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APPENDIX 2 *VIL1-GREM1* GENE EXPRESSION LISTS FOR QUADRATIC CONNECTIVITY MAPPING ANALYSIS

Table 2 500, 150 and 50 gene lists of top up- and down-regulated, statistically significant ($p < 0.05$) genes between Wild-type and *Vil1-Grem1* mice colon gene expression

The gene expression data set (GSE62307; (Davis *et al.*, 2015)) was downloaded as the Series Matrix and input into Partek® Genomics Suite® where the gene probe list (n= 45281) was cut to statistically significant gene probes (adj. $p < 0.05$ n= 2885). The gene list was then cut into a list of 500 (whole list: dark, middle and lightest shades), 150 (middle and lightest shades) and 50 (lightest shades) based on their fold change (FC). Orange colours represent *Vil1-Grem1* mice genes with increased FC compared to wild-type mice whilst green colours represent genes that decreased.

ID	adj.P.Val	FC	Gene.symbol	Gene lists
ILMN_1228522	0.00000097200	227.6166	Grem1	50, 100, 150
ILMN_2825562	0.00020900000	22.17945	Cybrd1	50, 100, 150
ILMN_2980323	0.00000634000	22.12114	Cldn2	50, 100, 150
ILMN_1255479	0.00000319000	19.90616	Cldn2	50, 100, 150
ILMN_3136983	0.00005060000	14.61218	Prss27	50, 100, 150
ILMN_1219188	0.00003590000	14.5276	Akr1b8	50, 100, 150
ILMN_2578829	0.00106000000	14.51362	Slc11a2	50, 100, 150
ILMN_1256676	0.00000539000	12.75499	Ddah1	50, 100, 150
ILMN_1244342	0.00047000000	12.01625	Anxa10	50, 100, 150
ILMN_1243129	0.00019200000	10.84353	Slc11a2	50, 100, 150
ILMN_2600883	0.00013200000	10.82602	Prss27	50, 100, 150
ILMN_2846865	0.00164000000	10.71792	Actb	50, 100, 150
ILMN_2773113	0.00003950000	10.69801	Capg	50, 100, 150
ILMN_1225029	0.00006520000	10.36366	Mboat1	50, 100, 150
ILMN_2618918	0.00000097200	10.32936	Slc2a6	50, 100, 150
ILMN_1249485	0.00338000000	9.957131	S100g	50, 100, 150
ILMN_1235433	0.00011300000	9.594114	Bmp3	50, 100, 150
ILMN_2525111	0.00174000000	9.582625	Cybrd1	50, 100, 150
ILMN_2588055	0.00045300000	9.573406	Actb	50, 100, 150
ILMN_3044544	0.00295000000	9.409069		50, 100, 150
ILMN_2612973	0.00112000000	9.310549	Sult1c2	50, 100, 150
ILMN_2747923	0.00212000000	9.100889	Slc40a1	50, 100, 150
ILMN_3160218	0.00000097200	9.020889	Amica1	50, 100, 150

ILMN_2511256	0.00000097200	8.929578	Hif1a	100, 150
ILMN_3041654	0.00001590000	8.82605	Cfhr2	100, 150
ILMN_2730999	0.00000944000	8.485607	Car9	100, 150
ILMN_3115281	0.00005270000	7.535366	Capg	100, 150
ILMN_1231204	0.00000097200	7.369586	Amica1	100, 150
ILMN_1244145	0.00003300000	7.30847	Car9	100, 150
ILMN_2596522	0.00336000000	7.300767	Mt1	100, 150
ILMN_2874084	0.00000451000	7.21052	Car9	100, 150
ILMN_2688075	0.00001280000	7.108468	Cyp51	100, 150
ILMN_1237349	0.00191000000	6.683495		100, 150
ILMN_3133448	0.00000097200	6.603884	Mfge8	100, 150
ILMN_1244853	0.00000097200	6.475717		100, 150
ILMN_2996933	0.00036500000	6.194337	Psg25	100, 150
ILMN_1226712	0.00000566000	6.14149	Ccdc134	100, 150
ILMN_1233122	0.00048400000	6.121612	Bglap3	100, 150
ILMN_2615672	0.00000097200	6.115119	Preli2	100, 150
ILMN_2669982	0.00016400000	5.969661	1700025G04Rik	100, 150
ILMN_2825080	0.00009530000	5.921531	Ldhd	100, 150
ILMN_2771034	0.00000097200	5.887315	Mfge8	100, 150
ILMN_2658168	0.00066300000	5.865772	Tcf23	100, 150
ILMN_1243988	0.00018600000	5.81774		150
ILMN_2453312	0.00032200000	5.76626	Dlgap1	150
ILMN_1258159	0.00000285000	5.729413	Slc2a1	150
ILMN_2618148	0.00000620000	5.546709		150
ILMN_2733915	0.00003590000	5.499441	Pde10a	150
ILMN_1257444	0.01410000000	5.419827	Slc37a2	150
ILMN_2558167	0.00000613000	5.372934	Slc38a1	150
ILMN_1259764	0.00002300000	5.366758		150
ILMN_1249289	0.00085200000	5.268969	Tspan12	150
ILMN_2571934	0.00000893000	5.250174		150
ILMN_1259209	0.00009240000	5.205885		150
ILMN_2425029	0.00008050000	5.059391	Phlda2	150
ILMN_2789974	0.00002550000	5.047819	Chst4	150
ILMN_1230766	0.00008050000	4.968479	Scmh1	150

ILMN_1217576	0.00071200000	4.895035	Mecom	150
ILMN_2730208	0.00011800000	4.886104	Mup2	150
ILMN_2614462	0.00002760000	4.867607	Krt19	150
ILMN_2851671	0.00007920000	4.77104	Myadm	150
ILMN_2713285	0.00137000000	4.755461	Fhl1	150
ILMN_2724397	0.00001980000	-4.7841		150
ILMN_2721399	0.00003330000	-4.81733	Ctsw	150
ILMN_2789948	0.00006600000	-4.86165	Arhgdib	150
ILMN_1215955	0.00040000000	-4.86255	Cyp2b10	150
ILMN_1240160	0.00001490000	-4.87369	Nmu	150
ILMN_2465291	0.00007410000	-4.87885		150
ILMN_2722784	0.00003860000	-4.87989	Cd3g	150
ILMN_2642922	0.00075100000	-4.91076	Mtmr11	150
ILMN_2628900	0.00020200000	-4.95193	Itgae	150
ILMN_1231136	0.00020900000	-5.00149		150
ILMN_2636349	0.00067200000	-5.06632	Rnf208	150
ILMN_1238847	0.00007790000	-5.08257	Cd3e	150
ILMN_2974664	0.00810000000	-5.18674	Slc5a4a	150
ILMN_2764727	0.00006840000	-5.20177	Actn2	150
ILMN_1228696	0.00030200000	-5.21068	Ada	150
ILMN_2577039	0.00000634000	-5.25842	Osbp11a	150
ILMN_2797061	0.00009170000	-5.33621	Actn2	150
ILMN_2975295	0.00053200000	-5.35259	2010107G12Rik	150
ILMN_1256430	0.00001530000	-5.4404	Mcoln3	150
ILMN_2507232	0.00219000000	-5.46925	Gas2l3	150
ILMN_2696532	0.00002550000	-5.4771	Aplp1	150
ILMN_3142104	0.00003860000	-5.50091	Tmprss9	150
ILMN_2491839	0.00003730000	-5.50716	Tcrg-V4	150
ILMN_1214573	0.00026800000	-5.54331	Aspa	150
ILMN_3077758	0.00049600000	-5.64168	Unc93a	150
ILMN_2617977	0.00156000000	-5.66691	2010109I03Rik	150
ILMN_1252778	0.00003570000	-5.69406	Tcrg-V5	150
ILMN_2742695	0.00007920000	-5.7196	Clca4a	150
ILMN_2460536	0.00003240000	-5.73052	Enpp3	150

ILMN_2911009	0.00007350000	-5.80892	Gm4956	150
ILMN_2784580	0.00001180000	-5.81082	Cd3e	150
ILMN_1213728	0.00003210000	-5.89709		150
ILMN_2725927	0.00002300000	-5.90635	Serpina3g	100, 150
ILMN_2524691	0.00011500000	-5.94989	1190002N15Rik	100, 150
ILMN_3162133	0.00008280000	-6.01431	1190002N15Rik	100, 150
ILMN_2672190	0.00001530000	-6.03869	Id1	100, 150
ILMN_1229370	0.00008020000	-6.21972	Podn	100, 150
ILMN_2819951	0.00003590000	-6.25313	Lrp12	100, 150
ILMN_2473612	0.00015300000	-6.31341	Unc93a	100, 150
ILMN_1227434	0.00000097200	-6.41147	Itgb7	100, 150
ILMN_1223257	0.00001020000	-6.57246	Ccl4	100, 150
ILMN_2467190	0.00194000000	-6.59135	Bambi-ps1	100, 150
ILMN_1223600	0.00000893000	-6.7929	Ido1	100, 150
ILMN_1236245	0.00000097200	-6.84102	Rab11fip4	100, 150
ILMN_2703738	0.00004110000	-6.86717	Lrp12	100, 150
ILMN_2699611	0.00911000000	-7.05907	Slc34a2	100, 150
ILMN_2943165	0.00000176000	-7.23911	Aqp7	100, 150
ILMN_1228557	0.00000141000	-7.46074	Id2	100, 150
ILMN_2596435	0.00000634000	-7.59455	Lpar3	100, 150
ILMN_2705390	0.00001460000	-7.79487	Acer1	100, 150
ILMN_2764551	0.00009950000	-7.9777	Cox6b2	100, 150
ILMN_1223330	0.00001530000	-7.98177	Aqp7	100, 150
ILMN_1225406	0.00005900000	-8.11185	Ccl24	100, 150
ILMN_3009440	0.00001250000	-8.19519	Lpar3	100, 150
ILMN_1228312	0.00000177000	-8.60593	Oas1e	100, 150
ILMN_1233493	0.00025900000	-8.71062		100, 150
ILMN_1230357	0.00001250000	-8.79588	Itpr1	100, 150
ILMN_1228535	0.00001280000	-8.91445	Pmp22	100, 150
ILMN_2773835	0.00000097200	-8.97704		100, 150
ILMN_1254953	0.00000944000	-8.99268	Aqp7	100, 150
ILMN_2537948	0.00000176000	-9.01725		100, 150
ILMN_2756486	0.00001650000	-9.10384	Aqp1	50, 100, 150
ILMN_2702857	0.00000097200	-9.92817		50, 100, 150

ILMN_2661299	0.00040600000	-10.0383	Pmp22	50, 100, 150
ILMN_2686132	0.00005400000	-10.1765	Ada	50, 100, 150
ILMN_2980661	0.00000097700	-10.3419	Aqp1	50, 100, 150
ILMN_2594926	0.00001050000	-10.5924	Cyp2b10	50, 100, 150
ILMN_2991272	0.00000298000	-10.7587	Aqp3	50, 100, 150
ILMN_2769991	0.00347000000	-10.7856	Cyp2c29	50, 100, 150
ILMN_2980663	0.00000097200	-10.797	Aqp1	50, 100, 150
ILMN_2910653	0.00000097200	-11.4454	Bmp8a	50, 100, 150
ILMN_2773348	0.00000872000	-11.6394	Bmp8a	50, 100, 150
ILMN_2752464	0.00017100000	-11.7449	Clca4a	50, 100, 150
ILMN_2843286	0.00028600000	-12.4621	Slc28a2	50, 100, 150
ILMN_2753183	0.00009420000	-12.6569	Cyp3a11	50, 100, 150
ILMN_2874554	0.00000319000	-12.7441	Aldh4a1	50, 100, 150
ILMN_2666935	0.00020900000	-12.9612	Gm14085	50, 100, 150
ILMN_2929966	0.00000008600	-13.1565	Oas1d	50, 100, 150
ILMN_2976211	0.00000726000	-14.2062	Cyp2b23	50, 100, 150
ILMN_1224851	0.00040600000	-14.9074	Cubn	50, 100, 150
ILMN_2636285	0.00007300000	-15.0463	Nt5e	50, 100, 150
ILMN_2813830	0.00004280000	-16.1633	Nt5e	50, 100, 150
ILMN_1244242	0.00000097200	-17.105	Aldh4a1	50, 100, 150
ILMN_3154252	0.00000119000	-26.5737	Enpp7	50, 100, 150
ILMN_2534526	0.00000097200	-29.3339	Enpp7	50, 100, 150
ILMN_2709166	0.00000023800	-29.6223	Susd2	50, 100, 150
ILMN_2734251	0.00000597000	-36.9009	Dnase1	50, 100, 150
ILMN_1242165	0.00000000182	-25376.2	Slc5a12	50, 100, 150