

**Table.S2 Complete list of top candidate genes in OT-I screen (FDR<0.05).**

LogFC, Log2 fold change; FDR, False Discovery rate. FDR and p value calculated by MaGeCK.

Gene	logFC	Positive selection		Negative selection	
		p value	FDR	p value	FDR
<i>B2m</i>	5.36	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Ifngr2</i>	3.53	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Ifngr1</i>	3.44	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Jak2</i>	3.10	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Setd2</i>	2.72	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Jak1</i>	2.50	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Stat1</i>	2.44	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Kmt2b</i>	1.82	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Alad</i>	1.38	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Wdr48</i>	1.37	2.39E-07	3.81E-04	9.99E-01	1.00E+00
<i>Wdr20</i>	1.34	2.39E-07	3.81E-04	1.00E+00	1.00E+00
<i>Nf1</i>	1.27	2.39E-07	3.81E-04	9.99E-01	1.00E+00
<i>Cs</i>	1.20	7.18E-07	1.06E-03	1.00E+00	1.00E+00
<i>Ubr5</i>	1.15	4.96E-05	4.66E-02	1.00E+00	1.00E+00
<i>Kctd5</i>	1.07	2.39E-07	3.81E-04	9.96E-01	1.00E+00
<i>Hnrnp1</i>	1.06	1.17E-05	1.43E-02	9.99E-01	1.00E+00
<i>Wdr24</i>	1.04	3.59E-06	4.95E-03	9.97E-01	1.00E+00
<i>Olfir600</i>	0.99	3.28E-05	3.23E-02	9.90E-01	1.00E+00
<i>Lrrc8a</i>	0.91	3.23E-05	3.23E-02	9.99E-01	1.00E+00
<i>Naa30</i>	0.89	1.46E-05	1.68E-02	9.97E-01	1.00E+00
<i>Sult6b1</i>	0.86	8.86E-06	1.14E-02	9.81E-01	1.00E+00
<i>Cep57l1</i>	0.84	2.47E-05	2.68E-02	9.90E-01	1.00E+00
<i>Olfir1450</i>	-1.38	9.01E-01	1.00E+00	1.42E-04	3.41E-02
<i>Pstpip2</i>	-1.53	9.83E-01	1.00E+00	2.56E-04	4.22E-02
<i>Lrrtm4</i>	-1.55	9.62E-01	1.00E+00	2.96E-04	4.22E-02
<i>Nmt2</i>	-1.58	5.03E-01	1.00E+00	2.71E-04	4.22E-02
<i>Lamtor4</i>	-1.59	9.74E-01	1.00E+00	8.02E-05	2.15E-02
<i>Tert</i>	-1.61	8.82E-01	1.00E+00	3.02E-04	4.22E-02
<i>Rce1</i>	-1.63	8.71E-01	1.00E+00	2.33E-04	4.19E-02
<i>Socs1</i>	-1.64	1.38E-01	9.49E-01	8.07E-05	2.15E-02
<i>Ropn1</i>	-1.64	2.64E-01	1.00E+00	2.44E-04	4.22E-02
<i>Alk</i>	-1.64	5.06E-01	1.00E+00	8.21E-05	2.15E-02
<i>Ctps</i>	-1.69	9.67E-01	1.00E+00	2.16E-04	4.11E-02
<i>Mogs</i>	-1.71	9.75E-01	1.00E+00	2.20E-04	4.11E-02
<i>Rars2</i>	-1.72	9.66E-01	1.00E+00	2.16E-04	4.11E-02

<i>Vmn1r2</i>	-1.74	9.83E-01	1.00E+00	3.02E-04	4.22E-02
<i>Gpx1</i>	-1.74	5.03E-01	1.00E+00	2.51E-04	4.22E-02
<i>Pdzph1</i>	-1.75	9.13E-01	1.00E+00	8.07E-05	2.15E-02
<i>Rwdd1</i>	-1.76	9.81E-01	1.00E+00	2.63E-04	4.22E-02
<i>Med23</i>	-1.77	5.68E-01	1.00E+00	2.47E-04	4.22E-02
<i>Rpl22l1</i>	-1.80	5.92E-01	1.00E+00	2.96E-04	4.22E-02
<i>B3glct</i>	-1.82	8.87E-01	1.00E+00	3.76E-05	1.65E-02
<i>Hsd17b10</i>	-1.83	9.88E-01	1.00E+00	2.21E-04	4.11E-02
<i>Kctd2</i>	-1.85	9.85E-01	1.00E+00	1.42E-04	3.41E-02
<i>Slc33a1</i>	-1.86	9.73E-01	1.00E+00	9.27E-05	2.37E-02
<i>Pak2</i>	-1.86	9.77E-01	1.00E+00	2.85E-04	4.22E-02
<i>Atf4</i>	-1.87	9.85E-01	1.00E+00	8.07E-05	2.15E-02
<i>Scyl1</i>	-1.88	9.89E-01	1.00E+00	2.86E-04	4.22E-02
<i>Gramd1b</i>	-1.90	9.75E-01	1.00E+00	2.43E-04	4.22E-02
<i>Rnd2</i>	-1.91	7.48E-01	1.00E+00	2.96E-04	4.22E-02
<i>Olfir220</i>	-1.91	9.79E-01	1.00E+00	2.96E-04	4.22E-02
<i>Olfir969</i>	-1.91	8.31E-01	1.00E+00	2.96E-04	4.22E-02
<i>Osgepl1</i>	-1.91	9.40E-01	1.00E+00	2.21E-04	4.11E-02
<i>Rbbp4</i>	-1.92	9.89E-01	1.00E+00	2.16E-04	4.11E-02
<i>Alg3</i>	-1.94	9.88E-01	1.00E+00	3.08E-04	4.22E-02
<i>Rbck1</i>	-1.96	9.30E-01	1.00E+00	2.85E-05	1.65E-02
<i>Ylpm1</i>	-1.97	5.12E-01	1.00E+00	2.86E-04	4.22E-02
<i>Ssu72</i>	-1.98	9.88E-01	1.00E+00	2.75E-04	4.22E-02
<i>Cyld</i>	-1.98	9.94E-01	1.00E+00	2.16E-04	4.11E-02
<i>Mclr</i>	-1.99	9.90E-01	1.00E+00	8.07E-05	2.15E-02
<i>Anp32b</i>	-1.99	9.97E-01	1.00E+00	2.47E-04	4.22E-02
<i>Ccs</i>	-1.99	9.94E-01	1.00E+00	2.85E-04	4.22E-02
<i>Hsd17b12</i>	-2.00	9.88E-01	1.00E+00	2.37E-04	4.22E-02
<i>Prl2c3</i>	-2.01	9.97E-01	1.00E+00	1.53E-04	3.50E-02
<i>Ankrd46</i>	-2.02	9.90E-01	1.00E+00	2.16E-04	4.11E-02
<i>Ikbkg</i>	-2.03	9.98E-01	1.00E+00	3.08E-04	4.22E-02
<i>Ddx20</i>	-2.03	9.89E-01	1.00E+00	2.85E-04	4.22E-02
<i>Akt1</i>	-2.04	6.94E-01	1.00E+00	2.16E-04	4.11E-02
<i>Exoc7</i>	-2.05	9.85E-01	1.00E+00	8.07E-05	2.15E-02
<i>Larp4</i>	-2.06	9.88E-01	1.00E+00	2.24E-04	4.11E-02
<i>Ubt1</i>	-2.07	9.71E-01	1.00E+00	1.42E-04	3.41E-02
<i>Brwd3</i>	-2.09	9.92E-01	1.00E+00	3.08E-04	4.22E-02
<i>Nudcd2</i>	-2.09	9.98E-01	1.00E+00	8.02E-05	2.15E-02
<i>Ppcs</i>	-2.09	9.88E-01	1.00E+00	1.40E-04	3.41E-02

<i>Mrps21</i>	-2.09	9.99E-01	1.00E+00	2.24E-04	4.11E-02
<i>Gnb2</i>	-2.09	9.88E-01	1.00E+00	7.40E-05	2.15E-02
<i>Chic2</i>	-2.09	9.95E-01	1.00E+00	3.90E-05	1.65E-02
<i>Fnbp4</i>	-2.09	9.98E-01	1.00E+00	2.16E-04	4.11E-02
<i>Plpp2</i>	-2.10	9.93E-01	1.00E+00	2.85E-04	4.22E-02
<i>Trip11</i>	-2.11	9.99E-01	1.00E+00	2.96E-04	4.22E-02
<i>Ccna2</i>	-2.12	9.89E-01	1.00E+00	1.53E-04	3.50E-02
<i>Brinp2</i>	-2.12	9.97E-01	1.00E+00	2.86E-04	4.22E-02
<i>Hnrnpf</i>	-2.12	9.84E-01	1.00E+00	3.57E-05	1.65E-02
<i>Ccdc134</i>	-2.12	9.99E-01	1.00E+00	3.90E-05	1.65E-02
<i>Prdm10</i>	-2.14	9.83E-01	1.00E+00	2.80E-05	1.65E-02
<i>Smarce1</i>	-2.15	9.88E-01	1.00E+00	7.06E-05	2.15E-02
<i>Tmed2</i>	-2.15	9.97E-01	1.00E+00	2.75E-04	4.22E-02
<i>Usp24</i>	-2.15	9.99E-01	1.00E+00	3.02E-04	4.22E-02
<i>Ipo11</i>	-2.17	9.95E-01	1.00E+00	2.96E-04	4.22E-02
<i>Arf6</i>	-2.18	9.94E-01	1.00E+00	2.96E-04	4.22E-02
<i>Prrc2a</i>	-2.19	9.98E-01	1.00E+00	2.20E-04	4.11E-02
<i>Rhbdl2</i>	-2.19	9.97E-01	1.00E+00	2.10E-04	4.11E-02
<i>Lman2</i>	-2.20	9.93E-01	1.00E+00	3.67E-04	4.99E-02
<i>Parn</i>	-2.22	9.97E-01	1.00E+00	9.27E-05	2.37E-02
<i>Tvp23b</i>	-2.24	9.98E-01	1.00E+00	2.16E-04	4.11E-02
<i>Vmn1r167</i>	-2.25	7.30E-01	1.00E+00	8.12E-05	2.15E-02
<i>Med7</i>	-2.25	9.98E-01	1.00E+00	7.73E-05	2.15E-02
<i>Prkcq</i>	-2.26	9.97E-01	1.00E+00	8.07E-05	2.15E-02
<i>Gne</i>	-2.27	9.97E-01	1.00E+00	8.02E-05	2.15E-02
<i>Aip</i>	-2.27	9.99E-01	1.00E+00	8.07E-05	2.15E-02
<i>Crocc</i>	-2.27	9.97E-01	1.00E+00	8.02E-05	2.15E-02
<i>Uggt1</i>	-2.31	9.98E-01	1.00E+00	3.02E-04	4.22E-02
<i>Atr</i>	-2.32	9.95E-01	1.00E+00	7.45E-05	2.15E-02
<i>Ccnc</i>	-2.33	9.99E-01	1.00E+00	2.20E-04	4.11E-02
<i>Rer1</i>	-2.34	9.93E-01	1.00E+00	7.40E-05	2.15E-02
<i>Cks1b</i>	-2.34	9.94E-01	1.00E+00	7.90E-06	7.22E-03
<i>Ptar1</i>	-2.35	9.98E-01	1.00E+00	3.71E-05	1.65E-02
<i>Dlst</i>	-2.35	9.92E-01	1.00E+00	2.80E-05	1.65E-02
<i>Ubr4</i>	-2.35	9.97E-01	1.00E+00	3.86E-05	1.65E-02
<i>Ddx42</i>	-2.35	9.89E-01	1.00E+00	8.38E-06	7.22E-03
<i>C330007P06Rik</i>	-2.35	9.99E-01	1.00E+00	2.69E-04	4.22E-02
<i>Vps29</i>	-2.37	9.98E-01	1.00E+00	8.07E-05	2.15E-02
<i>Atg13</i>	-2.37	1.00E+00	1.00E+00	2.88E-04	4.22E-02

<i>Rab1a</i>	-2.39	1.00E+00	1.00E+00	1.53E-04	3.50E-02
<i>Rad51d</i>	-2.39	9.97E-01	1.00E+00	4.19E-05	1.67E-02
<i>Otulin</i>	-2.39	9.99E-01	1.00E+00	2.16E-04	4.11E-02
<i>Gpaal</i>	-2.40	9.99E-01	1.00E+00	8.02E-05	2.15E-02
<i>Pih1d1</i>	-2.41	9.98E-01	1.00E+00	8.02E-05	2.15E-02
<i>Nrbf2</i>	-2.41	8.58E-01	1.00E+00	8.07E-05	2.15E-02
<i>BC030336</i>	-2.42	9.89E-01	1.00E+00	7.90E-06	7.22E-03
<i>Nepro</i>	-2.43	9.96E-01	1.00E+00	2.16E-04	4.11E-02
<i>Rbm34</i>	-2.44	9.90E-01	1.00E+00	6.47E-06	7.22E-03
<i>Ireb2</i>	-2.44	9.98E-01	1.00E+00	2.16E-04	4.11E-02
<i>Sgoll</i>	-2.44	9.98E-01	1.00E+00	1.53E-04	3.50E-02
<i>Ugp2</i>	-2.45	9.99E-01	1.00E+00	2.29E-04	4.15E-02
<i>Arf3</i>	-2.46	9.99E-01	1.00E+00	2.16E-04	4.11E-02
<i>Itgav</i>	-2.47	9.98E-01	1.00E+00	3.86E-05	1.65E-02
<i>Ube2n</i>	-2.47	9.96E-01	1.00E+00	3.62E-05	1.65E-02
<i>Mcl1</i>	-2.48	9.99E-01	1.00E+00	1.42E-04	3.41E-02
<i>Map3k7</i>	-2.48	9.98E-01	1.00E+00	3.57E-05	1.65E-02
<i>Vps11</i>	-2.49	9.99E-01	1.00E+00	2.16E-04	4.11E-02
<i>Birc2</i>	-2.49	1.00E+00	1.00E+00	3.62E-05	1.65E-02
<i>Vmn1r202</i>	-2.50	9.99E-01	1.00E+00	2.71E-04	4.22E-02
<i>Rela</i>	-2.51	9.99E-01	1.00E+00	2.16E-04	4.11E-02
<i>N4bp1</i>	-2.54	9.99E-01	1.00E+00	2.80E-05	1.65E-02
<i>Slc35a1</i>	-2.55	9.96E-01	1.00E+00	6.47E-06	7.22E-03
<i>Gm7534</i>	-2.57	9.99E-01	1.00E+00	3.86E-05	1.65E-02
<i>Tmed10</i>	-2.58	9.99E-01	1.00E+00	8.02E-05	2.15E-02
<i>Tlcd1</i>	-2.58	1.00E+00	1.00E+00	8.07E-05	2.15E-02
<i>Sptlc2</i>	-2.62	9.97E-01	1.00E+00	6.94E-06	7.22E-03
<i>Sepsecs</i>	-2.62	9.98E-01	1.00E+00	4.19E-05	1.67E-02
<i>Pigk</i>	-2.62	9.99E-01	1.00E+00	6.94E-06	7.22E-03
<i>Sptlc1</i>	-2.64	9.97E-01	1.00E+00	3.14E-05	1.65E-02
<i>Asnsd1</i>	-2.65	9.99E-01	1.00E+00	3.86E-05	1.65E-02
<i>Gpx4</i>	-2.65	9.99E-01	1.00E+00	8.07E-05	2.15E-02
<i>Uba6</i>	-2.66	9.99E-01	1.00E+00	7.02E-05	2.15E-02
<i>Vps33a</i>	-2.67	1.00E+00	1.00E+00	7.42E-06	7.22E-03
<i>Tmx2</i>	-2.67	9.99E-01	1.00E+00	8.38E-06	7.22E-03
<i>Cwc27</i>	-2.68	9.95E-01	1.00E+00	1.92E-06	5.45E-03
<i>Chtf8</i>	-2.69	1.00E+00	1.00E+00	7.45E-05	2.15E-02
<i>Kmt2d</i>	-2.69	9.99E-01	1.00E+00	3.76E-05	1.65E-02
<i>Atg5</i>	-2.69	9.98E-01	1.00E+00	3.90E-05	1.65E-02

<i>Dscc1</i>	-2.70	9.97E-01	1.00E+00	2.63E-06	5.45E-03
<i>Atp6v1h</i>	-2.71	9.98E-01	1.00E+00	6.94E-06	7.22E-03
<i>Slc7a11</i>	-2.73	9.99E-01	1.00E+00	3.71E-05	1.65E-02
<i>Gss</i>	-2.74	1.00E+00	1.00E+00	2.21E-04	4.11E-02
<i>Pigu</i>	-2.78	1.00E+00	1.00E+00	2.63E-06	5.45E-03
<i>Stub1</i>	-2.79	9.97E-01	1.00E+00	7.18E-07	4.95E-03
<i>Calr</i>	-2.82	9.99E-01	1.00E+00	2.85E-05	1.65E-02
<i>Aprt</i>	-2.83	9.99E-01	1.00E+00	2.80E-05	1.65E-02
<i>Alg8</i>	-2.84	9.99E-01	1.00E+00	2.16E-06	5.45E-03
<i>Ei24</i>	-2.85	1.00E+00	1.00E+00	4.14E-05	1.67E-02
<i>Mtch1</i>	-2.87	9.99E-01	1.00E+00	7.90E-06	7.22E-03
<i>Eefsec</i>	-2.91	9.97E-01	1.00E+00	2.39E-07	2.48E-03
<i>Traf3</i>	-2.94	1.00E+00	1.00E+00	7.90E-06	7.22E-03
<i>Usp18</i>	-2.95	9.99E-01	1.00E+00	3.71E-05	1.65E-02
<i>Vps4b</i>	-2.97	1.00E+00	1.00E+00	2.90E-05	1.65E-02
<i>Traf2</i>	-2.98	1.00E+00	1.00E+00	6.47E-06	7.22E-03
<i>Pigs</i>	-3.01	1.00E+00	1.00E+00	2.75E-05	1.65E-02
<i>Fitm2</i>	-3.03	1.00E+00	1.00E+00	2.63E-06	5.45E-03
<i>Megf8</i>	-3.14	1.00E+00	1.00E+00	2.16E-06	5.45E-03
<i>Eri1</i>	-3.18	1.00E+00	1.00E+00	6.47E-06	7.22E-03
<i>Rnf31</i>	-3.40	1.00E+00	1.00E+00	2.16E-06	5.45E-03
<i>Ptpn2</i>	-3.63	1.00E+00	1.00E+00	2.39E-07	2.48E-03