAGATCCTGAATCATT-------CATAAATCCATTTCT
TCTTTTTCCAGAGCACAAAATTACAGTACACTTGCCAGCCTTCTTTGAGATTCAGTACAGCCATGTGACTATTCAATAA-
----CTAACACTTACCTTATTCTTTTTATTAGGGTAACACATTAAGAAAAATACTCCTGAATCGATACTTTAAGGGTGAT
TATGGAGTTGGTATGAACGGACCCCTCGCTGGAACCTACAGCAAGTCTGCACAAGGCGGAGGCAAGACTAATGA-TTTTT
TCCTCATTTTAAGATTCTCATAACATATCTTCATGCTGGTGTTACTCTAGTATTTTACTT---AAAAGAGTACAGATA-T
AAAAAATTCATTTAAAAAGCACTACTATTAG-CCAT-AAAAC--AATTTCGGGTTCATAAAACA---GATTTGAACAATT
GAATTAATTTTGCTTTTTGACTTTGG-AAAATAG-TTAAACT-GTCGTAATTTCTTAATATGTAAGTTAAGGAC-AAAAA
TAAAGCTATTTTTCTT
>Myotis_lucifugus
CCAGCAGTTGTGT---TTTTGT------TTTTGAGCAACATATATT------------GTTACCT----AAAACAAT--G
AAAGACACCCACCTAAGCTGAACTCTAAAATGGGTTCATCTGGATCTTGTAGATTTCCTGAATAAAAAAGAAATGCCAGA
CAAAAA--TCAGCCTTAATCAACTTTTCCCT-GCTTTCAGATTTTATACAAAAAAC----ACACAACCCCAACATATTTT
TATATCCA--------AAACT--TATGTGAGGTGATTTCTTCATTTTATAAACTTTTTG-TTTTGAGGTTTCTAGAAAGT
CTCAGACTCCAAGACCAAATCCCT--ACCTTTCCAGGTCTGCATACCCACAACAGACAGGCCTTTCACTATGGCCTGGGC
ACTGGCCAGACA---------------GGCCCCATGGACACTCCCACATCATCTCCTGGC----TCTTGATCCT-GAACA
CACCA----------TCTCTCTCTCTCTGTCTCTCTC--TCTC-------TCTCTGTCTCAAAATTCCTACTAGATTCTC
-ATCTGTGTGT--ATTT------ATGTTCCTTTA-TTTTA---------------GCCAAAAGAATTACTTGGAAGAAAA
AGAAATATAATCACTACTCTTTGTTGC-TGTGCAAG-AGTAAATCA-TTGTTCAGTATGGTCATAGAAC-TTTTTACTAC
AGAATACTA---TTACTGTACATATTATAA---------------------TTATAAGAGTCCTCAGATCTTTTGCTTTT
GCACCATAGCTTTTCTCTCCATGGTTCTCCCTTTCTACTTATTCACCTTGACCCCACCCCACCCACCCACCCACACAA--
---GCCCACCTTGAAA--TTGCCTTGTCAGCATCCATAGAGTTA-GTATCTCCTCTCCATTCTGGCTTGAGGG-TCAGAT
GGTCAAGGGTCTTAGGTGACACTTCGAAGAACTGGGGCTTTGTTCAGTGACCAGTGGGAACCT-----------------
--CTGAAGATTGGTG-AACACAGCTATGCCCAAGGCAGAGTAA-TTTGGTAATGGTATTTGGGGGGGATTCAACCAGGGA
GAGCCCAGTTAGGGAGTCAGGGTTAGTATTAAAAGTGTGCCAGGAGAGAAGTACAATGGGTAAGAG-----------GCT
CTGGCTCAGTAGTGGAGGAGGAAGATGCGAGAGCAATT--GGTTTCAGGCATGTTGGATTGAAGTACCACAGCCAGGTAC
TTCTATGAAGGTGA---CCTAATTTTCAGAGCCTTTGATTACCCATCA------------TTATGACAAAGATTCTATAC
ATAAGGGCAC----------TTAAAAAAATGTGAGTGCCTT-ATTTCAATTCAGTGTCTCTGATATAACACTAAGATAAT
TTTTA---TATTTTCAAAGTCCTTTTGCTTATTAAT--ATGGCAAATATTTAGAAAGAAAATTTAAATCCCAAGACTATA
TTT---CAAGTACTTTTCGTTAG-TTTGTCATAATAAAATTAAGAGAACAAAGTGAAATAAGTTTATACTGAATTTTCCA
ATTAGAAAT-------CAGTGAAGATCTGTCCTTATT---A-TAGAGACTGTCTCCATGAATTTTTTTATG-TTCCTGGT
CAAAGCACA-TCTCTCAGATATATGTTG--ATATAAAATGTACAGCTACAT------TCCTTCCT-GTTTTCTGCCAGA-
TTACAGGAGATTCCTNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTT
TTATTTAAAGATTCCAAAGACCCTCCTCATATAGTGTTTTGTT-------------------------GTTTCTTTTCAT
TAAAACTTATCTGAGGAGGTAGAG----------ACTAGTTGAGT---------TTCTTAATCTCTCTGATTCATTAAAT
AGATATATTC-TGATTTGATAAA-TACATATATACCCTTTTGATTATTAACA---TTCTTTGTTTTC-TAAGCCACTGG
ATGTGGACAAAGATTCCTCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGAAGAGCTCTGGGGACTGCATCC
CACCATATGTCCAGGTACT---GGCATTTCTGTTTTAGGAAGGGAGTGTGGGAAGCTGTATGATCTAAGTC--------
-TGGAATCGTCTTTCATGGAAGC----GTACTGTGATAGACATGTTTTGGATAATAAGCATTTCTTATAGTGCCCATTTG
AACAAAATTACAT-GACAATAGGAGCATATTCTCCTACCAACTAATTC-ATGCTTTGTGTATTTCAGCGATTGACAGCAA
GAAGATGAGGAATCTTCTCAATAGCCGTAAGCTCCAAACCCCACAATTAACTGTCTCTTTCATAGT-AAAGATAATGAAT
AAAAGCCATA-AAAAGTTAG---TAAAATTTGGTAAGGTTGT-TTTGTTCATTTTATGTTTTTATAAACTGAACACTTAG
-CTTTTTATTATTGTTATTAT-----------TCTTAAGATATTTAAGTTTATAAA-------------TTTACATCAA
ATACAATTTTAAATGT-TGTGACTTACAGAATATAATTTTTAAAA-TTACATGGT--ATTTTT-ATATTATTACATATGT
AACTATAA--C--C-TGACCTTGACATG
AGAAGAGAGACAAGGGAGAACA--GCATCCCATGTTTGGCCAAC-AGGGAGTGCCCC-CAGCCTTAGGGAAGATTT-ATT
GGCCATTTATATAGACC---TGTGTATAATATGAAACA-GCTGCTCTCAAGATTCCCCC--ATCTTTTTAAAGGAAAACG
---CTTGTCACATCTGGGCCTTCTAGATGT-AAAGAAATT-CTGACATGTGATAG-A---------AAAATCCCATGTCT
TGAAAATACCTTTTTGAAAAAAAAA-----------AAAGTCA---TAGGAAATAAATGTCTTCTGAAAATGAC-T--TG
GAAATTGAATTTTCAGCCCAGCTCTAGTGCCCCCAACCTGGCCCA----CACCTGTGCAG----------TAGGACCCAT
ATTGCTTGTTC----TCT--------TTGTTCCAC-TTCCATCC--------CTTAATCTTTCCCTCTGC----CAAGCC
CTCAAGCCCAGTTTGAGATCTGGTTCCCTCAG-TTTCCAGGAAGAAAGTTTCTACTTATTGCCATTGTGAAGGTATCTTC
TCTGATT--AGTTATACCT--CTCCCAAAGGTTTAGAAAAGGCCAATAAA--CCTTGAATTCCAGGCAGCATTCCCCAAA
A----CTGCTACTTTTCTACCATTTGCAGCATCTCATT-TTTGGTTTCCCTTTAATCTCTTGGAAGTAAA-TGGCTCTCA
CAAGTCCACCAGGGAAATGTATGACTTCAGAAGT--CCTTCC-TTTACTTGTGCC-ATTATTGTAACAGTGGAGTACACT
ATTTCACTTTGGAGTGATCTGTT--ACACTTTGCGGCTATGTAGGAAAAAAGGATTTGTCATGCTGGATTAGAGCACTGC
TCTATTACATGTGCAATGGTGATTCCGGCAAGAGAGAAATAGTTCTTCCACCAAATGAAAGCAAAATCTTCCAGAACAGG
CTGTCATACTTGCGGTGCTCTAGACAGCAGCCAAAA-TT-CACCTGGCATTATACTTCA----TTGGACTCCAATTTTAA
AGAAAAGATAAATT--AACAAAAATGGAATTT-AAG--ACCTTATTTTAT-GAAGGTCTGTATAAATGTTAATATGGTCA
CATCTTCCGGCGTCCCTTCTCCTCCGCTAAAATAACTTCTCTTTAGCCAACTACTGTACCCAAGTGGAGGGTCATGAAAG
GTTAAGGACACATGAAG---GTAAGAAGCTAGAGAGTTCCATAAGGTGTGTGTGGTTGAAAGCTAGTCTATGTGATACTG
ATATACATAATATAAAAAGAAGATTG---------AAAATGAAAAAGGATAGATGAGTTAAAAATATATTAT-AAAATTT
AGCCATGATGATCCAGGGTTTGGGAGGAAGTGAGGTTATTAGACTTTCTTCAGTCCCA-AAGAAAAGGAAAAGGTATGAC
TTC-AAGTCTGAAAAACAAAAAAAGATTTATTGTAAC-CATGGCCACACACTCAACGTGCCTTCCCCAGTGTGTGTG-CA
GGCATGCTTTCCATGGGCAGTTAGCAGGGC-----------------AATTGGAAAACAT-GTCAACACTTTAGGGTGGG
-CCCATTTTCAAGGGCTTAGTATNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN

```
NNNNNNNNNNNNNNNNNNATTCATTCTTCTTTCATTCAAGTGGTTCATATTTAATGATCTCAAAAGAGCAATCTTTT-TTAT
TCAGTGTGGTATCAAAGCCTTTCTTAAATC---------------------AAGGTTTATGAATTTA--AGACTAGATGA
CAAAAGT-AGCTCTATTAGCCTCTTTGTCATGGCCAAGTTTCAATAGTGGCA---CTCT--ATATAAAAC----AATTCT
AAGTCCAATTACATACAGTA-AATATTTCACTTTTCATCAGAATCATTATGTATAACTTAGCTGTTTTATAACTTAGCTG
TTT-AAAAAATTCAGGGTTCT-GTGTGAGGGATGCTGAAGCAAAGACCCTAAACCANNNNNNNNNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNCAATAA-
----CCAACACTTTCTTGTC---TTTTTTTAGGGTAACACATTAAGAAAAATACTCCTGAATCGTTACTTTAAAGGTGAT
TATGGAGTTGGTATAAATGGACACCTTTCCGGAACCTACGGCAAATCTGCACCAGGGGGAGGCAAGTCTCACCA--TTTT
TCTTCATTTAAAAATTCTCATCAAAT--CTTCA-GCCAG---TACTCTCATATTTCACTT---AAAATAGCACAAATA-T
AAAAATTTCATTTATAAAGCACTATTATGAG-CCAT--GAGC--CATTTCAGGTTCATAAAATGATGGATTTGAACATTA
GTATTAATTTTGTCTTTTAACTTTGT-AAA---G-TAAACTAAGTTATAATTTCTTAATATGTAAATTAAAGAT-AAAAG
TCAAGCTAGTTTTCTT
>Outgroup1
GCACTGGTGGTAGTGTTTTTGTTTTCATTTTTAAGTAAA--ATATT-------------TTTTAAAACAAAAAAATAATG
AAAGATACCTACCTAAGCTAAATTCTAAAATGGGCTCATCTGGGTCTTGTATATTTCCTGAATAGAAAAGAAATGACAGA
AAAA----TCATCCTTAATAAACTTTTCTCT-GTTTTCAGATTAAATGCACAAAT----------GACCCTCTACTTCCC
CCCAACAACAACAA--AAACTGCCATGCAAGACAATTTCTTTATTTTAAAAATATTTTGTTTTTGAGATTGCTAAGAAGT
CCCTGACCCCACAACCAAACCCCTGCTCCTCCTCAGATCTACACATCCACAACAGGGAGGGCTTTTACCATGGCCTGGGC
ATGGGCCAGCAA----------------AACACTTGGACATTCCCACACTACC--CTGGT----TCTTGACCTT-GAAAC
ATTTGGACACTTATTAATGTGTCTGCCTGCCTGTCTCTCTCTC-------TCTCACACACACACATCCTGTTAGTTCCTC
--TGTGTGTGT--ATTT-GTGTTAGATTATTTTA-TTTTAGCTAGTTATTTTTCTCCCAAAATAAGTATTCAGGAAGAAA
AGAAATACAACCACTATTCCTTGTTGCTTGTGCAAA--ATACATTA-TTATTCAGTAAGGTTATATAAC-TTTTAAAGAT
GTAATAATACTGTTACTACGCATATTATACG--------------------GTGTAAGAGCTCTCAC---TTTTTATTTT
GCATTATTGCTTTCCTCCTCATACTTCTCTCTTTCTACTTTTTCACCTTGATGTTC----------ACAAAACAAAAA--
---GGTGCGTCTTAAAG-TTGCATTGTAGGCACCAAAAGCATTAAGTATCTCTTTTCCGTATTAGTTCTGGGA-TCAGAT
GGTCAAAGGCTTAAAGTTGTGGTTTGAGGGGCTGGATCTTTGTCCATTGAGCAATGAGGACCTG----------------
--CTAAAGATTGATGGACAGAGTCATATCCTAAGGTAGATTAATTTGG-TGACAGTATTCAGGATGGATTCCATTGAGAG
GAGTGGAGTTAGGGAATCCAAAAAAGTATTACAAATATGCCAGAAGAGAAGTAAAAATGGTAAGAA-----------GCA
CTAGTTCAGTAGTTGAGAGGAATGACGAAAACGTGATT--AGTGTCAGACATATTGAATTCAAGTACCACAGCCAAGAAC
TTAAATGGAGGAGATGTCCTGGTTTTTAGAGCCTTTGGTTACCTACCCATCATTAGGTTGTTATGCCAAAGATACTCTAT
GTATTGGTACATTAATTTTTTTTAATA----TGAG-TCCCTTATTTCTACTCAGTGTTTCTGATTCAATGCTAAGAGGAC
TTTTA---CATTTTCAAAGACCTTTTGATAATGAATAGACGGTAAGTATTTGGAAAGAAAATATAAATCCCAGGATTATA
TTT---GAAGCACTTTTCTTCAG-TTTGCAATGCTAAAGTTAGGAGATTAAAT-GAGAAAACCCCATACTAAATTTTCCA
ATTAAAA----------AATGA-GGTAGGCCCTGGCTATAAAGAAAGTCTCTTTACATAGACTTCATTATG-TTGCTGGT
CAAATCATA-CCCCTTACATATATGGTG---ATACACATAGGCAGCTTTGTTACTCCTTCTTTC--TGTTTTTGCCAAAG
TTAAAAGAGATTCTTCTGTATTTTGCTTTCTTGTTGGAAAACAAAGATTTACTACCATGTTTAATACCCCTGGGCTGATT
TTATTTAAGGATTCCAAAGAAACTCCCCATACACATTCATGCTTCATTTCATACAGTT---TTATTAAG-----------
------TTTATTTTGAGGAGATAGAAATTA-TGTACTCTTTGAAT----------TCTTTATCATTTCGCTATAT----T
ATTTCGATTTATGATTTGTTAAA-TACTTACATACCTTTCTGATAACTAATG---TTTTTTGTTTTTTTAAAGCCTGTGG
ATGTGGACAAAGATTCATCCCTAGTGACTCTCTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTTTGGGGACTGCATCC
CATCATATGTCCAGGTAAAGAAGGCATTTCTGTTCTGAGGAAGAGAGCATGGGAAGCTGTATAGCCTAAATC--------
-TAAAATGATTTTTCATGGACGCATGTATTCTATGATATGTATGCTTTAGATAATTCACATTTCTATTAATGACCAGTTG
AACAACACAACAT-GAAAATGGGAATATATTCTTCTGCCAACTAATTC-ATGTTTTGCTTATTCCAGCTATTGACAGCAA
AAAGATGAGGAATCTTCTCAACAGTCGTAAGTTCCAAAACCCACAATTAACTGTTTATTTCACAGTAAAAGATCATGAAA
AAA-GTTATAGAAAAGTTGGCAGTAAAGTTTACCAAGCTTTTTAAGACTCATTTTATATTTTTGTAAACCGAACACTTAG
TCTTTTTATTATT-TTTAGCATT--------------TAAGTATTTAAATTTATAAA-------------TTTATACCAA
ATACAATTCTAAGTTTATATGACCTACGAGATGTGGTT-AAAAAC--ACCTTACATAATATTCTAGATATTAT---AT-T
AATATTCA-----------------AGAAAATGAGCTGAGACTACAAAAGTTGGTTAATCAAC-ACCAGACCTTGATGTT
GGAAGAGAGAAATGGTAGAACA--CTGTGCCACACTTGGCCAAC-AGGATGTGTCTGCCATCCTTTGGGAAGATTA-AGT
AGACATTAATAGAAGACCTGCCTGTAGCATATGAAAGA-GCTGCACTCAAGTTTCCCCCC-ATTTTTTGAGAGGAAAACT
TATTTTGCTATATCTTGGCCTTCTGTATGT-AAAGAAGTT-CTAAGGTATGTTAG-----------AAAATCCCACATCT
TGTAAATGTCTTATTTAAAAAGAGGAAGAAAGAA--GAAATCA---TAGGAAAGAAATGTCTTCTGAAAATGAC-TTTTG
GATATGGAATTGTGAGACCATCTCTAGAAGTGACACCAAGAGACA----CACAAGTCCATGTTCACTCACTGGGACCTAT
ATTACCTGTTCTCT-TCT----AAACTTGTTCTCC-CTCCACCC--------CCTTATCCTTCCCTTTGCCTCTCAATTC
CTACAGTTCAGTTTGAGATCTGGTTTCTTGAA-TTTCCAGGAAAGGAAACGCA-----TTGCCATTGCCAAGCTATCTTC
TCTGATTATAGTTATATCT--CTTCCAAGGACTTAGAAAGGGTAAGTACATTGCCATAATCCTAGGCAGTATTTCCAAGA
A----CTAGAACTTCCCTACCATTTGCAGGGCCCTGCG-TTTTTCCTCTCTTCAGTCTCTAGGAACTAAGGCTCCTCTCA
C-TATTCTCCATAGCAGTGTCTGACTTCA-AAAGCGCCCTTCACCCACTGGTGCCCATCATCTGAACAATGAAGTATACT
TTTTCACTTTGCAGGAATCTATT--ACACTTCACCGCCACAGAGGAAAATAGGATTTGTCATGCTGGATTAGATCATTGC
TCTATTACATGTGCAATGCTGATTCCAGCATGAGTCAAATATTTGTTGCATCAGACGAAAGTAAAAGCTTCCAAAACAAG
TTGTCATACTTGCCGTGCTTTCAACTGCAGTCAAAA-TTCCATGTAGAGCTATACTTCAATCATTGAGCTCCTATTTTAG
ATATAAGAC--TTT-TTTTAA----GAAGTTT-AAGACACTATATTTTATAGAGGCCTCAATAAATGTGAAATATGGTCA
CATCTTCCAGCTTCAATTCTCCTGCTCTAAA--TGTTTCTCTTTATCTCCCATCTATATTCATTTT--GTGCCATGGAAG
ACAGGGGAGAAAAAGAGGCAGTAAACAGCTATATAGTTCCATAGG----ACATGGTTGAAAGTTAGTCTGTCTGATATTG
ATCTATAGGTTGGAAGAGGAATATGGAGAGATCAGAAAATGAAAGAGGGTAGAAGAGTTAGAAATACATTGGGAAAATTC
TACCATGAAGAGCCAGGGTTGAGTACAAAGTGCGGTTAGTAGATTTTCTTCCTACTCAAAGGAAGAGGGACAGGTATGAC
TTC-AAGTTAGATAAC-T-AAAAGGATTAATTTTAGC-CATGCCCACCCTCCCAACCTTCCCTCCCCAGAGTG-----CA
TGCAGCATGTTCTCATGCAGTTAGCAGGACGGTTAATTGGTTCAATCAAGTTGAAAACATGGTCAATAGTTTAGGGTGGG
G-CCCATTTCAAGGTCTCAGTATACTTCATGACTTTGTATAATTTCTTTTTCTGGGTT--------------------GG
CATTCTCTTTGTTTTAA-TCCTTCCTT---TATTCAAGTGGCTCATATTTAATGACCCCAAAAAATCAGTCTTTTTTTCT
TCAGTGTGGTATCAACACTTTCATTAAATC---------------------AAGGTTT-TAAATCTA--AGACCAGATGA
CAAAAGGAAGCTGTGTTAGCATCTTTGTCATGGCCACATTTCAGTAATGACA-----TATTATGTTAAAGTGTCCTATCA
AGCTTCAGTTGTATACAGTAGATTCCTTCACTTTTCATCAGAATTAGTAGCCTTGACCTCG------------CCAGCTA
TTT-AAAAATTTCAGAATCCT-GAGAGAGGGATGGTGGGGTGAAGCTCCTGAACCTTTCACAAATCACAAATTCATTCCT
TCTCTTTCTGGGGCACAAAGTTACACTATGCTTGCCAGCCTCCTTCGAGGCTCAGTACAGCCATGGGACTAGCCAGTAA-
--------CTC-TTTGTTATCCTTCTTATTAGGGTAACACATTAAGAAAGATACTTCTGAATCGATACTTTAAAGGTGAT
TATAGTATTGGTGTGAATGGACACCTATCAGGAGCCTACTCCAAAACTGCACAGGTGGGAGGTAAGTCCTGTCATTTGTT
TTCTCATTTTAGGATTCTCATGATACATCTTCATGTCAGTGTTACTCTAGTATTTTACT----GAAATGGCAGATATA-T
AAAAGAGTCATTTAAAAATCACTGTTAAAA--ACTTTCATAC--AATTTGGGGCTCATAAAACAACAGATTTGAACATCA
```

GAATTGATTTTGCTTTTTGACCTTGGAAAAATAGTTAAACTAAGTTATAATCTCTTAATGTATAAATTAAGGAC-AAAA-
TAAAGCTAGTTTTCTC
>Outgroup2
CCAGGGCAGCGGG----------TTTTTTTAAGCAATATATTTCTTTAAGCAATATATTTCTTTAAATAAAAATTTTA
AAAGATACCTACCTAAGCTGAATTCTAAAATGGGCTCATCAGGATCTTGTATATTTCCTGGACAGAAAAGAAATAACAGA
AAAA----TCATCCTTAATAAACTTTTCCCT-GATTCTAGAATGAATGCAAAAACAACACTCTACCCCACCTTCCTCCCC
ACCACACCCCCCAAAAAAACTATTATAGAAAATGATTTCTTCATTTTCTAAATACTTTGCTTTTGTGATTCCTAAG-TGT
CTCAGACCCCAAGACCAAATGTCC-TTCCTCCTCAGGCCTATATACCCCTACTAGAGAGAGCTTTTACCATAGCCTGGGC
ACTGGTCAGACA----------CACACTGTGGATGTTCTCACATTATCTACCAGCAAACTTTTGACCCTAGAGCA
C----------TTATCTGTCCTATTCCTCTGTCTCATTTTCTCCTTCTTTCAAACAAAATCCTGCTAGCTCCTC
TGTTTGTATATGCATTT-TTGTTAAATTATTTTATTTGAG----------CCA----GTTATTTTTCTCCCAAA
AGAAATGCCATCACTATTATTTGTTGCTTGTGCAAA-ATAAAATTAATTATTCTGAATGGTCCTATAAC-TTTTAAAGAT
ATAATATGACCCCTGCCATGCATATTAGAAT----------TTATAAGCGTTCTCAGATCTTGTCTT-TT
ACACCTTAGCCTTCCTCCCTTA-CTTCTCCCTTTCTACTTTTTCACTTTGATGTCC----------ACAAAAGAAAAA--
---GTATGTCTTAAAA--TTGCCTTCTGAACACCAAAAGCATTAGCTGTCTCTTCTCCATCTGAGTGCTGGGC-TTGGAC
ATTCAGGGGCCCTGAGCGGCAG-CTGGAAGGCTCCGGCTTTGTCCAGTGAGCAACAAGCCCCTC----------
--CTGAGGACTGAGG-AACAGAGCTGTGCCCCACGTACATGAATTTGG-CAATAGTGTTCAGGGTGCACTCAAATGGGGA
GCCTGGATTTCGGGGGTCTGAATAAGTACTGAGAGTTTCCCAGAAGAATAG----------GCA
GTGGCTCGGTAGTGGAGGGGAAAGATGAAAAAGAGATT--GGTTTCAGACTTATTGAATTGAAGCAGTACAACCAAATCC
TTTAATGAAAGAGTTATCCTGATTTTCAGCAACTTTGGTTAC---TCC----------TTATGCCAAAGATGCTGTAT
GTATTGGAATATTGATTTTTTTTAAAC---ATGA-TTCCCTTTTCCCAATTCAATGTCTCTGACTTCATACTAAGAAGAT
TTGTA---TGTCTTTAATACTCCTTTGGTTATAAATAGATGGAAAGTATTTAGAAAGAAAATATAAATCTCAGGACTATA
TTC---CAAGTATCTTTCTTCAC-TTTGCCATAGTAAAATTAGGAGAATAAAGTCAGATAATTCCACACA----------
-TTAAAAAAAAAAAAAAAGTGGACGTGAGTCCTTA-------TAGAGTCTCTTGAGGTGAATTTTGTTATA-TTGTTGGT
CAAATTGTA-CCTTTCAGATAAATGGTG--AAATAAAATGTGCCGCCATGTTACTCCCCCTTCC-CATTTTTGGCTAGAT
TTAAAGGAGCT-CTTCCATACTTTGCTTTTAAATTGACAAACAAAAATCTCTCACCGTGTTTACCTCCCCTAGACTGGTT
TTATTT---GATTCCAAAGAACCTCCTCATACATATTCAAAATTCATTTTATACTATTGTGTTGCTAAGTGTAGTTTCAT
TAGAAATTTTATTTGGATAGAAAT----------TAACATTCTAGTTGGTTCTTTATTCTGGCATTGATTTATTAAAT
AGATGTCTTC-TGATTTGTTAAA-TACATATCTACCTTTATGATACCTTGTA---TTGATTGTTTTTT-AAAGCCACTGG
ATGTGGACAAAGATTCATCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTCTGGGGACTGCATCC
CACCATATGTCCAGGTAAGGGAAACATTTCAGTTTTCAGAAA----------
-CTGAATAGTTCTTCATGGGACAC---ATTCTATAATATTGATGCTTCAG---ATAAGGATGTCTAACAATGATCATTTG
AATAAAATAACAT-GAAATATGGAC-ATATTCTTCTGCCAAGTAATTC-ATGTTTTGTTTGTTACAGCTCTTGACAGCAA
AAAGATGAGAAATCTTCTCAACAGTCGTAAGTTTCAAAATCCACAAGTAATTGTTTATTTCATAGC------CAATGATA
TAAATCCACAGAAAAGTCAGAAATAGAATTTGCCAAGCATTT-TTTGTTCCTTTTATATTTTCATATACAAAATGCTTAG
TCTTCTTATTGCTCATTATT-------TTGAATATTTAAGACATATAGAGCTATAAA----------TTTATGCCAA
ATAAAATGTCAAATAC-TA---CTTATGAAATGTGGT---AAAAC-TTACATT----------ATATTTGAATTCTTAT
AATTATAACCGGAAGGCTAAGCGTGGAGCCGT----------CAGAAGGTCTATGCTCTATCAGACTTTGATATT
GGAAGAAAGAAATGGTAGAACA--TGGTGCCACATTTGGCCAACAAAAAAGTGCCCATTATCCTTTGGGAAGATTT-ATT
GGC----------CGTTCATAAAAGGCCTGTGC-AAGTAATATTAGCTGCCCCTCCCCCATTTTAAATGAAAACA
CATTTTGCTACATCTAGACCCCCTAGATGA-AAATAGGTT-TCAAAGTATGATAG----------ATAATCACACATCT
TGTAAATGCCCCTTT-GAAAGAAGGAAGAA------AGAATCATAGGGGGAGAAAAATGTCT-CTGGAAATGAC-TTTTG
AAAATAGAATTGTTAGGCCACTTCTGTAAGTGACACCAGAAGCAA----CACAGGCACACATTCGTTCAGTGGGAGCCAT
ATTACCTGTTTTCTGTCT----AAGTTTACTCCCC-CTCAATCC--------CCTTATCCTTCCCTCTGCCCCCTAATTC
CTAC--TCCAGACTGAGATCTGGT--CCCACAGTTTCCAGGAAGAAAATTTATACTCAGTATCATTGCCAAACTATCTCT
ACTGATTAGAGTTATACTT--CTTCCAAGGGTTTAGAAAGAGCAAATAAATCGCTGTAATCCCAGGCAGCATTTCCAAGA
G-CAACTGGTACTTTCCTACCATTTGCATGGTCCTGCATTTTGCCTTCTCTTTAATTTCTAGCAAATATAGCTCTTCTTG
C-AATTCACCACAGTAGTGTCTGACCTC----------CACTTGTGCCTATCATTTTAACTGTGGGGTATACG
ATTCCACTTCACAGTTACCTATT--ACATTTCACCTCCACATAGGGAAATAGGATTTGTCATGCTGGATTAGAGCATTGC
TCTATTACATGTGCAATGATGATTCTAGCAAGAGTCAAACAGTTCTTGCATTAGACGAAAG-AAAAACATCCAAAACAGG
TTGTCATATTTGCTGTGCTTTCAACAGCAACCAAAATTTTCATCTAGAGCTCCCCTTCAATTGTCGAACTCCTATTTTAG
ATAAAAGATATTTT-ATTCAA----G-AGTTTTAAGATATCTTATTTTAAAGAGATCTGAACAAGTGT-AAATGTGATCA
CATCTTACAGCTTTACTTCTCCTCCTTTAAAGTCATTTCTTTTCATCAAGCATCTATAGTCAAGTTGGGTG-CTTGAGAG
GTAGAGGAGTCACAGAT---GTAAAGGTCTAGAGAGTTCCACACTGCA-GTGTGGATGAAACTTCGGGTAC---------
----ATAGAATGGAAAAGGAAGATTGAGAGAGAAGAAAATGGAATAAAGTAAATGAGTTAGAAATATGTTGGGAAAATTC
AGCCATGTTGAGTCTGGA----------TCGGTAGACTTTCTTTCTTCCCGAAGGAAGAGAGAAAGATAAAAC
TTA-AACTCTGTGAAACT--AAAATAATTTATTAAAA-CTATATCACTCTCCCAACCTTCTCTCCCCAGAGTG-----CG
TGCAGGCATGTTATTAGGCAGTTAGAAAGGTAATTAGGTAGTTCAGTCCAGTGGAAAACAGGATCAATAGTTGAGAGTAG
AACCCATTTCAAGGGCTAAGTATACTTCATGCCCTGGTGCAATTTCTTCTTCTGAGTT----------GG
-ATTCTC--TGTTATAG-TTCTTT------TGTTCAAGTGCTTCACATTTAATGACCTCAAAATAGCAGTCTTTTCTTC-
TAAATATGGTATCAAAACTTTCCTTAAATC----------AAGGCTTATGAATTTA--TGACTAGCTAA
CTAAAGTTATGTCC----------AAATTTCAACTTGGAACAATGACTTTTCTTCCTATGTAAAAGTGTTTTATCA
AAAACCTGTTCCATACAGTAAAATTCTTCACTTTTCATGTGAATCATTATG-TTGCTCTTGGT----------CC-GCTG
TTT-AAAAATTCCAGGCTTCT-GGGGGAGGGGTGGTGGAGAAAAGACCCTGAATGTGT-------CACAAATCCATTTCT
TCTCATTCTAGGGCACAAAGTTACACTACTTTTGCCAGCCTGTTTTGAGGTTCAGTATAGTCATGNNNNNNNNCAATAAC
CAACACAACACTTTTCTCGTCCTTTTTATTAGGGTAACACATTAAGAAAAATACTCCTCAATCGATATTTTAAAGGTGAT
TATGGAGTTACTGTGAACGGACATCTATCAGGAGCCTACTCCAAAAGTACACAAGTGGGAGGTAAGGCTCGTCA-TTTTT
GTCTCAGTTTAGGATTCTC-----ACATCTTCATGTCAATGTTACTCTAGTGTTTTATCT---AAAATGGCACAAATA-T
AAAACATTCATTTAACAAGCATTATTAAAAA-TCTT-CGTAC--AACTTGGGGTTTATGAAACAACAGGTTTGAACATTA
GAATTGTATCTGCCTTTTGACTTTGGGAAAATGATTAAACTGTGTCAGAATTTCTTAATCTATAAATTAAAGAC-AAAAA
TAAAGCTAGTTTTCTT
>Perissodactyla_Sp2
CCACAGCAGTCGT-GTTTTTGTTTTTGTTTTTAAGAAACATATATT----------TAAAAAAAAAAATTTAA
AAAGACACTTACCTAAGCTGAATTCTAAAATGGGCTCATCTGGATCTTGCATATTTCCTGAATCAAAAAGACATGACAGA
AAAAAA--TCACCCTTGATAAATTTTTCCCT-GCTTTTAGATTTTATGCAAAAA----------CCCAACACATTTC
CCCCTCCA--------AAAC--TTATACGAGATGATTTCTTCATTTTCTAAATACTTTTCTTTTGAGGCTCCTAAGCAGT
CTCGGACCCCAAGACCAAACCCCC--TCCTCCTGGGGTCTGCACACCCACAACAGGCAAGGCTTTCATTACAGCCTGGGC
ACCTGCCAGACA----------GGCACCGTGGACATTCCCACGTCATCTACTGGCAAATTCTTGACCCT-GAACA
C----------TGTGTGTCTGCCTGTCTCTGCTTCTGTCTG-----TCTCTCTCTCAATAATCCTGCTAGTTCCTC

-ATCTGTGTGT--ATTT-ATGTTAAATTATTTTA-TTTTA----------GCCAAAAGAATTACTCAGGAGAAAA
AGAAATACCGTCACTACTCTTTGTTGCTTGTGCAAG-AGTAAATCA-TTATTCAGAATGGTTATATCACTTTTTAATGAT
ACACTACTACTGTTACTGTGCATATTATAAT----------TTATAAG-GTTCTCAGACCTTTGCATTTT
GCACCATAGCTTTCCTCCACATGCTTCTCCCTTTCTACTTTCTTACCTTGATTCCC--------A-CAAAAGAAAAAA--
---ATGTGTCTTGAAA--TTGACTTGTCAGCATCAACAGCATTAAGTGTCTCCTCTCCATTTTGGTTCCAGGG-TCAGGT
GGTCAAGGGCTTTAAGTGGCAGTTTGAGGGTCTGGGGCTTTGTCCAGTGATCAATGGGGACCTA----------
--CTGAAG-TTGATG-AACAGAGTTGTGCCCAAGGCA-GTTAA-TTTGGTAATGGTATTCAGGATGGATTCAACTATGGA
GATTGGAGTTAGAGAGGATGAATTAGTATTAAAAGTGTGCCAGGGAAGAACTACAGTGGATAAGTG----------GCA
CTGGCTCAATAGTGGGGGAGAAAGATGAAACAGCAATT--GGTTTCAGACATGTTAAATTCAAATACCACCACCAAGTAC
TGAACTGAGGATGA---CCTGATTGTCAGAACCTTTGATTACCCATCA----------TCATACCAAAGATACTATAT
GTTATGACACTTT-------TTTACAAAATGAGAGTTCTTT-ATTTCAATTCAGTGTCTCTGACTCAACACTAGGAGGAC
ATTTA---CATTTTCGTTGTCCTTTTGGTTATTAATATATGGCAAGCATTTGGAAAGAAAATATAAATCCCATGACTGTA
TTC---CAAGTACTTTTCTTCAG-TTTGTAATAATAAAATTAGGAAATTAAAGTGAGATAATTCCATACCAAATTTTCCA
ATTAAAAA---------AATGAAGGTAAGCCCTTGTT----CCAGAGTCTGTCTATATGGATTTTGCTATG-TTGCAGGT
CAAATCCTA-CCTCTCAGATGCATGGGAATATATAAAATGTACAGCTATGTGACCCCTCCATCTT-GTTTTCTGCCAGAT
TTAAAGCAGATTCTTTTGTATTTTGCTTTCTAGTTGAAAAACAAAAATCTATTACCACGCTTAACTCCCCTGAGCTGGTT
TTACTTAGAGATTCCAAAGAACCTCCTCATATACATTTATACTTTGC----------TTGTTAAGTTTCTTTTCAT
TAGAACTTTTATTTGAAGAGATA----------GGAATTATGTACTAGTTGAGTTCCTTATC-TTCTGATTTATTAAAT
GA-TATCTTC-TGATTCGTTAAA-TACTTATATACCTTTCTGATAACTAACA---TTCTTTGTTTTTT-AAAGCCAGTGG
ATGTAGACAAAGATTCATCCCTGGTGACTCTTTGTTATGGACTCTGTGTTCTGGGACGGAGAGCTTTGGGGACAGCATCC
CACCATATGTCCAGGTAACGAAGGCGTTTCTGTTTTCAGGAA--GACTGTGGGAAGCTGTGTAACCTAAATCTGAAAAAT
TTGAAATAATTTTCCATGGAAGC----ATTCTATGATATGGATGCTTTGAATAATAAGCATTTCTTATAGTGACCATTTG
AACAACATCACAT-AAAAATAGAAACATATTTTTCTGCCAACTAATTC-ATGTTATGTTTATTCCAGCTATTGACAGCAA
AAAGATGAGGAATCTTCTCAACAGCCGTAAGTTC----------ATATC-AAAGATAATGAGG
AAAAGCCACAGAAATGTTAGAAGTAGAATTTACCAAGTTTTT-TTTGTT-ATTTTATGTTTTTGTAAACCAAACACTTAG
TC-TTTTATTATTGTTCATTAGTT----TTAATATTTAAGACATTCAAATTTATAAA----------TTTCCACCAA
ATACAATTTTAAGTTT-TGTGTCTTATGGAATGTGGTAAAAAAGAATTATATAGT--ATTCTTAATATTATGACATATGT
AACTATAT----------GAAGTCTGTCA-CC----AGACCTTGACATT
GGAAGAGAGAAATGGTAGAACA--GCATCCCACATTTGGCGAAC-ACGGAGTGCCCACCACCCTTTGGGAAGATTT-ACT
GGCCATTTATAGAAGACTTGTGTAAACAATATGAAACA-GCTGCTCTCAAGTTTCCCTC--ATCTTTTTAAAAGAAAACA
---CT----------

----------TCAGTTGGACCCAT
ATTGCCTGTTC----TCTT---AAGTTTGTTCCCCACTCCATCC--------CTTTATCCTCTCCTCTAC----CAATTT
CTACAGCCCAGGTTGAGATCTGGGCCCCTCAG-TTTCCAGAAAGAAAATTTTTAC---TTGCCATTGCCAAGGTATCTTT
TCCGATT--AATTACACTT--CTCCCGAGGGTTTAGAAAAGACAAGTAAA--CTCTGAATCCCAGGCAGCATCCCCCAAA
A----------CTTTCCTGCCATTTGCAATGTCTCATT-TTTGTCTTCCCTTTAAACTCTGGGAAGTAAA-CTCCTCTCA
C-AGTCCACCAGGGTACTGTCTGACTTCAGAAGACCCCTTCCCTCCACTTGTGCCCATCAGTTTAGCAATGAAGTACACT
ATTTCACTTTGGAGCTATCTATT--ACACTTTTCCTCCACATAGGAAAATAGGATTTGTCATGCTGGATTAGAGCACTGC
TCTATTACATGTGCAATGCTGATTCCAGCAAGAGTCAAATAGTCCTTGCGTCGGGCAAAAGCAAAAACTTCCAAAATAGG
TTGTCATACTTGCTGTGCTTTCAACAGCAGCCAAAA-TTCCTTCTGGAGCTATACTTCA----TTGGACTCCCATTTTAA
AAAAAA--TAAATA--AAAAAA--AGAACTTT-ATAATAACTTGTCTTAT-GAAGGTCTGTATAAGTCTTAATATTGTCA
CATCTTCCAGCTTCCCTTCTCCTCCTCTAAAATAATTTCTCCTTACCCAACATCTGCACTCAAGTTGGCTGTCATGGAAG
GTAAGGGAGACACAGAG---GTAAAGAGTTAGAGAGTTCCATGAA----GTGTGGTTGAAAATTAGTCTATCTGATATTG
ATCTATAGAATAGAATAGAAAGATTGAGAAAGAAGAAAATGGGAGAAGATAGATGAGTTAGAAACATATTGG-AAAATTT
AGCCATGATGAGCCAGGGTTGGGGATCAAGTGAGGTTAGTAGACTTATTTCTGTGCCA-AAGAAAAGGAAAAGCTATGAC
TTC-AGGTCTGGAAAACTCAAAAAAATTTGTTGTAAC-CATGCCCACACTCCGAACCTTCCTTCCTCAGAGTGCATG-TA
GGCATGCTCTTCTAATGCAATTAGAGGGGC----------AGTTAGCTGAAAAACACAGTCAATAGTTTAGGGTGGA
ACCCAATTTCAAGGATTTAGTATATTTCATGCCA----------TGGGTT----------AG
CATTATCCTTGTTTCAATTCATTCTCCTTTCATGCAAGTGGTTCATATTTAATGACTTCAAAATAGCAATC-----TTCT
TCAGTGTGGTATCAAAACCTTTCTTAAATC----------AAAGTTTATGAATTTA--AGACTAGATGT
CAAAAGTAAGCTGTATTAGCTTCTTTCTCATGGCCAAGTTTCAGTACCAACA-TTCTCTCTACGTACATGTATTCTGTCA
AAGTCCAATTACATGCGGTAGAATCCTTCACTTTTCATCATAATCATTATGCTTAACCTAG----------ACAGCTG
TTT-AAAAATTGCAGGGTTCT-GTGAGAGGGATAGTGGGGCAAAGACCCTGAATCATT-------CATAAATCCATTTCT
TCTTTTTCCAAGGCACAAAATTACACTACACATGCCAGCCGTCTTTGAAGTTCAGTATGGCCATGCGACTACTCAGTAA-
----CTAATACTTTTCTCATTCTTTTTATTAGGGTAACACATTAAGAAAAATACTCCTGAATCGATACTTTAAAGGTGAT
TATGGAGTTGGTATGAATGGACACCTCTCCGGAACCTACAGCAAGTCTGCACAAGGGGGAGGCAAGACTTA----TTTTT
TCCTCATCTTAGGATTCTCATAAGATATCTTCATGCCAGTGTCACTCTAGTATTTTACTT---AAAAGAGCAGAAATA-T
AAAAACTTCATTTAAAAAGCACTATTATCAG-CCAT-AAAAC--AATTTTGGGTTCATAAAACAGCAGATTTGAACATTG
GAATTAATTTTGCTTTTTGACTTGGG-AAAATAGTTAAACTAAGTCATAATTTCTTAATATATAAGTTAAGGAC-AAAAA
TAAACCTAGTTTTCTT