

Supplemental Information

Natural Variation in the Histone Demethylase, KDM4C, Influences Expression Levels of Specific Genes Including Those that Affect Cell Growth

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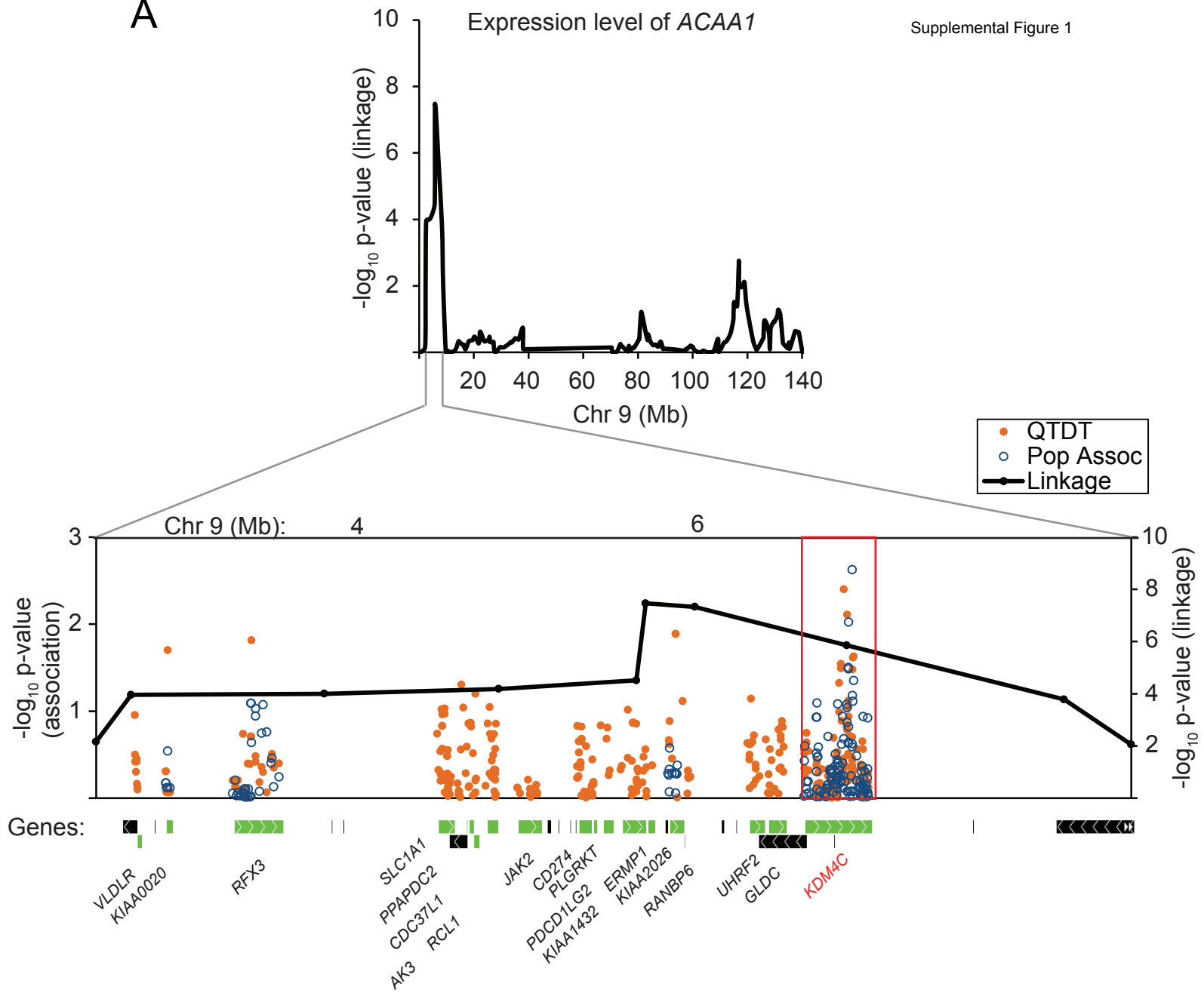
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Supplemental Figure 1. **Linkage and association analyses identify *KDM4C* as a regulator of gene expression.** Linkage plots are shown for the gene expression phenotypes with significant linkage ($t > 4$) to chromosome 9p24. An expanded view of each linkage region is shown below each linkage plot. Genes that are expressed in B-cells (RPKM > 1) within this region are indicated in green and labeled, while the genes that are not expressed are indicated in black. SNPs within or near the expressed genes within each linkage region were tested for linkage and association with the gene expression phenotype by QTDT analyses, and the results are shown. For the expressed genes with significant SNPs in the QTDT analyses, population association analyses were also carried out, and the results are shown. The gene *KDM4C* is labeled in red and the *KDM4C* gene region is boxed. The most significant SNPs within the *KDM4C* gene from these analyses are summarized in Supplemental Table 1. The gene expression phenotypes appear in alphabetical order as (A-AO).

A

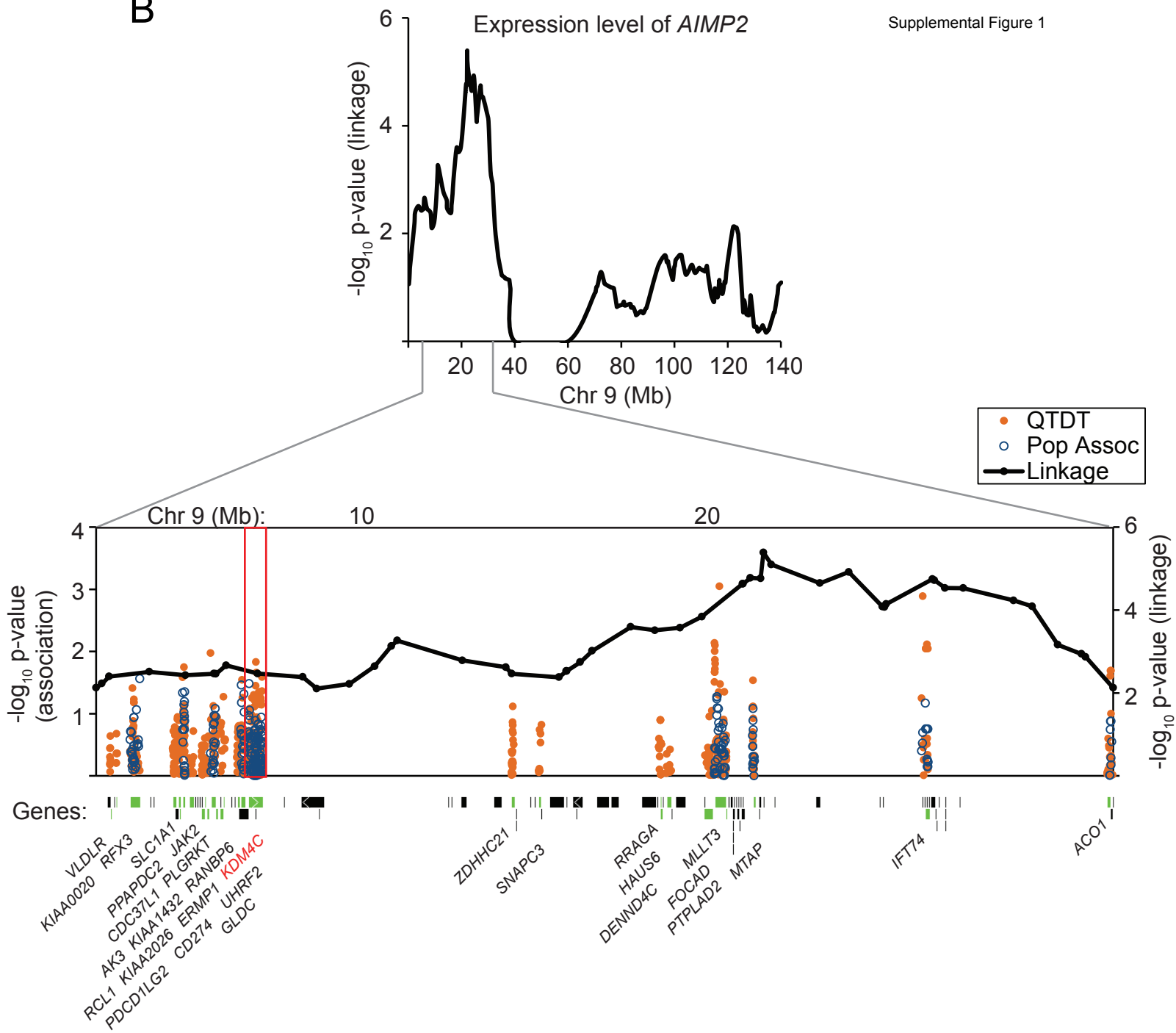
Expression level of *ACAA1*

Supplemental Figure 1



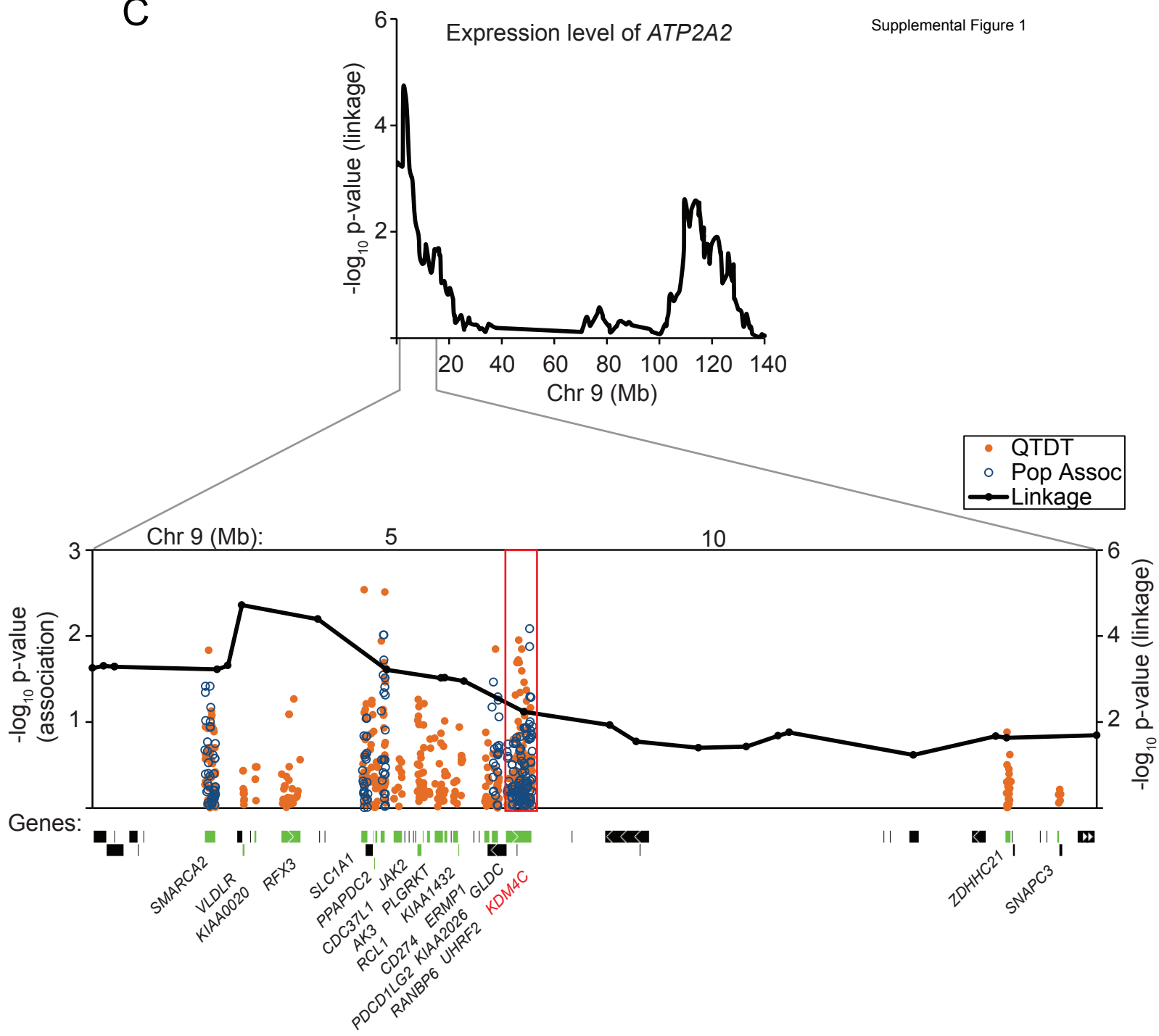
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Supplemental Figure 1



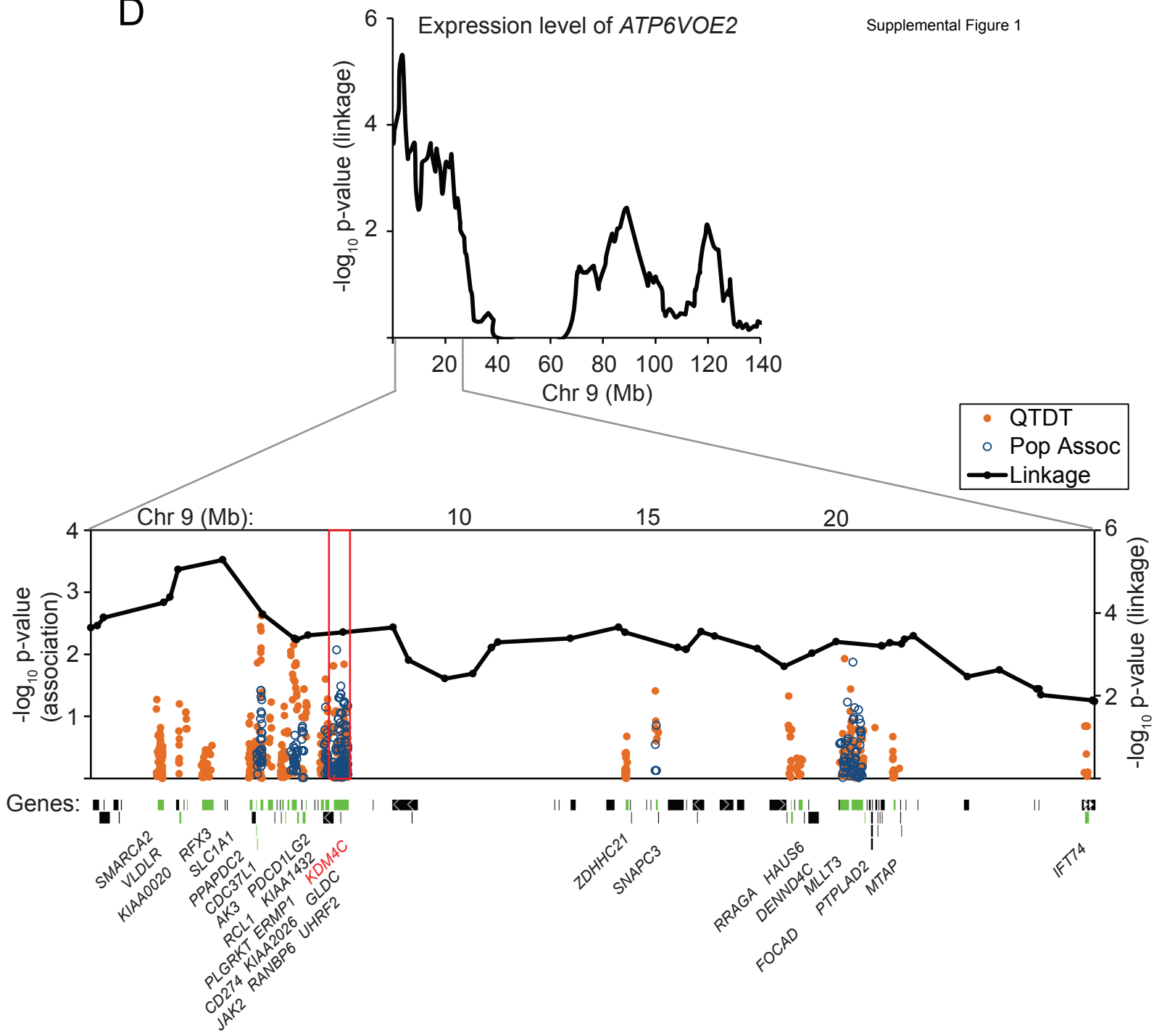
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Supplemental Figure 1



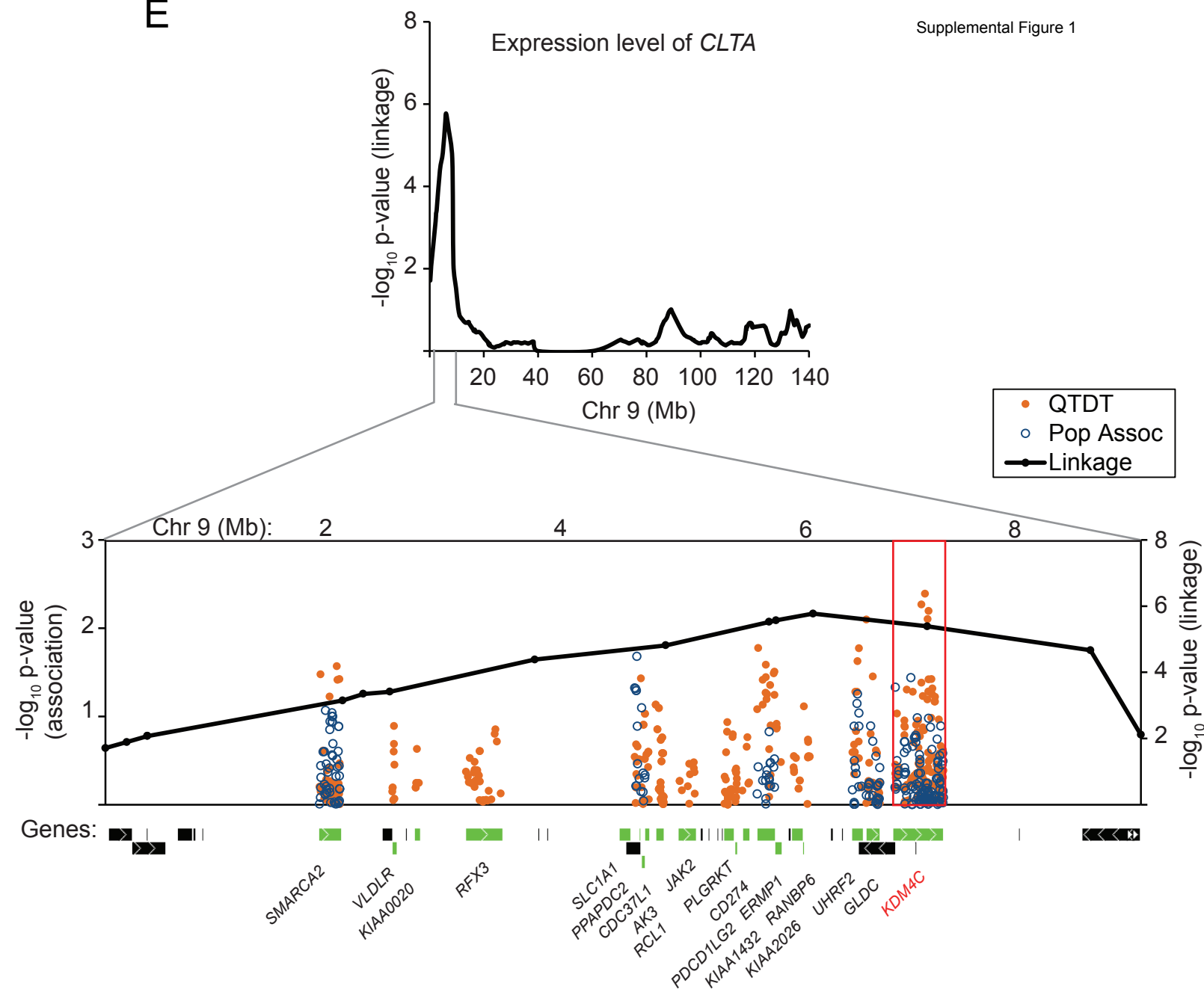
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Supplemental Figure 1



E

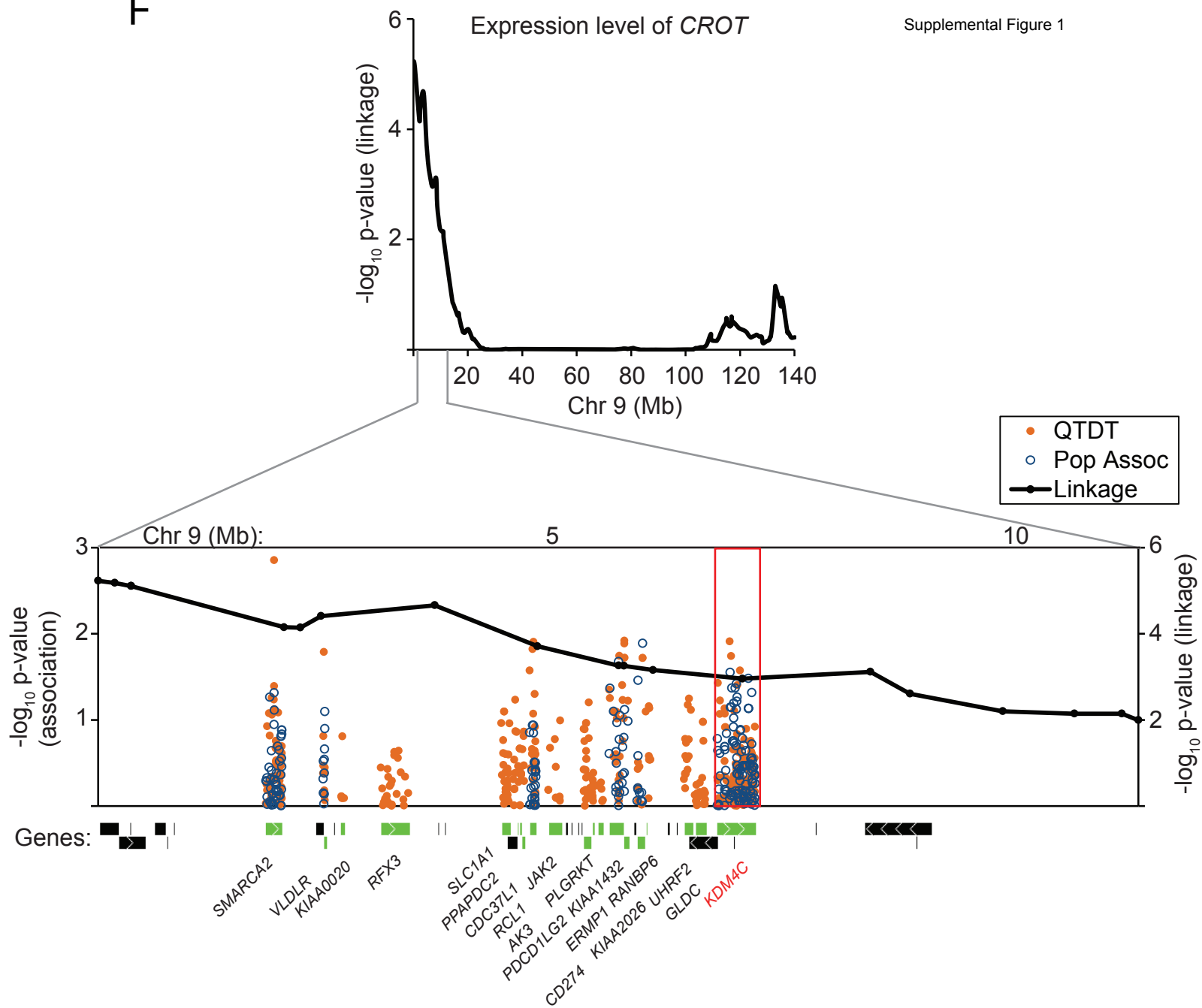
Supplemental Figure 1



F

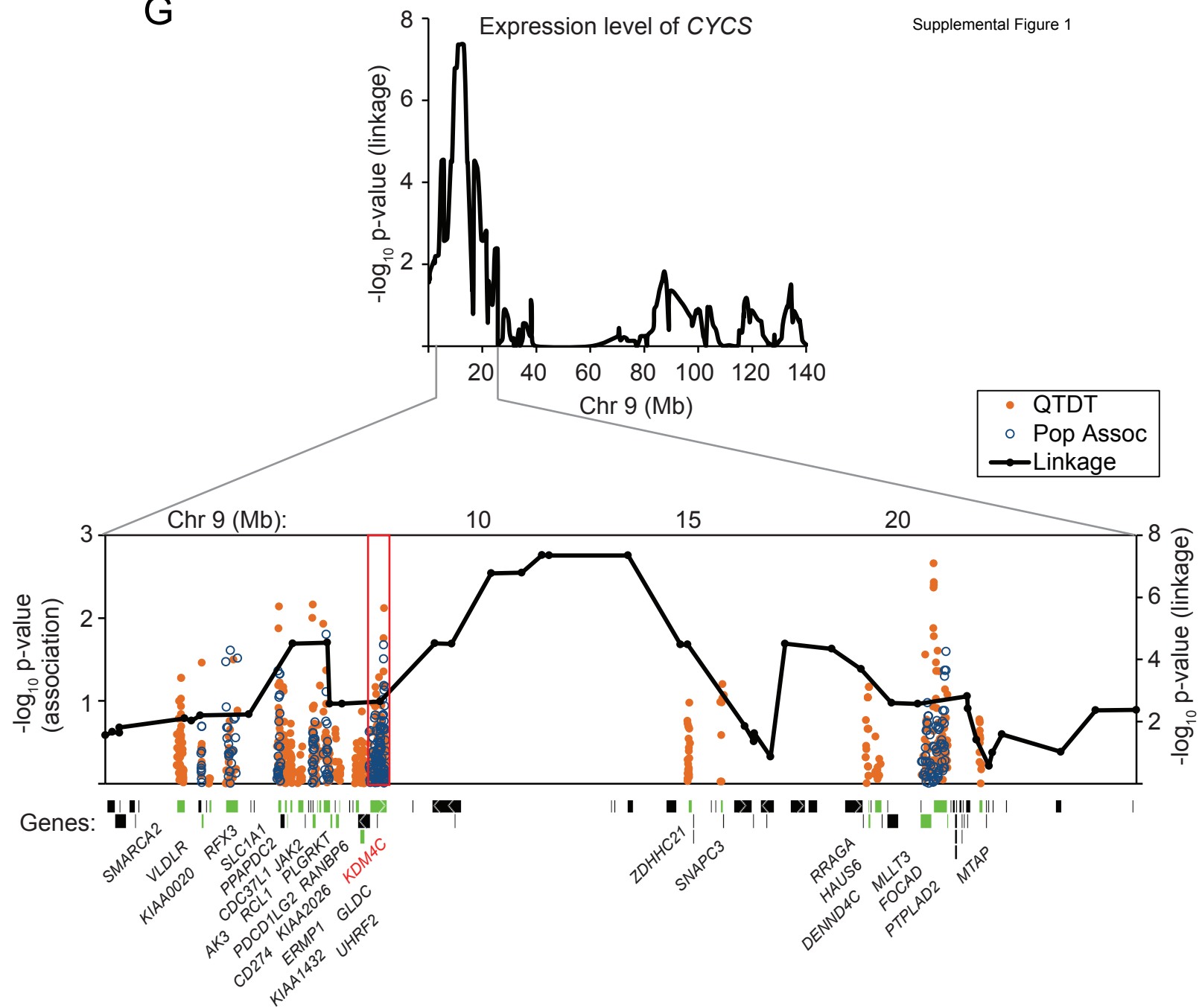
Expression level of *CROT*

Supplemental Figure 1



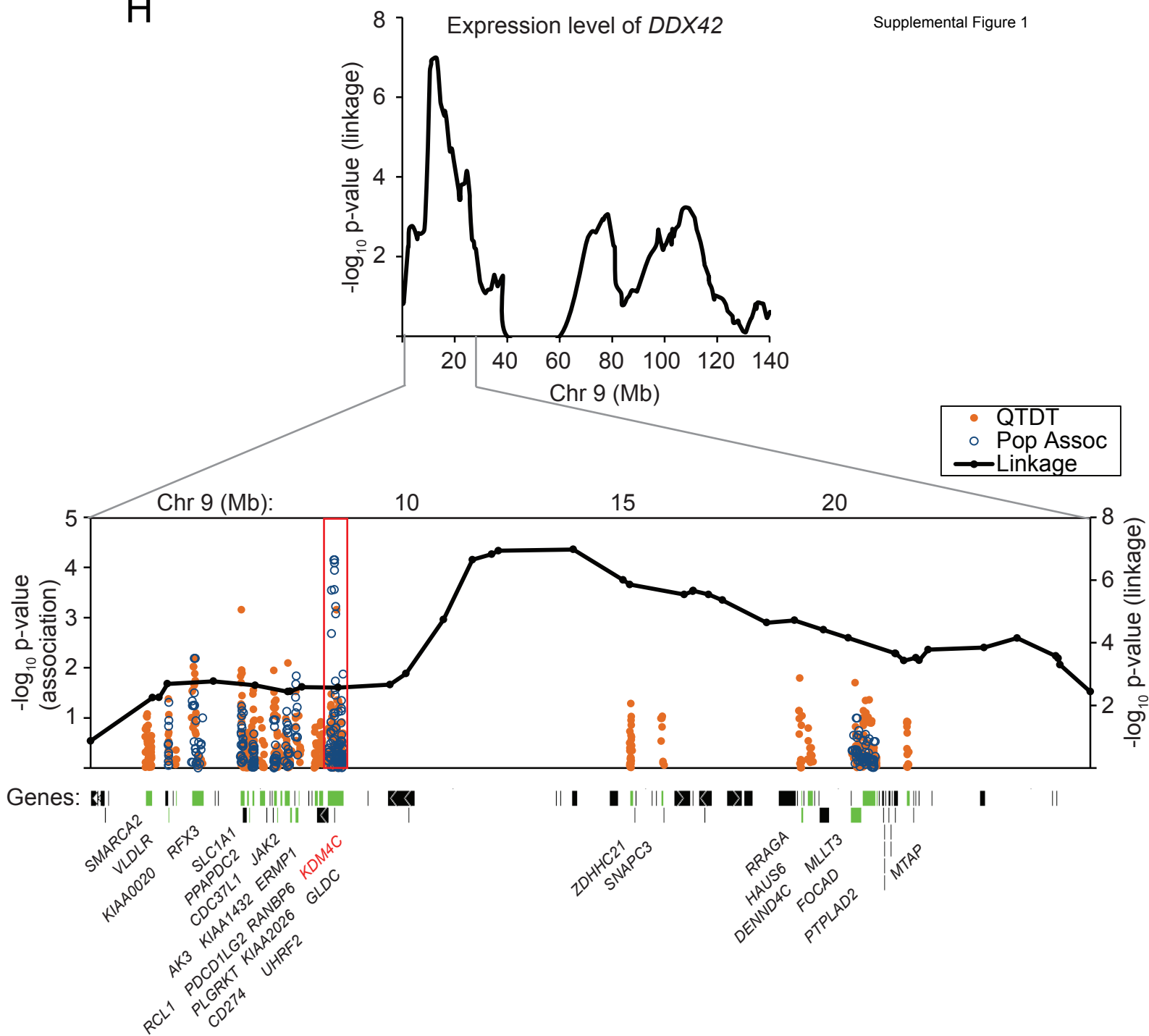
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Supplemental Figure 1



H

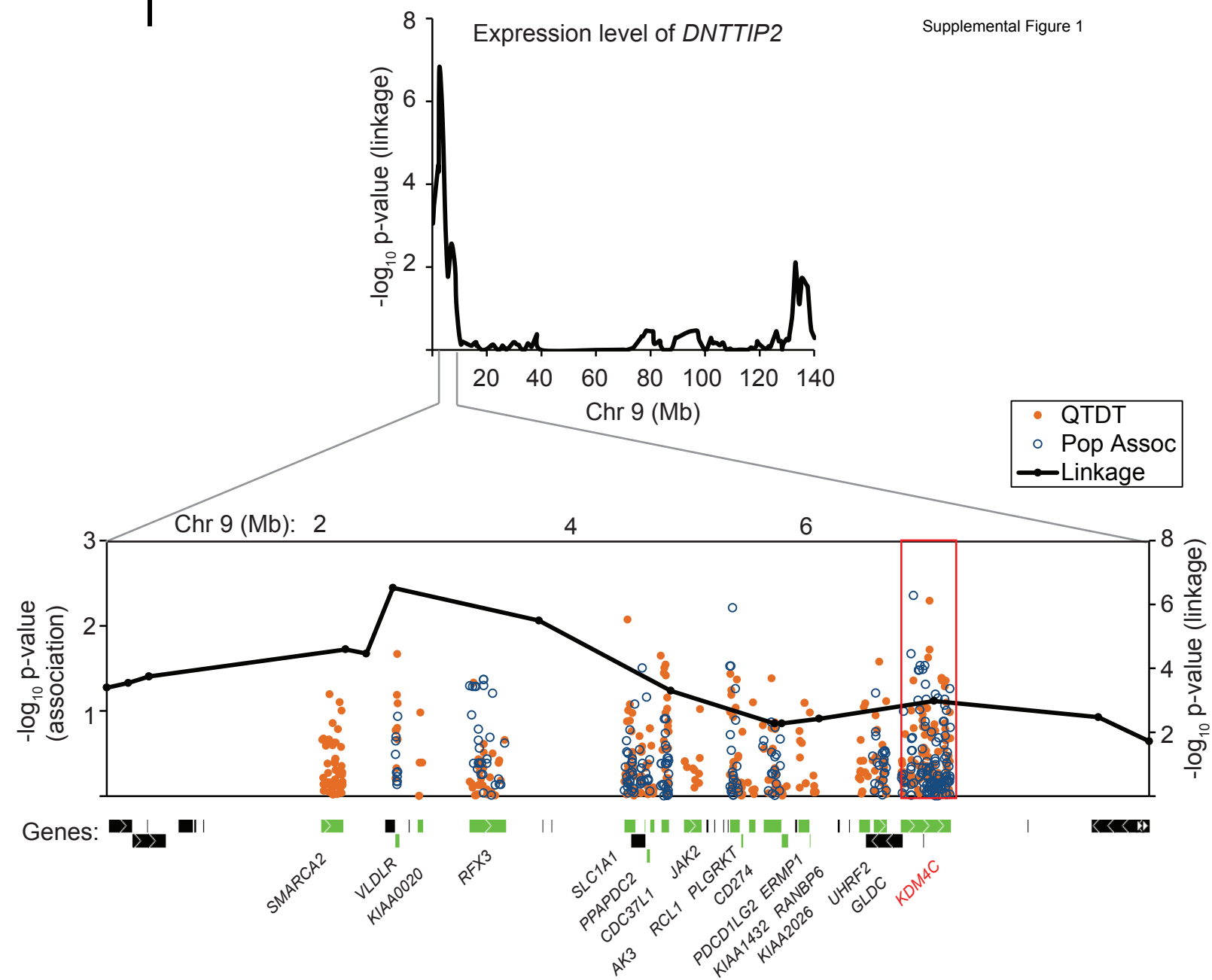
Supplemental Figure 1



I

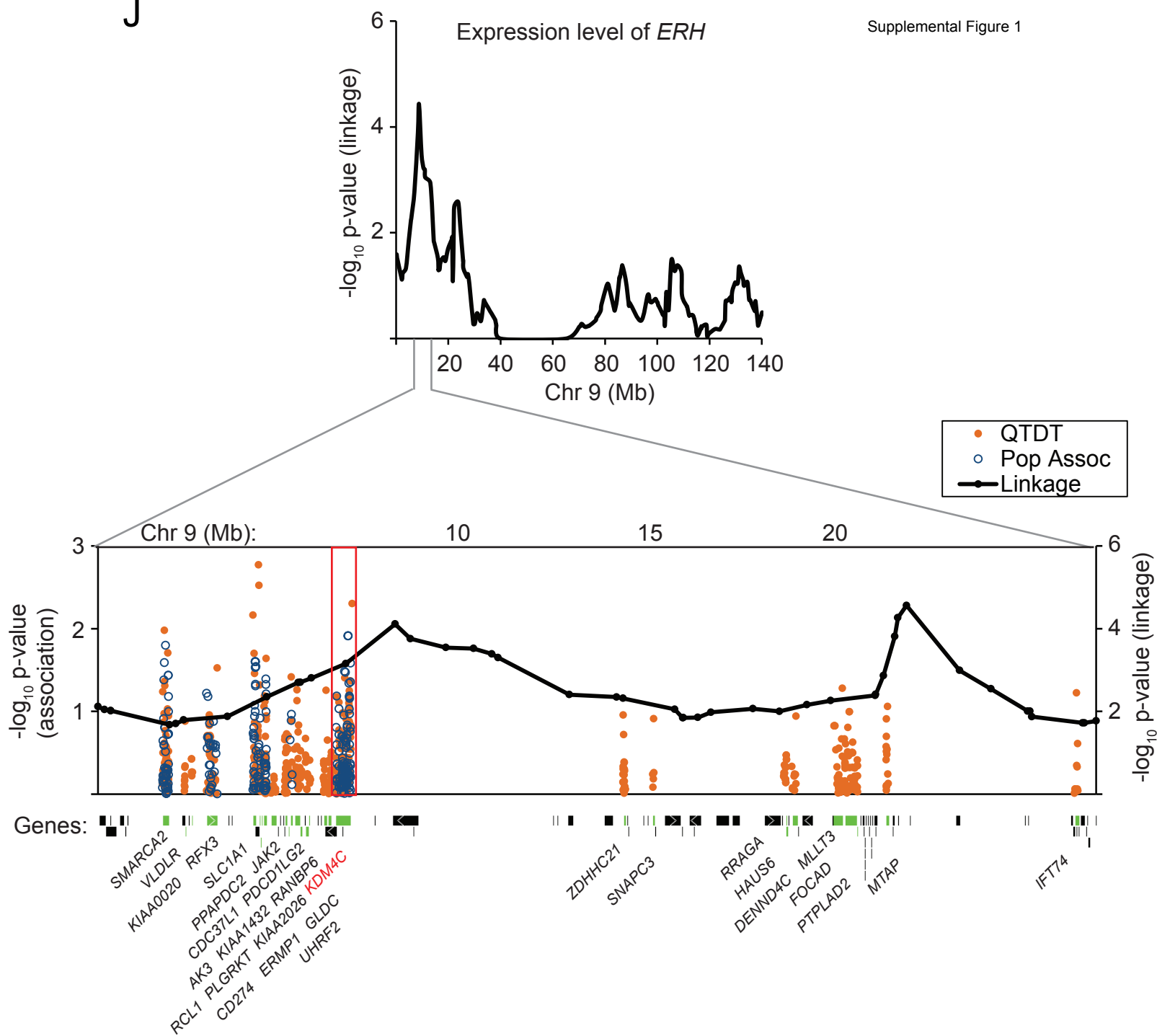
Expression level of *DNTTIP2*

Supplemental Figure 1



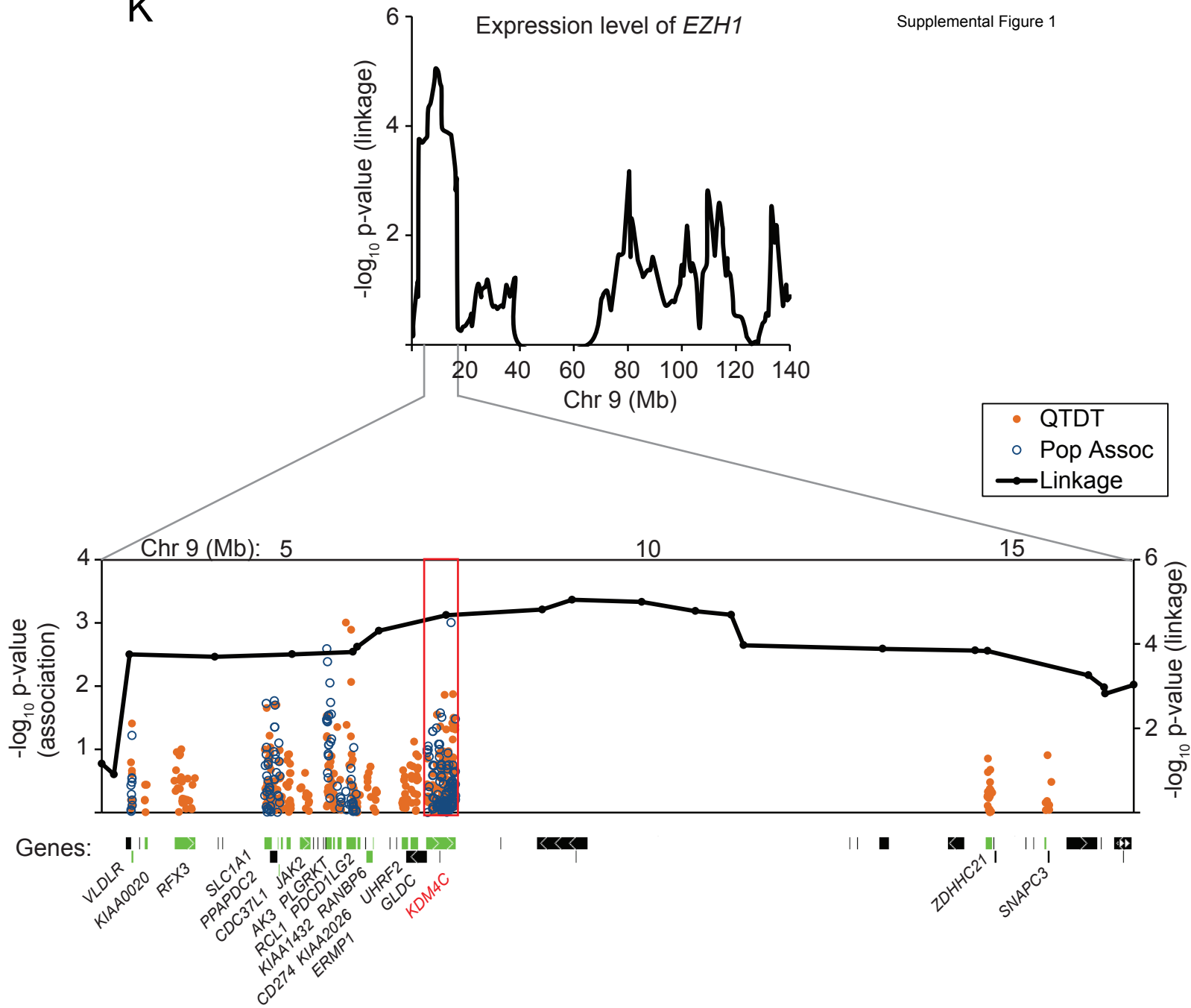
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Supplemental Figure 1

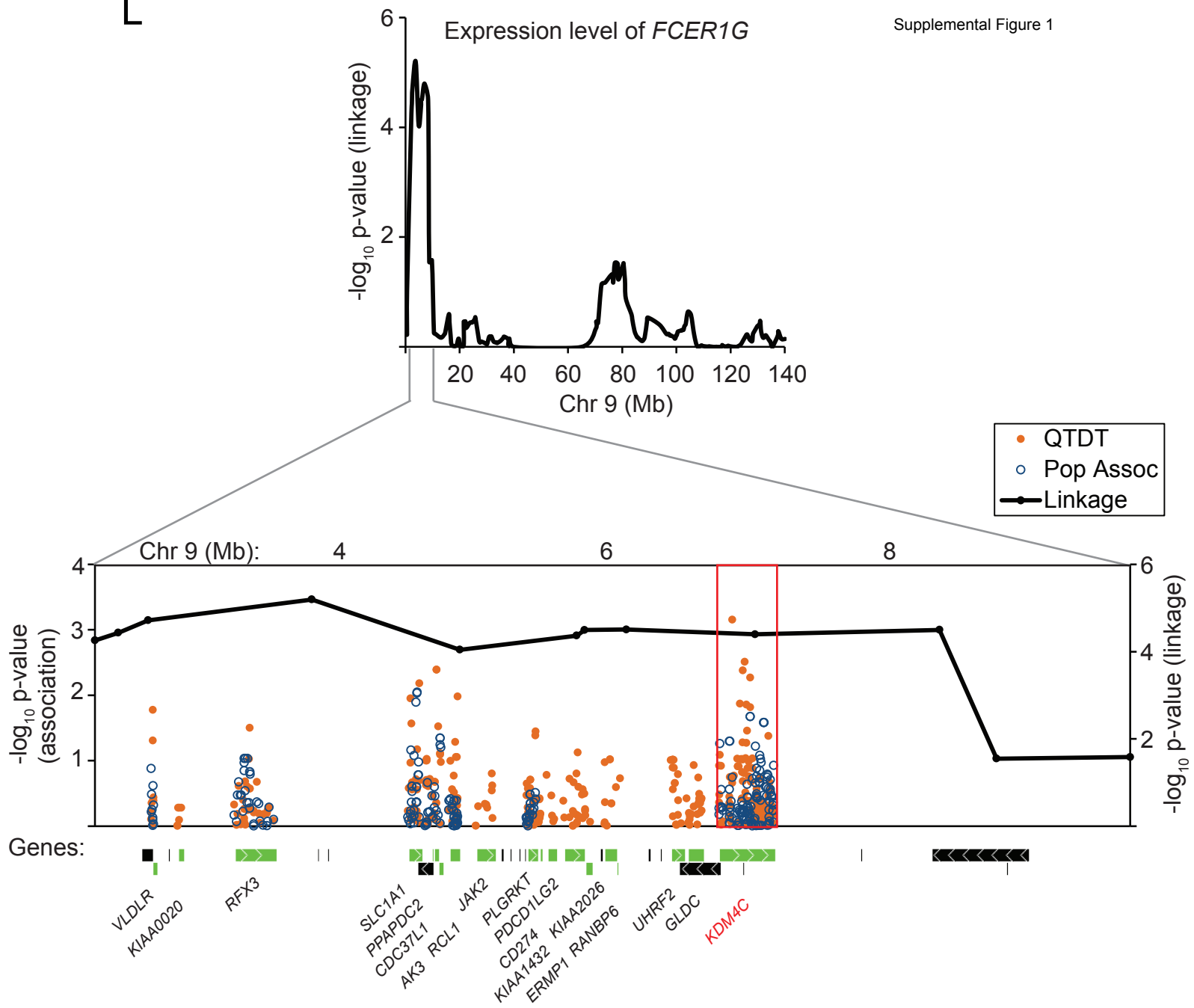


K

Supplemental Figure 1



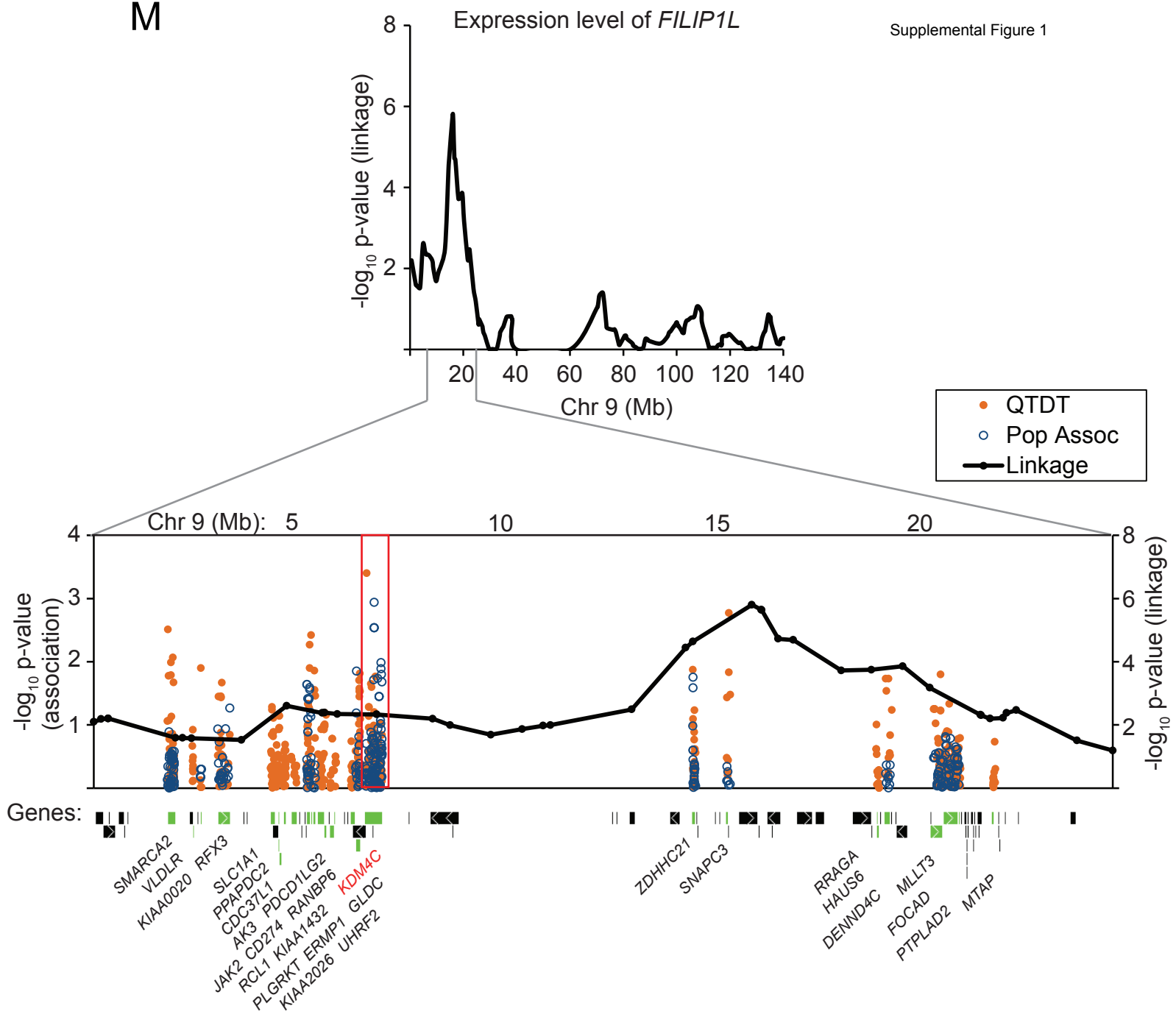
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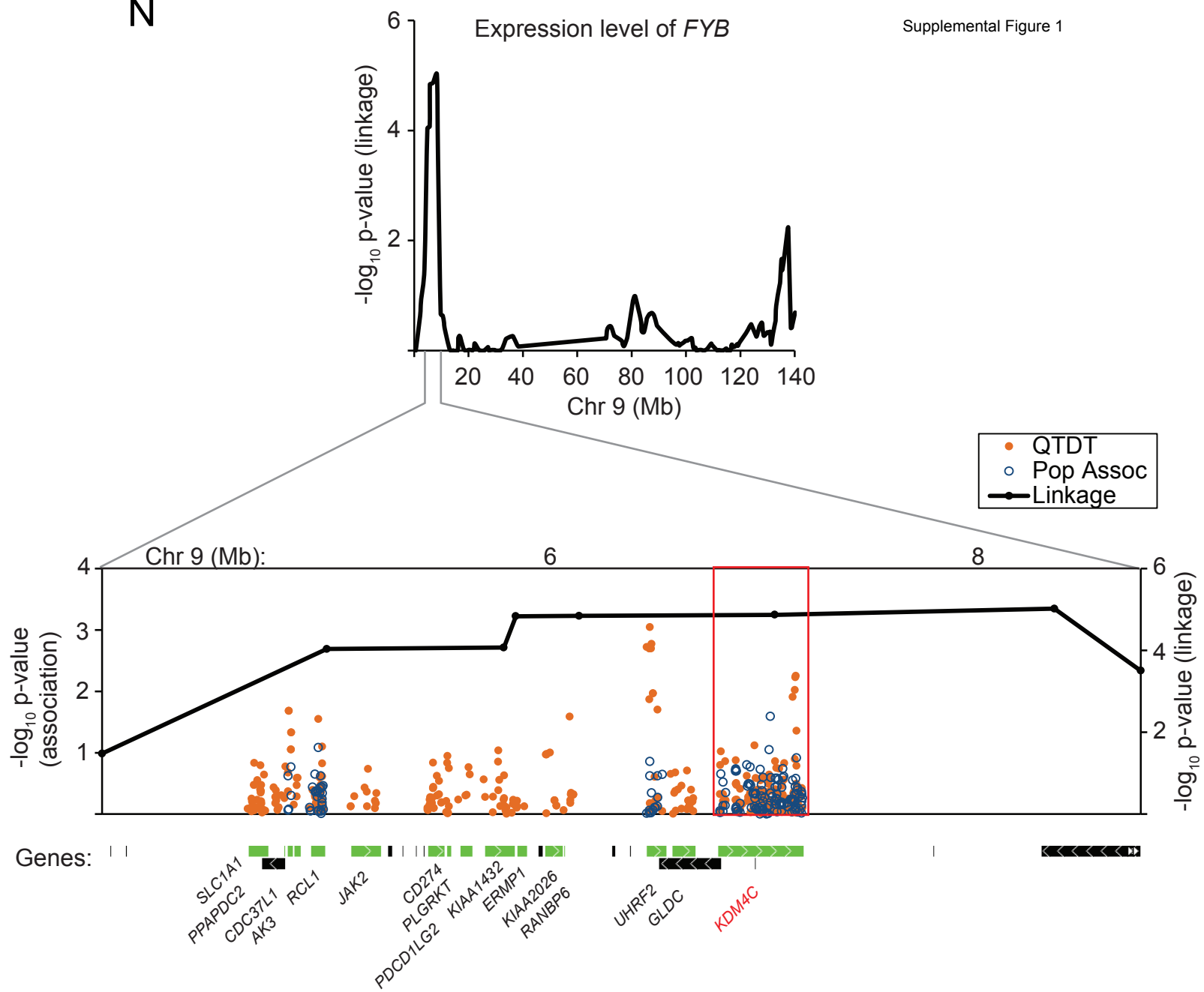
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Expression level of *FILIP1L*

Supplemental Figure 1



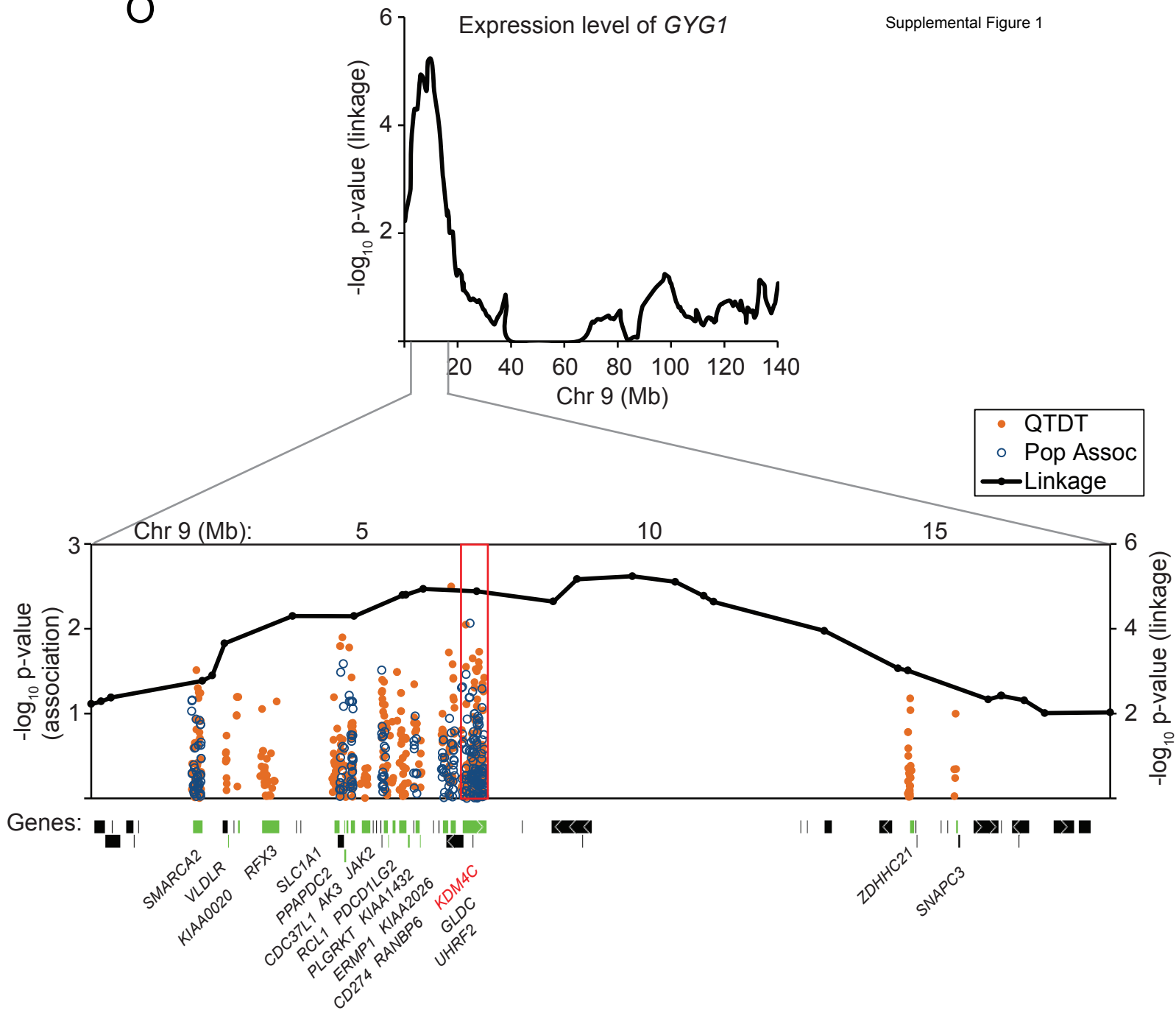
N



O

Expression level of *GYG1*

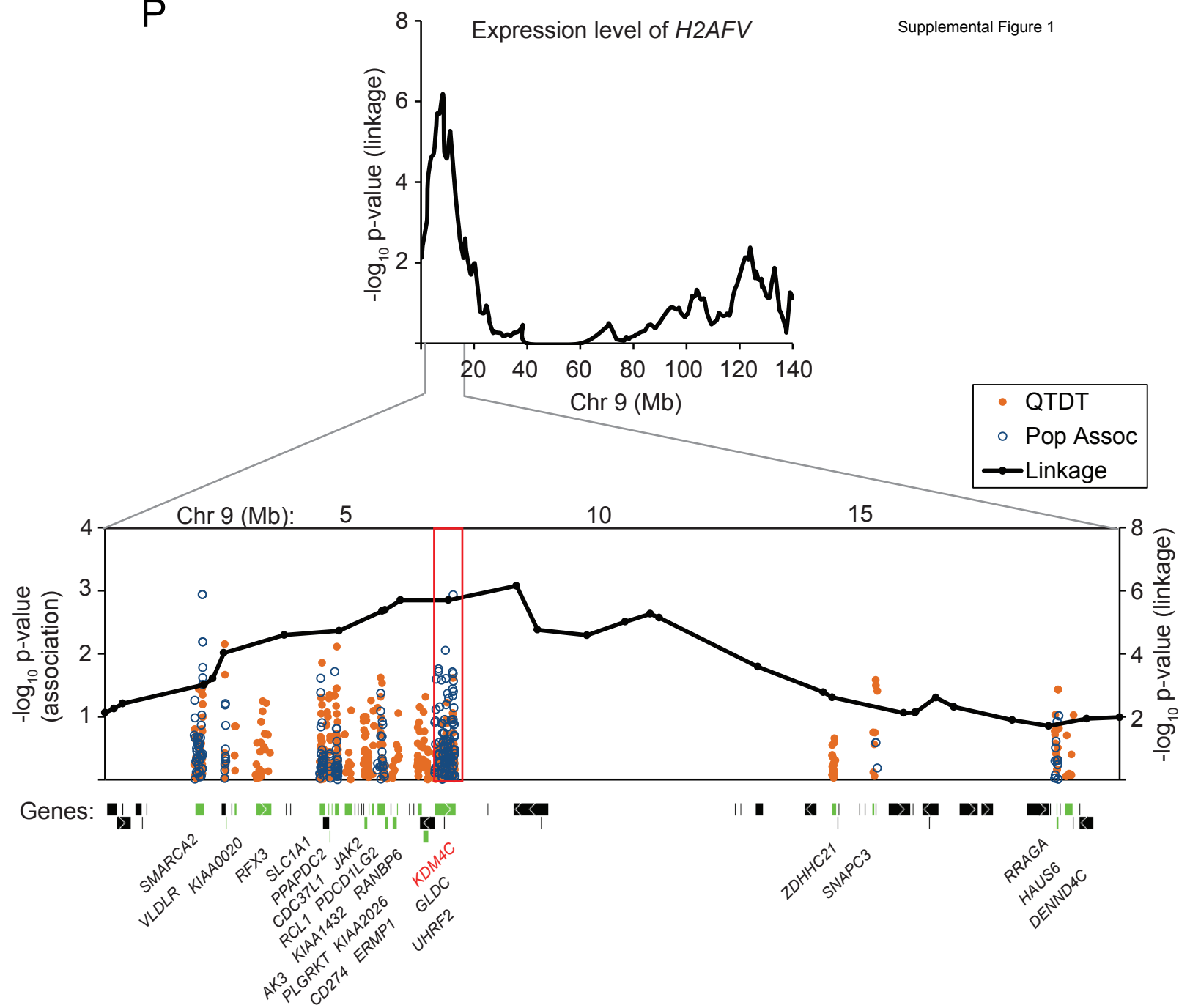
Supplemental Figure 1



P

Expression level of *H2AFV*

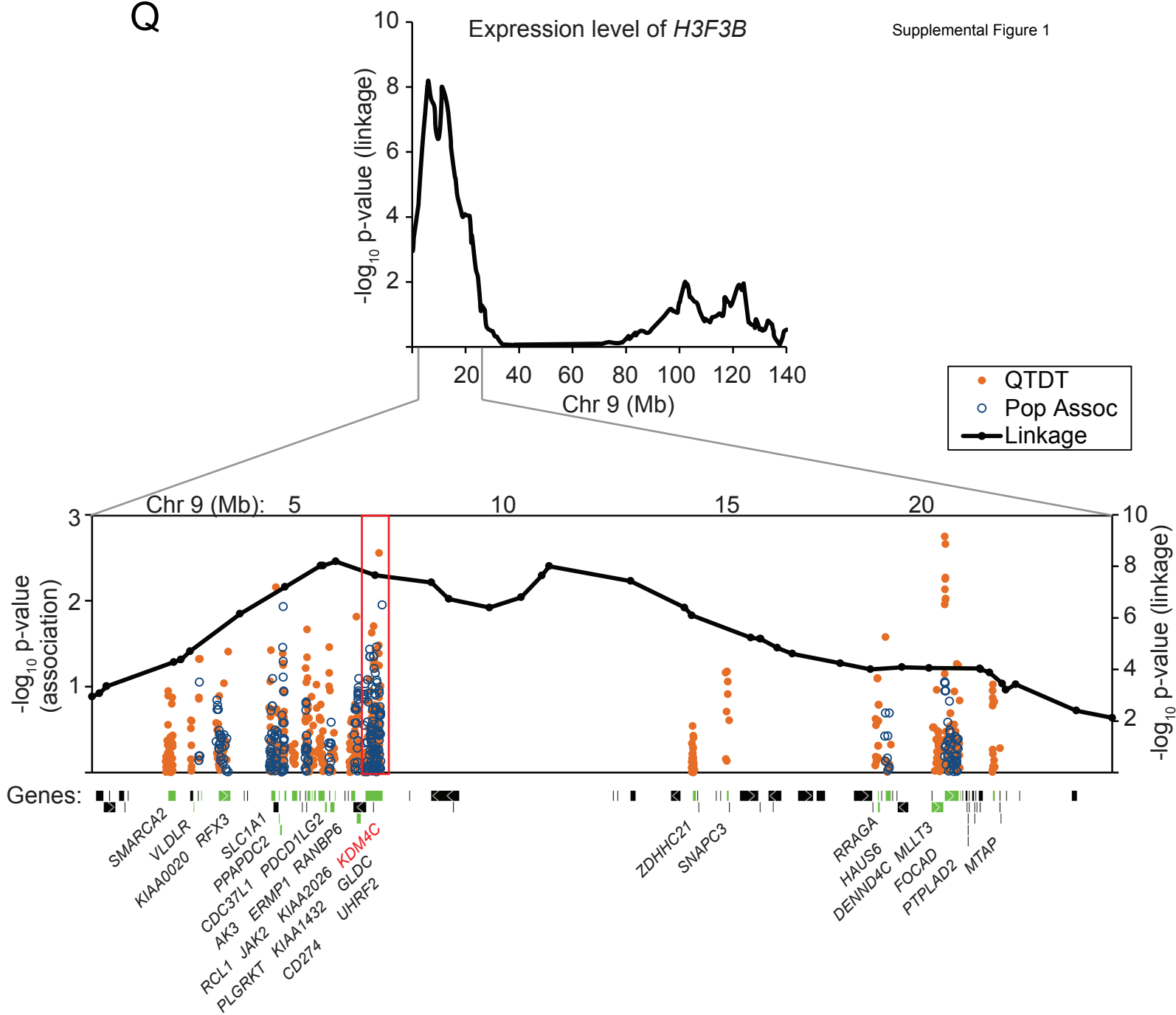
Supplemental Figure 1



Q

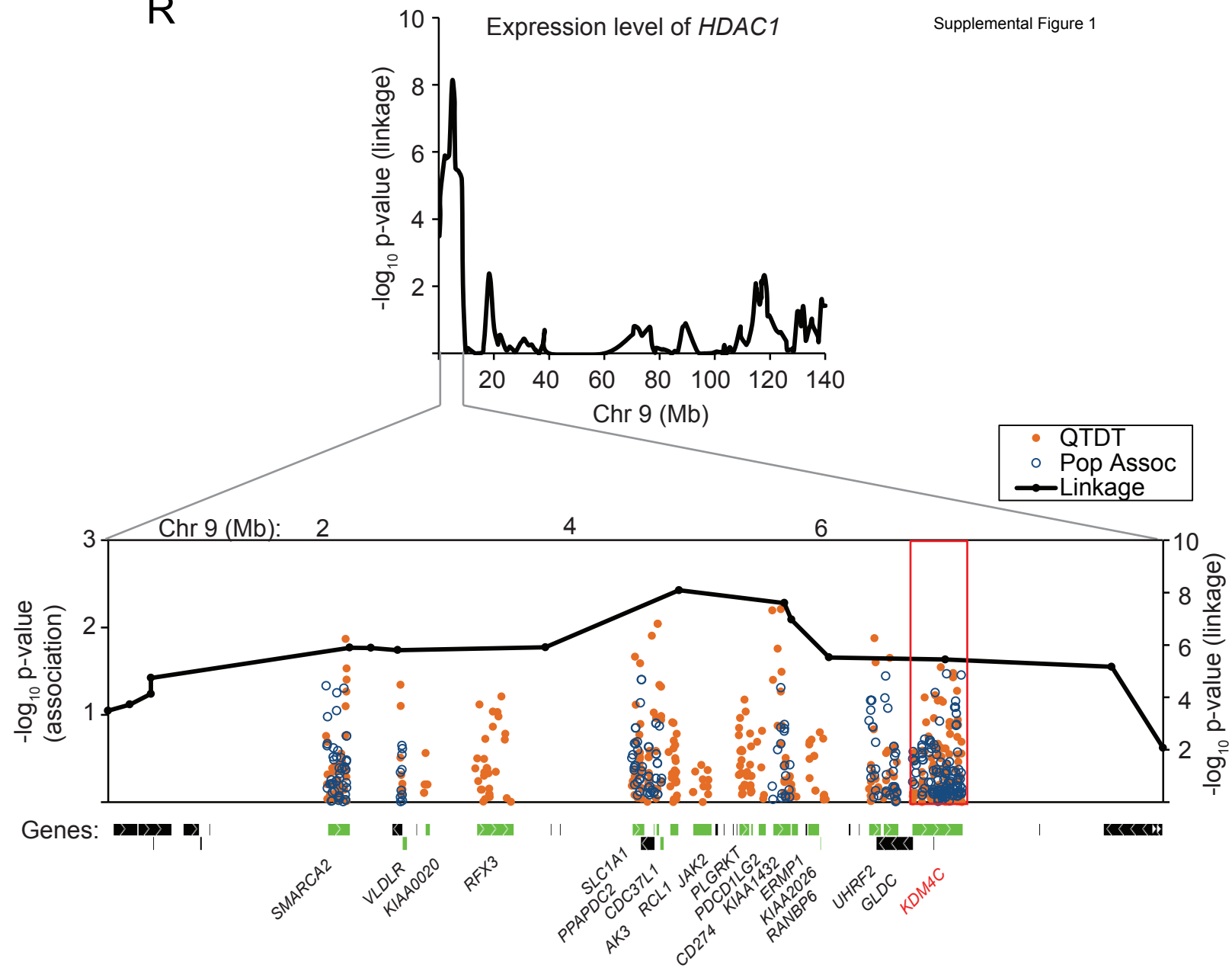
Expression level of *H3F3B*

Supplemental Figure 1



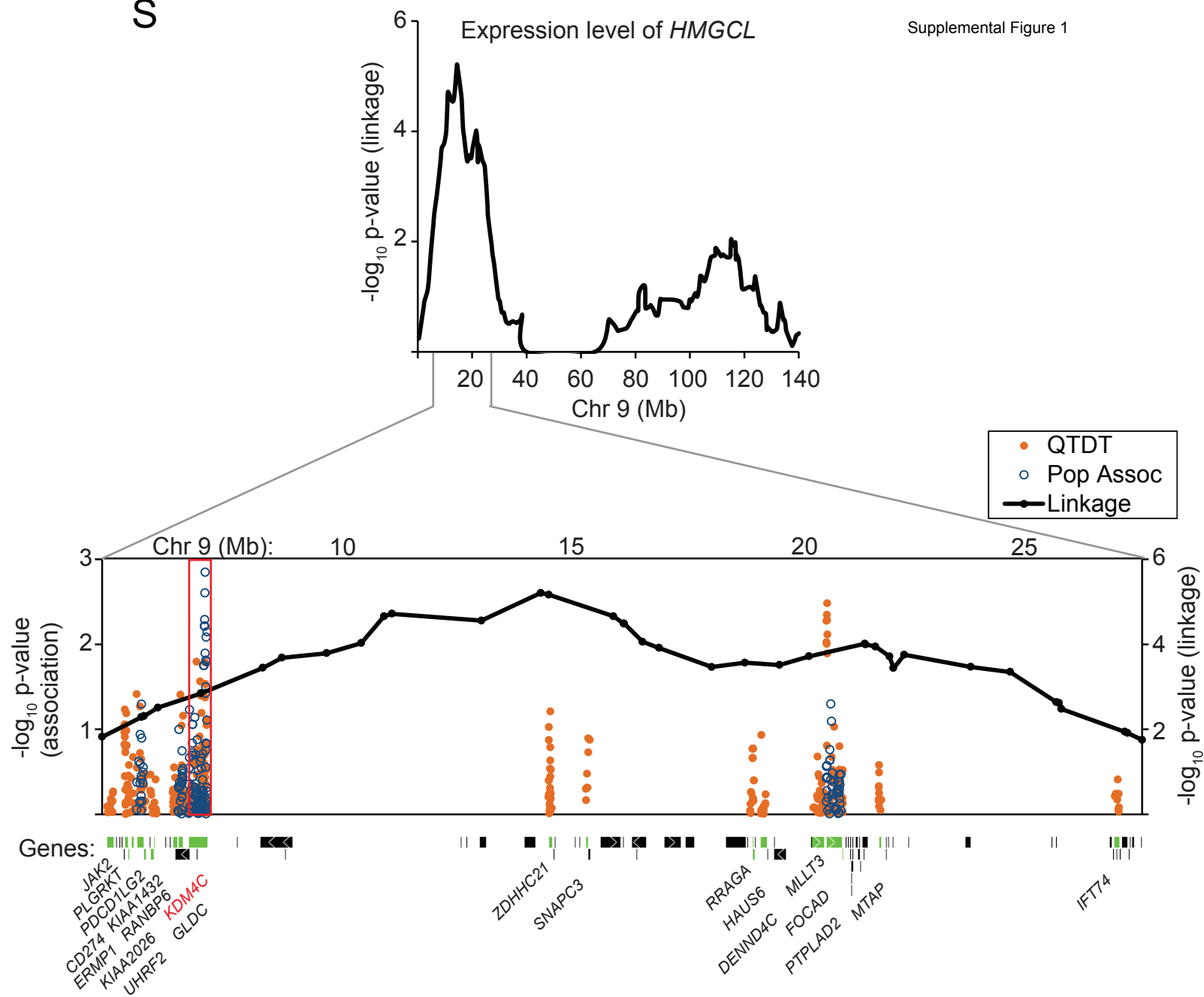
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Supplemental Figure 1

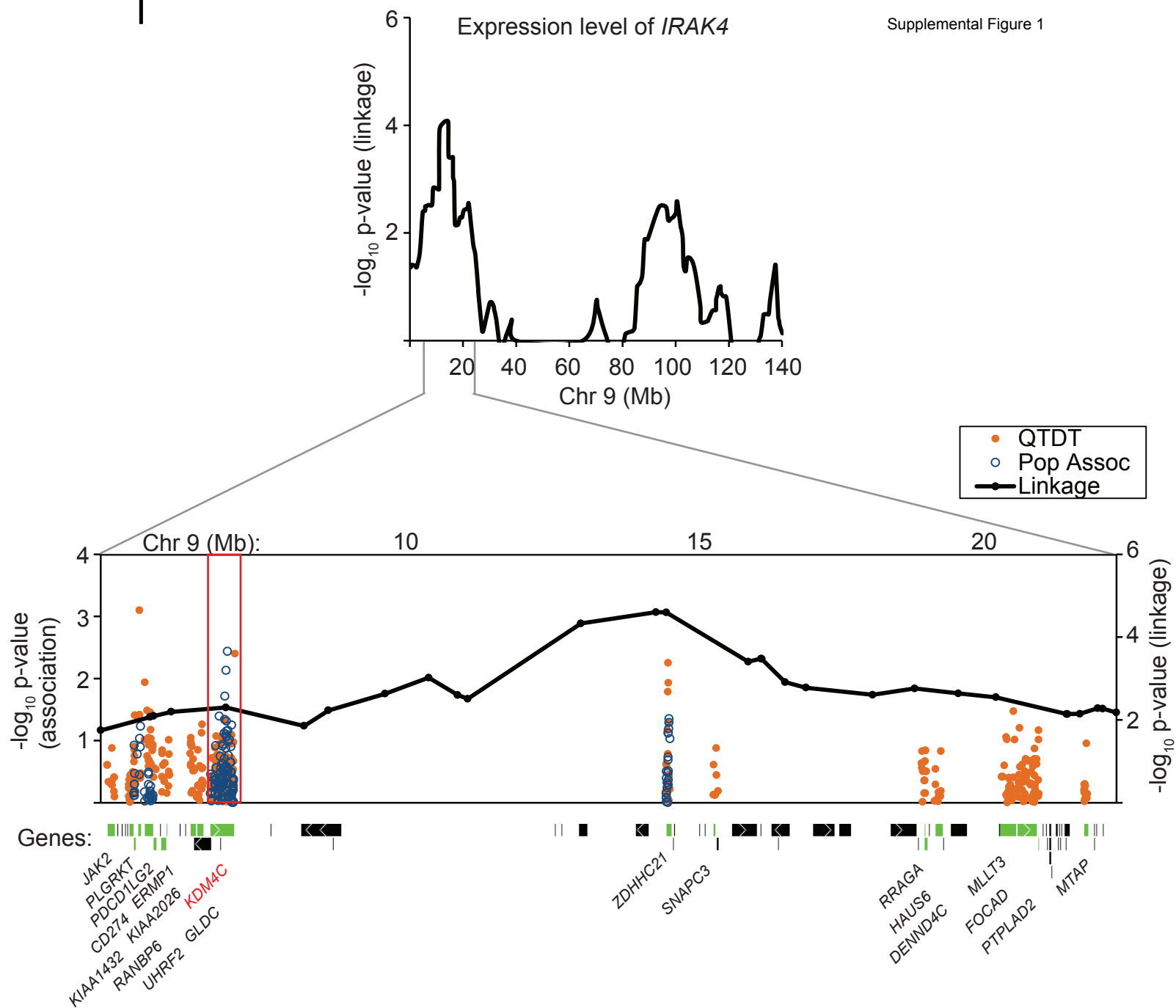


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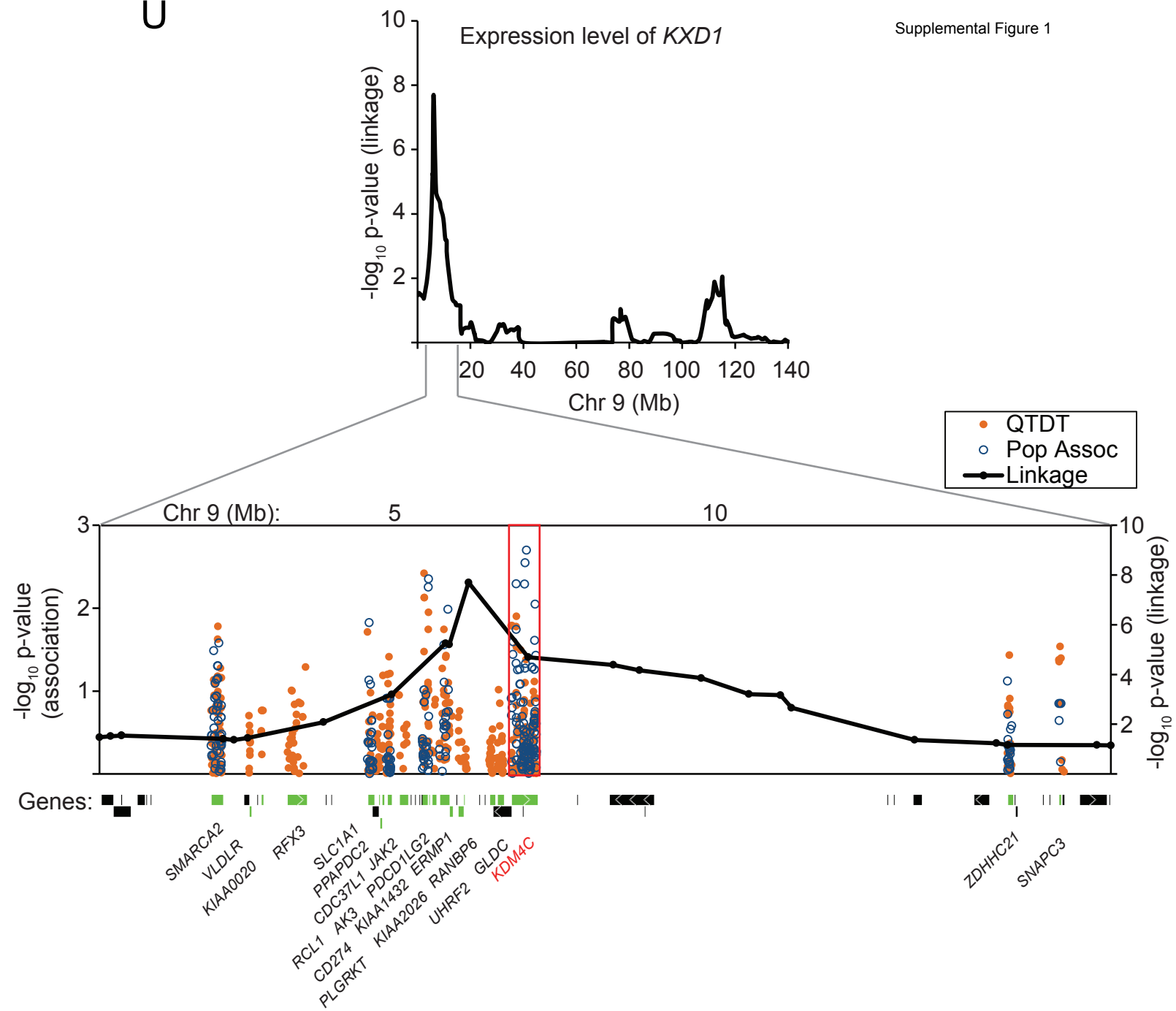
Supplemental Figure 1



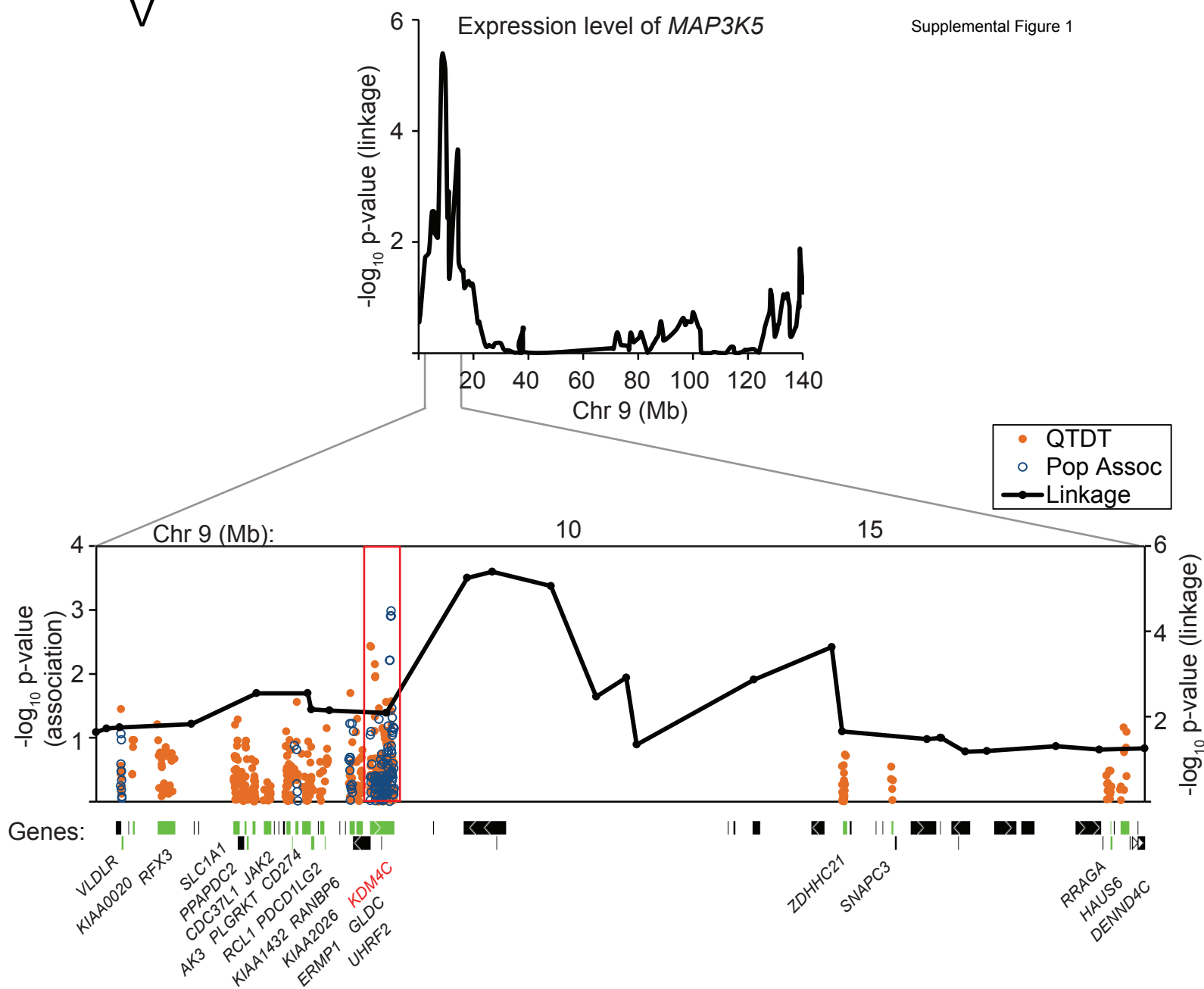
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U

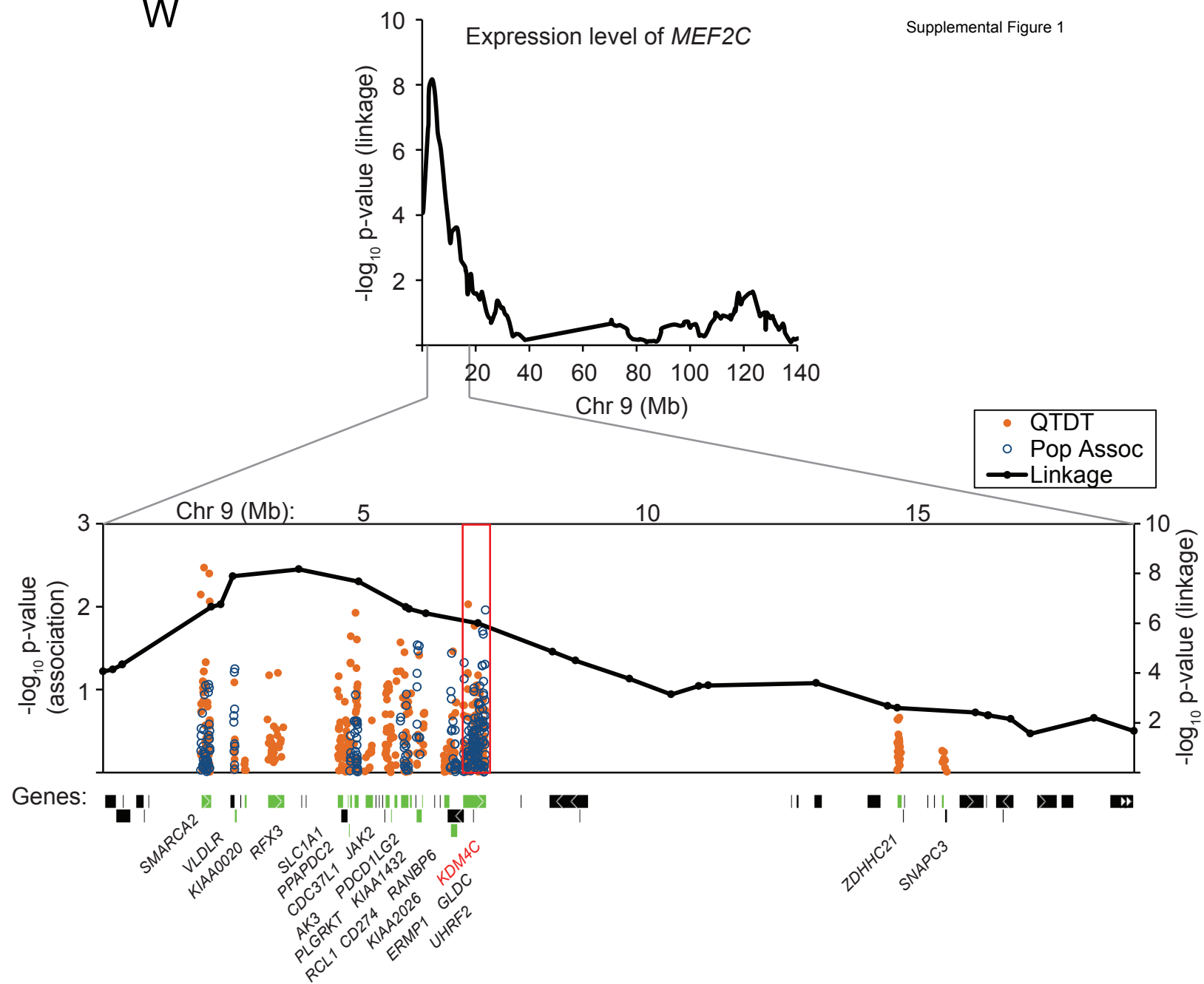


V



W

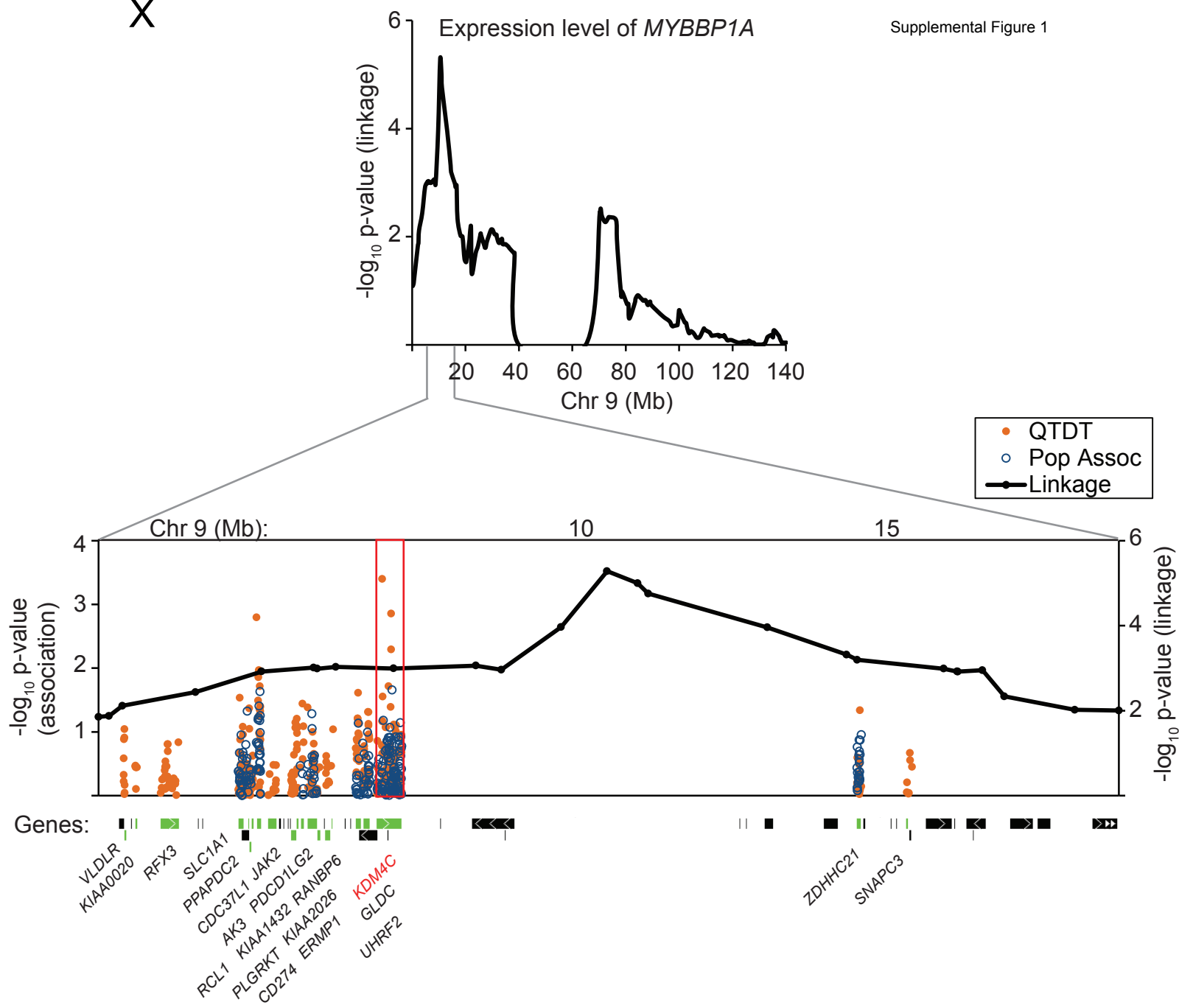
Supplemental Figure 1



X

Expression level of *MYBBP1A*

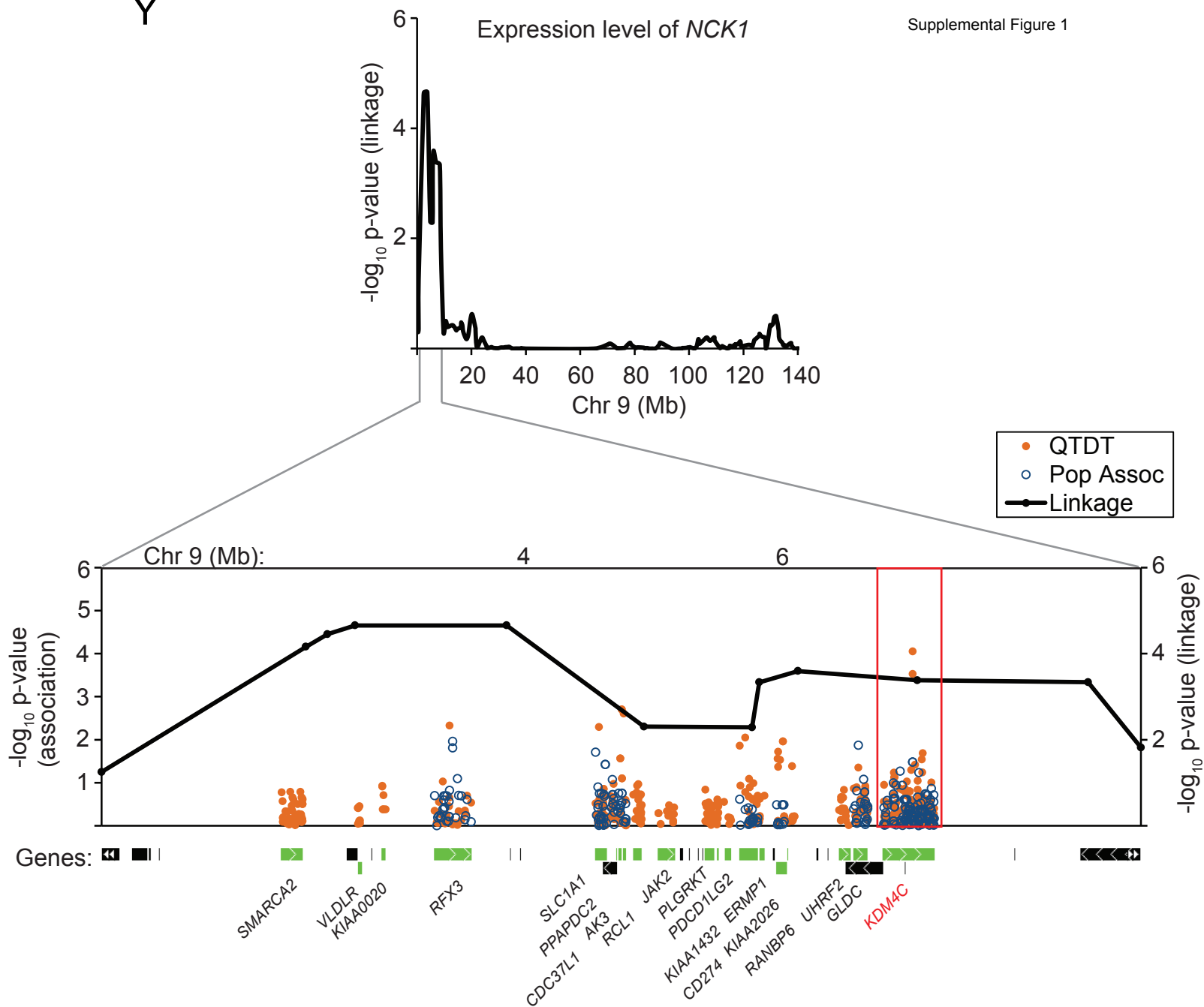
Supplemental Figure 1



Y

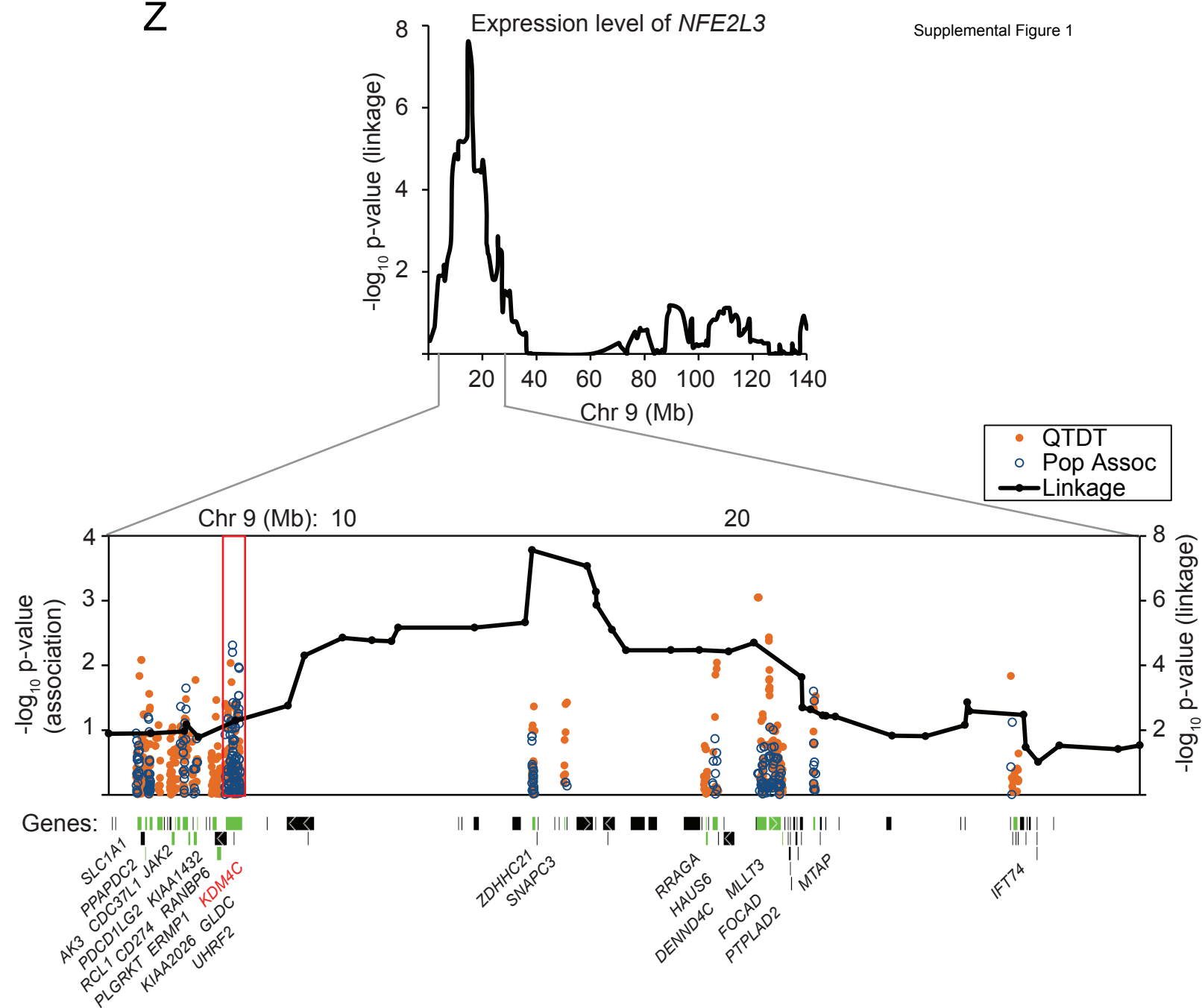
Expression level of *NCK1*

Supplemental Figure 1



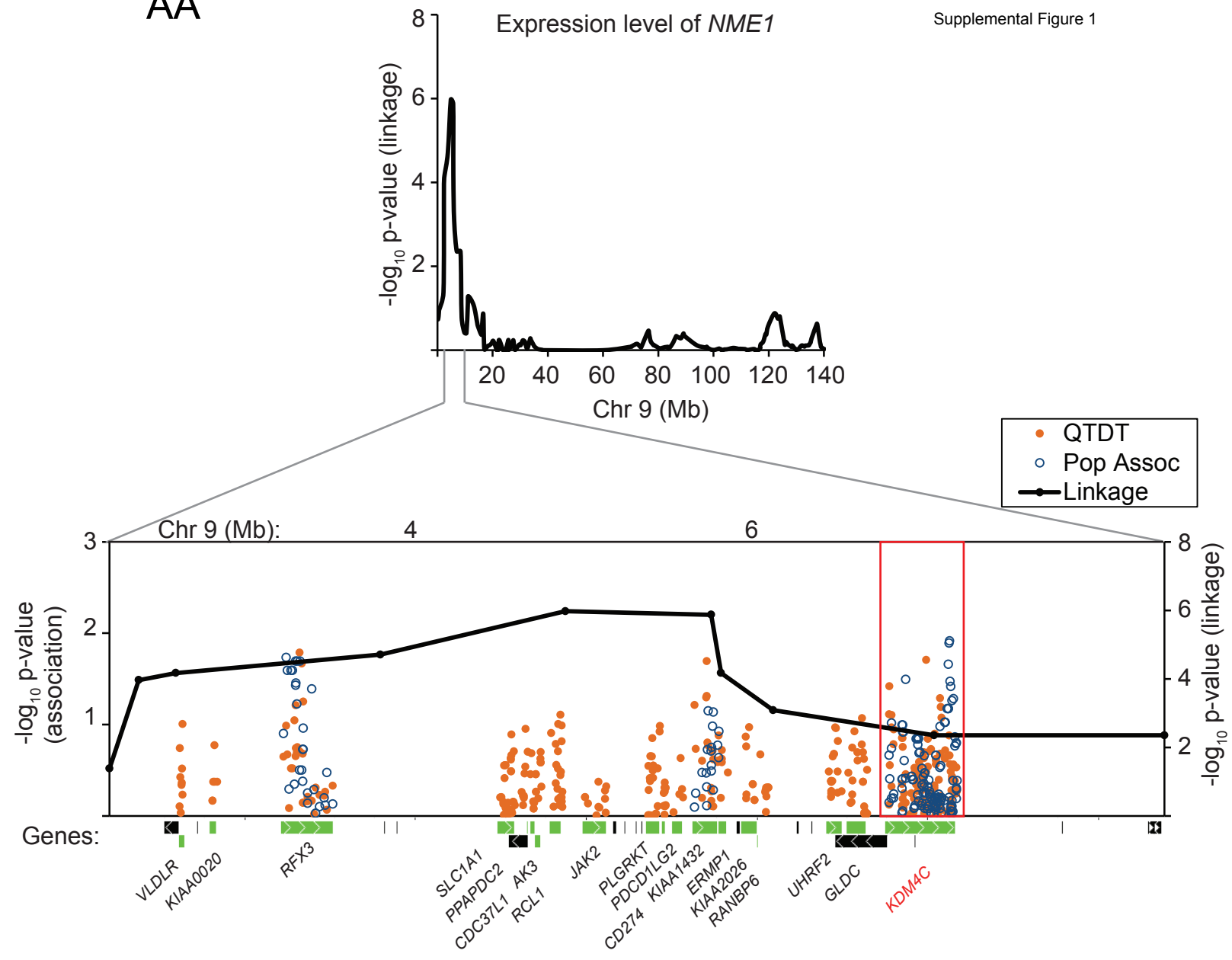
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Supplemental Figure 1



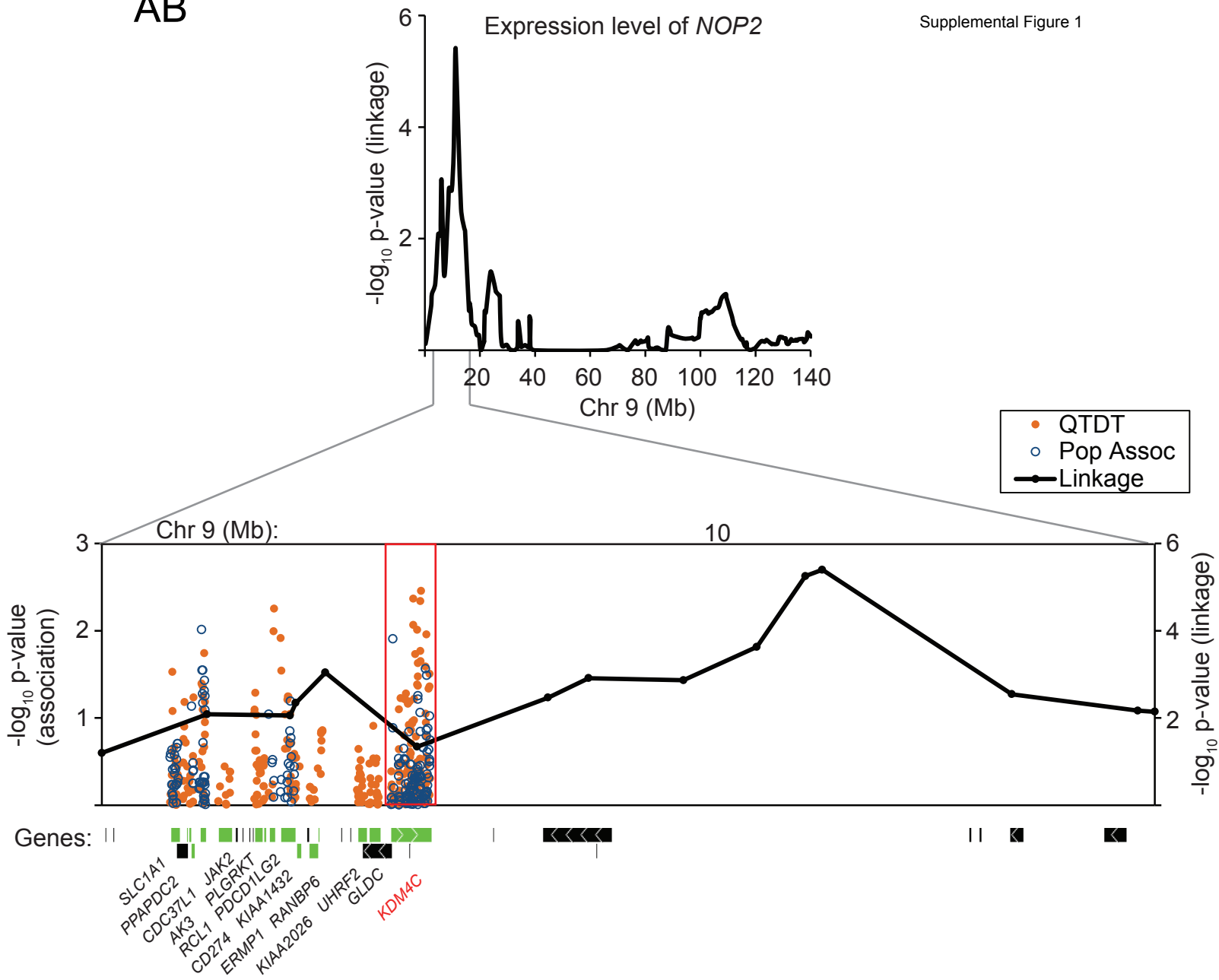
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Supplemental Figure 1



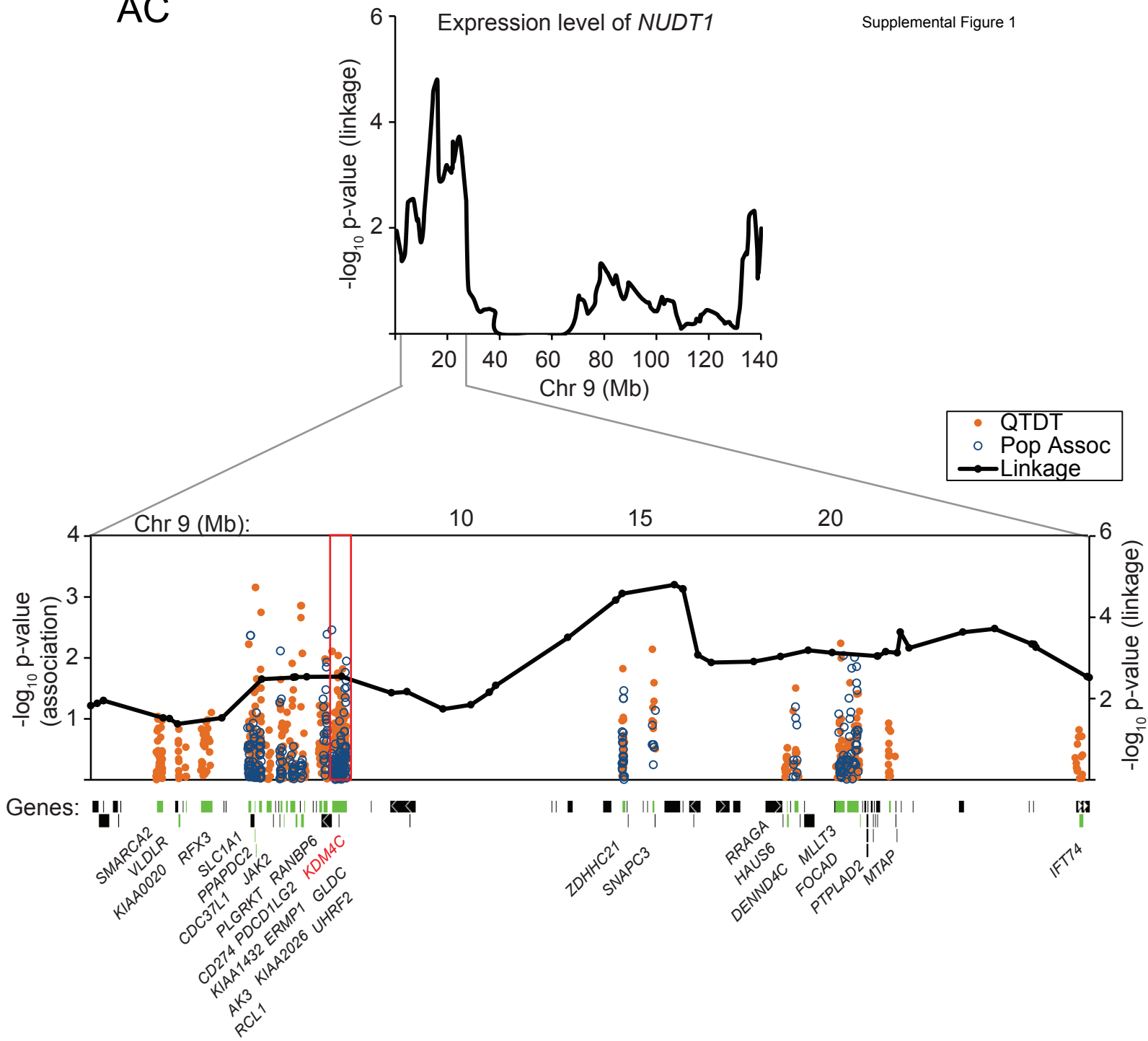
AB

Supplemental Figure 1



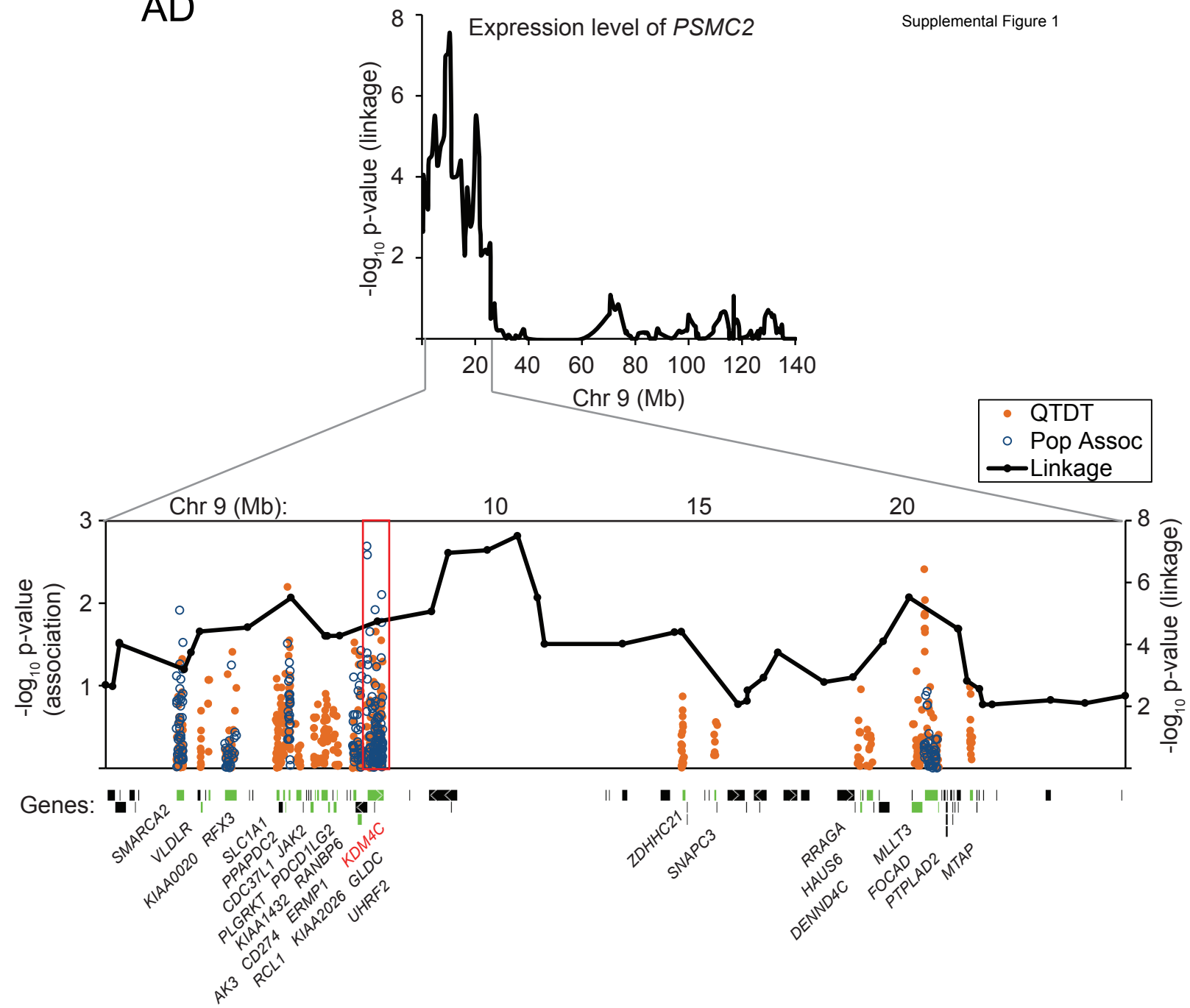
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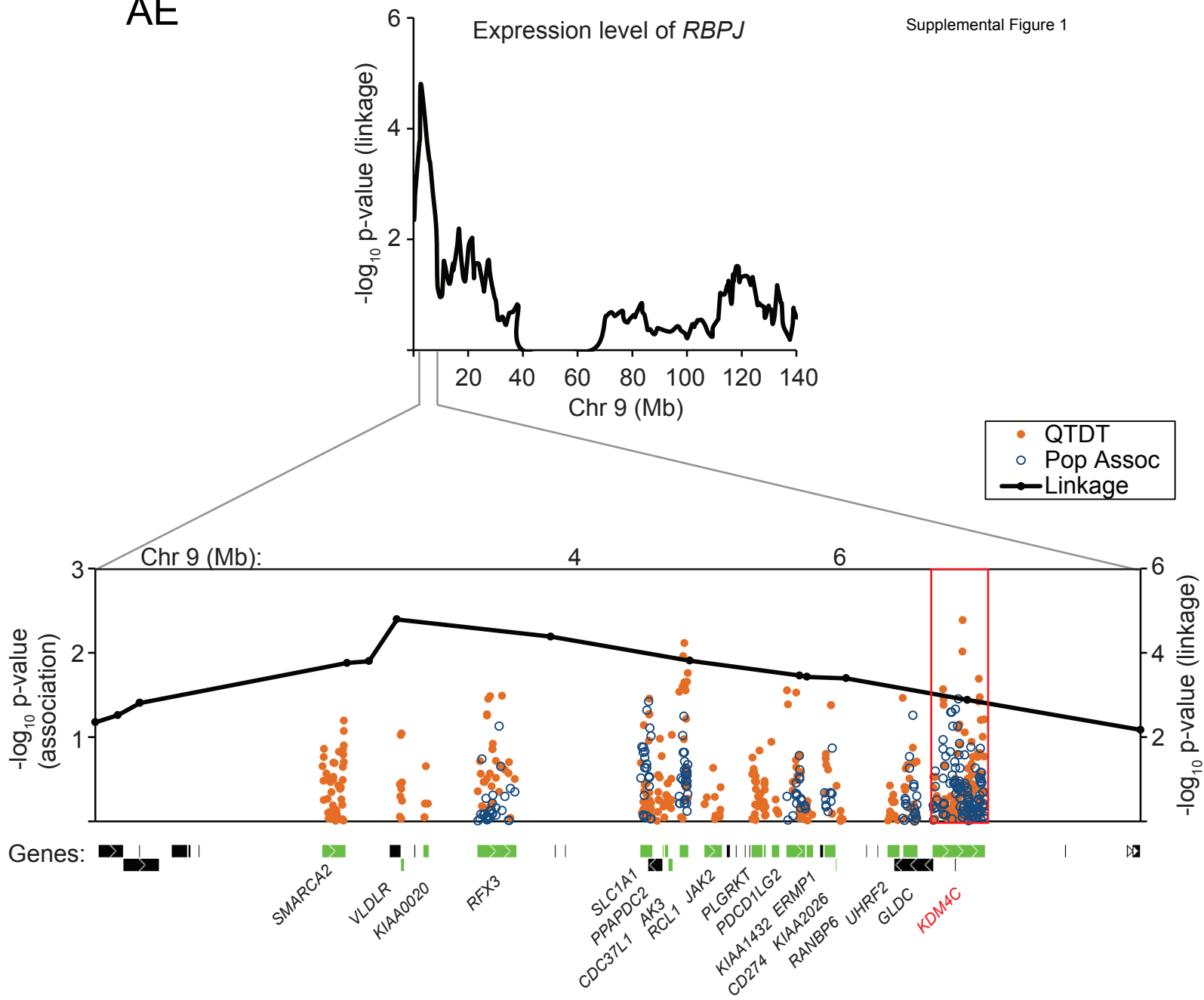
Supplemental Figure 1



AD

Supplemental Figure 1

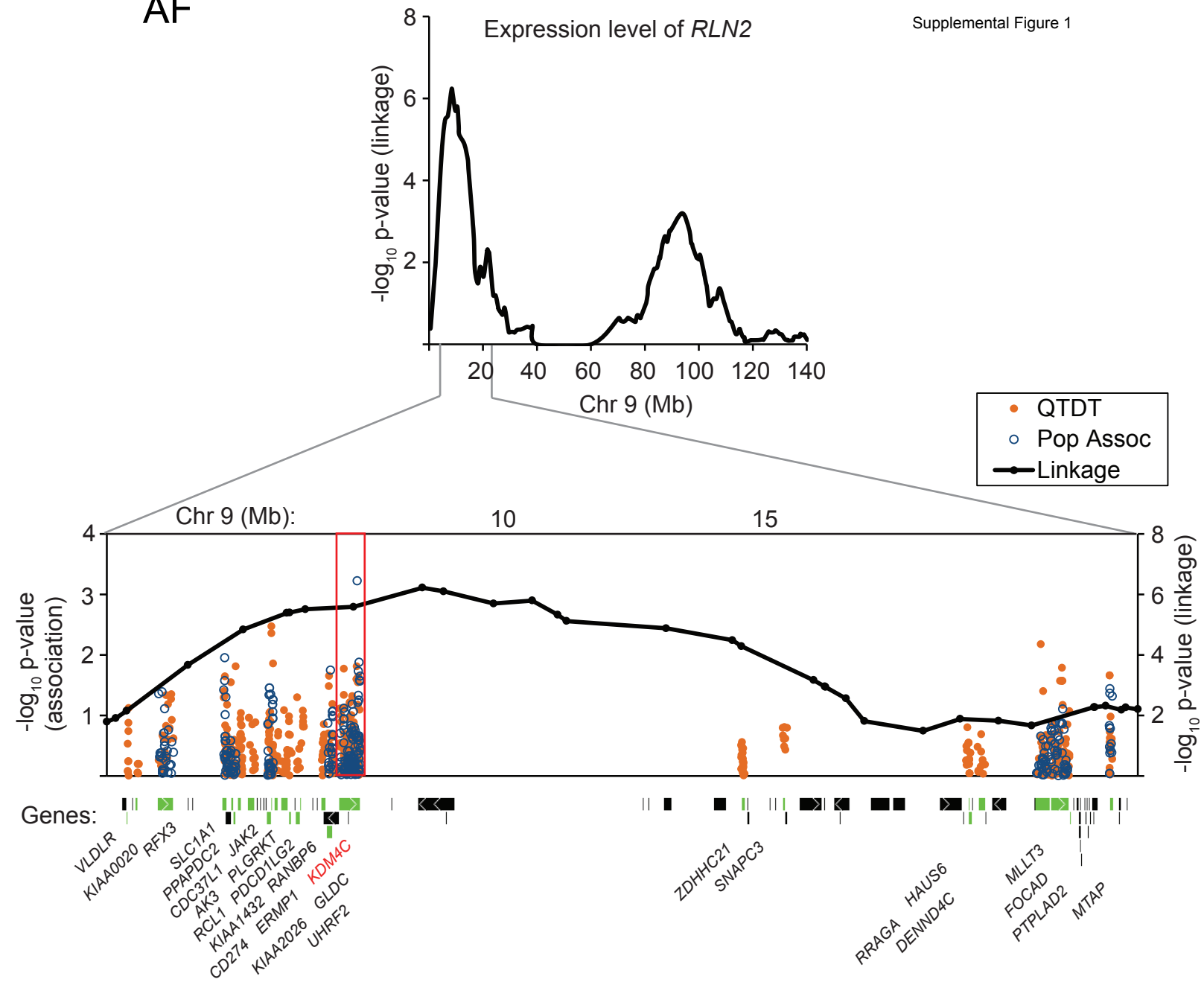


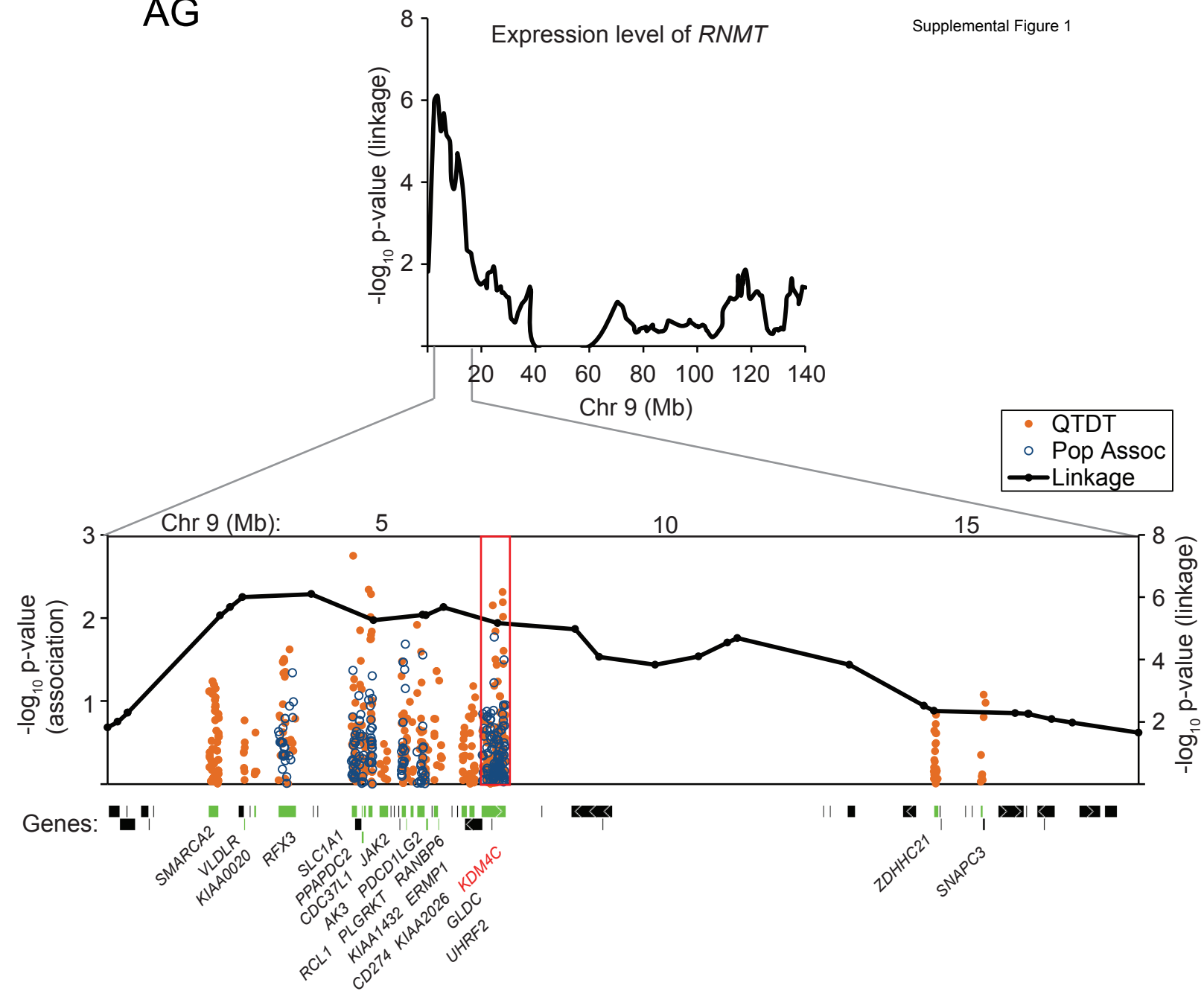


AF

Expression level of *RLN2*

Supplemental Figure 1

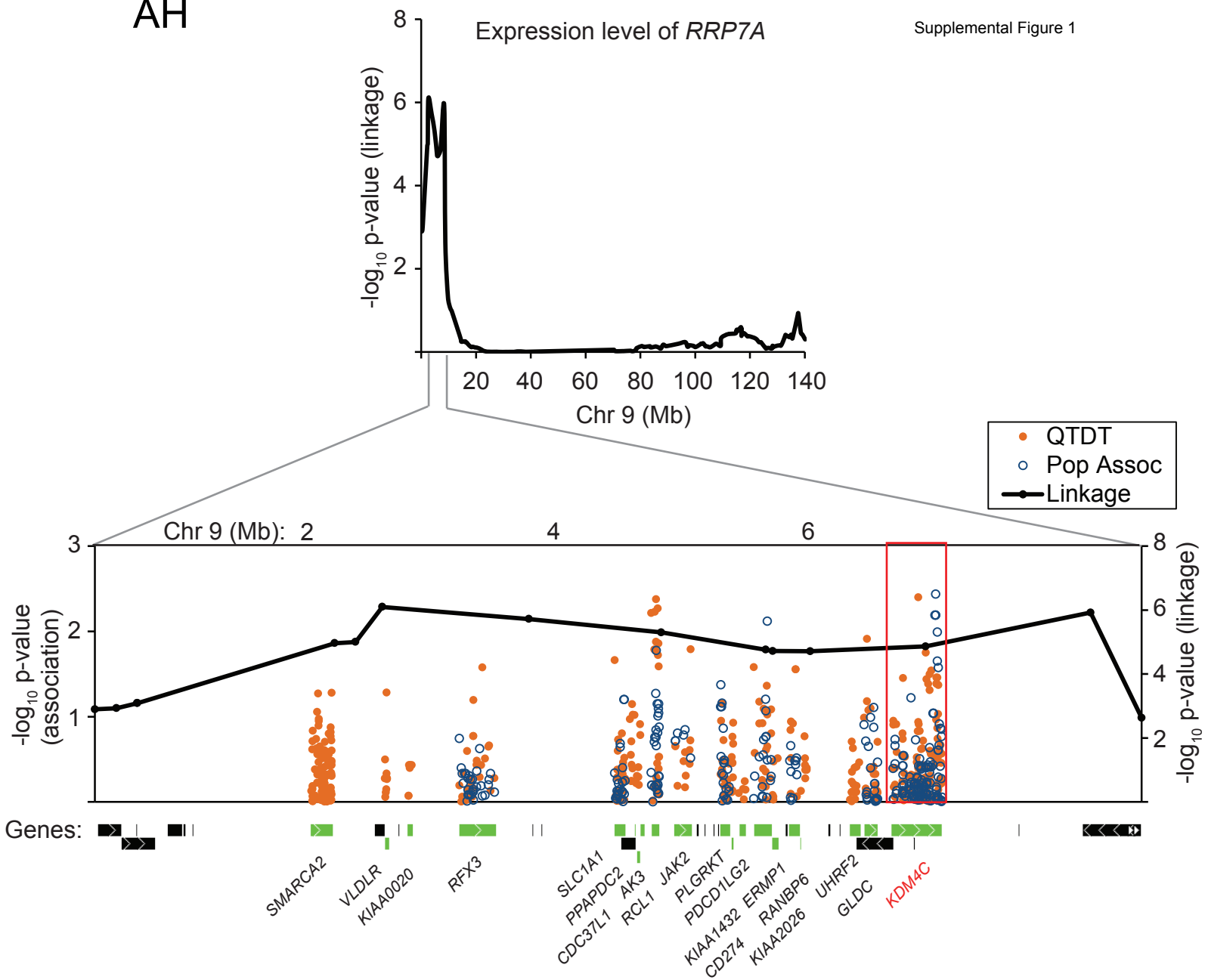




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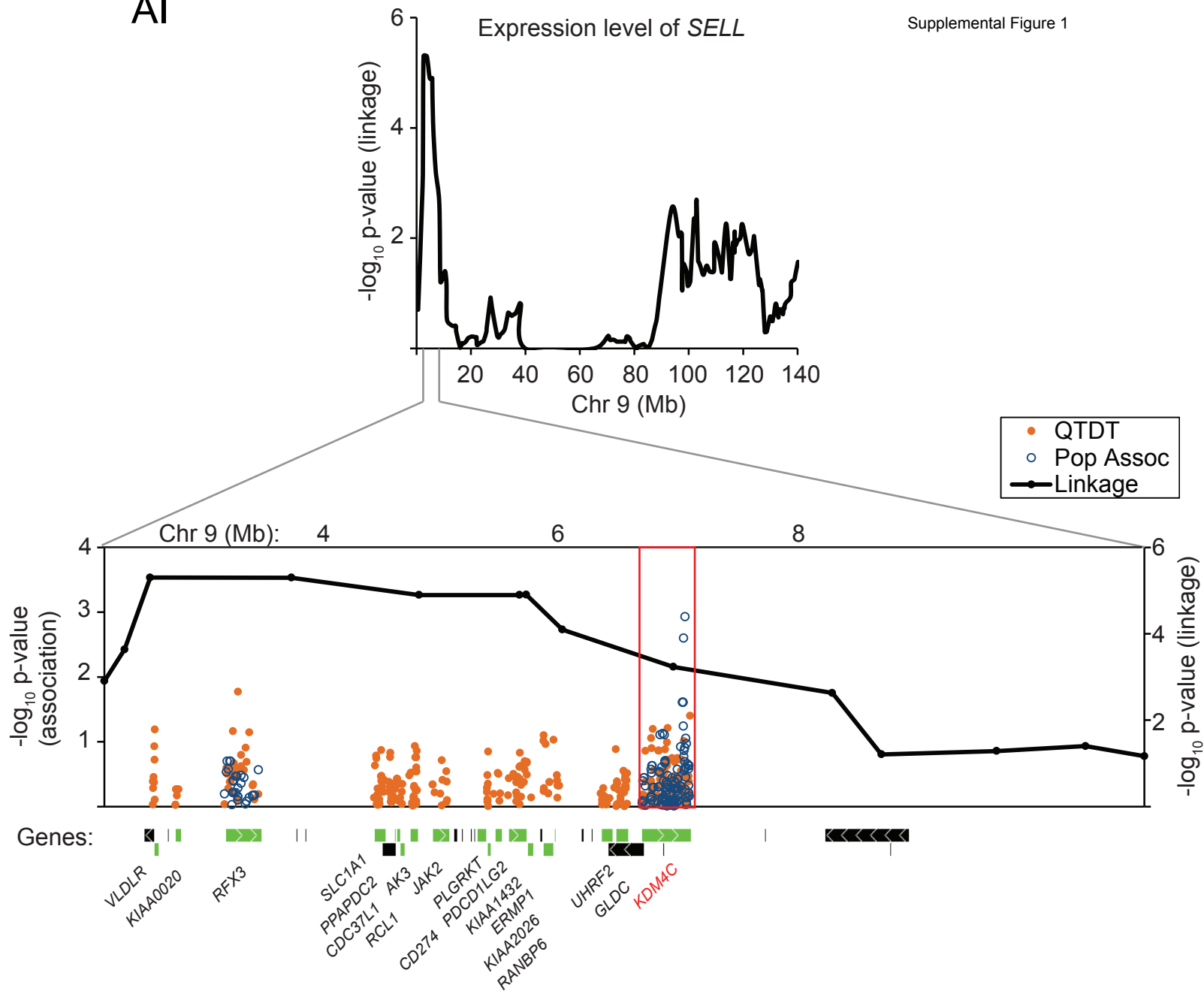
Expression level of *RRP7A*

Supplemental Figure 1



AI

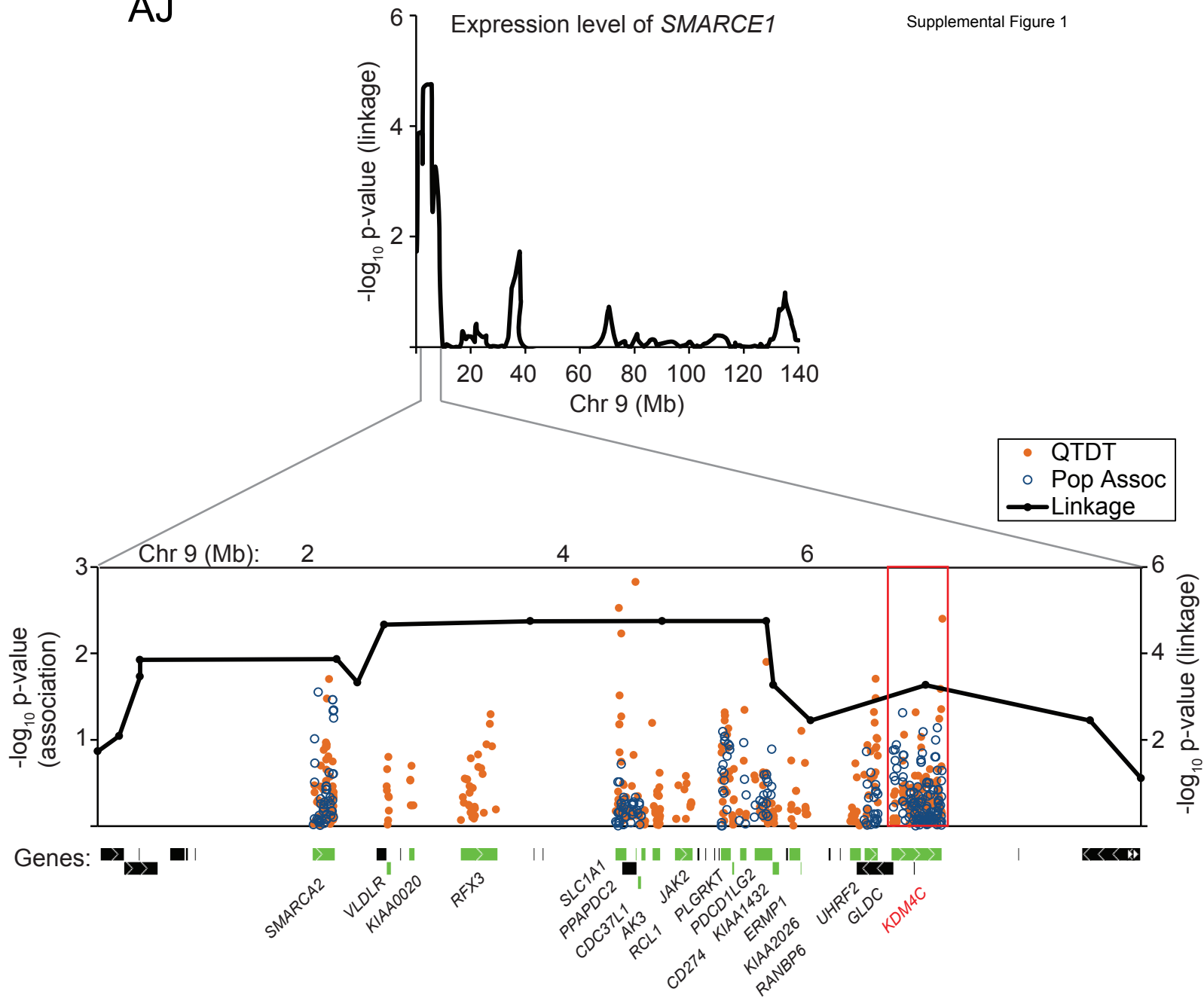
Supplemental Figure 1



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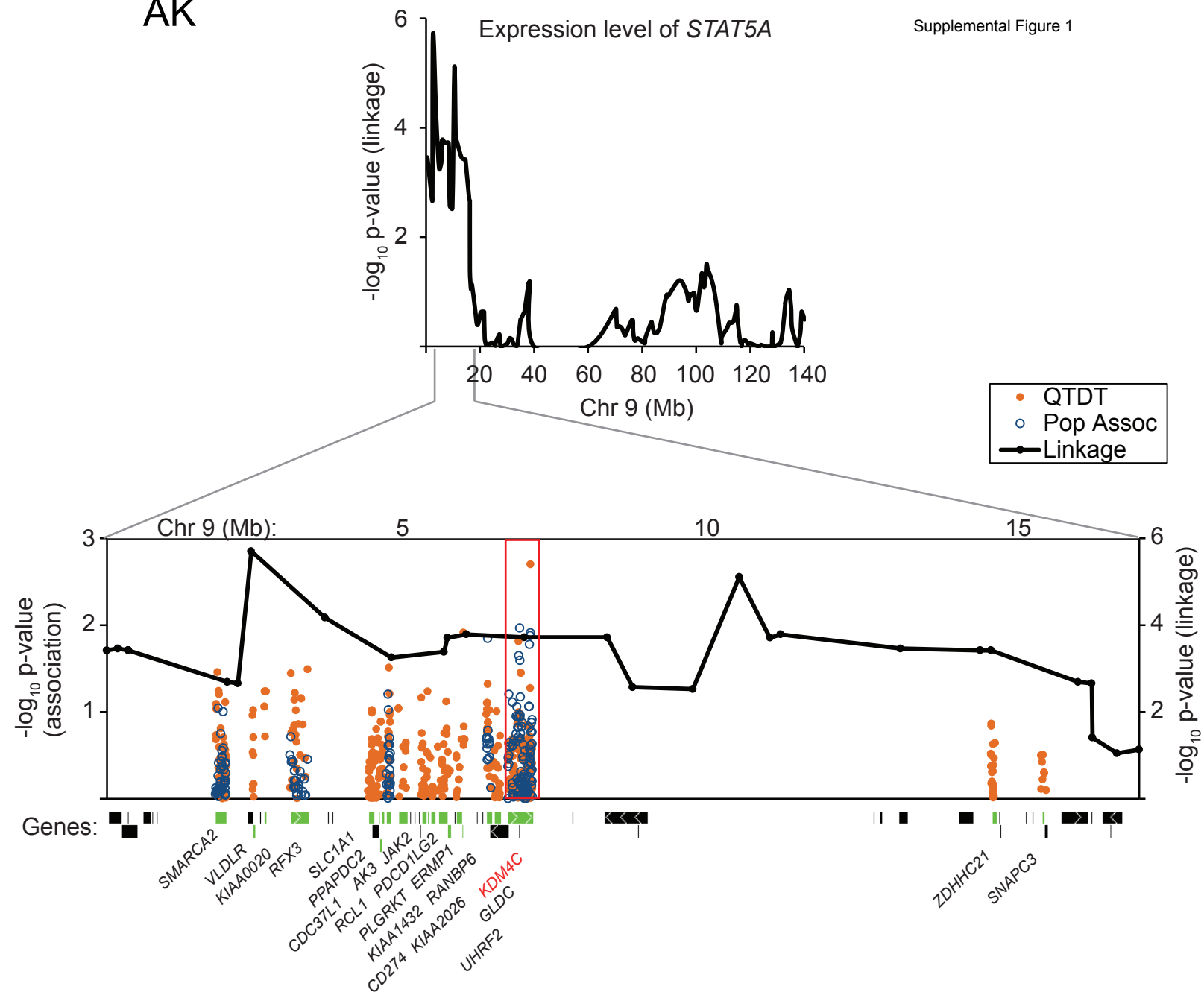
Expression level of *SMARCE1*

Supplemental Figure 1



AK

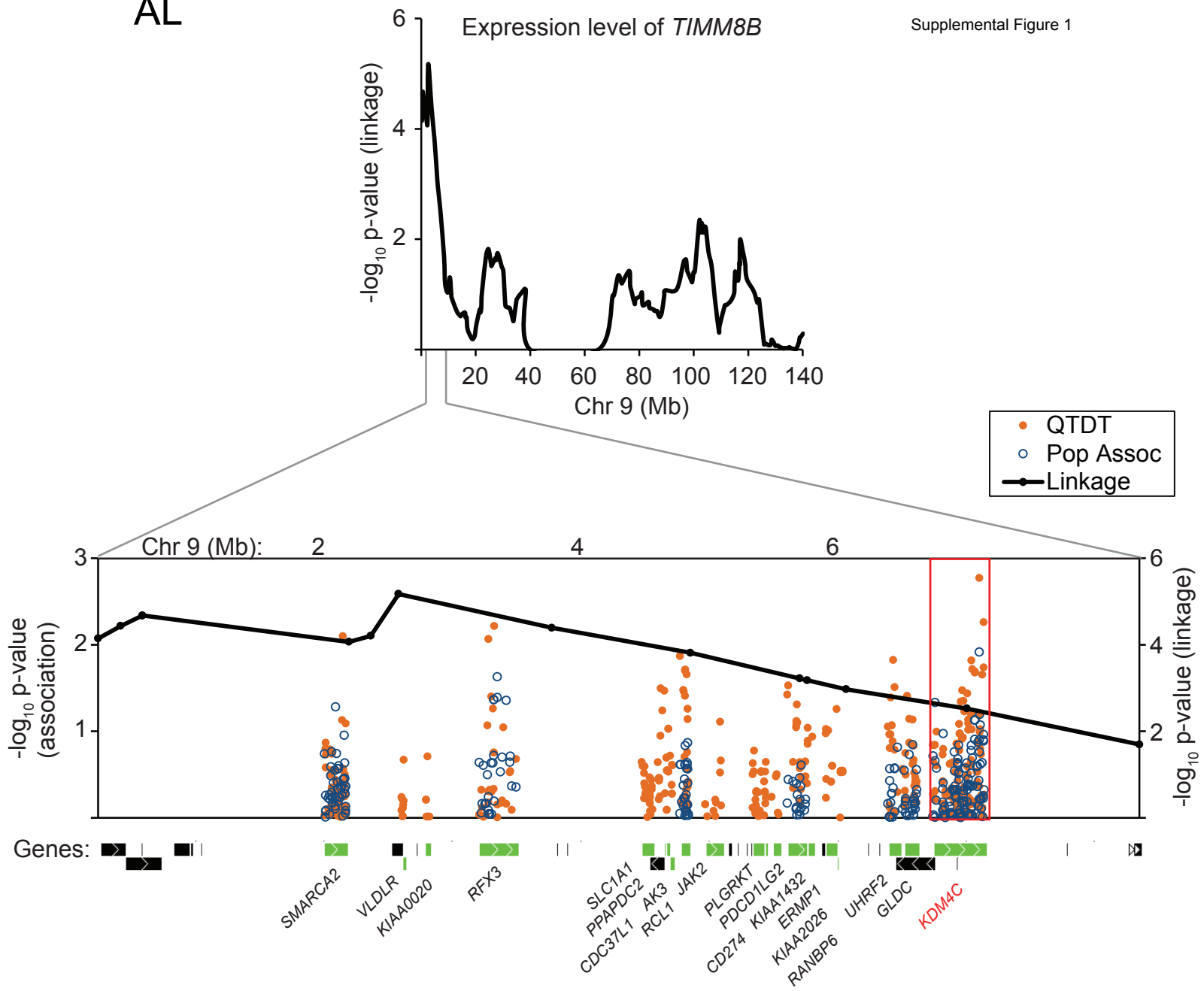
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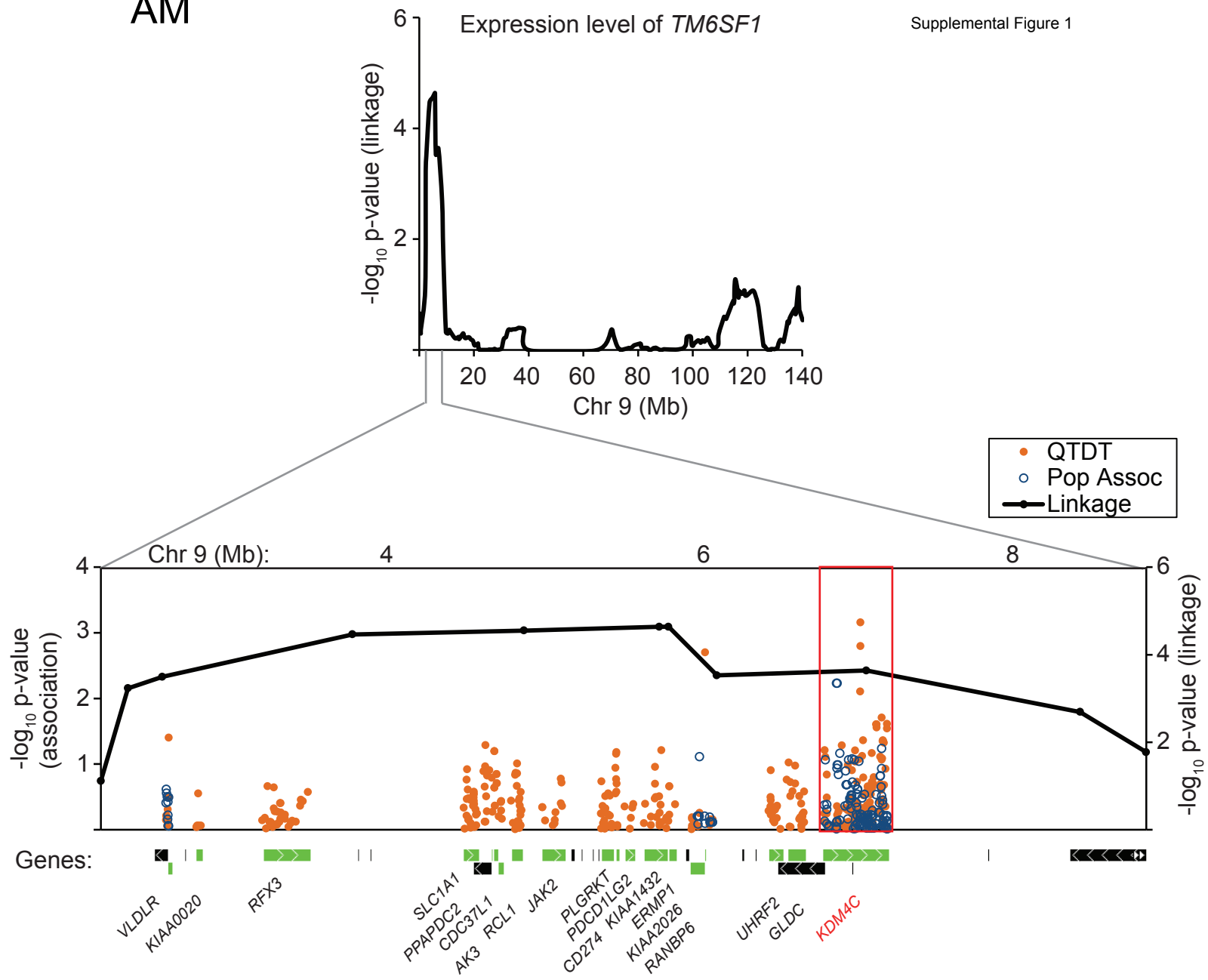


AL

Expression level of *TIMM8B*

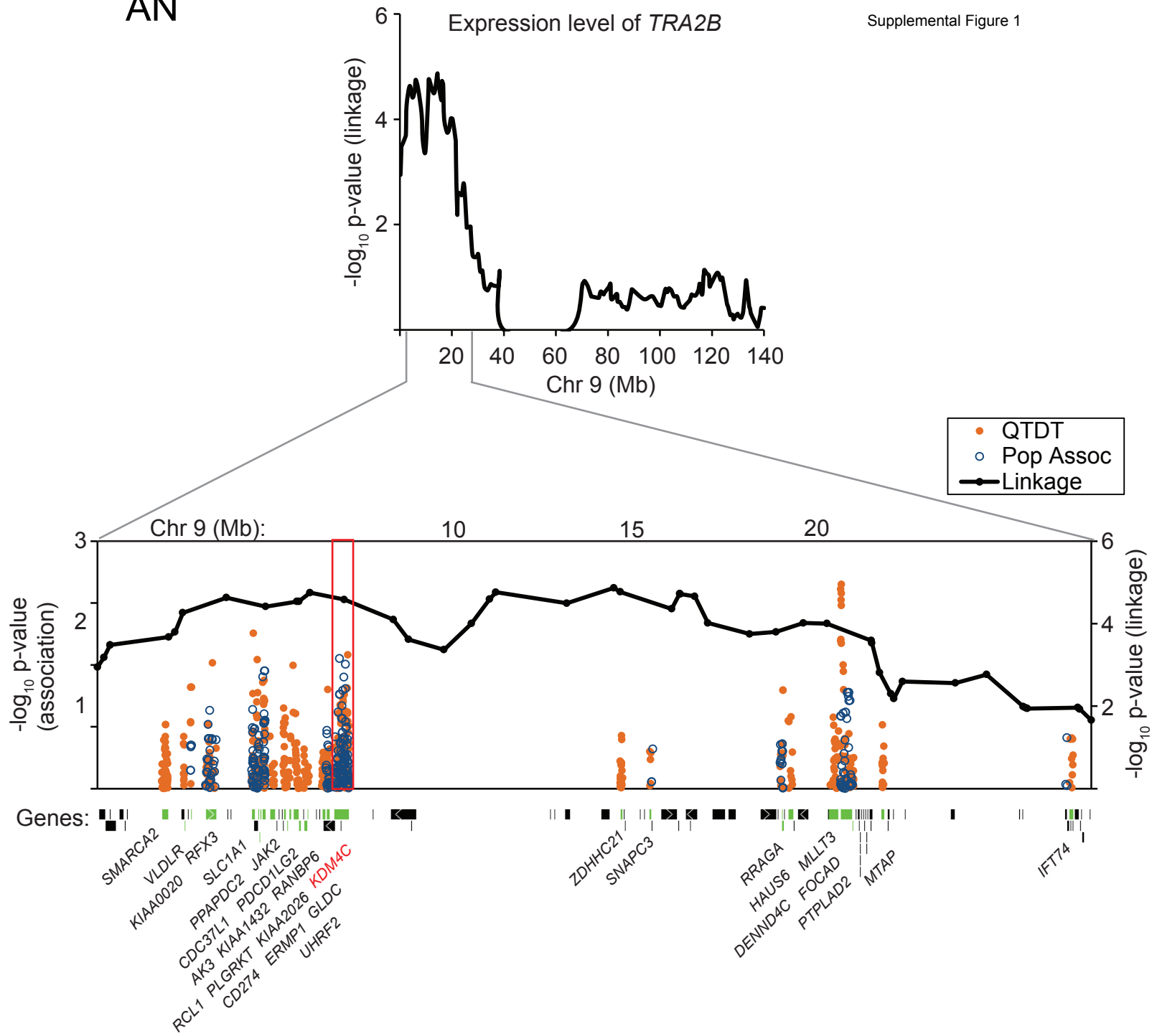
Supplemental Figure 1





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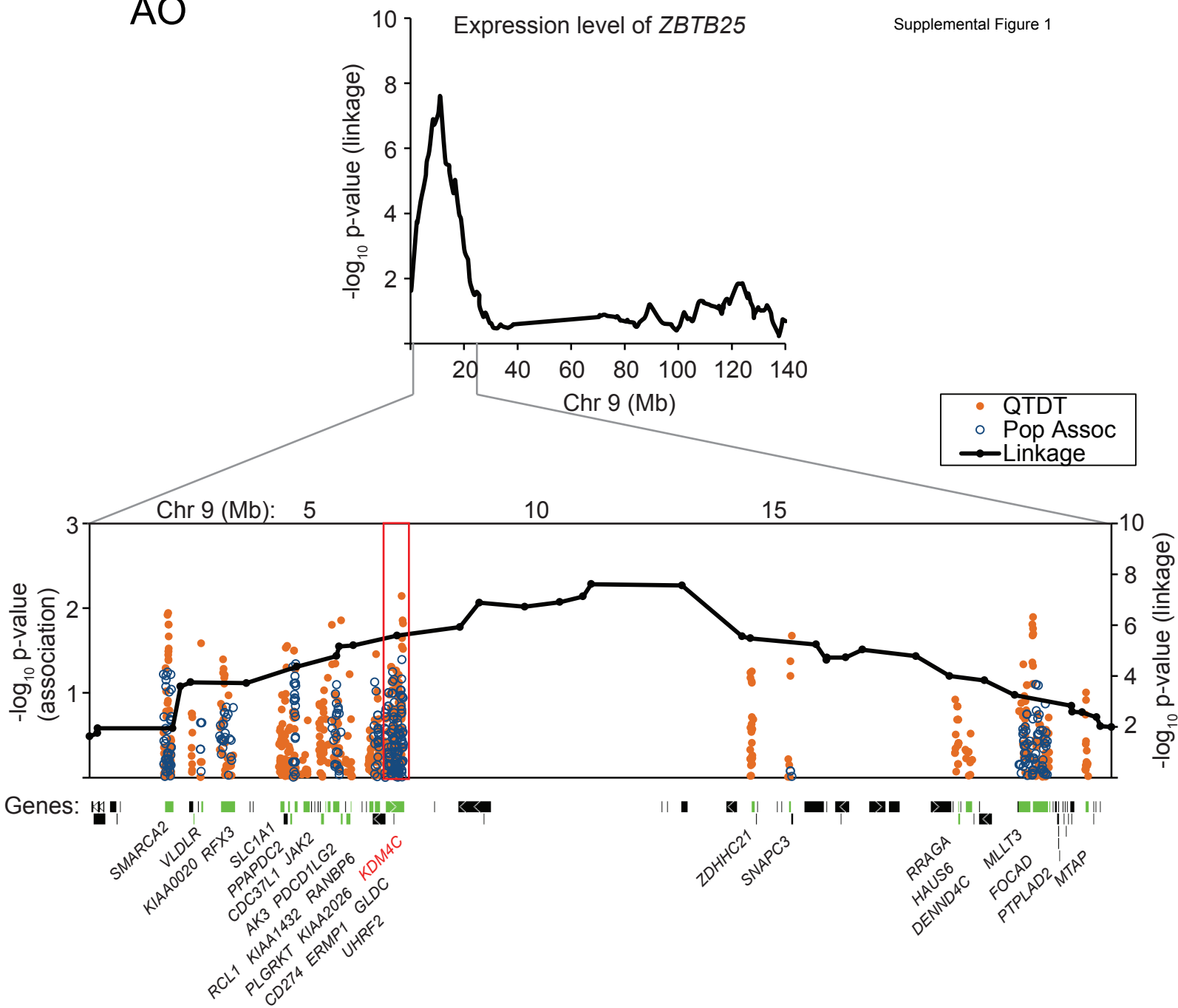
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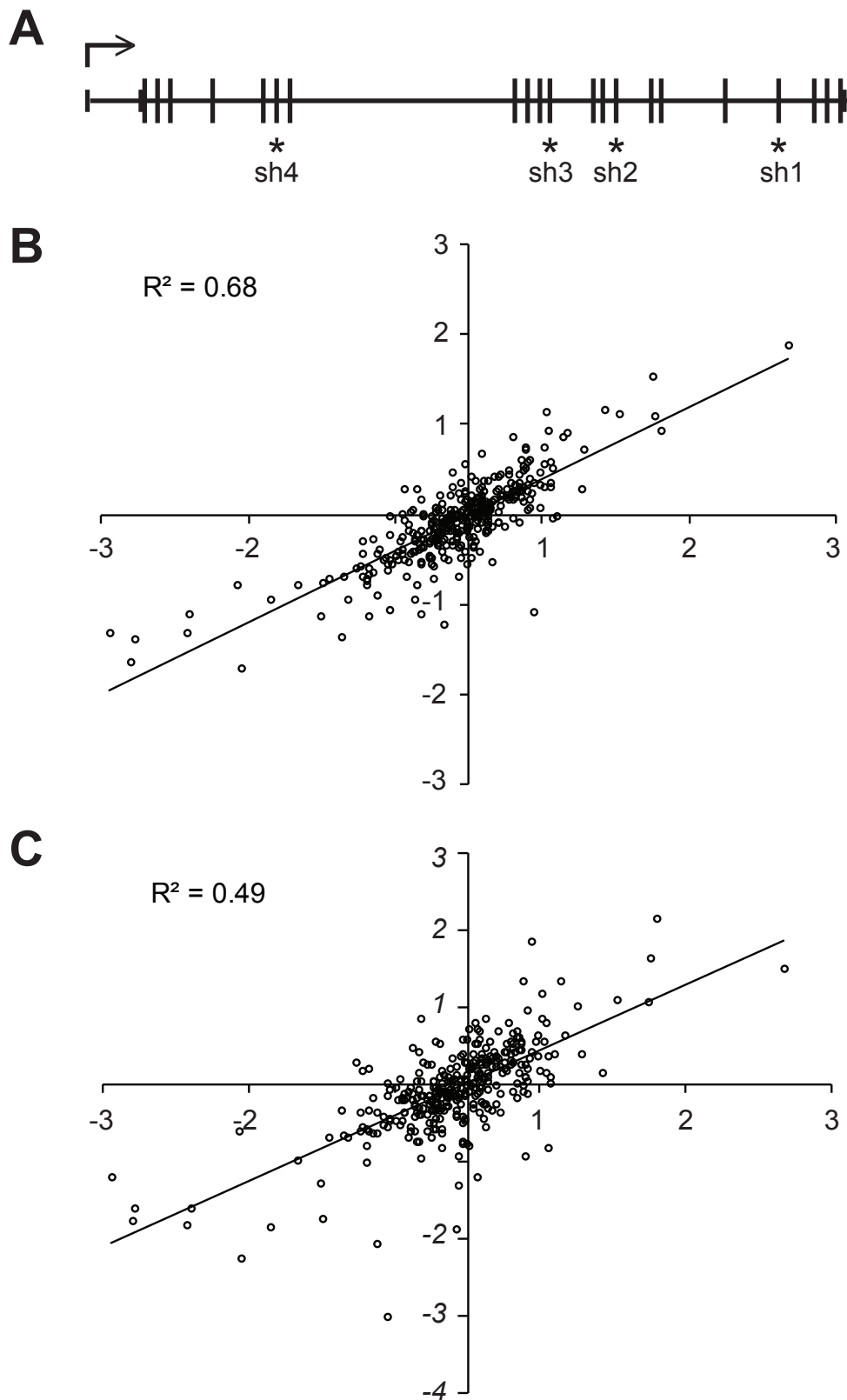


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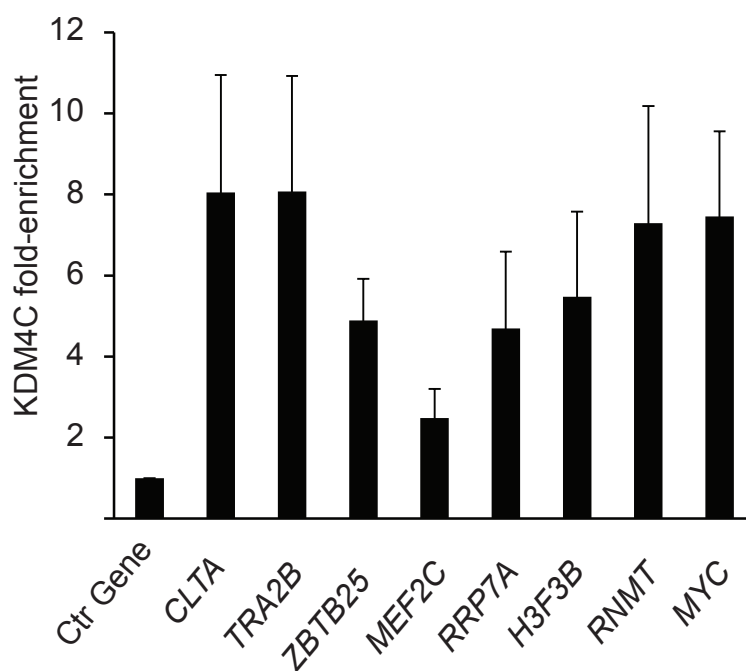
Expression level of *ZBTB25*

Supplemental Figure 1

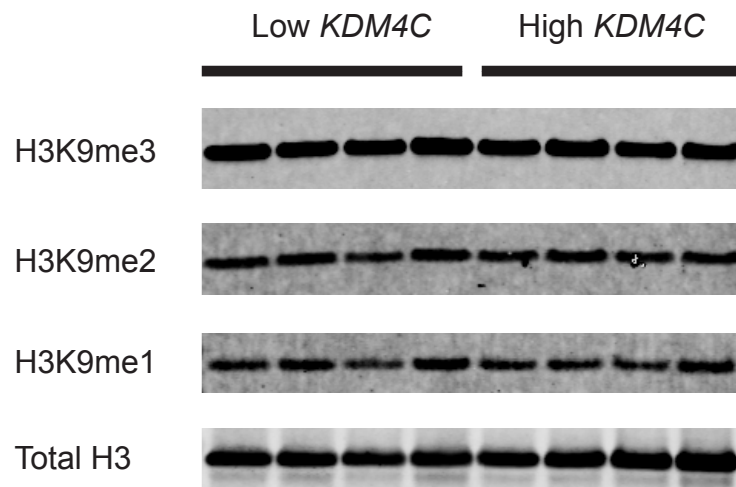




Supplemental Figure 2. **Correlation of gene expression fold differences between shRNA constructs used to knockdown *KDM4C* expression in primary fibroblasts.** (A) Location of shRNA construct target sequences used to knockdown *KDM4C* expression. Fold differences in expression were determined by microarray for 340 genes following knockdown of *KDM4C* using 3 shRNA constructs (sh1-3) compared to a control shRNA ($n=2$). Correlation between the fold differences in expression are shown for (B) sh1 and sh2, and (C) for sh1 and sh3 ($P<0.001$).



Supplemental Figure 3. **Fold enrichment of KDM4C protein at target gene promoters.** ChIP was performed for KDM4C protein in B-cells from 6 individuals. The average enrichment of KDM4C protein at target gene promoters is shown relative to a control, the *RPS6* promoter. Error bars are s.e.m. (Also see Fig. 5A).



Supplemental Figure 4. ***KDM4C* expression level does not affect total levels of methylated H3K9.** Total histones were extracted from the B-cells of individuals with high and low *KDM4C* expression in duplicate; a representative western blot from one extraction is shown ($n=4$ for each group). No significant differences were found in total histone H3K9 methylation levels among individuals with low or high *KDM4C* expression.

Supplemental Table 1: Linkage and association analyses identify 391 *KDM4C* target genes in B-cells

Gene	Max t-value	<u>QTD</u>		<u>Population Association</u>	
		SNP	p-value	SNP	p-value
<i>H3F3B</i>	5.73	rs7033490	0.003	rs7034275	0.011
<i>MEF2C</i>	5.72	rs10975858	0.009	rs1535624	0.011
<i>ZBTB25</i>	5.49	rs7033490	0.007	rs10976063	0.041
<i>HDAC1</i>	5.47	rs10975955	0.029	rs16925200	0.034
<i>KXD1</i>	5.34	rs10815471	0.013	rs912207	0.002
<i>ACAA1</i>	5.33	rs12380879	0.004	rs7034275	0.002
<i>NFE2L3</i>	5.29	rs10975894	0.034	rs10815491	0.005
<i>PSMC2</i>	5.27	rs10975955	0.022	rs7861740	0.002
<i>DDX42</i>	5.22	rs10975954	0.001	rs17595667	0.00007
<i>CYCS</i>	5.22	rs7033490	0.008	rs10976050	0.021
<i>DNTTIP2</i>	5.02	rs10975955	0.005	rs4439184	0.004
<i>RLN2</i>	4.87	rs717381	0.016	rs7872232	0.0006
<i>H2AFV</i>	4.83	rs7033490	0.025	rs7033490	0.001
<i>RNMT</i>	4.82	rs10976048	0.005	rs7872232	0.017
<i>RRP7A</i>	4.82	rs6477134	0.004	rs6477161	0.004
<i>NME1</i>	4.7	rs2381530	0.02	rs10976050	0.012
<i>CLTA</i>	4.66	rs12380879	0.004	rs7873365	0.037
<i>FILIP1L</i>	4.64	rs7874501	0.0004	rs1570507	0.001
<i>STAT5A</i>	4.59	rs2381566	0.002	rs9657633	0.011
<i>AIMP2</i>	4.48	rs2381530	0.015	rs7847729	0.033
<i>MAP3K5</i>	4.47	rs7861740	0.004	rs6477161	0.001
<i>NOP2</i>	4.44	rs1570513	0.004	rs17593759	0.012
<i>MYBBP1A</i>	4.43	rs10815471	0.0004	rs818879	0.022
<i>ATP6V0E2</i>	4.43	rs16925271	0.015	rs4439184	0.009
<i>SELL</i>	4.43	rs912207	0.041	rs7028357	0.001
<i>CROT</i>	4.4	rs7873365	0.012	rs10975884	0.028
<i>GYG1</i>	4.4	rs1570513	0.009	rs10975897	0.009
<i>HMGCL</i>	4.39	rs2153498	0.016	rs10976050	0.001
<i>TIMM8B</i>	4.37	rs7033490	0.002	rs7033490	0.012
<i>NUDT1</i>	4.36	rs7861740	0.008	rs10815532	0.003
<i>EZH1</i>	4.32	rs7033490	0.014	rs10975932	0.001
<i>FYB</i>	4.31	rs2381566	0.002	rs818879	0.026
<i>FCER1G</i>	4.21	rs4439184	0.001	rs10975954	0.021
<i>TRA2B</i>	4.21	rs7033490	0.007	rs10975884	0.008
<i>SMARCE1</i>	4.19	rs1556096	0.004	rs6477117	0.049
<i>RBPJ</i>	4.18	rs10975955	0.004	rs1538844	0.035
<i>NCK1</i>	4.15	rs10975955	0.0001	rs10975955	0.033
<i>TM6SF1</i>	4.14	rs10975955	0.001	rs17594512	0.006
<i>ATP2A2</i>	4.13	rs10975932	0.011	rs10976050	0.008
<i>IRAK4</i>	4.07	rs818881	0.004	rs10976014	0.004
<i>ERH</i>	4.05	rs7025832	0.005	rs7849812	0.012

<i>SRP19</i>	3.98	rs4439184	0.006	rs702279	0.015
<i>NSF</i>	3.94	rs7018851	0.007	rs1094039	0.006
<i>SSBP1</i>	3.92	rs4439184	0.005	rs16925200	0.015
<i>GNAS</i>	3.92	rs7018851	0.005	rs1538844	0.008
<i>PRPS1</i>	3.9	rs10976003	0.037	rs16925200	0.009
<i>DARC</i>	3.89	rs7847729	0.0003	rs7852014	0.003
<i>INTS6</i>	3.88	rs1556100	0.018	rs16925503	0.018
<i>C20orf24</i>	3.87	rs7858552	0.015	rs1538844	0.009
<i>HSP90AA1</i>	3.85	rs2792235	0.013	rs10976063	0.019
<i>ZNF141</i>	3.83	rs10975955	0.0001	rs12002543	0.035
<i>MAP2K4</i>	3.83	rs12380879	0.001	rs6477118	0.026
<i>KHSRP</i>	3.82	rs10975955	0.001	rs17593759	0.04
<i>DYRK1A</i>	3.81	rs9657633	0.048	rs1538844	0.042
<i>DBT</i>	3.81	rs7849812	0.001	rs818879	0.016
<i>PPM1G</i>	3.81	rs10815471	0.006	rs6477161	0.002
<i>BCKDHA</i>	3.8	rs7858552	0.011	rs818879	0.016
<i>HNRNPM</i>	3.79	rs10975955	0.018	rs16925027	0.11
<i>HIPK2</i>	3.79	rs818887	0.015	rs16925027	0.027
<i>ICT1</i>	3.79	rs4439184	0.027	rs16924883	0.003
<i>USP8</i>	3.77	rs2381530	0.036	rs10815491	0.059
<i>MTCH1</i>	3.77	rs7033490	0.037	rs2381566	0.038
<i>BTG1</i>	3.77	rs2381530	0.007	rs7860305	0.021
<i>TRIB3</i>	3.77	rs1570507	0.015	rs1323404	0.003
<i>NDUFS1</i>	3.77	rs10975955	0.003	rs12345872	0.002
<i>LARP1</i>	3.76	rs3818891	0.033	rs1323404	0.008
<i>EIF2B3</i>	3.73	rs10975900	0.004	rs6477161	0.006
<i>EID1</i>	3.72	rs9657633	0.019	rs7873365	0.013
<i>TNFAIP1</i>	3.69	rs6477134	0.063	ND	ND
<i>LINC00094</i>	3.68	rs6477161	0.021	rs10975827	0.002
<i>VCP</i>	3.67	rs2381530	0.001	rs7872232	0.045
<i>TMEM59</i>	3.67	rs6477126	0.047	rs3858052	0.031
<i>BUB1</i>	3.66	rs1535624	0.002	rs16925503	0.025
<i>POP7</i>	3.65	rs10975955	0.001	rs1538844	0.004
<i>UAP1</i>	3.64	rs7028357	0.003	rs10976014	0.015
<i>EIF3D</i>	3.63	rs7033490	0.016	rs10815480	0.006
<i>DDX17</i>	3.63	rs7852014	0.003	rs2224762	0.004
<i>TRIM28</i>	3.63	rs1570513	0.01	rs10758835	0.002
<i>CCNB1IP1</i>	3.62	rs12380879	0.063	ND	ND
<i>CNPY3</i>	3.61	rs16925271	0.007	rs10815468	0.013
<i>GIT2</i>	3.6	rs7033490	0.003	rs2381566	0.002
<i>ADD3</i>	3.59	rs2153498	0.06	ND	ND
<i>NXF1</i>	3.57	rs1556100	0.003	rs1535624	0.01
<i>TMEM258</i>	3.54	rs7025832	0.036	rs10976050	0.013
<i>USP16</i>	3.53	rs10975856	0.046	rs10976063	0.03

<i>EHHADH</i>	3.53	rs10815471	0.001	rs3858052	0.047
<i>HARS</i>	3.5	rs17508851	0.002	rs16924883	0.033
<i>GPALPP1</i>	3.5	rs2792235	0.013	rs1535624	0.016
<i>APOL2</i>	3.49	rs10976048	0.006	rs10815468	0.044
<i>DDX10</i>	3.49	rs10975955	0.0002	rs1570507	0.017
<i>BCL2</i>	3.49	rs7873365	0.001	rs16925278	0.005
<i>EXTL3</i>	3.49	rs7034275	0.022	rs10976062	0.018
<i>PMM2</i>	3.49	rs10815532	0.001	rs10975861	0.003
<i>MFNG</i>	3.48	rs1556100	0.013	rs7033490	0.0002
<i>CD80</i>	3.47	rs2381566	0.024	rs10815468	0.022
<i>CDC5L</i>	3.46	rs2381566	0.015	rs16925200	0.012
<i>ZNF217</i>	3.46	rs2381530	0.005	rs16925271	0.037
<i>BIRC5</i>	3.45	rs1570513	0.021	rs1556100	0.023
<i>MRT04</i>	3.43	rs10815471	0.003	rs10758835	0.024
<i>SPAG9</i>	3.43	rs10815471	0.018	rs1538844	0.005
<i>ZMPSTE24</i>	3.42	rs10975955	0.003	rs702279	0.019
<i>PEX3</i>	3.42	rs17509513	0.001	rs7028357	0.0005
<i>POLR1E</i>	3.41	rs7033490	0.024	rs1535624	0.005
<i>RAB40B</i>	3.41	rs10976062	0.045	rs2381545	0.003
<i>CCNG2</i>	3.4	rs12380879	0.012	rs7873365	0.026
<i>EIF3H</i>	3.39	rs7025832	0.009	rs10815468	0.031
<i>DKC1</i>	3.39	rs10975955	0.005	rs10975884	0.013
<i>BET1</i>	3.38	rs10815471	0.013	rs10976062	0.004
<i>NUP98</i>	3.37	rs10975955	0.014	rs10975894	0.027
<i>HDGF</i>	3.36	rs10815511	0.006	rs10976054	0.0007
<i>CTPS1</i>	3.35	rs10975955	0.006	rs17511187	0.023
<i>DNAJA1</i>	3.34	rs10758835	0.023	rs16925027	0.024
<i>HNRNPA3</i>	3.32	rs2821446	0.032	rs4439184	0.018
<i>CPSF6</i>	3.31	rs10975955	0.006	rs17593759	0.033
<i>ZNF259</i>	3.31	rs16925271	0.007	rs12238468	0.026
<i>NBL1</i>	3.31	rs7025832	0.002	rs16925503	0.025
<i>NAMPT</i>	3.31	rs10975858	0.002	rs10975858	0.01
<i>VLDLR</i>	3.31	rs10815532	0.002	rs6477134	0.026
<i>HLA-F</i>	3.31	rs10975955	0.004	rs10975954	0.0008
<i>IL32</i>	3.3	rs818881	0.009	rs3858052	0.003
<i>HNRNPA2B1</i>	3.3	rs2821446	0.12	ND	ND
<i>CLK3</i>	3.29	rs7033490	0.01	rs6477126	0.027
<i>VPS4A</i>	3.28	rs16925200	0.006	rs7034275	0.021
<i>CACYBP</i>	3.28	rs2153498	0.033	rs3858052	0.012
<i>EI24</i>	3.28	rs12380879	0.004	rs4439184	0.005
<i>SP100</i>	3.27	rs2996066	0.009	rs10758835	0.065
<i>MYC</i>	3.27	rs7858552	0.017	rs17593759	0.044
<i>UBE2L3</i>	3.27	rs7033490	0.002	rs6477161	0.0007
<i>SOD1</i>	3.26	rs6477134	0.005	rs6477161	0.006

<i>SIT1</i>	3.26	rs7034275	0.003	rs10975894	0.000002
<i>SRSF6</i>	3.25	rs10975955	0.002	rs12685394	0.035
<i>IFNGR2</i>	3.25	rs10975955	0.011	rs17593759	0.013
<i>ODC1</i>	3.24	rs6477134	0.008	rs10976050	0.034
<i>CDK7</i>	3.24	rs10975827	0.017	rs6477126	0.013
<i>TBL1X</i>	3.24	rs6477118	0.016	rs7873365	0.0001
<i>TAX1BP1</i>	3.23	rs10976050	0.074	ND	ND
<i>SARS</i>	3.23	rs10976014	0.006	rs10815491	0.01
<i>ZKSCAN5</i>	3.23	rs1570513	0.00004	rs7025832	0.0003
<i>SCAF11</i>	3.23	rs2381530	0.012	rs10976054	0.0002
<i>NR2C2</i>	3.23	rs12345872	0.01	rs10976014	0.0001
<i>PSMC4</i>	3.22	rs10975955	0.006	rs6477161	0.024
<i>IDS</i>	3.22	rs10975955	0.004	rs1538844	0.02
<i>SRP72</i>	3.22	rs10975856	0.031	rs10758835	0.004
<i>COX7C</i>	3.21	rs10975954	0.044	rs7028357	0.009
<i>RUNX3</i>	3.21	rs2153498	0.018	rs10758835	0.004
<i>TPP2</i>	3.2	rs10815471	0.012	rs10975858	0.047
<i>DDX41</i>	3.18	rs10975954	0.032	rs16925332	0.058
<i>TFAM</i>	3.18	rs10815491	0.05	ND	ND
<i>STX7</i>	3.18	rs10815471	0.004	rs1407862	0.011
<i>CYTIP</i>	3.18	rs2381530	0.027	rs17596052	0.015
<i>SEPHS1</i>	3.17	rs7858552	0.01	rs7028357	0.016
<i>RGS10</i>	3.16	rs10975856	0.051	ND	ND
<i>MAP2K6</i>	3.16	rs16925271	0.09	ND	ND
<i>P4HA1</i>	3.15	rs12380879	0.021	rs17596052	0.034
<i>HNRNPD</i>	3.15	rs10975858	0.003	rs10815532	0.01
<i>FAM60A</i>	3.14	rs16925271	0.023	rs2224762	0.036
<i>PELI1</i>	3.13	rs7028357	0.017	rs7033490	0.012
<i>SLC25A13</i>	3.12	rs7033490	0.011	rs6477117	0.007
<i>DUSP1</i>	3.1	rs2821446	0.001	rs818879	0.006
<i>HN1</i>	3.1	rs10815511	0.02	rs6477161	0.003
<i>ATP2C1</i>	3.09	rs6477140	0.025	rs16925278	0.034
<i>KIF20B</i>	3.09	rs10975955	0.005	rs17593759	0.021
<i>ATXN3</i>	3.08	rs4439184	0.037	rs10976063	0.036
<i>MYLIP</i>	3.08	rs7858552	0.012	rs912207	0.033
<i>UQCRRS1</i>	3.08	rs9657633	0.006	rs1570507	0.014
<i>ARF4</i>	3.08	rs7018851	0.024	rs17596052	0.022
<i>CCL22</i>	3.07	rs16925271	0.03	rs9657633	0.014
<i>ID3</i>	3.07	rs10815468	0.009	rs16925271	0.03
<i>APBB1</i>	3.06	rs10975856	0.003	rs10975955	0.003
<i>RHOH</i>	3.05	rs3858052	0.004	rs12345872	0.011
<i>RPL11</i>	3.05	rs7018851	0.038	rs1407862	0.008
<i>RAB11A</i>	3.05	rs10975858	0.001	rs1535624	0.005
<i>GAK</i>	3.05	rs10975954	0.045	rs7847729	0.01

<i>AK4</i>	3.05	rs10975900	0.038	rs17593759	0.004
<i>CELF1</i>	3.04	rs2381567	0.003	rs16925503	0.015
<i>WBP5</i>	3.04	rs1556100	0.003	rs6477118	0.014
<i>RAB8A</i>	3.04	rs10815471	0.03	rs10815468	0.006
<i>HCCS</i>	3.03	rs7858552	0.029	rs10975827	0.016
<i>STAT4</i>	3.03	rs17594512	0.052	ND	ND
<i>MTIF2</i>	3.03	rs702279	0.058	ND	ND
<i>NCKIPSD</i>	3.03	rs7033490	0.002	rs10975884	0.018
<i>SRCAP</i>	3.02	rs2381566	0.015	rs10758835	0.007
<i>C11orf58</i>	3.01	rs16925027	0.002	rs10976014	0.035
<i>SRRT</i>	3.01	rs10975955	0.001	rs17593759	0.006
<i>PPOX</i>	3.01	rs10975894	0.015	rs6477161	0.017
<i>IL2RG</i>	3.01	rs2792235	0.019	rs4439184	0.001
<i>H2AFY</i>	3	rs10815511	0.017	rs17593759	0.018
<i>MTMR4</i>	3	rs1570513	0.025	rs6477117	0.017
<i>ECHS1</i>	3	rs10975955	0.0004	rs10975953	0.006
<i>POLI</i>	3	rs6477126	0.017	rs10976054	0.001
<i>HMBS</i>	2.99	rs2381530	0.004	rs7847729	0.045
<i>MBOAT7</i>	2.99	rs818887	0.01	rs10975884	0.033
<i>RNF103</i>	2.99	rs6477126	0.012	rs7019027	0.01
<i>CAPG</i>	2.98	rs10975858	0.013	rs7033490	0.003
<i>SLC37A1</i>	2.97	rs10975861	0.013	rs10975835	0.057
<i>CAV1</i>	2.97	rs7847729	0.013	rs16925503	0.002
<i>ALDOC</i>	2.95	rs7033490	0.014	rs6477126	0.054
<i>PCYT1A</i>	2.95	rs2821446	0.027	rs1538844	0.048
<i>TUBB4B</i>	2.95	rs1570513	0.008	rs7872232	0.002
<i>ITGA3</i>	2.94	rs2224762	0.009	rs10815511	0.056
<i>ERAP1</i>	2.94	rs4439184	0.003	rs12685394	0.01
<i>PSMD13</i>	2.94	rs10815471	0.003	rs7872232	0.006
<i>CCL20</i>	2.93	rs17508851	0.024	rs2792235	0.031
<i>VEGFA</i>	2.93	rs1570513	0.02	rs7028357	0.043
<i>MID2</i>	2.93	rs10975955	0.0004	rs1570507	0.007
<i>DHFR</i>	2.93	rs3818891	0.004	rs6477161	0.004
<i>ECI2</i>	2.92	rs10119509	0.0003	rs17593759	0.038
<i>PLA2G4C</i>	2.92	rs10975932	0.005	rs10976048	0.025
<i>RAE1</i>	2.92	rs10975955	0.008	rs1538844	0.008
<i>KLF3</i>	2.92	rs6477134	0.002	rs1323404	0.025
<i>LITAF</i>	2.91	rs7033490	0.015	rs1570507	0.051
<i>EZR</i>	2.91	rs17511187	0.002	rs7847729	0.007
<i>SKAP2</i>	2.91	rs6477118	0.003	rs16925271	0.005
<i>DDX58</i>	2.91	rs12380879	0.006	rs16925278	0.001
<i>UGCG</i>	2.91	rs10975835	0.011	rs10975932	0.006
<i>HMOX2</i>	2.9	rs10975884	0.012	rs10758835	0.001
<i>CINP</i>	2.89	rs17593759	0.026	rs6477126	0.019

<i>STK19</i>	2.89	rs2890734	0.001	rs12685394	0.027
<i>SLC7A5P2</i>	2.89	rs10975955	0.001	rs3858052	0.003
<i>ZNF593</i>	2.88	rs2890734	0.02	rs10975858	0.016
<i>CAPZA1</i>	2.87	rs1538844	0.018	rs16925200	0.021
<i>TMEM187</i>	2.86	rs6477134	0.001	rs2381567	0.025
<i>CDKN1B</i>	2.86	rs2381530	0.014	rs10976063	0.013
<i>PSMA4</i>	2.86	rs10975955	0.009	rs7018851	0.002
<i>ZNF137P</i>	2.85	rs2381567	0.009	rs16925332	0.011
<i>HTR5A</i>	2.85	rs35732562	0.004	rs10976054	0.038
<i>ZBTB32</i>	2.84	rs16925027	0.007	rs7025832	0.012
<i>RNASET2</i>	2.83	rs10975955	0.022	rs1538844	0.008
<i>SOD2</i>	2.83	rs17594512	0.011	rs16925027	0.007
<i>IARS</i>	2.82	rs4439184	0.001	rs16925271	0.049
<i>DNM1L</i>	2.82	rs1885975	0.003	rs3858052	0.013
<i>CXCR5</i>	2.82	rs6477134	0.023	rs2381566	0.003
<i>ING2</i>	2.82	rs10975932	0.007	rs1759414	0.007
<i>DNAJC15</i>	2.81	rs10815468	0.03	rs2153498	0.021
<i>PGK1</i>	2.81	rs10975955	0.015	rs2821446	0.02
<i>SLC6A4</i>	2.81	rs10976003	0.019	rs10119509	0.017
<i>ADK</i>	2.81	rs10975858	0.026	rs6477134	0.006
<i>CELSR3</i>	2.78	rs10975900	0.036	rs2381530	0.029
<i>DDX39A</i>	2.77	rs1556100	0.02	rs10976050	0.035
<i>HNRNPR</i>	2.77	rs10975858	0.026	rs16925027	0.02
<i>KL</i>	2.77	rs4742269	0.025	rs7028357	0.005
<i>TPT1</i>	2.77	rs7018851	0.023	rs1407862	0.003
<i>SQSTM1</i>	2.76	rs10975835	0.039	rs10975827	0.005
<i>CLDND1</i>	2.75	rs10975955	0.001	rs1538844	0.042
<i>CNN3</i>	2.75	rs818881	0.006	rs12685394	0.0000002
<i>SOS2</i>	2.74	rs10815471	0.005	rs10976063	0.081
<i>ARHGDIB</i>	2.73	rs10975856	0.024	rs10491780	0.013
<i>GOLGA4</i>	2.73	rs10815511	0.016	rs16925200	0.007
<i>GABARAP</i>	2.73	rs2792235	0.004	rs10975900	0.004
<i>LMO1</i>	2.73	rs9657633	0.047	rs2381566	0.0008
<i>FASTK</i>	2.72	rs6477117	0.01	rs10975894	0.052
<i>MSRB1</i>	2.72	rs2381545	0.013	rs7025832	0.026
<i>TGFB1I1</i>	2.72	rs4439184	0.012	rs17593759	0.02
<i>BAZ1A</i>	2.71	rs10976048	0.017	rs10815491	0.049
<i>HSD17B4</i>	2.71	rs7858552	0.003	rs16925027	0.011
<i>AAAS</i>	2.71	rs2153498	0.008	rs7849812	0.003
<i>ARF3</i>	2.7	rs7025832	0.039	rs10815486	0.022
<i>ENO1</i>	2.7	rs10975955	0.018	rs7852014	0.013
<i>KRR1</i>	2.7	rs2792235	0.014	rs1407862	0.008
<i>SCAMP3</i>	2.7	rs6477126	0.017	rs10815468	0.024
<i>ZNF384</i>	2.7	rs6477118	0.046	rs10975827	0.0009

<i>TOR3A</i>	2.69	rs10758835	0.019	rs10976014	0.041
<i>MAGED1</i>	2.69	rs10975954	0.057	ND	ND
<i>TYK2</i>	2.69	rs10975955	0.02	rs1556100	0.028
<i>TRIM33</i>	2.69	rs6477134	0.016	rs16925503	0.015
<i>G3BP1</i>	2.69	rs4439184	0.047	rs4439184	0.005
<i>SLC5A5</i>	2.69	rs4439184	0.044	rs10975897	0.001
<i>RAD54B</i>	2.68	rs12380879	0.002	rs7033490	0.006
<i>ATP7A</i>	2.66	rs818876	0.003	rs17509513	0.038
<i>PBX3</i>	2.66	rs10975858	0.0002	rs17511187	0.033
<i>BTN3A3</i>	2.66	rs6477126	0.009	rs2153498	0.035
<i>RPL28</i>	2.66	rs10975856	0.008	rs1407862	0.009
<i>AURKA</i>	2.66	rs7034789	0.018	rs16925332	0.007
<i>CAPZB</i>	2.66	rs10758835	0.007	rs2792235	0.014
<i>DEFA6</i>	2.65	rs1570507	0.001	rs12345872	0.017
<i>MRPL40</i>	2.65	rs2381530	0.002	rs1538844	0.001
<i>CYB5R3</i>	2.64	rs702279	0.012	rs7872232	0.057
<i>SEL1L</i>	2.64	rs7018851	0.006	rs912207	0.005
<i>CORO1C</i>	2.63	rs6477118	0.01	rs7033490	0.008
<i>DCXR</i>	2.62	rs6477126	0.028	rs10975932	0.045
<i>CSTF1</i>	2.62	rs10119509	0.004	rs10975858	0.044
<i>STX8</i>	2.62	rs10976084	0.009	rs10975861	0.01
<i>H3F3A</i>	2.61	rs10815511	0.014	rs1323404	0.045
<i>FKBP1A</i>	2.61	rs10815511	0.001	rs17594512	0.009
<i>HSPA13</i>	2.61	rs1535624	0.01	rs912207	0.004
<i>MRPL3</i>	2.6	rs4439184	0.006	rs10976050	0.022
<i>DUS4L</i>	2.6	rs1885975	0.002	rs7033490	0.005
<i>FRG1</i>	2.59	rs16925271	0.005	rs1407862	0.049
<i>LZTR1</i>	2.59	rs10975894	0.09	ND	ND
<i>DCK</i>	2.59	rs1885975	0.003	rs2381567	0.011
<i>SLC5A6</i>	2.59	rs17508851	0.065	ND	ND
<i>POLB</i>	2.59	rs4742269	0.098	ND	ND
<i>GPRC5C</i>	2.58	rs7018851	0.017	rs17594512	0.008
<i>IL12RB2</i>	2.58	rs10976050	0.003	rs6477118	0.007
<i>CD72</i>	2.56	rs10975955	0.046	rs16925027	0.019
<i>STIP1</i>	2.56	rs2792235	0.036	rs10976050	0.006
<i>SLC25A14</i>	2.55	rs11790944	0.013	rs16925332	0.002
<i>DCTN6</i>	2.54	rs10815471	0.004	rs10975827	0.032
<i>NOL7</i>	2.54	rs12380879	0.057	ND	ND
<i>SLC25A12</i>	2.54	rs10975894	0.033	rs7018851	0.017
<i>FSTL3</i>	2.54	rs2821446	0.023	rs10975858	0.011
<i>GFI1</i>	2.54	rs10815468	0.002	rs12685394	0.011
<i>COPS2</i>	2.54	rs7033490	0.038	rs2381566	0.004
<i>HINT1</i>	2.54	rs10975955	0.017	rs818879	0.0007
<i>KEAP1</i>	2.54	rs4439184	0.005	rs10758835	0.0006

<i>MRS2</i>	2.53	rs10975856	0.02	rs7028357	0.029
<i>RPS4X</i>	2.52	rs7018851	0.016	rs7033490	0.018
<i>ADAM9</i>	2.52	rs10976062	0.044	rs16925027	0.016
<i>TBL2</i>	2.52	rs10976054	0.038	rs1538844	0.019
<i>WBSCR22</i>	2.52	rs6477134	0.015	rs3858052	0.01
<i>GM2A</i>	2.52	rs10815491	0.005	rs17593759	0.011
<i>IL6</i>	2.52	rs3818891	0.002	rs10976088	0.002
<i>HIVEP2</i>	2.51	rs10975827	0.064	ND	ND
<i>GOLGB1</i>	2.51	rs10976048	0.001	rs6477161	0.001
<i>TNFRSF14</i>	2.5	rs7033490	0.003	rs1538844	0.032
<i>ST3GAL6</i>	2.49	rs10815511	0.033	rs10975835	0.039
<i>B9D1</i>	2.48	rs7849812	0.008	rs12345872	0.004
<i>SRSF2</i>	2.47	rs717381	0.03	rs10976050	0.022
<i>TFG</i>	2.46	rs4742269	0.048	rs2381530	0.033
<i>SNAPC3</i>	2.46	rs10975856	0.009	rs7033490	0.011
<i>TOP2B</i>	2.46	rs9657633	0.016	rs10976063	0.016
<i>ATG5</i>	2.45	rs12002543	0.007	rs7034275	0.021
<i>SDCBP</i>	2.45	rs10975932	0.011	rs10976063	0.011
<i>KIF11</i>	2.45	rs10975858	0.018	rs1407862	0.001
<i>SLBP</i>	2.44	rs10975955	0.006	rs2381545	0.043
<i>CLK1</i>	2.44	rs10975955	0.013	rs6477134	0.019
<i>IKBKAP</i>	2.44	rs4439184	0.018	rs16925027	0.014
<i>SHFM1</i>	2.44	rs2224762	0.013	rs10815532	0.006
<i>LBR</i>	2.44	rs3818891	0.1	ND	ND
<i>YWHAB</i>	2.43	rs10975955	0.001	rs12345872	0.024
<i>ZNF302</i>	2.43	rs818881	0.005	rs12345872	0.011
<i>GAR1</i>	2.42	rs10975955	0.001	rs6477161	0.031
<i>IVL</i>	2.41	rs10815471	0.087	ND	ND
<i>SNRPE</i>	2.4	rs7860305	0.062	ND	ND
<i>GNA11</i>	2.4	rs4742269	0.011	rs16925027	0.014
<i>XRCC6</i>	2.4	rs10815511	0.0003	rs10491780	0.004
<i>PPP3CC</i>	2.39	rs10975955	0.0004	rs12345872	0.038
<i>USP6</i>	2.39	rs10815471	0.039	rs6477117	0.026
<i>UQCR11</i>	2.39	rs17593759	0.021	rs7868863	0.006
<i>ARPC5L</i>	2.38	rs2381530	0.024	rs17509513	0.004
<i>TM9SF3</i>	2.38	rs2381530	0.012	rs6477134	0.003
<i>PHTF1</i>	2.38	rs7018851	0.005	rs10976054	0.002
<i>KCNN4</i>	2.38	rs7861740	0.052	ND	ND
<i>NMI</i>	2.38	rs6477118	0.005	rs6477118	0.003
<i>EGR3</i>	2.37	rs16925027	0.034	rs10975897	0.031
<i>BTN3A2</i>	2.37	rs10976048	0.007	rs1759402	0.011
<i>CTSA</i>	2.36	rs2381567	0.1	ND	ND
<i>FTSJ2</i>	2.35	rs818889	0.035	rs4439184	0.018
<i>ALCAM</i>	2.34	rs10975955	0.015	rs1570507	0.068

<i>BRE</i>	2.34	rs7025832	0.014	rs10119509	0.008
<i>PLEK</i>	2.34	rs10975894	0.018	rs17594512	0.0007
<i>RASA4</i>	2.33	rs10815468	0.051	ND	ND
<i>SRSF3</i>	2.32	rs818876	0.025	rs2224762	0.023
<i>ECD</i>	2.32	rs7873365	0.012	rs7849812	0.009
<i>KAT6B</i>	2.32	rs12380879	0.062	ND	ND
<i>RPS12</i>	2.32	rs7018851	0.031	rs1407862	0.003
<i>IMPDH2</i>	2.32	rs7028357	0.011	rs7860305	0.047
<i>TP53TG1</i>	2.31	rs2224762	0.036	rs16925187	0.007
<i>ETV5</i>	2.31	rs2381566	0.039	rs7022345	0.0004
<i>TAF5L</i>	2.28	rs2381545	0.011	rs818879	0.076
<i>ATP5O</i>	2.28	rs7025832	0.063	ND	ND
<i>RPS26</i>	2.27	rs10975932	0.006	rs2381567	0.008
<i>MAP3K13</i>	2.27	rs1570513	0.0004	rs6477161	0.013
<i>UFD1L</i>	2.26	rs10975955	0.001	rs6477161	0.02
<i>DIMT1</i>	2.26	rs702279	0.0001	rs16925271	0.005
<i>EHMT2</i>	2.25	rs16925271	0.027	rs10976053	0.005
<i>FARSA</i>	2.25	rs10815471	0.024	rs17593759	0.016
<i>EGR2</i>	2.23	rs6477134	0.007	rs10815486	0.026
<i>PNP</i>	2.21	rs10975955	0.005	rs16925027	0.009
<i>ADAT1</i>	2.2	rs818876	0.014	rs12345872	0.038
<i>SPG7</i>	2.2	rs10975954	0.001	rs2381567	0.016
<i>DGKD</i>	2.19	rs2821446	0.003	rs1556100	0.005
<i>RABIF</i>	2.19	rs7033490	0.019	rs1538844	0.003
<i>PTPN22</i>	2.19	rs10975955	0.0003	rs7872232	0.003
<i>TIMM17A</i>	2.18	rs10975955	0.022	rs1538844	0.026
<i>POU2AF1</i>	2.18	rs12345872	0.028	rs16925503	0.01
<i>SPHK2</i>	2.17	rs10975955	0.007	rs10119509	0.042
<i>RBM8A</i>	2.17	rs10975861	0.004	rs10975861	0.012
<i>NARF</i>	2.17	rs6477126	0.004	rs10491780	0.007
<i>DNPH1</i>	2.15	rs4742269	0.062	ND	ND
<i>FZD6</i>	2.15	rs2381530	0.01	rs2224762	0.034
<i>CD53</i>	2.15	rs10975884	0.007	rs6477161	0.005
<i>RPL31</i>	2.15	rs7858552	0.007	rs7872232	0.005
<i>NDUFB6</i>	2.15	rs818876	0.011	rs912207	0.002
<i>EIF2B2</i>	2.11	rs17593759	0.006	rs6477161	0.021
<i>RPL37</i>	2.1	rs10975856	0.012	rs7033490	0.02
<i>ETHE1</i>	2.1	rs7025832	0.026	rs10976050	0.002
<i>HRAS</i>	2.09	rs10975835	0.015	rs7872232	0.0009
<i>CNR2</i>	2.08	rs16925200	0.012	rs7034275	0.021
<i>RAB33A</i>	2.05	rs7025832	0.005	rs2224762	0.01
<i>AIP</i>	2.03	rs1570507	0.033	rs12685394	0.003

ND=test not done

Supplemental Table 2: Target gene expression changes in primary fibroblasts following *KDM4C* knockdown

Gene	Linkage Maximum t-value	Controls		<i>KDM4C</i> knockdown		
		shNT1	shNT2	sh1	sh2	sh3
<i>H3F3B</i>	5.73	14.12	14.33	13.90	13.90	14.14
<i>MEF2C</i>	5.72	8.70	8.64	7.95	8.96	8.42
<i>ZBTB25</i>	5.49	7.32	7.09	7.10	7.38	7.17
<i>HDAC1</i>	5.47	12.26	12.34	12.00	11.81	12.09
<i>KXD1</i>	5.34	10.45	10.96	10.76	10.36	10.91
<i>ACAA1</i>	5.33	10.61	11.03	11.21	10.87	10.82
<i>NFE2L3</i>	5.29	9.94	8.63	9.16	8.80	7.99
<i>PSMC2</i>	5.27	13.47	13.70	13.28	13.54	13.46
<i>DDX42</i>	5.22	10.68	10.51	10.76	10.65	10.56
<i>CYCS</i>	5.22	14.27	14.20	13.57	13.98	13.86
<i>DNTTIP2</i>	5.02	11.68	11.71	11.26	11.45	11.48
<i>H2AFV</i>	4.83	13.06	12.75	11.20	12.22	12.25
<i>RNMT</i>	4.82	9.35	9.05	9.94	9.35	9.48
<i>RRP7A</i>	4.82	8.75	8.96	7.79	8.31	8.81
<i>NME1</i>	4.7	13.09	13.25	12.91	13.40	13.40
<i>CLTA</i>	4.66	13.13	13.02	13.13	13.08	13.31
<i>FILIP1L</i>	4.64	12.10	11.41	11.69	11.36	11.03
<i>AIMP2</i>	4.48	11.25	11.52	10.64	11.09	11.12
<i>MAP3K5</i>	4.47	10.13	9.88	8.75	9.11	9.64
<i>NOP2</i>	4.44	9.68	9.26	8.76	9.24	9.12
<i>MYBBP1A</i>	4.43	9.40	9.15	9.44	9.28	9.56
<i>ATP6V0E2</i>	4.43	10.09	10.03	9.58	9.49	9.72
<i>CROT</i>	4.4	10.13	10.45	9.84	10.00	9.73
<i>GYG1</i>	4.4	12.67	12.48	12.57	12.67	13.16
<i>HMGCL</i>	4.39	10.09	10.05	10.56	9.94	10.23
<i>TIMM8B</i>	4.37	12.47	12.20	12.44	12.43	12.19
<i>NUDT1</i>	4.36	8.22	8.88	7.01	7.95	8.86
<i>EZH1</i>	4.32	8.75	8.73	9.69	8.82	9.30
<i>FCER1G</i>	4.21	5.64	5.97	6.88	6.74	6.63
<i>TRA2B</i>	4.21	13.98	13.81	13.34	13.58	13.70
<i>SMARCE1</i>	4.19	12.67	12.51	12.72	12.68	12.49
<i>RBPJ</i>	4.18	11.63	10.67	11.93	11.21	11.25
<i>NCK1</i>	4.15	9.82	9.56	9.73	9.91	9.70
<i>ATP2A2</i>	4.13	13.08	12.99	12.66	13.15	13.58
<i>IRAK4</i>	4.07	7.43	7.22	8.01	7.78	7.94
<i>ERH</i>	4.05	14.18	14.27	13.97	14.10	14.18
<i>SRP19</i>	3.98	12.63	12.32	12.32	12.71	12.29
<i>NSF</i>	3.94	11.57	11.82	11.68	11.80	11.82
<i>SSBP1</i>	3.92	13.19	12.92	13.21	13.18	13.20
<i>GNAS</i>	3.92	8.26	8.14	6.46	6.84	7.88
<i>PRPS1</i>	3.9	10.69	10.59	9.28	9.51	10.86
<i>INTS6</i>	3.88	9.75	9.30	9.26	9.35	9.50
<i>C20orf24</i>	3.87	13.20	13.36	13.00	13.22	13.13
<i>HSP90AA1</i>	3.85	14.62	14.97	14.41	14.67	14.90
<i>ZNF141</i>	3.83	6.30	6.13	5.69	5.67	6.09
<i>MAP2K4</i>	3.83	10.12	10.28	9.96	9.91	10.10
<i>KHSRP</i>	3.82	12.12	12.11	11.64	11.86	12.16
<i>DYRK1A</i>	3.81	12.29	11.81	11.89	11.69	11.74
<i>DBT</i>	3.81	7.77	7.20	8.15	7.84	7.33

<i>PPM1G</i>	3.81	9.83	10.57	8.75	9.76	10.39
<i>BCKDHA</i>	3.8	8.47	9.04	8.10	8.93	9.62
<i>HNRNPM</i>	3.79	13.11	12.81	11.60	12.37	12.63
<i>HIPK2</i>	3.79	7.16	6.33	7.79	7.90	7.32
<i>ICT1</i>	3.79	10.75	10.95	10.19	10.68	10.91
<i>USP8</i>	3.77	10.56	10.31	10.33	10.47	10.20
<i>MTCH1</i>	3.77	13.61	13.61	13.56	13.65	13.68
<i>BTG1</i>	3.77	12.44	12.51	12.72	12.37	11.92
<i>TRIB3</i>	3.77	9.91	9.52	10.98	10.58	11.06
<i>NDUFS1</i>	3.77	11.41	11.57	10.61	11.43	11.31
<i>LARP1</i>	3.76	13.49	13.38	13.41	13.37	13.43
<i>EIF2B3</i>	3.73	10.08	10.07	9.53	9.91	10.35
<i>EID1</i>	3.72	13.47	12.95	13.28	13.20	12.96
<i>TNFAIP1</i>	3.69	10.64	10.74	10.93	10.75	11.04
<i>LINC00094</i>	3.68	9.78	9.80	10.17	9.71	10.04
<i>VCP</i>	3.67	12.86	12.91	12.33	12.60	12.50
<i>TMEM59</i>	3.67	12.57	13.13	13.59	13.35	13.31
<i>BUB1</i>	3.66	11.74	11.67	7.09	10.06	9.93
<i>POP7</i>	3.65	10.60	10.97	10.11	10.43	10.72
<i>UAP1</i>	3.64	13.55	12.91	13.06	13.08	13.04
<i>EIF3D</i>	3.63	12.65	12.82	13.13	12.64	13.06
<i>DDX17</i>	3.63	9.41	10.28	9.97	10.05	10.59
<i>TRIM28</i>	3.63	11.69	12.08	11.14	11.61	12.37
<i>CCNB1IP1</i>	3.62	10.24	10.64	11.26	11.05	11.41
<i>CNPY3</i>	3.61	8.78	8.75	8.86	8.63	9.10
<i>ADD3</i>	3.59	11.66	11.91	13.63	12.96	11.96
<i>NXF1</i>	3.57	9.81	10.13	9.52	10.00	9.90
<i>TMEM258</i>	3.54	12.90	13.35	13.74	13.39	13.42
<i>USP16</i>	3.53	11.86	11.82	11.39	11.56	11.52
<i>EHHADH</i>	3.53	8.25	6.84	7.66	7.75	7.73
<i>HARS</i>	3.5	11.63	11.50	11.06	11.48	11.38
<i>GPALPP1</i>	3.5	9.34	8.94	8.48	8.63	8.76
<i>DDX10</i>	3.49	10.34	10.53	9.81	10.45	10.73
<i>BCL2</i>	3.49	6.55	6.71	5.97	6.44	5.67
<i>EXTL3</i>	3.49	9.07	9.31	8.42	8.79	8.60
<i>PMM2</i>	3.49	9.64	10.28	9.74	9.82	10.02
<i>CDC5L</i>	3.46	11.45	11.17	10.80	11.05	10.97
<i>ZNF217</i>	3.46	11.96	11.46	11.23	11.00	11.24
<i>BIRC5</i>	3.45	12.43	12.45	7.56	11.12	11.24
<i>MRT04</i>	3.43	10.87	11.20	9.92	10.43	10.90
<i>SPAG9</i>	3.43	11.68	11.13	10.85	10.96	10.82
<i>ZMPSTE24</i>	3.42	12.90	12.92	12.57	12.83	12.59
<i>PEX3</i>	3.42	10.73	10.18	10.66	10.50	10.02
<i>POLR1E</i>	3.41	10.16	9.99	10.29	9.91	10.18
<i>RAB40B</i>	3.41	9.69	9.85	10.77	10.08	9.97
<i>CCNG2</i>	3.4	10.60	10.57	12.14	11.30	11.00
<i>EIF3H</i>	3.39	13.07	13.33	13.81	13.45	13.69
<i>DKC1</i>	3.39	11.93	12.10	11.10	11.62	11.83
<i>BET1</i>	3.38	10.81	10.69	11.18	11.21	10.98
<i>NUP98</i>	3.37	9.90	9.89	8.95	9.62	9.39
<i>HDGF</i>	3.36	12.91	13.53	12.29	12.79	13.29
<i>CTPS1</i>	3.35	11.03	10.74	8.98	10.18	10.22

<i>DNAJA1</i>	3.34	12.40	12.41	12.13	12.42	12.47
<i>HNRNPA3</i>	3.32	13.75	13.70	12.41	13.09	13.56
<i>CPSF6</i>	3.31	11.99	11.62	11.18	11.78	11.66
<i>ZNF259</i>	3.31	9.60	9.84	9.78	9.48	10.01
<i>NBL1</i>	3.31	11.85	12.48	12.14	11.61	11.39
<i>NAMPT</i>	3.31	11.42	10.97	11.33	10.78	10.00
<i>VLDLR</i>	3.31	8.15	8.06	10.61	9.20	9.74
<i>HLA-F</i>	3.31	6.67	6.70	5.98	5.91	5.95
<i>HNRNPA2B1</i>	3.3	15.05	14.27	13.17	14.09	14.07
<i>CLK3</i>	3.29	9.06	9.29	9.35	9.45	9.58
<i>VPS4A</i>	3.28	10.76	10.75	10.33	10.44	10.46
<i>CACYBP</i>	3.28	12.53	12.08	10.86	11.62	11.75
<i>EI24</i>	3.28	11.71	10.85	11.11	11.21	10.88
<i>SP100</i>	3.27	10.79	10.38	10.96	10.85	11.02
<i>MYC</i>	3.27	12.27	11.10	9.79	10.69	10.54
<i>UBE2L3</i>	3.27	13.18	13.29	12.80	13.02	13.00
<i>SOD1</i>	3.26	13.79	13.92	14.02	13.76	14.03
<i>SRSF6</i>	3.25	12.12	12.00	11.95	11.90	12.14
<i>IFNGR2</i>	3.25	11.57	11.71	11.85	11.78	11.39
<i>ODC1</i>	3.24	13.47	13.67	13.22	12.34	12.75
<i>CDK7</i>	3.24	10.86	11.05	11.21	10.94	11.81
<i>TBL1X</i>	3.24	10.67	11.47	10.74	11.04	11.22
<i>TAX1BP1</i>	3.23	11.86	12.62	12.85	12.58	12.77
<i>SARS</i>	3.23	11.68	11.87	12.79	12.54	12.96
<i>ZKSCAN5</i>	3.23	8.29	8.62	7.97	8.26	8.25
<i>SCAF11</i>	3.23	11.53	11.40	11.53	11.85	11.50
<i>NR2C2</i>	3.23	7.38	8.49	6.94	7.49	7.90
<i>PSMC4</i>	3.22	11.37	11.43	11.09	11.22	11.33
<i>IDS</i>	3.22	10.43	10.24	10.60	10.17	10.27
<i>SRP72</i>	3.22	12.64	12.60	12.19	12.40	12.51
<i>COX7C</i>	3.21	10.14	10.20	11.00	10.58	10.38
<i>TPP2</i>	3.2	11.30	10.75	10.86	10.35	10.63
<i>DDX41</i>	3.18	10.35	10.70	10.37	10.17	10.76
<i>TFAM</i>	3.18	8.60	9.09	8.01	8.73	8.77
<i>STX7</i>	3.18	7.54	7.50	7.81	7.58	7.62
<i>SEPHS1</i>	3.17	10.28	10.40	9.88	10.41	10.39
<i>RGS10</i>	3.16	11.31	11.77	12.21	11.46	11.55
<i>P4HA1</i>	3.15	11.55	11.60	14.07	13.12	12.66
<i>HNRNPD</i>	3.15	13.43	12.45	11.86	12.44	12.52
<i>FAM60A</i>	3.14	8.92	8.62	9.34	9.64	9.35
<i>PELI1</i>	3.13	8.16	7.43	7.73	8.37	8.39
<i>SLC25A13</i>	3.12	9.93	9.21	8.17	8.86	9.00
<i>DUSP1</i>	3.1	12.44	12.82	12.95	12.51	12.30
<i>HN1</i>	3.1	12.66	12.76	11.31	11.94	11.92
<i>ATP2C1</i>	3.09	10.33	9.84	10.11	10.25	9.31
<i>KIF20B</i>	3.09	11.03	11.25	7.29	9.84	9.34
<i>ATXN3</i>	3.08	8.36	8.53	8.62	8.67	8.73
<i>UQCRCF1</i>	3.08	13.47	13.96	13.20	13.61	13.98
<i>ARF4</i>	3.08	14.24	14.37	14.72	14.51	14.66
<i>ID3</i>	3.07	13.55	13.51	10.43	11.83	11.29
<i>APBB1</i>	3.06	7.01	7.29	7.91	7.90	8.50
<i>RPL11</i>	3.05	14.72	14.95	15.43	15.09	15.24

<i>RAB11A</i>	3.05	12.93	12.99	12.96	13.03	13.01
<i>GAK</i>	3.05	10.78	11.06	10.69	10.63	10.78
<i>AK4</i>	3.05	6.99	6.44	11.05	8.61	8.23
<i>CELF1</i>	3.04	9.68	9.90	10.21	9.96	10.50
<i>WBP5</i>	3.04	13.66	12.74	13.96	13.73	13.19
<i>RAB8A</i>	3.04	11.63	11.76	11.16	11.21	11.45
<i>HCCS</i>	3.03	10.73	10.44	10.54	10.56	10.13
<i>MTIF2</i>	3.03	11.04	11.11	10.84	10.73	10.95
<i>NCKIPSD</i>	3.03	8.85	9.25	9.64	9.22	9.33
<i>SRCAP</i>	3.02	8.00	7.74	7.75	7.53	6.96
<i>C11orf58</i>	3.01	13.54	13.29	13.60	13.40	13.39
<i>SRRT</i>	3.01	12.31	12.17	11.08	11.75	11.71
<i>PPOX</i>	3.01	8.75	8.57	8.61	8.53	8.52
<i>H2AFY</i>	3	13.25	13.14	12.46	12.78	12.79
<i>MTMR4</i>	3	9.68	8.95	9.27	9.42	9.21
<i>ECHS1</i>	3	12.11	12.60	12.18	12.33	12.49
<i>POLI</i>	3	9.19	9.14	10.03	9.53	9.60
<i>HMBS</i>	2.99	10.36	10.36	9.27	10.14	10.39
<i>MBOAT7</i>	2.99	11.17	11.90	11.18	11.26	11.25
<i>RNF103</i>	2.99	10.24	10.33	11.23	10.62	10.65
<i>CAPG</i>	2.98	9.52	9.88	9.34	9.63	9.13
<i>CAV1</i>	2.97	14.15	14.39	14.59	14.44	14.52
<i>ALDOC</i>	2.95	8.13	8.18	10.19	9.29	9.27
<i>PCYT1A</i>	2.95	8.55	9.10	9.33	9.11	9.12
<i>TUBB4B</i>	2.95	14.36	14.46	13.25	13.92	14.00
<i>ITGA3</i>	2.94	9.79	10.28	9.29	9.09	9.44
<i>ERAP1</i>	2.94	7.79	8.46	7.71	7.91	7.99
<i>PSMD13</i>	2.94	11.34	11.41	10.92	11.24	11.35
<i>VEGFA</i>	2.93	9.77	9.68	12.33	10.67	11.89
<i>MID2</i>	2.93	8.73	8.57	8.52	8.31	8.56
<i>DHFR</i>	2.93	11.12	10.45	8.44	10.01	9.82
<i>ECI2</i>	2.92	11.66	11.99	11.58	11.78	11.87
<i>RAE1</i>	2.92	11.62	11.43	10.86	11.02	10.80
<i>KLF3</i>	2.92	7.82	7.91	8.09	7.66	7.97
<i>LITAF</i>	2.91	11.78	12.49	12.91	12.72	11.20
<i>EZR</i>	2.91	12.46	12.27	10.71	11.43	11.68
<i>SKAP2</i>	2.91	9.65	8.82	10.36	9.77	9.34
<i>DDX58</i>	2.91	7.50	7.09	6.88	7.51	7.23
<i>UGCG</i>	2.91	10.66	10.08	11.89	10.66	11.40
<i>HMOX2</i>	2.9	10.08	10.17	9.86	10.19	10.03
<i>CINP</i>	2.89	8.74	8.89	8.69	8.79	8.66
<i>STK19</i>	2.89	9.84	9.47	10.17	9.85	10.09
<i>SLC7A5P2</i>	2.89	8.98	8.55	8.77	8.64	8.69
<i>ZNF593</i>	2.88	9.94	10.14	10.11	10.20	10.45
<i>CAPZA1</i>	2.87	14.41	14.19	14.55	14.36	14.04
<i>CDKN1B</i>	2.86	12.16	11.49	11.98	12.01	11.47
<i>PSMA4</i>	2.86	13.30	13.22	12.73	13.25	13.12
<i>ZNF137P</i>	2.85	6.70	6.43	5.10	6.27	6.23
<i>RNASET2</i>	2.83	10.09	10.66	11.50	10.33	10.41
<i>SOD2</i>	2.83	10.04	8.72	10.47	9.69	8.56
<i>IARS</i>	2.82	13.47	13.38	13.98	13.78	14.24
<i>ING2</i>	2.82	10.16	10.59	9.60	10.17	10.18

<i>DNM1L</i>	2.82	10.11	10.05	9.90	9.84	9.95
<i>DNAJC15</i>	2.81	12.98	13.16	12.72	12.60	13.26
<i>PGK1</i>	2.81	13.89	14.10	15.11	14.35	14.36
<i>ADK</i>	2.81	11.35	8.51	8.69	9.54	7.88
<i>DDX39A</i>	2.77	12.65	12.82	9.58	11.95	12.15
<i>HNRNPR</i>	2.77	14.08	13.85	13.06	13.73	13.50
<i>TPT1</i>	2.77	14.98	15.32	15.84	15.41	15.84
<i>SQSTM1</i>	2.76	8.70	8.64	9.86	8.65	9.06
<i>CLDND1</i>	2.75	10.33	10.08	10.47	10.33	9.90
<i>CNN3</i>	2.75	12.98	12.88	13.33	13.37	13.32
<i>SOS2</i>	2.74	9.89	9.82	10.30	10.08	9.75
<i>ARHGDIB</i>	2.73	7.93	9.85	7.79	7.83	5.89
<i>GOLGA4</i>	2.73	11.89	10.98	10.96	11.28	10.86
<i>GABARAP</i>	2.73	13.43	13.62	14.55	14.10	14.38
<i>FASTK</i>	2.72	10.19	10.29	9.79	10.16	9.80
<i>MSRB1</i>	2.72	10.57	10.69	10.66	10.63	10.86
<i>TGFB1I1</i>	2.72	12.87	13.17	13.11	13.06	13.84
<i>BAZ1A</i>	2.71	10.75	10.35	9.63	10.57	10.39
<i>HSD17B4</i>	2.71	11.24	10.96	11.28	11.47	11.44
<i>AAAS</i>	2.71	8.59	9.35	8.52	9.06	9.55
<i>ARF3</i>	2.7	11.38	11.51	11.41	11.26	11.73
<i>ENO1</i>	2.7	14.60	14.41	14.58	14.22	14.73
<i>KRR1</i>	2.7	10.50	10.95	10.33	10.78	10.41
<i>SCAMP3</i>	2.7	11.40	11.56	11.10	11.45	11.41
<i>ZNF384</i>	2.7	9.41	9.71	9.58	9.70	9.77
<i>TOR3A</i>	2.69	10.47	9.89	9.65	9.69	9.70
<i>MAGED1</i>	2.69	13.34	13.53	14.14	14.05	13.91
<i>TYK2</i>	2.69	9.40	9.44	9.05	9.23	9.43
<i>TRIM33</i>	2.69	9.79	10.77	10.28	10.26	10.56
<i>G3BP1</i>	2.69	13.33	12.90	12.27	12.94	12.96
<i>RAD54B</i>	2.68	9.66	9.22	6.74	8.49	7.60
<i>ATP7A</i>	2.66	7.85	8.03	8.70	8.66	7.87
<i>PBX3</i>	2.66	11.42	11.55	10.53	10.98	11.30
<i>BTN3A3</i>	2.66	10.30	10.51	10.30	10.76	10.30
<i>RPL28</i>	2.66	14.73	15.03	15.54	15.19	15.49
<i>AURKA</i>	2.66	12.40	12.89	8.84	11.55	11.04
<i>CAPZB</i>	2.66	13.51	13.60	13.78	13.48	13.63
<i>MRPL40</i>	2.65	11.53	11.77	11.61	11.82	11.96
<i>CYB5R3</i>	2.64	13.96	14.07	14.61	13.97	14.35
<i>SEL1L</i>	2.64	11.59	11.13	12.16	11.64	11.46
<i>CORO1C</i>	2.63	13.60	13.74	12.99	13.28	13.83
<i>DCXR</i>	2.62	10.77	11.53	11.04	11.19	11.53
<i>CSTF1</i>	2.62	9.21	8.48	8.78	9.12	8.08
<i>STX8</i>	2.62	10.82	10.93	11.40	11.06	11.41
<i>H3F3A</i>	2.61	14.73	15.04	15.15	14.97	15.21
<i>FKBP1A</i>	2.61	12.87	13.08	13.08	12.91	13.52
<i>HSPA13</i>	2.61	11.15	10.94	10.96	11.18	10.56
<i>MRPL3</i>	2.6	13.66	13.45	13.20	13.47	13.48
<i>DUS4L</i>	2.6	8.53	8.20	8.26	8.31	8.42
<i>FRG1</i>	2.59	10.84	10.95	11.02	11.05	11.01
<i>LZTR1</i>	2.59	9.06	9.33	9.22	9.61	9.92
<i>DCK</i>	2.59	10.94	10.55	9.49	10.32	10.11

<i>POLB</i>	2.59	10.80	10.64	10.49	11.03	10.60
<i>STIP1</i>	2.56	11.22	11.31	10.41	10.58	10.93
<i>SLC25A14</i>	2.55	9.13	9.10	8.84	9.07	8.84
<i>DCTN6</i>	2.54	11.32	11.64	11.75	11.56	11.64
<i>NOL7</i>	2.54	12.95	12.63	12.36	12.45	12.55
<i>SLC25A12</i>	2.54	11.38	8.72	8.65	9.31	9.04
<i>FSTL3</i>	2.54	9.62	10.28	9.28	8.86	10.38
<i>COPS2</i>	2.54	12.63	12.68	12.83	12.77	12.74
<i>HINT1</i>	2.54	13.86	13.95	14.08	13.98	13.70
<i>KEAP1</i>	2.54	10.23	10.89	10.38	10.36	10.64
<i>MRS2</i>	2.53	8.95	8.84	8.97	8.81	8.60
<i>RPS4X</i>	2.52	14.77	15.03	15.61	15.17	15.52
<i>ADAM9</i>	2.52	14.08	13.64	14.64	14.19	14.12
<i>TBL2</i>	2.52	11.74	11.97	11.91	11.52	11.61
<i>WBSCR22</i>	2.52	10.94	11.04	11.09	10.97	10.97
<i>GM2A</i>	2.52	7.01	6.62	6.81	6.56	6.83
<i>IL6</i>	2.52	10.26	10.98	11.48	9.55	12.49
<i>HIVEP2</i>	2.51	9.56	9.82	10.49	9.77	9.75
<i>GOLGB1</i>	2.51	10.32	10.21	11.22	10.73	10.91
<i>TNFRSF14</i>	2.5	7.34	7.16	7.41	7.94	7.86
<i>B9D1</i>	2.48	9.41	9.58	9.83	9.93	9.85
<i>SRSF2</i>	2.47	13.54	13.50	12.14	12.86	12.91
<i>TFG</i>	2.46	12.07	12.33	12.50	12.34	12.56
<i>SNAPC3</i>	2.46	10.10	9.75	9.43	9.86	9.25
<i>TOP2B</i>	2.46	12.80	12.06	12.40	12.29	12.31
<i>ATG5</i>	2.45	9.92	10.02	9.27	9.75	10.03
<i>SDCBP</i>	2.45	13.73	13.30	13.95	13.62	13.16
<i>KIF11</i>	2.45	11.97	11.79	7.32	10.50	10.28
<i>SLBP</i>	2.44	12.92	12.64	11.95	12.26	12.11
<i>CLK1</i>	2.44	9.11	8.63	9.48	9.05	9.17
<i>IKBKAP</i>	2.44	11.25	10.89	10.76	10.98	10.79
<i>SHFM1</i>	2.44	12.35	11.73	12.54	12.27	12.26
<i>LBR</i>	2.44	12.14	11.42	10.47	11.52	11.15
<i>YWHAB</i>	2.43	13.42	13.69	13.48	13.62	13.95
<i>ZNF302</i>	2.43	9.47	9.19	9.96	9.68	9.26
<i>GAR1</i>	2.42	11.43	10.95	10.39	10.76	10.64
<i>SNRPE</i>	2.4	13.97	13.89	13.78	13.74	13.90
<i>GNA11</i>	2.4	11.44	12.09	11.11	11.22	11.48
<i>XRCC6</i>	2.4	13.65	13.63	12.95	13.32	13.49
<i>USP6</i>	2.39	9.04	8.18	8.89	8.74	8.66
<i>UQCR11</i>	2.39	13.03	12.79	14.00	13.49	13.08
<i>ARPC5L</i>	2.38	12.18	12.50	11.23	11.81	11.80
<i>TM9SF3</i>	2.38	12.86	12.46	12.62	12.53	12.24
<i>PHTF1</i>	2.38	8.94	8.98	8.73	9.44	9.32
<i>NMI</i>	2.38	11.02	10.87	10.78	10.69	10.82
<i>EGR3</i>	2.37	6.49	7.68	6.92	7.10	5.22
<i>BTN3A2</i>	2.37	9.23	9.83	8.65	9.83	9.42
<i>CTSA</i>	2.36	11.86	11.76	12.65	12.06	12.16
<i>FTSJ2</i>	2.35	11.35	11.37	10.48	10.86	11.02
<i>ALCAM</i>	2.34	13.64	13.77	13.08	13.45	13.41
<i>BRE</i>	2.34	10.14	9.96	10.75	10.24	10.21
<i>RASA4</i>	2.33	8.80	9.07	9.23	8.42	9.49

<i>SRSF3</i>	2.32	12.82	12.16	11.51	12.08	12.03
<i>ECD</i>	2.32	10.05	9.98	9.71	9.86	9.93
<i>KAT6B</i>	2.32	10.43	10.78	11.13	11.10	11.05
<i>RPS12</i>	2.32	14.75	15.27	15.62	15.23	15.70
<i>IMPDH2</i>	2.32	12.85	12.76	13.05	12.74	13.09
<i>TP53TG1</i>	2.31	8.14	8.26	8.73	8.65	8.38
<i>ETV5</i>	2.31	10.10	10.21	10.08	10.40	9.74
<i>TAF5L</i>	2.28	9.73	9.40	9.19	9.26	9.48
<i>ATP5O</i>	2.28	13.63	13.50	13.80	13.94	13.87
<i>RPS26</i>	2.27	14.56	14.83	15.34	14.96	15.13
<i>UFD1L</i>	2.26	12.73	12.74	12.37	12.62	12.59
<i>DIMT1</i>	2.26	9.44	9.66	9.70	9.67	9.47
<i>EHMT2</i>	2.25	8.03	8.32	8.34	8.48	8.88
<i>FARSA</i>	2.25	9.33	8.91	8.75	8.71	8.50
<i>PNP</i>	2.21	9.58	9.90	7.75	8.97	8.00
<i>ADAT1</i>	2.2	9.78	9.63	8.63	9.69	9.24
<i>SPG7</i>	2.2	10.38	10.47	10.16	10.42	10.52
<i>RAB1F</i>	2.19	9.54	9.26	8.64	9.46	9.30
<i>TIMM17A</i>	2.18	13.28	13.41	12.92	13.41	13.33
<i>RBM8A</i>	2.17	10.40	10.35	10.00	10.23	9.94
<i>NARF</i>	2.17	8.63	8.90	9.50	9.31	9.32
<i>DNPH1</i>	2.15	9.90	10.10	10.24	10.04	10.48
<i>FZD6</i>	2.15	11.96	11.04	11.52	11.03	11.42
<i>CD53</i>	2.15	6.84	5.87	7.18	6.53	6.26
<i>RPL31</i>	2.15	9.99	9.90	11.27	10.86	10.59
<i>NDUFB6</i>	2.15	13.15	12.95	12.84	13.11	12.98
<i>EIF2B2</i>	2.11	10.81	10.90	10.05	10.88	10.82
<i>RPL37</i>	2.1	14.71	14.93	15.57	15.15	15.40
<i>ETHE1</i>	2.1	11.29	11.06	11.56	11.46	10.93
<i>HRAS</i>	2.09	11.29	11.68	10.85	11.13	11.35
<i>AIP</i>	2.03	9.29	9.41	9.48	9.65	9.89

Supplemental Table 3: *KDM4C* expression in cancer versus normal tissues

Tissue Type	qRT-PCR				Microarray*		
	<i>KDM4C</i> expression (cancer/normal)	Percentage of cancer samples with higher <i>KDM4C</i> expression than the average of the normal samples	Number of cancer samples	Number of normal samples	<i>KDM4C</i> expression (cancer/normal)	Number of cancer samples	Number of normal samples
Pancreas	2.0	58.8	17	4	1.3	90	61
Kidney	1.7	88.9	18	5	1.1	351	103
Bladder	1.7	86.4	22	2	0.9	55	17
Ovary	1.5	76.2	21	3	1.3	195	26
Liver	1.5	56.3	16	3	1.1	122	51
Adrenal	1.3	50	10	5	1.2	10	5
Cervix	1.2	33.3	9	4	1.3	84	39
Prostate	1.1	66.7	21	5	1.0	460	130
Esophagus	1.1	50	20	3	0.9	29	26
Stomach	1.1	41.7	12	4	0.8	51	45
Lymph Node	0.9	20	15	3	NA	0	0
Uterus	0.9	0	2	3	0.8	22	11
Colon	0.8	30.8	13	7	0.9	337	153
Lung	0.8	21.1	19	4	1.0	336	270
Endometrium	0.7	20	15	2	NA	0	0
Thyroid	0.7	23.5	17	3	1.1	65	46
Breast	0.7	17.4	23	2	1.0	586	328
Testis	0.3	0	19	6	NA	0	0

* (GENT)

Supplemental Table 4: Primers for qRT-PCR, Chromatin Immunoprecipitation, and Cloning
Primers for qRT-PCR:

Gene	Forward:	Reverse:
<i>ATP6VOE2</i>	5'-GGTCATCATCTTCACACGTT-3'	5'-AGCCAGAAGAGGTAACAGCAG-3'
<i>CLTA</i>	5'-TTGATGGAGTAATGAATGGTGAA-3'	5'-GCTGCATAACTGTCTGTTGGA-3'
<i>GYG1</i>	5'-CTGAAACAGCACAGGACCAC-3'	5'-AATCGCCACTGTCCAAGAC-3'
<i>H2AFV</i>	5'-CAATCCGTGGTGATGAAGAG-3'	5'-GCTGTCCCTTCTTTCCAATC-3'
<i>H3F3B</i>	5'-GTGCTGGTTTTTCGCTCGT-3'	5'-CCATTTTCTTTCACCCAACG-3'
<i>HRAS</i>	5'-GCCATCAACAACACCAAGTC-3'	5'-GAGTCCTTCACCCGTTTGAT-3'
<i>KDM4C</i>	5'-TGGATCCCAGATAGCAATGA-3'	5'-TGTCTTCAAATCGCATGTCA-3'
<i>MAP3K5</i>	5'-TCATAACATCAAGCCGCACT-3'	5'-AGATGCAAGGCTGAAATGTG-3'
<i>MYC</i>	5'-AGCTGCTTAGACGCTGGATT-3'	5'-TCCTGTTGGTGAAGCTAACG-3'
<i>NCK1</i>	5'-TGCTCGGAAAGCATCTATTG-3'	5'-AGATGCAGAATCTGGCACAC-3'
<i>NDUFA4</i>	5'-TCTCCTTTCCAGTCGGAGA-3'	5'-TGCCAGACGCAAGAGATACA-3'
<i>PDIA6</i>	5'-TTGTAGATGCTGCGCTGAGT-3'	5'-GCTGTCGTCTGTCAGCTCAA-3'
<i>RNASET2</i>	5'-GCCAGAAATGAGGGCATACT-3'	5'-ATGCTTTTCCCACTCATGCT-3'
<i>RNMT</i>	5'-GAATTTATAACTGCTGACAGCTCAA-3'	5'-AAACACATTTGTGGGTCACG-3'
<i>RPS6</i>	5'-CAGAATCCGCAAACTTTTCA-3'	5'-GAATCTTGGGTGCTTTGGTC-3'
<i>RRP7A</i>	5'-GACAAGGCACCAAGTCCAC-3'	5'-GGGACAGGCTCTCCTCTGT-3'
<i>SQSTM1</i>	5'-AAGAACGTTGGGGAGAGTGT-3'	5'-TCTGTGCTGGAAGTCTCTGG-3'
<i>TRA2B</i>	5'-CAGCAGTCTAGGCGTTCAAG-3'	5'-GGCACGTTCTTTAGCTTCCT-3'
<i>ZBTB25</i>	5'-CAGTGCTTGCTGCTTTTTTCT-3'	5'-TGTCAGTTGGTTGTATTTTTATGC-3'

Primers for ChIP:

Amplified region	Forward:	Reverse:
Non-promoter control	5'-TTCTTGAGTTTGGCATGAAAGA-3'	5'-TCTTAATCCAGCATTGGCAGT-3'
<i>CLTA</i> promoter	5'-ACCCAGTCACGAGTTGTTT-3'	5'-AGGGAACAACCAATCAGAGG-3'
<i>H3F3B</i> promoter	5'-GTCGGAGAAGTGGCCTAAAA-3'	5'-AACGGTTGGCAGAACCTG-3'
<i>MEF2C</i> promoter	5'-GGCCATCAGACACTTGGAAT-3'	5'-TCAGTCTCCCCCTAGCTTGA-3'
<i>MYC</i> promoter	5'-CAGTGCGTTCTCGGTGTG-3'	5'-TCTCCCTTTCTCTGCTGCTC-3'
<i>RNMT</i> promoter	5'-CACGTCGGGACTCGTAGTT-3'	5'-GCGTGTCTGCTTACGTCACT-3'
<i>RPS6</i> promoter	5'-AGACTACCACCACTGGCACA-3'	5'-GAAGTACGGGATAGCGGAAG-3'
<i>RRP7A</i> promoter	5'-GACAGCATTTCCAAGAAGCA-3'	5'-CAAAGGGCCTCTCAGACTGT-3'
<i>TRA2B</i> promoter	5'-GCGTCACATCCGGTAGAGT-3'	5'-CAACCTCTTGACCTTCCTT-3'
<i>ZBTB25</i> promoter	5'-CACACCCTGGGGAAAGTC-3'	5'-TGTGACTCTGTAGGCGGAAG-3'

Primers for Cloning:

Amplified region	Forward:	Reverse:
<i>KDM4C</i> ORF	5'-CACCATGGAGGTGGCCGAGGTGGAAGTCCTCTGA-3'	5'-CTGTCTCTTCTGGCACTTCTTC-3'
Enhancer region	5'-TAACTCGAGCAGCATCTAATGCAGCCTGT-3'	5'-TAACCTAGGAAATCCTCTGCCCAGAAAA-3'

Supplemental Table 5: Expressed genes within the linkage peak regions of 391 gene expression phenotypes

Gene	Linkage Peak Chr	Max t-value	Linkage Peak Size (Mb)	Expressed Genes in Linkage Region
<i>H3F3B</i>	9	5.73	24	29
<i>MEF2C</i>	9	5.72	19	22
<i>ZBTB25</i>	9	5.49	22	29
<i>HDAC1</i>	9	5.47	8	20
<i>KXD1</i>	9	5.34	16	22
<i>ACAA1</i>	9	5.33	6	19
<i>NFE2L3</i>	9	5.29	26	26
<i>PSMC2</i>	9	5.27	25	29
<i>DDX42</i>	9	5.22	26	29
<i>CYCS</i>	9	5.22	25	29
<i>DNTTIP2</i>	9	5.02	9	20
<i>RLN2</i>	9	4.87	20	28
<i>H2AFV</i>	9	4.83	20	25
<i>RNMT</i>	9	4.82	18	22
<i>RRP7A</i>	9	4.82	9	20
<i>NME1</i>	9	4.7	6	19
<i>CLTA</i>	9	4.66	9	20
<i>FILIP1L</i>	9	4.64	24	29
<i>STAT5A</i>	9	4.59	17	22
<i>AIMP2</i>	9	4.48	30	30
<i>MAP3K5</i>	9	4.47	17	24
<i>NOP2</i>	9	4.44	11	16
<i>MYBBP1A</i>	9	4.43	17	21
<i>ATP6V0E2</i>	9	4.43	27	30
<i>SELL</i>	9	4.43	9	19
<i>CROT</i>	9	4.4	11	20
<i>GYG1</i>	9	4.4	18	22
<i>HMGCL</i>	9	4.39	23	21
<i>TIMM8B</i>	9	4.37	8	20
<i>NUDT1</i>	9	4.36	27	30
<i>EZH1</i>	9	4.32	14	21
<i>FYB</i>	9	4.31	5	16

<i>FCER1G</i>	9	4.21	8	19
<i>TRA2B</i>	9	4.21	27	30
<i>SMARCE1</i>	9	4.19	9	20
<i>RBPJ</i>	9	4.18	8	20
<i>NCK1</i>	9	4.15	8	20
<i>TM6SF1</i>	9	4.14	7	19
<i>ATP2A2</i>	9	4.13	16	22
<i>IRAK4</i>	9	4.07	17	20
<i>ERH</i>	9	4.05	27	30
<i>SRP19</i>	9	3.98	11	19
<i>NSF</i>	9	3.94	13	20
<i>SSBP1</i>	9	3.92	9	20
<i>GNAS</i>	9	3.92	22	29
<i>PRPS1</i>	9	3.9	9	20
<i>DARC</i>	9	3.89	11	21
<i>INTS6</i>	9	3.88	8	20
<i>C20orf24</i>	9	3.87	22	28
<i>HSP90AA1</i>	9	3.85	14	20
<i>ZNF141</i>	9	3.83	17	20
<i>MAP2K4</i>	9	3.83	19	28
<i>KHSRP</i>	9	3.82	8	20
<i>DYRK1A</i>	9	3.81	9	8
<i>DBT</i>	9	3.81	11	19
<i>PPM1G</i>	9	3.81	8	20
<i>BCKDHA</i>	9	3.8	14	21
<i>HNRNPM</i>	9	3.79	28	21
<i>HIPK2</i>	9	3.79	15	12
<i>ICT1</i>	9	3.79	8	20
<i>USP8</i>	9	3.77	18	25
<i>MTCH1</i>	9	3.77	8	20
<i>BTG1</i>	9	3.77	4	12
<i>TRIB3</i>	9	3.77	8	12
<i>NDUFS1</i>	9	3.77	9	20
<i>LARP1</i>	9	3.76	8	19
<i>EIF2B3</i>	9	3.73	8	19
<i>EID1</i>	9	3.72	9	19
<i>TNFAIP1</i>	9	3.69	6	19

<i>LINC00094</i>	9	3.68	9	19
<i>VCP</i>	9	3.67	15	21
<i>TMEM59</i>	9	3.67	23	22
<i>BUB1</i>	9	3.66	11	19
<i>POP7</i>	9	3.65	8	20
<i>UAP1</i>	9	3.64	8	19
<i>EIF3D</i>	9	3.63	7	19
<i>DDX17</i>	9	3.63	5	16
<i>TRIM28</i>	9	3.63	8	19
<i>CCNB1IP1</i>	9	3.62	19	16
<i>CNPY3</i>	9	3.61	10	19
<i>GIT2</i>	9	3.6	24	25
<i>ADD3</i>	9	3.59	8	20
<i>NXF1</i>	9	3.57	9	20
<i>TMEM258</i>	9	3.54	9	20
<i>USP16</i>	9	3.53	8	20
<i>EHHADH</i>	9	3.53	8	20
<i>HARS</i>	9	3.5	8	20
<i>GPALPP1</i>	9	3.5	9	20
<i>APOL2</i>	9	3.49	11	19
<i>DDX10</i>	9	3.49	6	12
<i>BCL2</i>	9	3.49	7	20
<i>EXTL3</i>	9	3.49	12	19
<i>PMM2</i>	9	3.49	16	21
<i>MFNG</i>	9	3.48	10	19
<i>CD80</i>	9	3.47	10	20
<i>CDC5L</i>	9	3.46	8	12
<i>ZNF217</i>	9	3.46	19	21
<i>BIRC5</i>	9	3.45	8	19
<i>MRT04</i>	9	3.43	9	19
<i>SPAG9</i>	9	3.43	8	19
<i>ZMPSTE24</i>	9	3.42	26	13
<i>PEX3</i>	9	3.42	6	19
<i>POLR1E</i>	9	3.41	27	30
<i>RAB40B</i>	9	3.41	8	12
<i>CCNG2</i>	9	3.4	28	24
<i>EIF3H</i>	9	3.39	11	19

<i>DKC1</i>	9	3.39	11	20
<i>BET1</i>	9	3.38	5	16
<i>NUP98</i>	9	3.37	7	7
<i>HDGF</i>	9	3.36	8	20
<i>CTPS1</i>	9	3.35	14	8
<i>DNAJA1</i>	9	3.34	20	27
<i>HNRNPA3</i>	9	3.32	6	19
<i>CPSF6</i>	9	3.31	6	19
<i>ZNF259</i>	9	3.31	11	19
<i>NBL1</i>	9	3.31	10	20
<i>NAMPT</i>	9	3.31	9	20
<i>VLDLR</i>	9	3.31	9	20
<i>HLA-F</i>	9	3.31	25	29
<i>IL32</i>	9	3.3	9	20
<i>HNRNPA2B1</i>	9	3.3	8	20
<i>CLK3</i>	9	3.29	16	11
<i>VPS4A</i>	9	3.28	17	16
<i>CACYBP</i>	9	3.28	9	19
<i>EI24</i>	9	3.28	11	20
<i>SP100</i>	9	3.27	7	19
<i>MYC</i>	9	3.27	11	17
<i>UBE2L3</i>	9	3.27	7	3
<i>SOD1</i>	9	3.26	6	19
<i>SIT1</i>	9	3.26	8	19
<i>SRSF6</i>	9	3.25	16	15
<i>IFNGR2</i>	9	3.25	8	20
<i>ODC1</i>	9	3.24	8	20
<i>CDK7</i>	9	3.24	10	20
<i>TBL1X</i>	9	3.24	5	16
<i>TAX1BP1</i>	9	3.23	8	20
<i>SARS</i>	9	3.23	8	20
<i>ZKSCAN5</i>	9	3.23	8	19
<i>SCAF11</i>	9	3.23	5	12
<i>NR2C2</i>	9	3.23	8	20
<i>PSMC4</i>	9	3.22	25	29
<i>IDS</i>	9	3.22	8	20
<i>SRP72</i>	9	3.22	6	19

<i>COX7C</i>	9	3.21	13	20
<i>RUNX3</i>	9	3.21	6	19
<i>TPP2</i>	9	3.2	9	20
<i>DDX41</i>	9	3.18	6	19
<i>TFAM</i>	9	3.18	9	20
<i>STX7</i>	9	3.18	7	19
<i>CYTIP</i>	9	3.18	5	16
<i>SEPHS1</i>	9	3.17	9	19
<i>RGS10</i>	9	3.16	19	27
<i>MAP2K6</i>	9	3.16	17	21
<i>P4HA1</i>	9	3.15	9	19
<i>HNRNPD</i>	9	3.15	9	20
<i>FAM60A</i>	9	3.14	21	28
<i>PELI1</i>	9	3.13	3	7
<i>SLC25A13</i>	9	3.12	11	20
<i>DUSP1</i>	9	3.1	8	20
<i>HN1</i>	9	3.1	10	20
<i>ATP2C1</i>	9	3.09	13	20
<i>KIF20B</i>	9	3.09	8	20
<i>ATXN3</i>	9	3.08	9	20
<i>MYLIP</i>	9	3.08	15	12
<i>UQCRCF1</i>	9	3.08	4	11
<i>ARF4</i>	9	3.08	4	12
<i>CCL22</i>	9	3.07	9	20
<i>ID3</i>	9	3.07	16	16
<i>APBB1</i>	9	3.06	7	19
<i>RHOH</i>	9	3.05	19	27
<i>RPL11</i>	9	3.05	7	19
<i>RAB11A</i>	9	3.05	8	20
<i>GAK</i>	9	3.05	9	20
<i>AK4</i>	9	3.05	10	13
<i>CELF1</i>	9	3.04	10	20
<i>WBP5</i>	9	3.04	5	7
<i>RAB8A</i>	9	3.04	6	19
<i>HCCS</i>	9	3.03	19	25
<i>STAT4</i>	9	3.03	9	19
<i>MTIF2</i>	9	3.03	8	20

<i>NCKIPSD</i>	9	3.03	28	29
<i>SRCAP</i>	9	3.02	5	16
<i>C11orf58</i>	9	3.01	6	19
<i>SRRT</i>	9	3.01	8	20
<i>PPOX</i>	9	3.01	9	20
<i>IL2RG</i>	9	3.01	8	20
<i>H2AFY</i>	9	3	9	20
<i>MTMR4</i>	9	3	8	20
<i>ECHS1</i>	9	3	8	20
<i>POLI</i>	9	3	6	19
<i>HMBS</i>	9	2.99	12	18
<i>MBOAT7</i>	9	2.99	9	20
<i>RNF103</i>	9	2.99	21	20
<i>CAPG</i>	9	2.98	8	19
<i>SLC37A1</i>	9	2.97	10	20
<i>CAV1</i>	9	2.97	13	14
<i>ALDOC</i>	9	2.95	9	19
<i>PCYT1A</i>	9	2.95	9	20
<i>TUBB4B</i>	9	2.95	6	19
<i>ITGA3</i>	9	2.94	5	16
<i>ERAP1</i>	9	2.94	5	12
<i>PSMD13</i>	9	2.94	10	20
<i>CCL20</i>	9	2.93	6	19
<i>VEGFA</i>	9	2.93	9	8
<i>MID2</i>	9	2.93	8	20
<i>DHFR</i>	9	2.93	8	20
<i>ECI2</i>	9	2.92	5	12
<i>PLA2G4C</i>	9	2.92	9	20
<i>RAE1</i>	9	2.92	8	20
<i>KLF3</i>	9	2.92	8	19
<i>LITAF</i>	9	2.91	9	20
<i>EZR</i>	9	2.91	9	20
<i>SKAP2</i>	9	2.91	5	12
<i>DDX58</i>	9	2.91	9	19
<i>UGCG</i>	9	2.91	4	12
<i>HMOX2</i>	9	2.9	5	7
<i>CINP</i>	9	2.89	6	19

<i>STK19</i>	9	2.89	9	20
<i>SLC7A5P2</i>	9	2.89	5	16
<i>ZNF593</i>	9	2.88	8	20
<i>CAPZA1</i>	9	2.87	8	20
<i>TMEM187</i>	9	2.86	8	20
<i>CDKN1B</i>	9	2.86	5	7
<i>PSMA4</i>	9	2.86	12	20
<i>ZNF137P</i>	9	2.85	11	19
<i>HTR5A</i>	9	2.85	14	18
<i>ZBTB32</i>	9	2.84	5	16
<i>RNASET2</i>	9	2.83	5	12
<i>SOD2</i>	9	2.83	6	19
<i>IARS</i>	9	2.82	8	20
<i>DNM1L</i>	9	2.82	7	20
<i>CXCR5</i>	9	2.82	6	19
<i>ING2</i>	9	2.82	6	19
<i>DNAJC15</i>	9	2.81	8	20
<i>PGK1</i>	9	2.81	18	24
<i>SLC6A4</i>	9	2.81	8	20
<i>ADK</i>	9	2.81	9	19
<i>CELSR3</i>	9	2.78	9	20
<i>DDX39A</i>	9	2.77	8	20
<i>HNRNPR</i>	9	2.77	8	20
<i>KL</i>	9	2.77	10	20
<i>TPT1</i>	9	2.77	9	20
<i>SQSTM1</i>	9	2.76	7	19
<i>CLDND1</i>	9	2.75	8	20
<i>CNN3</i>	9	2.75	8	20
<i>SOS2</i>	9	2.74	6	19
<i>ARHGDIB</i>	9	2.73	8	21
<i>GOLGA4</i>	9	2.73	9	20
<i>GABARAP</i>	9	2.73	9	20
<i>LMO1</i>	9	2.73	8	20
<i>FASTK</i>	9	2.72	13	14
<i>MSRB1</i>	9	2.72	9	20
<i>TGFB1I1</i>	9	2.72	10	20
<i>BAZ1A</i>	9	2.71	6	19

<i>HSD17B4</i>	9	2.71	9	20
<i>AAAS</i>	9	2.71	7	19
<i>ARF3</i>	9	2.7	4	12
<i>ENO1</i>	9	2.7	3	7
<i>KRR1</i>	9	2.7	9	20
<i>SCAMP3</i>	9	2.7	8	20
<i>ZNF384</i>	9	2.7	8	20
<i>TOR3A</i>	9	2.69	9	20
<i>MAGED1</i>	9	2.69	9	20
<i>TYK2</i>	9	2.69	10	20
<i>TRIM33</i>	9	2.69	7	16
<i>G3BP1</i>	9	2.69	9	20
<i>SLC5A5</i>	9	2.69	4	11
<i>RAD54B</i>	9	2.68	14	13
<i>ATP7A</i>	9	2.66	6	19
<i>PBX3</i>	9	2.66	4	12
<i>BTN3A3</i>	9	2.66	13	20
<i>RPL28</i>	9	2.66	7	19
<i>AURKA</i>	9	2.66	8	20
<i>CAPZB</i>	9	2.66	6	19
<i>DEFA6</i>	9	2.65	8	20
<i>MRPL40</i>	9	2.65	8	20
<i>CYB5R3</i>	9	2.64	6	20
<i>SEL1L</i>	9	2.64	10	11
<i>CORO1C</i>	9	2.63	6	19
<i>DCXR</i>	9	2.62	8	20
<i>CSTF1</i>	9	2.62	7	16
<i>STX8</i>	9	2.62	20	25
<i>H3F3A</i>	9	2.61	6	12
<i>FKBP1A</i>	9	2.61	8	20
<i>HSPA13</i>	9	2.61	9	7
<i>MRPL3</i>	9	2.6	8	20
<i>DUS4L</i>	9	2.6	11	19
<i>FRG1</i>	9	2.59	5	7
<i>LZTR1</i>	9	2.59	8	20
<i>DCK</i>	9	2.59	3	7
<i>SLC5A6</i>	9	2.59	7	20

<i>POLB</i>	9	2.59	4	12
<i>GPRC5C</i>	9	2.58	5	16
<i>IL12RB2</i>	9	2.58	11	19
<i>CD72</i>	9	2.56	8	20
<i>STIP1</i>	9	2.56	19	27
<i>SLC25A14</i>	9	2.55	8	20
<i>DCTN6</i>	9	2.54	8	20
<i>NOL7</i>	9	2.54	6	19
<i>SLC25A12</i>	9	2.54	14	8
<i>FSTL3</i>	9	2.54	8	20
<i>GFI1</i>	9	2.54	4	12
<i>COPS2</i>	9	2.54	6	19
<i>HINT1</i>	9	2.54	5	6
<i>KEAP1</i>	9	2.54	8	20
<i>MRS2</i>	9	2.53	9	20
<i>RPS4X</i>	9	2.52	8	20
<i>ADAM9</i>	9	2.52	8	20
<i>TBL2</i>	9	2.52	3	7
<i>WBSCR22</i>	9	2.52	8	20
<i>GM2A</i>	9	2.52	12	20
<i>IL6</i>	9	2.52	8	20
<i>HIVEP2</i>	9	2.51	3	7
<i>GOLGB1</i>	9	2.51	8	20
<i>TNFRSF14</i>	9	2.5	6	19
<i>ST3GAL6</i>	9	2.49	11	16
<i>B9D1</i>	9	2.48	8	20
<i>SRSF2</i>	9	2.47	4	12
<i>TFG</i>	9	2.46	5	16
<i>SNAPC3</i>	9	2.46	6	19
<i>TOP2B</i>	9	2.46	5	16
<i>ATG5</i>	9	2.45	5	7
<i>SDCBP</i>	9	2.45	8	20
<i>KIF11</i>	9	2.45	20	28
<i>SLBP</i>	9	2.44	6	19
<i>CLK1</i>	9	2.44	13	19
<i>IKBKAP</i>	9	2.44	3	7
<i>SHFM1</i>	9	2.44	8	20

<i>LBR</i>	9	2.44	8	20
<i>YWHAB</i>	9	2.43	3	7
<i>ZNF302</i>	9	2.43	9	20
<i>GAR1</i>	9	2.42	3	13
<i>IVL</i>	9	2.41	11	20
<i>SNRPE</i>	9	2.4	3	7
<i>GNA11</i>	9	2.4	3	3
<i>XRCC6</i>	9	2.4	8	20
<i>PPP3CC</i>	9	2.39	4	12
<i>USP6</i>	9	2.39	8	20
<i>UQCR11</i>	9	2.39	19	27
<i>ARPC5L</i>	9	2.38	5	16
<i>TM9SF3</i>	9	2.38	8	20
<i>PHTF1</i>	9	2.38	4	12
<i>KCNN4</i>	9	2.38	5	16
<i>NMI</i>	9	2.38	8	20
<i>EGR3</i>	9	2.37	4	11
<i>BTN3A2</i>	9	2.37	9	20
<i>CTSA</i>	9	2.36	8	20
<i>FTSJ2</i>	9	2.35	8	20
<i>ALCAM</i>	9	2.34	9	21
<i>BRE</i>	9	2.34	10	20
<i>PLEK</i>	9	2.34	12	13
<i>RASA4</i>	9	2.33	16	16
<i>SRSF3</i>	9	2.32	11	20
<i>ECD</i>	9	2.32	8	20
<i>KAT6B</i>	9	2.32	4	12
<i>RPS12</i>	9	2.32	9	20
<i>IMPDH2</i>	9	2.32	6	12
<i>TP53TG1</i>	9	2.31	10	20
<i>ETV5</i>	9	2.31	10	20
<i>TAF5L</i>	9	2.28	9	20
<i>ATP5O</i>	9	2.28	13	20
<i>RPS26</i>	9	2.27	3	7
<i>MAP3K13</i>	9	2.27	9	20
<i>UFD1L</i>	9	2.26	11	19
<i>DIMT1</i>	9	2.26	8	20

<i>EHMT2</i>	9	2.25	6	19
<i>FARSA</i>	9	2.25	2	3
<i>EGR2</i>	9	2.23	19	20
<i>PNP</i>	9	2.21	12	10
<i>ADAT1</i>	9	2.2	12	9
<i>SPG7</i>	9	2.2	10	20
<i>DGKD</i>	9	2.19	16	21
<i>RABIF</i>	9	2.19	9	20
<i>PTPN22</i>	9	2.19	8	20
<i>TIMM17A</i>	9	2.18	8	20
<i>POU2AF1</i>	9	2.18	8	20
<i>SPHK2</i>	9	2.17	8	20
<i>RBM8A</i>	9	2.17	6	19
<i>NARF</i>	9	2.17	6	20
<i>DNPH1</i>	9	2.15	8	20
<i>FZD6</i>	9	2.15	9	19
<i>CD53</i>	9	2.15	6	12
<i>RPL31</i>	9	2.15	5	16
<i>NDUFB6</i>	9	2.15	5	7
<i>EIF2B2</i>	9	2.11	5	7
<i>RPL37</i>	9	2.1	8	20
<i>ETHE1</i>	9	2.1	15	15
<i>HRAS</i>	9	2.09	8	20
<i>CNR2</i>	9	2.08	6	16
<i>RAB33A</i>	9	2.05	5	7
<i>AIP</i>	9	2.03	6	19

Supplemental Table 6: **Number of SNPs in expressed genes tested in QTDT and population association analyses**

Expressed Gene	Region	Region size (kb)	SNPs tested
<i>SMARCA2</i>	chr9:2005341-2183623	178	48
<i>VLDLR</i>	chr9:2611792-2644485	33	9
<i>KIAA0020</i>	chr9:2794154-2834130	40	6
<i>RFX3</i>	chr9:3214646-3515983	301	29
<i>SLC1A1</i>	chr9:4480426-4577469	97	28
<i>PPAPDC2</i>	chr9:4602293-4705272	103	17
<i>CDC37L1</i>	chr9:4669565-4696594	27	5
<i>AK3</i>	chr9:4699556-4731309	32	6
<i>RCL1</i>	chr9:4782833-4851064	68	23
<i>JAK2</i>	chr9:4975244-5118183	143	11
<i>PLGRKT</i>	chr9:5347966-5427937	80	22
<i>CD274</i>	chr9:5440502-5460567	20	9
<i>PDCD1LG2</i>	chr9:5500544-5561282	61	5
<i>KIAA1432</i>	chr9:5619118-5766556	147	19
<i>ERMP1</i>	chr9:5774571-5823081	49	5
<i>KIAA2026</i>	chr9:5909007-5998003	89	7
<i>RANBP6</i>	chr9:5951918-6045640	94	11
<i>UHRF2</i>	chr9:6403150-6497051	94	17
<i>GLDC</i>	chr9:6522463-6635692	113	23
<i>KDM4C</i>	chr9:6747640-7160920	413	118
<i>ZDHHC21</i>	chr9:14601068-14683480	82	24
<i>SNAPC3</i>	chr9:15412781-15451627	39	5
<i>RRAGA</i>	chr9:18989371-19091021	102	13
<i>HAUS6</i>	chr9:19043134-19092940	50	6
<i>DENND4C</i>	chr9:19220762-19364137	143	9
<i>MLLT3</i>	chr9:20334967-20612514	278	29
<i>FOCAD</i>	chr9:20648308-20985954	338	48
<i>PTPLAD2</i>	chr9:20996364-21021635	25	6
<i>MTAP</i>	chr9:21792634-21855969	63	14
<i>IFT74</i>	chr9:26937036-27052931	116	10
<i>ACO1</i>	chr9:32374600-32440832	66	8