

Supplementary Material II. 215 candidate genes with betweenness greater than 0 and their permutation FDRs

Ensemble ID of candidate gene	Gene name	Betweenness	Permutation FDR
ENSP00000227638	PANX1	72	0
ENSP00000235310	MAD2L2	72	0
ENSP00000245323	EFNB2	335	0
ENSP00000258428	REV1	72	0
ENSP00000265727	ADAM22	72	0
ENSP00000281821	EPHA4	339	0
ENSP00000293831	EIF4A1	72	0
ENSP00000302719	KCNAB3	72	0
ENSP00000312697	DMAP1	88	0
ENSP00000329797	CADM1	72	0
ENSP00000335434	WDR20	72	0
ENSP00000341138	EPB41L3	72	0
ENSP00000351697	REV3L	72	0
ENSP00000354778	CNTNAP2	72	0
ENSP00000356150	MDM4	72	0
ENSP00000357177	ARHGEF11	142	0
ENSP00000361366	SFTPD	72	0
ENSP00000369218	RBM17	72	0
ENSP00000370119	SMN2	72	0

ENSP00000245304	RAP2A	72	0.001
ENSP00000275815	EPHA1	72	0.001
ENSP00000328511	KCNA4	72	0.001
ENSP00000377446	SUCLG1	210	0.001
ENSP00000399511	TNIK	72	0.001
ENSP00000229595	ASF1A	72	0.002
ENSP00000252699	ACTN4	72	0.002
ENSP00000263208	HIRA	72	0.002
ENSP00000263923	KDR	104	0.002
ENSP00000304169	PITX2	210	0.002
ENSP00000330633	CNTN2	72	0.002
ENSP00000276072	TAF1	72	0.003
ENSP00000295600	MITF	138	0.003
ENSP00000360157	FOXD3	6	0.003
ENSP00000264010	CTCF	72	0.004
ENSP00000271628	SF3B4	75	0.004
ENSP00000350941	SRC	421	0.004
ENSP00000361125	VEGFA	164	0.004
ENSP00000226091	EFNB3	67	0.006
ENSP00000358309	EPHA7	2	0.006
ENSP00000358918	SUFU	72	0.007
ENSP00000316879	EIF4G1	72	0.011

ENSP00000260653	SIX3	2	0.012
ENSP00000352516	DNMT1	90	0.016
ENSP00000358716	DDX20	72	0.017
ENSP00000357393	EFNA3	50	0.018
ENSP00000341680	DTNBP1	66	0.02
ENSP00000344456	CTNNB1	607	0.02
ENSP00000297904	FIGF	2	0.021
ENSP00000265165	LEF1	134	0.022
ENSP00000347948	TNFRSF14	68	0.023
ENSP00000288986	NCK1	78	0.027
ENSP00000261937	FLT4	2	0.029
ENSP00000333919	BTLA	68	0.03
ENSP00000332549	GRIN2A	58	0.032
ENSP00000376765	PIAS3	4	0.033
ENSP00000361818	SDC4	1	0.035
ENSP00000386165	CEBPD	38	0.035
ENSP00000348307	SIRPA	34	0.036
ENSP00000344666	NF2	1	0.037
ENSP00000219255	PARD6A	72	0.038
ENSP00000204961	EFNB1	5	0.039
ENSP00000172229	NGFR	72	0.043
ENSP00000344115	CDH5	24	0.043

ENSP00000405041	POU5F1	6	0.045
ENSP00000360532	CDC5L	6	0.046
ENSP00000295897	ALB	72	0.047
ENSP00000340944	PTPN11	112	0.047
ENSP00000376076	SUMO1	78	0.05
ENSP00000227507	CCND1	145	0.051
ENSP00000318297	RUVBL1	54	0.055
ENSP00000356024	CR2	72	0.055
ENSP00000363763	EPHB2	3	0.055
ENSP00000281950	GEMIN6	4	0.056
ENSP00000257904	CDK4	38	0.057
ENSP00000233154	NCK2	2	0.058
ENSP00000368438	PCNA	141	0.061
ENSP00000245479	SOX9	66	0.067
ENSP00000370473	IGFBP3	59	0.067
ENSP00000269321	ARHGDIA	134	0.068
ENSP00000304895	IRS1	132	0.071
ENSP00000400175	RHOA	142	0.072
ENSP00000357674	SNAPIN	66	0.089
ENSP00000323588	SOX2	2	0.094
ENSP00000401303	SHC1	138	0.097
ENSP00000332643	NDN	5	0.102

ENSP00000358622	IKBKG	72	0.102
ENSP00000162330	BCAR1	38	0.103
ENSP00000309831	SNUPN	68	0.107
ENSP00000278568	PAK1	24	0.114
ENSP00000340691	EIF4EBP1	36	0.114
ENSP00000222005	CDC37	1	0.128
ENSP00000360266	JUN	109	0.128
ENSP00000313419	CD19	72	0.132
ENSP00000218388	TIMP1	1	0.137
ENSP00000244741	CDKN1A	67	0.139
ENSP00000280892	EIF4E	72	0.143
ENSP00000363804	KLF4	3	0.145
ENSP00000249636	PIAS1	14	0.153
ENSP00000359206	BTRC	79	0.162
ENSP00000302665	IGF1	59	0.164
ENSP00000365891	WAS	11	0.168
ENSP00000310491	ARHGAP1	13	0.169
ENSP00000223023	WASL	50	0.17
ENSP00000292303	CCR5	54	0.18
ENSP00000369757	RPS6	12	0.181
ENSP00000354586	GLI2	2	0.185
ENSP00000244007	PLCG1	55	0.192

ENSP00000306512	IL8	18	0.196
ENSP00000338297	IGF2	71	0.201
ENSP00000364893	ARHGEF7	28	0.203
ENSP00000351486	NTRK1	5	0.21
ENSP00000279593	GRIN2B	84	0.214
ENSP00000314458	CDC42	153	0.214
ENSP00000302486	MAP2K1	13	0.22
ENSP00000330393	LEPR	6	0.224
ENSP00000354119	LAT	2	0.238
ENSP00000264972	ZAP70	4	0.24
ENSP00000324806	GSK3B	147	0.25
ENSP00000317714	STX4	1	0.268
ENSP00000263967	PIK3CA	15	0.277
ENSP00000254976	SNAP25	66	0.28
ENSP00000222139	EPOR	1	0.286
ENSP00000297261	SHH	2	0.29
ENSP00000303830	INSR	22	0.292
ENSP00000261023	ITGAV	2	0.294
ENSP00000357656	FYN	88	0.299
ENSP00000222254	PIK3R2	2	0.302
ENSP00000320935	SLC2A4	1	0.317
ENSP00000343204	JAK1	8	0.325

ENSP00000368190	NPHS1	2	0.344
ENSP00000396127	RAN	66	0.361
ENSP00000353483	MAPK8	98	0.364
ENSP00000324897	UBE2I	59	0.369
ENSP00000335153	HSP90AA1	47	0.378
ENSP00000264033	CBL	117	0.383
ENSP00000267859	BNIP2	22	0.39
ENSP00000346839	FN1	72	0.392
ENSP00000342793	PLD1	56	0.399
ENSP00000262320	AXIN1	1	0.404
ENSP00000283195	RANBP2	30	0.404
ENSP00000230354	TBP	72	0.405
ENSP00000320940	NCOA1	7	0.406
ENSP00000282561	GJA1	7	0.408
ENSP00000346300	CRKL	6	0.42
ENSP00000258682	CAMK2B	54	0.424
ENSP00000046794	LCP2	80	0.431
ENSP00000228872	CDKN1B	47	0.433
ENSP00000221494	SF3A2	147	0.436
ENSP00000011653	CD4	54	0.439
ENSP00000356713	IFNGR1	2	0.439
ENSP00000231509	NR3C1	8	0.447

ENSP00000350283	BRCA1	78	0.455
ENSP00000348577	RANGAP1	36	0.46
ENSP00000304903	CD2BP2	83	0.474
ENSP00000326366	PSEN1	72	0.486
ENSP00000359424	CHUK	5	0.489
ENSP00000222812	STX1A	65	0.507
ENSP00000261799	PDGFRB	69	0.508
ENSP00000358490	CD2	83	0.508
ENSP00000268035	IGF1R	15	0.51
ENSP00000274255	SKP2	3	0.511
ENSP00000312652	LEP	72	0.518
ENSP00000302269	VAV1	37	0.519
ENSP00000337825	LCK	110	0.535
ENSP00000221930	TGFB1	20	0.54
ENSP00000274335	PIK3R1	7	0.546
ENSP00000283635	CD8A	13	0.547
ENSP00000267163	RB1	28	0.552
ENSP00000378338	GIT1	3	0.554
ENSP00000387699	CREB1	55	0.572
ENSP00000215829	SNRPD3	4	0.574
ENSP00000384675	SOS1	11	0.578
ENSP00000216797	NFKBIA	26	0.585

ENSP00000265171	EGF	8	0.588
ENSP00000326804	CUL1	3	0.592
ENSP00000003084	CFTR	65	0.608
ENSP00000264657	STAT3	210	0.616
ENSP00000362649	HDAC1	71	0.62
ENSP00000226574	NFKB1	7	0.631
ENSP00000354558	MTOR	24	0.632
ENSP00000361626	YBX1	55	0.633
ENSP00000380227	ITGA4	42	0.638
ENSP00000262613	SLC9A3R1	65	0.64
ENSP00000356346	PTPRC	11	0.645
ENSP00000274376	RASA1	1	0.655
ENSP00000309845	HRAS	12	0.66
ENSP00000348986	INS-IGF2	25	0.671
ENSP00000268182	IQGAP1	18	0.683
ENSP00000306245	FOS	2	0.698
ENSP00000339151	IKBKB	1	0.71
ENSP00000344352	ATF3	8	0.713
ENSP00000345571	E2F1	5	0.713
ENSP00000262367	CREBBP	26	0.716
ENSP00000228307	PXN	42	0.731
ENSP00000299421	ILK	5	0.741

ENSP00000363676	RPL11	12	0.754
ENSP00000363822	AR	7	0.756
ENSP00000339007	GRB2	226	0.759
ENSP00000338799	IL6ST	1	0.781
ENSP00000354394	STAT1	17	0.784
ENSP00000215832	MAPK1	19	0.788
ENSP00000384273	RELA	34	0.8
ENSP00000229135	IFNG	4	0.804
ENSP00000371067	JAK2	18	0.809
ENSP00000371138	FKBP1A	2	0.816
ENSP00000206249	ESR1	70	0.831
ENSP00000360683	PTPN1	5	0.833
ENSP00000364133	TGFBR1	2	0.862
ENSP00000329357	SP1	28	0.864
ENSP00000300574	CRK	1	0.896
ENSP00000367207	MYC	4	0.915
ENSP00000262160	SMAD2	18	0.923
ENSP00000263253	EP300	174	0.934
ENSP00000344818	UBC	207	0.948
ENSP00000329623	BCL2	22	0.966