Supplementary Table 2. Master regulator analysis result of differentially expressed proteins (DEPs)

EntrezID	Symbol	Full name	Interaction partner count		MRA enrichment P-value	
			DEP	Detected protein	DEP	Detected protein
648	*BMI1*	BMI1 proto-oncogene, polycomb ring finger	5	300	0.0760136	3.62E-97
8359	*HIST1H4A*	histone cluster 1 H4 family member a	3	136	0.1328097	2.13E-28
6647	*SOD1*	superoxide dismutase 1	3	55	0.0112825	5.51E-15
1072	*CFL1*	cofilin 1	2	66	0.1168637	7.22E-16
11315	*PARK7*	Parkinsonism associated deglycase	2	51	0.0786162	4.99E-12
6418	*SET*	SET nuclear proto-oncogene	2	83	0.2394652	2.37E-11
3848	*KRT1*	keratin 1	2	45	0.0769116	1.59E-08
8338	*HIST2H2AC*	histone cluster 2 H2A family member c	2	55	0.1246029	2.91E-08
5037	*PEBP1*	phosphatidylethanolamine binding protein 1	2	52	0.1168637	1.41E-07
3013	*HIST1H2AD*	histone cluster 1 H2A family member d	2	25	0.0335778	0.000356542
4625	*MYH7*	myosin heavy chain 7	2	21	0.0298887	0.005782197
4632	*MYL1*	myosin light chain 1	2	16	0.0169545	0.010754971
6234	*RPS28*	ribosomal protein S28	1	101	0.5075137	9.59E-39
1984	*EIF5A*	eukaryotic translation initiation factor 5A	1	40	0.2725641	1.11E-12
72	*ACTG2*	actin, gamma 2, smooth muscle, enteric	1	57	0.4323822	4.14E-11
6196	*RPS6KA2*	ribosomal protein S6 kinase A2	1	28	0.1910856	4.14E-10
51371	*POMP*	proteasome maturation protein	1	36	0.2725641	1.82E-09
1674	*DES*	desmin	1	37	0.2853288	3.34E-09
3852	*KRT5*	keratin 5	1	50	0.4153535	2.38E-08
10910	*SUGT1*	SGT1 homolog, MIS12 kinetochore complex assembly cochaperone	1	40	0.3262945	2.63E-08
84817	*TXNDC17*	thioredoxin domain containing 17	1	22	0.1619632	2.02E-07
6767	*ST13*	ST13, Hsp70 interacting protein	1	31	0.2682591	1.79E-06
10471	*PFDN6*	prefoldin subunit 6	1	24	0.1958407	2.01E-06
57092	*PCNP*	PEST proteolytic signal containing nuclear protein	1	10	0.0571705	2.29E-06
3857	*KRT9*	keratin 9	1	40	0.3611674	2.55E-06
3868	*KRT16*	keratin 16	1	31	0.2725641	3.11E-06
10204	*NUTF2*	nuclear transport factor 2	1	14	0.0952488	3.57E-06
8337	*HIST2H2AA3*	histone cluster 2 H2A family member a3	1	22	0.1814914	5.72E-06
6282	*S100A11*	S100 calcium binding protein A11	1	24	0.2099405	1.44E-05
29108	*PYCARD*	PYD and CARD domain containing	1	27	0.2595732	9.30E-05
4621	*MYH3*	myosin heavy chain 3	1	11	0.07912	9.61E-05
1828	*DSG1*	desmoglein 1	1	23	0.223795	0.00024846
6120	*RPE*	ribulose-5-phosphate-3-epimerase	1	6	0.0347021	0.000413414
100037417	*DDTL*	D-dopachrome tautomerase like	1	5	0.0290025	0.001515157
397	*ARHGDIB*	Rho GDP dissociation inhibitor beta	1	13	0.1266704	0.002950171
6273	*S100A2*	S100 calcium binding protein A2	1	13	0.1369019	0.007590542
1645	*AKR1C1*	aldo-keto reductase family 1 member C1	1	5	0.0403685	0.01904062
2049	*EPHB3*	EPH receptor B3	1	7	0.0682093	0.023219862

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Supplementary Table 2. Continued

EntrezID	Symbol	Full name	Interaction partner count		MRA enrichment P-value	
			DEP	Detected protein	DEP	Detected protein
8663	*EIF3C*	eukaryotic translation initiation factor 3 subunit C	0	129	1	1.10E-50
64981	*MRPL34*	mitochondrial ribosomal protein L34	0	45	1	1.06E-19
7295	*TXN*	thioredoxin	0	63	1	1.55E-17
140809	*SRXN1*	sulfiredoxin 1	0	32	1	1.54E-12
55573	*CDV3*	CDV3 homolog	0	27	1	1.02E-10
8335	*HIST1H2AB*	histone cluster 1 H2A family member b	0	36	1	8.01E-09
5504	*PPP1R2*	protein phosphatase 1 regulatory inhibitor subunit 2	0	28	1	2.27E-08
136319	*MTPN*	myotrophin	0	20	1	6.14E-08
5908	*RAP1B*	RAP1B, member of RAS oncogene family	0	35	1	7.16E-08
51247	*PAIP2*	poly(A) binding protein interacting protein 2	0	12	1	1.70E-07
7345	*UCHL1*	ubiquitin C-terminal hydrolase L1	0	39	1	4.99E-07
134492	*NUDCD2*	NudC domain containing 2	0	34	1	1.57E-06
6451	*SH3BGRL*	SH3 domain binding glutamate rich protein like	0	12	1	1.66E-06
8331	*HIST1H2AJ*	histone cluster 1 H2A family member j	0	13	1	2.72E-06
11165	*NUDT3*	nudix hydrolase 3	0	24	1	4.03E-06
26099	*SZRD1*	SUZ RNA binding domain containing 1	0	8	1	3.08E-05
9491	*PSMF1*	proteasome inhibitor subunit 1	0	18	1	4.70E-05
8682	*PEA15*	proliferation and apoptosis adaptor protein 15	0	22	1	7.04E-05
4634	*MYL3*	myosin light chain 3	0	8	1	0.000209765
653781	*POTEJ*	POTE ankyrin domain family member J	0	16	1	0.000262754
6902	*TBCA*	tubulin folding cofactor A	0	49	1	0.000575454
2171	*FABP5*	fatty acid binding protein 5	0	24	1	0.000680299
8342	*HIST1H2BM*	histone cluster 1 H2B family member m	0	8	1	0.000795551
319101	*KRT73*	keratin 73	0	8	1	0.000795551
57644	*MYH7B*	myosin heavy chain 7B	0	9	1	0.001957697
92815	*HIST3H2A*	histone cluster 3 H2A	0	9	1	0.001957697
85236	*HIST1H2BK*	histone cluster 1 H2B family member k	0	8	1	0.002215545
4619	*MYH1*	myosin heavy chain 1	0	13	1	0.002950171
3010	*HIST1H1T*	histone cluster 1 H1 family member t	0	9	1	0.004154871
8969	*HIST1H2AG*	histone cluster 1 H2A family member g	0	15	1	0.004504949
388697	*HRNR*	hornerin	0	11	1	0.00483665
4626	*MYH8*	myosin heavy chain 8	0	7	1	0.006000389
55204	*GOLPH3L*	golgi phosphoprotein 3 like	0	7	1	0.006000389
85235	*HIST1H2AH*	histone cluster 1 H2A family member h	0	5	1	0.007023875
90861	*JPT2*	Jupiter microtubule associated homolog 2	0	7	1	0.012623866
51155	*JPT1*	Jupiter microtubule associated homolog 1	0	5	1	0.01904062
83442	*SH3BGRL3*	SH3 domain binding glutamate rich protein like 3	0	5	1	0.01904062
374666	*WASH3P*	WAS protein family homolog 3 pseudogene	0	3	1	0.02034412
28971	*AAMDC*	adipogenesis associated Mth938 domain containing	0	4	1	0.021701049

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Supplementary Table 2. Continued

EntrezID	Symbol	Full name	Interaction partner count		MRA enrichment P-value	
			DEP	Detected protein	DEP	Detected protein
375260	*WASH2P*	WAS protein family homolog 2 pseudogene	0	4	1	0.021701049
11333	*PDAP1*	PDGFA associated protein 1	0	7	1	0.023219862
4622	*MYH4*	myosin heavy chain 4	1	7	0.07912	0.059439085
448834	*KPRP*	keratinocyte proline rich protein	0	3	1	0.064719474
8735	*MYH13*	myosin heavy chain 13	0	5	1	0.069076803
4620	*MYH2*	myosin heavy chain 2	1	15	0.2005682	0.069887722
55766	*H2AFJ*	H2A histone family member J	0	2	1	0.074532785
56097	*PCDHGC5*	protocadherin gamma subfamily C, 5	0	2	1	0.074532785
83641	*FAM107B*	family with sequence similarity 107 member B	0	2	1	0.074532785
29085	*PHPT1*	phosphohistidine phosphatase 1	0	6	1	0.07968771
1652	*DDT*	D-dopachrome tautomerase	0	5	1	0.107879776
285220	*EPHA6*	EPH receptor A6	0	3	1	0.129247111
9973	*CCS*	copper chaperone for superoxide dismutase	2	9	0.0079735	0.149339629
143903	*LAYN*	layilin	0	1	1	0.273024136
653269	*POTEI*	POTE ankyrin domain family member I	0	1	1	0.273024136
1646	*AKR1C2*	aldo-keto reductase family 1 member C2	2	16	0.0348451	0.273328801
8334	*HIST1H2AC*	histone cluster 1 H2A family member c	0	2	1	0.301100757
54503	*ZDHHC13*	zinc finger DHHC-type containing 13	0	2	1	0.301100757
670	*BPHL*	biphenyl hydrolase like	0	1	1	0.471515487
1109	*AKR1C4*	aldo-keto reductase family 1 member C4	0	1	1	0.471515487
7092	*TLL1*	tolloid like 1	0	1	1	0.471515487
26025	*PCDHGA12*	protocadherin gamma subfamily A, 12	0	1	1	0.471515487
353288	*KRT26*	keratin 26	0	1	1	0.471515487
23589	*CARHSP1*	calcium regulated heat stable protein 1	0	6	1	0.530395621
121391	*KRT74*	keratin 74	0	1	1	0.615818174
9819	*TSC22D2*	TSC22 domain family member 2	0	1	1	0.720723979
8641	*PCDHGB4*	protocadherin gamma subfamily B, 4	0	0	1	1
9708	*PCDHGA8*	protocadherin gamma subfamily A, 8	0	0	1	1
56098	*PCDHGC4*	protocadherin gamma subfamily C, 4	0	0	1	1
56102	*PCDHGB3*	protocadherin gamma subfamily B, 3	0	0	1	1
56107	*PCDHGA9*	protocadherin gamma subfamily A, 9	0	0	1	1
56109	*PCDHGA6*	protocadherin gamma subfamily A, 6	0	0	1	1
56110	*PCDHGA5*	protocadherin gamma subfamily A, 5	0	0	1	1
56111	*PCDHGA4*	protocadherin gamma subfamily A, 4	0	0	1	1
56112	*PCDHGA3*	protocadherin gamma subfamily A, 3	0	0	1	1
56113	*PCDHGA2*	protocadherin gamma subfamily A, 2	0	0	1	1
56114	*PCDHGA1*	protocadherin gamma subfamily A, 1	0	0	1	1
80179	*MYO19*	myosin XIX	0	0	1	1
144106	*ST13P5*	ST13, Hsp70 interacting protein pseudogene 5	0	0	1	1

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Supplementary Table 2. Continued

EntrezID	Symbol	Full name	Interaction partner count		MRA enrichment P-value	
			DEP	Detected protein	DEP	Detected protein
283450	*HECTD4*	HECT domain E3 ubiquitin protein ligase 4	0	0	1	1
644591	*PPIAL4G*	peptidylprolyl isomerase A like 4G	0	0	1	1
653598	*PPIAL4C*	peptidylprolyl isomerase A like 4C	0	0	1	1
728945	*PPIAL4F*	peptidylprolyl isomerase A like 4F	0	0	1	1
102723897	*WASH9P*	WAS protein family homolog 9, pseudogene	0	0	1	1
105371242	*PPIAL4H*	peptidylprolyl isomerase A like 4H	0	0	1	1
285533	*RNF175*	ring finger protein 175	0	0	1	1
645142	*PPIAL4D*	peptidylprolyl isomerase A like 4D	0	0	1	1