

TcasOBP01 1 -----MKTVAVLFLALAACT**Q**EDDDRQETIRQYRDD**C**IAETKVDPALIDRADNGD----FTDDAKLQCFSK**C** 65  
TcasOBP02 1 -----MKAFIVLVAVAVCA**Q**ALTDEQKEKIKNYHKE**C**SAVSGVSDVITKARKGE----FIEDPKFKEHFL**C** 63  
TcasOBP03 1 -----MKFLVVI**STVLMANIVQ**GLTDEQKSKLEEYSKE**C**LKESKVDESVLKEAEKGV----YLD**DPKLMNHVY****C** 65  
TcasOBP04 1 -----MRASAVFLSSFIISIQ**AAAF**FNPEDELRRSAA**C**LEQSKVSS**ESIKNLQIGN**----FDDDERLKE**YLF****C** 64  
TcasOBP05 1 -----MKTIICFVFLAGAW**F**CFQAL**TKE**QIDKLEPISKE**C**RELNGISED**TILKVR**RG**E**----AVNEPKLKNHVL**C** 67  
TcasOBP06 1 -----MNFVCFVIFILVAIIGAH**GL**SEQTEKLNQLSKE**C**RALTGV**SQETIT**NARNGN----FEEDPKLKLQVL**C** 65  
TcasOBP07 1 -----MKFLVCLLFVIVAAN**ALT**KEQKEKLDKISKE**C**KNQSGV**SQELID**KARTGE----LINDPKLKAQI**Y****C** 63  
TcasOBP08 1 -----MENRLVLLIVINTLLLA**Q**AAAKQDFHKK**C**LASSGANAD**TI**AKVRNGK----FSNDPQ**TQKY**FG**C** 60  
TcasOBP09 1 -----MKYLLFLT**VITLTCGFI**F**AF**SLSNRE**QAI**FLSTYST**C**LET**SKVD**SERALRTASGIID----DEPKLKEFL**C** 67  
TcasOBP10 1 -----MNIYTCLVLV**VIAASA**Q**HL**TEEQKNNWRKWSNE**C**KVLIGV**SQEA**INKIRNNE----FDSVDDKIKKHGL**C** 66  
TcasOBP11 1 -----MKQIYCLITVVVLI**IF**LTAL**ENEG**QNPDTAN**C**VALGG-----QRIKDSE-----IAKMAH**C** 51  
TcasOBP12 1 -----MKIVLCLLALATVALAK**K**FLAEDTDKLEVMINE**C**KT**KTG**VPDDILQKAR**NGE**----KIDDPK**LRE**HAL**C** 66  
TcasOBP13 1 -----MKVFLAVFALVAA**QA**ETAKEKLRKYSDE**C**KS**SV**SGVSE**ELLN**KVRNHED----VHDPK**LDE**HGF**C** 63  
TcasOBP14 1 -----MKLFILLSLLSVCYAR**K**WFDKDPQDVAKWQKE**C**FEASGV**SME**SMNKL**PNIT**----LSEDPK**LGE**NAF**C** 64  
TcasOBP15 1 -----MKIVLICVLIGLVVAK**Q**Q**K**DTLDEEKEKMKWTQ**E**CIQESGVTSE**ILQ**QLRNQ**K**----RVEDPKLKE**YTF****C** 68  
TcasOBP16 1 -----MIRYYIVLLLYFFAP**IG**ISEEMQELVNQLHST**C**VAETGVSE**DLIN**KVNSDK----VMIDDEK**LK**CYIK**C** 65  
TcasOBP17 1 -----MSPLLLIFISCLFP**IG**ISEEMQELANTLHAT**C**VDETGVSE**DAI**ESARKGN----FAEDDK**LK**CYMK**C** 63  
TcasOBP18 1 ---MYKTRVIYVLFALCLVEIFV**SRA**IE**MDD**DMKELINNLHNT**C**TGETGATD**Q**IENARKGN----FAEDDS**FP**KCYFK**C** 72  
TcasOBP19 1 ----MSRMLPAALFVVLATLTFATA**E**IVVPDDLKDYINELHDH**C**LKEMGLTE**GD**HKNYNIHV----KDPKM**Y**CMK**C** 69  
TcasOBP20 1 -----MMPLKNLILIVCPL**IF**VDIP**DLQ**AEIDGYDY**C**YKQIGL**TKD**LKAYKIGD----RDPK**IM**CFMK**C** 63  
TcasOBP21 1 -----MMHLKNFVVLVVCPL**IF**VEIP**DL**EAEIDEYFEQ**C**FE**PNG**VT**MDI**KAYKMGD----KDPK**IM**CFMR**C** 63  
TcasOBP22 1 -----MKMCVIFTL**LL**LVLASA**EED**NVGKIESVEK**C**QEK**TGV**SE**ESLQ**KIMRLE----EVD**DP**L**V**KENAL**C** 64  
TcasOBP23 1 -----MKISTLVAI**LV**LAGSAVCA**DE**DNLTEN**VQS**IEE**C**QK**ET**GV**SDE**SLQELSETG----DS**DD**L**V**K**KN**AL**C** 67  
TcasOBP24 1 -----MKSFVIFVLIIVITG**Q**INAT**PS**DDFKVQK**C**Q**KT**GV**SDE**SINKVNNLE**P**----VCD**LL**L**Q**ENAL**C** 65  
TcasOBP25 1 -----MNSVL**FLL**V**CALL**DK**FL**M**Q**FLQKIKK**VSE**D**C**IA**ET**QATKN**DI**KT**LLE**HK----IP**S**HEG**K**CMIF**C** 63  
TcasOBP26 1 -----MKLFILAGLFTGVCA**VD**Q**F**VEK**FL**QKMEKIGEE**C**AE**ETH**ATS**DDI**AD**LIE**QR----DP**K**THEG**K**CLIF**C** 67  
TcasOBP27 1 -----MKSTWFFLLLACSL**TA**F**LE**KMQ**E**FGA**C**AE**ET**DAT**S**DI**AELI**ARK**L**P---P**ST**HEG**K**CMIF**C** 61  
TcasOBP28 1 -----MKYFVV**FAS**LFLAT**NAL**SQ**DF**IDK**FV**AKVKSIG**ET****C**VP**ET**NASK**DI**SS**LL**AHK----MP**S**HEG**K**CLIF**C** 67  
TcasOBP29 1 -----MKFLLVFLSVAILCT**FAM**DES**FL**Q**TR**DRVKAIVKE**C**V**TE**E**KAT**D**S**FD**DDI**MAL**K**----IP**T**HEG**K**CVFF**C** 68  
TcasOBP30 1 -----MKLLITL**AT**LVVAT**YAL**ID**KE**FV**QEL**RQK**L**RS**HVEA****C**AK**EV**NAG**PD**VSA**IF**AHK----LP**AT**HEG**K**CIFF**C** 67  
TcasOBP31 1 ---MQLLVV**LAV**CVLG**AN**AGVSI**IL**DP**K**F**L**E**KL**TQ**EV**QAVG**T****S****C**GE**KE**HAT**AD**MI**E**IMEEK**FP**---P**T**SHEA**K**CVV**A****C** 74  
TcasOBP32 1 MLILIA**VN**CHKCIIVSALSLSAT**VFG**Q**S**LS**E**DEMRENARK**LMT****S****C**KDKV**GAS**DAD**VEA**LKM**HQ**----MP**ES**REG**FC**MLE**C** 76  
TcasOBP33 1 -----MNFFAIC**LC**FCVASTVGV**S**SE**EN**DINEIR**S**VEEN**C**Q**K**Q**T**GV**S**VEKVNN**FEL**VD-----D**PL**V**K**ENAL**C** 62  
TcasOBP34 1 -----MSKTVFIFVIF**YI**DFYAT**GD**ESVYLSN**HEA****C**V**K**LS**G**VD**ET**L**LE**TI**Y**EGD----V**F**ED**M**K**F**K**T**YI**H****C** 63  
TcasOBP35 1 -----MKAILLLVATLSFYH**M**SE**AQ**MKAAL**K**LVR**NV****C**Q**PK**TKAT**NE**Q**I**EA**M**H**T**GN----W**DL**D**K**NG**K**CM**Y**M**W****C** 64  
TcasOBP36 1 -----MKYFPHLCLCLIFFEL**SEAM**SE**AQ**LKA**AV**LVR**NM****C**Q**PK**SKAT**NE**DI**E**K**M**H**H**GD----W**N**I**D**RT**A**M**Y**M**H****C** 68  
TcasOBP37 1 -----MILKASIFLILAVAT**FGA**IL**D**SEL**M**K**V**VEN**C**V**KK**T**N**AN**ES**EF**SS**PN**F**LET----T**P**S**Q**PA**L**CT**A**K**C** 63  
TcasOBP38 1 -----MAKKQLV**L**FFLAFIFL**Q**K**FA**EV**RE****C**LS**EN**S**M**T**M**DEL**H**EG**W**K**M**EN----L**P**ESH**L**C**F**L**K****C** 56  
TcasOBP39 1 -----MAK**M**CR**L**FV**VL**SLFV**ASQ**AL**LM**AD**K**NF**VE**LR**NK****C**LD**K**L**G**KE**ED**LR**DL**K**F**DG----D**V**SE**D**LM**C**FG**K****C** 65  
TcasOBP40 1 ---MNPIT**S**VIL**T**FL**F**V**S**FG**E**KE**SEEA**Q**I**FT**EL**D**G**PA**EL**R**DQ****C**LE**K**NS**M**K**V**T**DL**K**T**Y**N**TS**N**----D**I**PE**K**EL**C**F**Y**K**C** 72  
TcasOBP41 1 -----MWSFV**T**LL**S**F**L**V**LA**S**AQ**K**K**Y**WT**T**ISE****C**LT**EH**S**M**G**V**ED**M**K**K**FD**L**PA----E**K**M**S**E**E**ML**C**F**N**K**C** 59  
TcasOBP42 1 -----MAT**R**FC**F**GL**L**IL**F**VG**T**VL**HE**I**L**EV**RAL****C**M**NET**GV**S**E**ET**AR**NY**K**PA**ED----P**A**SE**I**LC**M**V**K****C** 60  
TcasOBP43 1 -----MS**F**L**L**IC**V**IP**A**IF**CR**S**F**SH**DEL**DT**DL**S**F**IK**T****C**N**RT**SP**I**SM**S**K**F**GL**F**L**T**EF**N**---L**T**EP**G**T**M**NE**C**F**L**H**C** 67  
TcasOBP44 1 -----MK**T**IL**L**CL**L**S**Q**LL**L**L**AA**EL**Q**PE**DR**H**Q**I**ALQ****C**DI**V**G**I**D**Q**K**V**ED**A**IN**I**E**I**P---K**NN**PK**Y**E**F**L**A****C** 65

TcasOBP01 66 FYQKAGFVSETCDLLFDVIKDKIPK-----EANREKALAIIDKCKELKG-----ADSCETVYLVHKCYFLHSYGTDKKT 134  
TcasOBP02 64 FSKKAGFQNEACDFQEEVIRKKLNA-----ELNDLDATNKLIAKCAVKKD-----SPQQTAFETIKCYEENTPTHVSLA 131  
TcasOBP03 66 LVKKINSQKDKCELEVTVQIKEKLM-----QINDEKEVDKLIQLCLVQEK-----SARYSLGKCEVSS----- 122  
TcasOBP04 65 VSKNAGYQDPACHLQHEMIRLRFRG-----GRYSDDTINEVLQCGHQKD-----TPQETAFFQFMKCAEQNAFPRNYK- 131  
TcasOBP05 68 VSKKTGLASETCETNVEVLRTRKLR-----VSENDDEVNSIIQKCVVKS-----TPEETAFAEIVCLRKVKPNFSPAN 135  
TcasOBP06 66 IGGKVGIMNESSQIDENVLKAKLR-----VSDNDEEVNKIYNKCAVKKP-----APEETAFAETIKCVMKNKPKFSPVE 133  
TcasOBP07 64 VSKKAGLATEACEINMDNLTKTKLK-----VAANDDEVNKIIQKCVVKKP-----TPEETAFAEVYKCLHANKPNFVSVD 131  
TcasOBP08 61 MLRSVGVVNQACQLQVAALRKQVPK-----DMKRDEAMKIYMSCKDKG-----ANNDETAYLLYKCFWEASPRHVKID 129  
TcasOBP09 68 INKQNGVQDDACNFVKDAVRKRIEHP-----LLTDKTMELIVNCKTRKRE-----TGEETAYQFLKCSYFTIMNEKHQ- 134  
TcasOBP10 67 FAKKASLADSSENIINQIKIKLKR-----VIEDDEEVDRIVTKCTIRKN-----TPEETTFETFRCLRENSSKFVFPV- 133  
TcasOBP11 52 ILTKTNLMTDKCFNSNLLKERLRQS-----VHSDDELVDKVVMMCTVEKE-----TPLKSAFSGYKCLRYLVPWFPLD- 118  
TcasOBP12 67 MMKKSEMMDACEMQMDKIRARLKH-----AVSNEAEGTRIMNECAVKKD-----TPLATAYEMICCLIRNKNSVDE-- 132  
TcasOBP13 64 ILKKAGFMNEACDILADTIKTKLKE-----NSEHPDVTDALVEKCKNEKD-----TPQETASHLFTCLVDKK-VHSH-- 128  
TcasOBP14 65 LLKKLGFISEDCETLLIEKLRSLKN-----QWGEIANKLVNECARQKS-----TPQETAHEMFLCIPAKLK----- 125  
TcasOBP15 69 TFKKNGFMNEDCKLQYDVIKSTLMK-----VSGSEEEANKVVKCKVVEKS-----TPQDTAFETVDCWYRYKKN----- 131  
TcasOBP16 66 LLTETGCIISDDGVVDVEATIALLP-----EDMKAKTTPVIRSCGAKMG-----ANPCESAWLTHKCYLETSPAIDYVLI 132  
TcasOBP17 64 IMEQMACIIDDECIIDVEATIAVLP-----EEYQAKAEPVIRKCGTKVIG-----ANACDN AFLTNK CWY EEDPEVSLQL 131  
TcasOBP18 73 VFDQMGQMTDDCKVDSEAVIAVMP-----PELADKIASTVRGCTEVG-----ANPCETAWLANKCYQKSNPDVSKVS 139  
TcasOBP19 70 LMTTSKWNMDES IQYDFILSSVHP-----AVKNILLPALDKCRDIPK-----GTMECEKAYNFMCLFNADPEINWFFI 137  
TcasOBP20 64 VFVEAKWMDENENLQYDIKNTI-----HSIRHITPELENGCKKAE-----GDKCEKSFNFNMCNKAEPEDVWLI 131  
TcasOBP21 64 LRVSGKWMENENMQYDIKETI-----HAIRHITPELENGCKEAE-----TGDKCEKSFNFNMCNRAEP EV---- 127  
TcasOBP22 65 TLKAYGVMDDCENIFPDKFEEKLKP-----EIGADEAKRVAEKCAVKKD-----SPEETAHQTLWCATEENALTDTSQ 132  
TcasOBP23 68 ILKAYGVIDDQCEISEDKLEEKLEP-----DRGKEEAEKVAKCAVKKD-----SPEETAHEALLCMQKQSQK----- 129  
TcasOBP24 66 ILKTYEVMDEECKICPDKLMEVLEP-----KFGKEKAELIEKCTLEKD-----TPQLLAHATLFLCLSVQKYVV---- 128  
TcasOBP25 64 FHKHFQIQNEDCSLNKVAASLLEP-IKDHSDIYDKVVKIFNTCFDSAE---RDDDSCIYASNLAECAIRESKSVSVQ- 137  
TcasOBP26 68 YHKKFNTMKEDCSLDKVGSVLALAEVR-DADFELYKNILTI FVTGDKKAK---IYDDPCETATALTMCGRDEAKAVSWAY 143  
TcasOBP27 62 MQKKFNMMKENCGIDRAGAIAALKP-LQKADPELHQKVLKIFVTCGMRVK---PSPDPCDTATELALCGKKEAEAVFCRL 137  
TcasOBP28 68 FHKQFQIQNDDCSINREGAIIKALEP-LKADDAELYEKVISIFKCESTPV---DGDSCLYAAASLAECAVKEGRAVSWFK 142  
TcasOBP29 69 SHKKFNMQHPDCSINKEGALDTFEV-VKDVDAEFHDKVITVYNHCLSTPV---DPDPCVYSVNLVFCFMKEAKAVRK-- 140  
TcasOBP30 68 MHKLYNAQNEDCSLNMAGALANLEL-IKMDPDVYTKVSTSFKNCESAPF---DSDPCLYAAANLVT CIVKEGRAVSNNF 142  
TcasOBP31 75 FYKHYKMKEDCTFDKDAAVKAFDE-IKAQDAEIHAKILKVIDADAKKQ---MSDDHCVSAASMAGCVKTEAIAV---- 145  
TcasOBP32 77 VFDSAKIMQ-DEKFSKSGMIEGFKPLIG-DDKAKLESLEKLSATCESELG---DGEDKCETAKRLVECVIKNGKTHGFEV 151  
TcasOBP33 63 ILKAYGIMDEDCNIYEDKLKEQITS-----ELGEKNAEQVAKCTIKKE-----SPQETAHESLWCVGEQKPIPGASP 130  
TcasOBP34 64 FFKKSGFQDENCMVMHFDAIKSSPHK-----DFSQTENIDKTITECEEKLN---GESALET AFLHFKCFMGEL----- 127  
TcasOBP35 65 ILNMYKLIHGKDNSFDWEAGIATLKA---QAPESVRDPAIASVNNCKDAVK---TTSKCEAAAYEIAH CMYLDNPEIKYFLP 137  
TcasOBP36 69 ALNSNKLIHTKENVFNRDYAITLAEK---NLPTALKTASIEAANLCKDSAK---TLDDKCVAAAYEISKCLYESNPEIKYFLP 141  
TcasOBP37 64 LLESLEIVNSECNINMETLKEYAQP-----FESPAREAVATCGEEIK---SVTTCDDMEKYRKCVEPLIKNS---- 126  
TcasOBP38 57 LLEKREVIDENGVQKEKIDEILTV-----KQLSDEKREEISTCITNVE---KIENCETMSEIMRCFPKRRD----- 120  
TcasOBP39 66 IQEEDGLLDSECNLNEEKLEKKIET--MPFLSRVSDDTKNNIMECLKEIG---KIETCQDFGKQRDCIHKYV----- 131  
TcasOBP40 73 FYEGVEFIDANCNLNVNNMKEIPAI-----SELGDEVLNEITAVEKIG---KIRCCGDLRKIEQCYQNITM----- 135  
TcasOBP41 60 FYDKLLITDENCEINTDNLMSIPLV-----NAIDASKHDDLVTCLKKVG---KIEECDGVKKIEQCFVEFI----- 121  
TcasOBP42 61 IFEKIGCLKDDCSFCVDTMKKNYI-----MDVINEENEKEIYELRGVG---KITNCRDMAAVEECFVKND SK----- 125  
TcasOBP43 68 LFMKYGWMDSDCGFLLDIKQTLLE-----SDVEIASLEFILYKCTATES-----NNRCERAFVFTQCFWDKMAEQQPSE 137  
TcasOBP44 66 SYKKQGYQNEENCEILMENIKKFLQK-----FYHPSDLQELNSCSGHNG-----TNHAENAYQALQCIYNRLSNMTVVG 133

TcasOBP01	135	E-----	135
TcasOBP02	132	-----	132
TcasOBP03	123	-----	123
TcasOBP04	132	-----	132
TcasOBP05	136	-----	136
TcasOBP06	134	-----	134
TcasOBP07	132	-----	132
TcasOBP08	130	GQ-----	131
TcasOBP09	135	-----	135
TcasOBP10	134	-----	134
TcasOBP11	119	-----	119
TcasOBP12	133	-----	133
TcasOBP13	129	-----	129
TcasOBP14	126	-----	126
TcasOBP15	132	-----	132
TcasOBP16	133	-----	133
TcasOBP17	132	N-----	132
TcasOBP18	140	SNVRSD-----	145
TcasOBP19	138	-----	138
TcasOBP20	132	Q-----	132
TcasOBP21	128	-----	128
TcasOBP22	133	EQ-----	134
TcasOBP23	130	-----	130
TcasOBP24	129	-----	129
TcasOBP25	138	-----	138
TcasOBP26	144	FA-----	145
TcasOBP27	138	GWKTLS-----	143
TcasOBP28	143	NTNFKLI-----	149
TcasOBP29	141	-----	141
TcasOBP30	143	SGFFF-----	147
TcasOBP31	146	-----	146
TcasOBP32	152	PPPRE-----	156
TcasOBP33	131	DEKN-----	134
TcasOBP34	128	-----	128
TcasOBP35	138	-----	138
TcasOBP36	142	-----	142
TcasOBP37	127	-----	127
TcasOBP38	121	-----	121
TcasOBP39	132	-----	132
TcasOBP40	136	-----	136
TcasOBP41	122	-----	122
TcasOBP42	126	-----	126
TcasOBP43	138	DQFFYNIEDKK	148
TcasOBP44	134	N-----	134