

1 **DJ-1 (Park7) affects the gut microbiome, metabolites and the development of Innate**
2 **Lymphoid cells (ILCs)**
3

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20 **Short title:** DJ-1 deficiency leads to gut dysbiosis
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22 **Suppl. Fig. legends**
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24 **Suppl. Fig. 1:** Species and functional pathway analysis.

25 (a) Clustering of all bacteria at species level. (b) Significant increase in *Rikenella sp.* and
26 *Alistipes timonensis* in DJ-1^{-/-} mice compared with DJ-1^{+/+}. Bar diagram (mean±SD) shows all
27 the significantly different bacteria at species level in DJ-1^{+/+} and DJ-1^{-/-} mice. *represents the
28 p value of <0.05 using Student's unpaired t-test.
29

30 **Suppl. Fig. 2:** KEGG functional gene pathway analysis from 16S rRNA.
31

32 **Suppl. Fig. 3:** Inflammatory cytokine production in the feces of DJ-1^{-/-} and DJ-1^{+/+} mice.
33

34 **Suppl. Fig. 4:** α-Syn and GFAP expression by IHC and Immunoblotting. (a) A representative
35 IHCs colon pictures from DJ-1^{+/+} (n=3) and DJ-1^{-/-} (n=3) mice. Each mouse is shown and
36 marked with #1, #2 and #3 and staining of α-Syn is shown with arrow heads in the pictures.
37 (b) Bar diagram (mean±SEM) data shows similar expression in DJ-1^{+/+} (n=5) and DJ-1^{-/-} (n=5).
38 (c) GFAP expression (green), nuclei (blue) in the colon as demonstrated by
39 immunofluorescence staining.
40

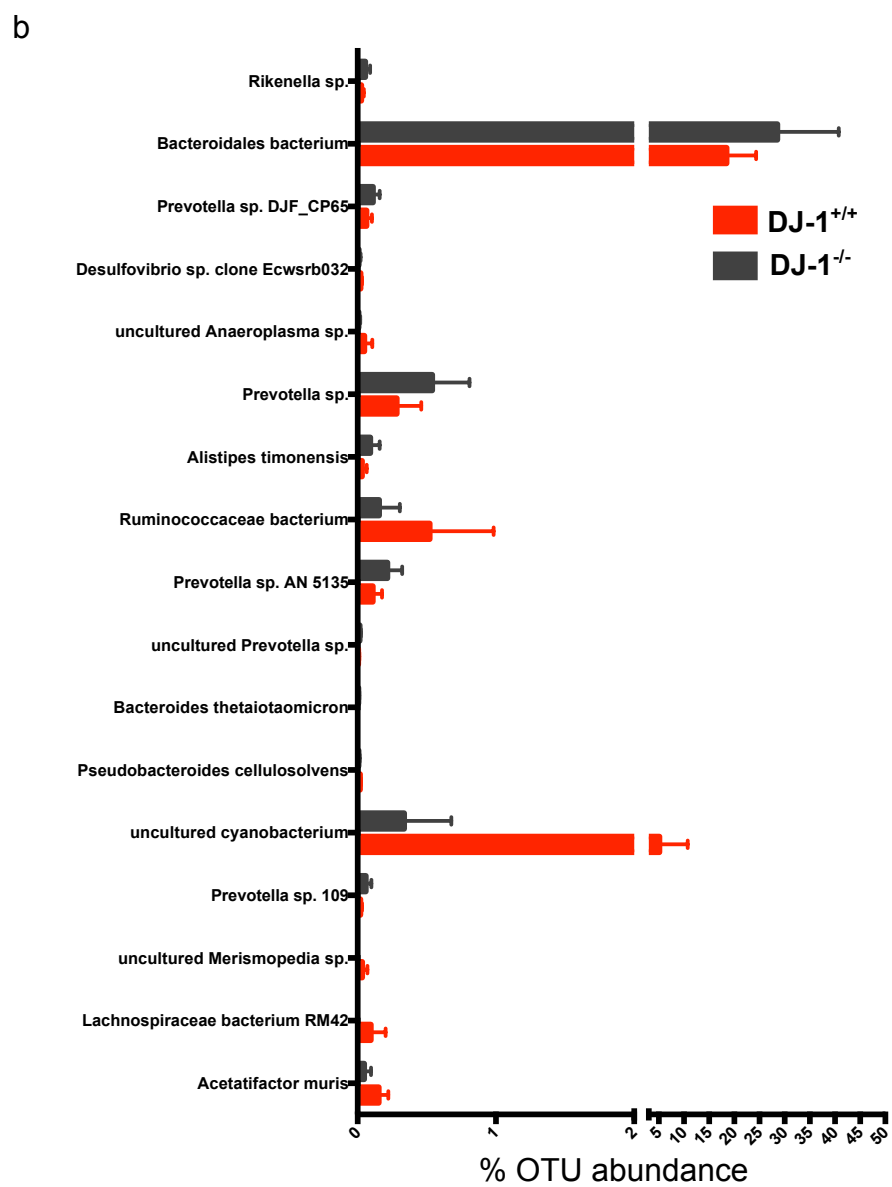
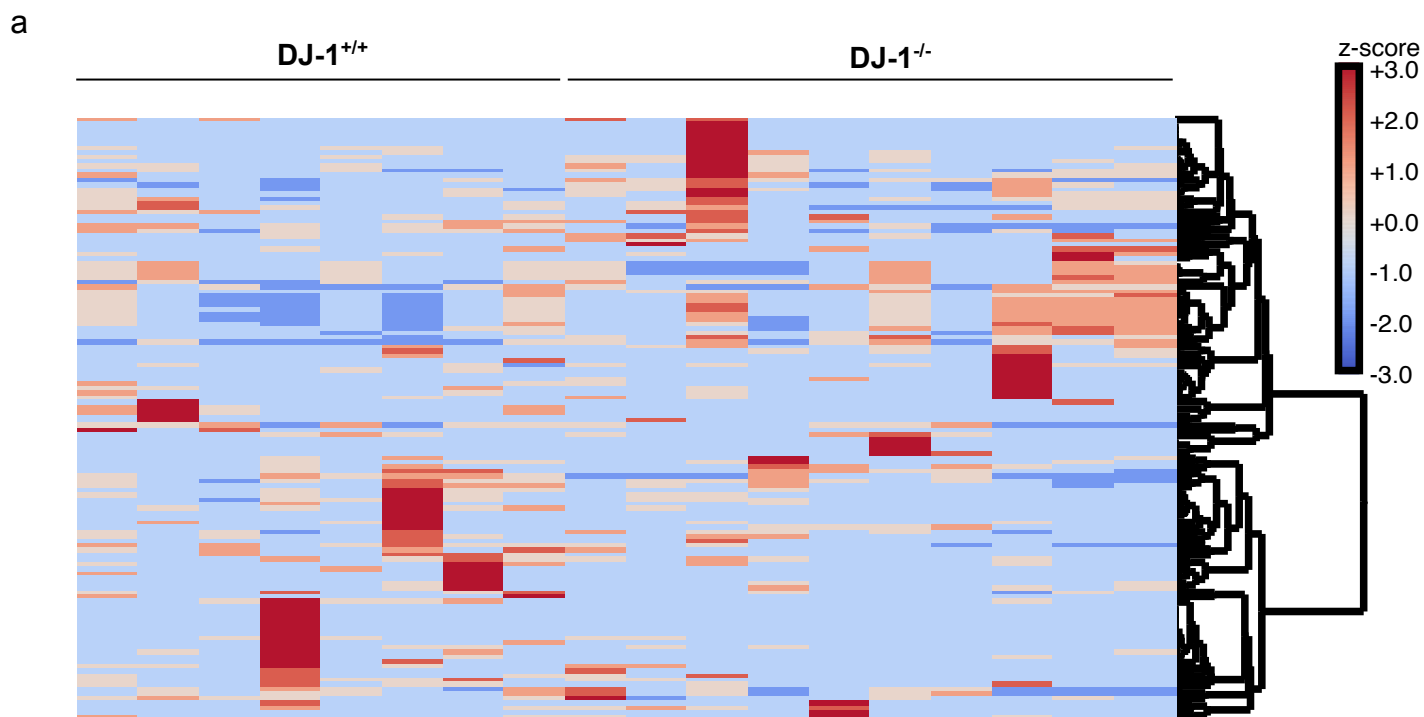
41 **Suppl. Fig. 5:** NMR Metabolites Heatmap and metabolites clustering in DJ-1^{+/+} and DJ-1^{-/-}
42 feces.
43

44 **Suppl. Fig. 6:** Example of ¹H-NMR spectra of DJ-1 and recorded reference standard spectrum
45 for 3-HPPA
46

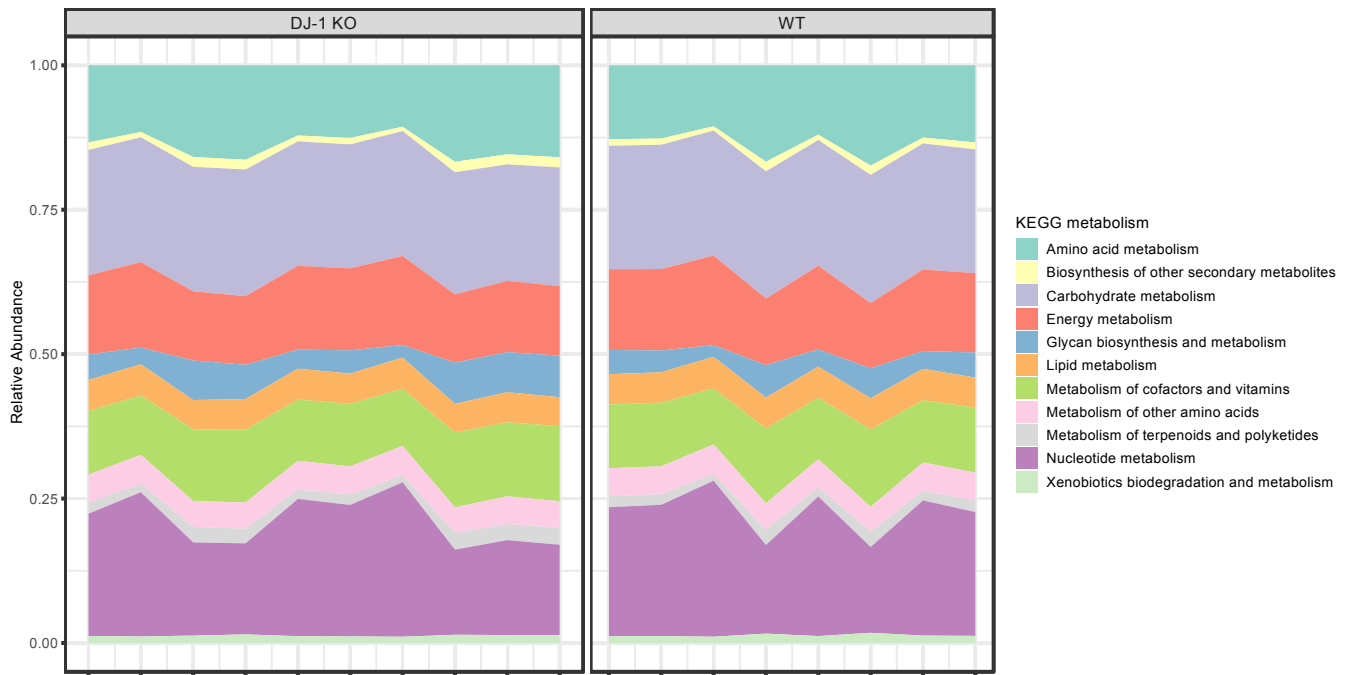
47 **Suppl. Fig. 7:** Original Immunoblots used in the figures. (A) GFAP and corresponding Gapdh.
48 (B) α-Syn (mouse) and corresponding Gapdh.
49

50 **Suppl. Table 1:** Differentially expressed genes (DEGs) in DJ-1^{-/-} mice mid brain containing
51 *SNpc*.
52

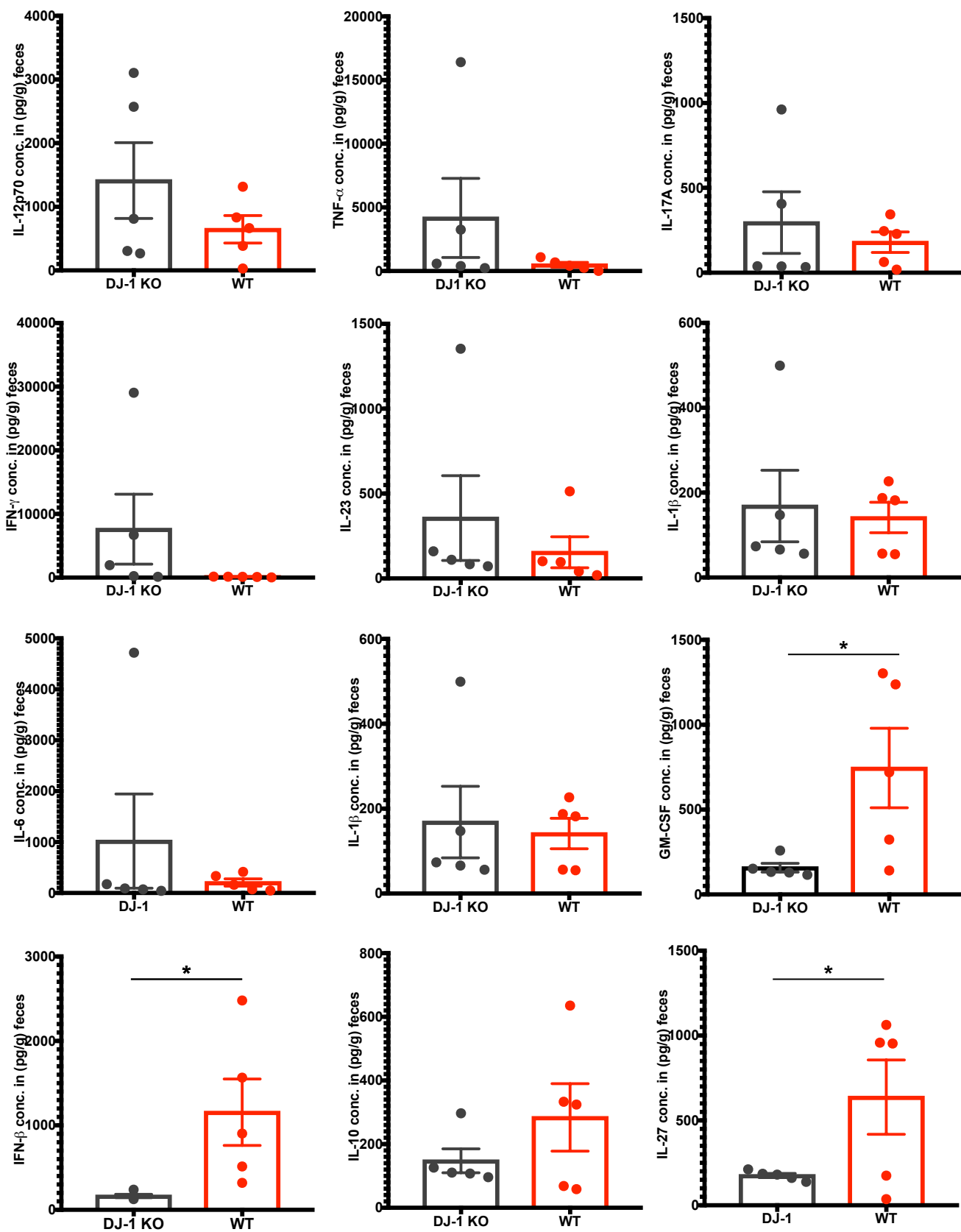
53 **Suppl. Table 2:** Ingenuity canonical pathways in DJ-1^{-/-} mice mid brain containing *SNpc*.
54
55
56



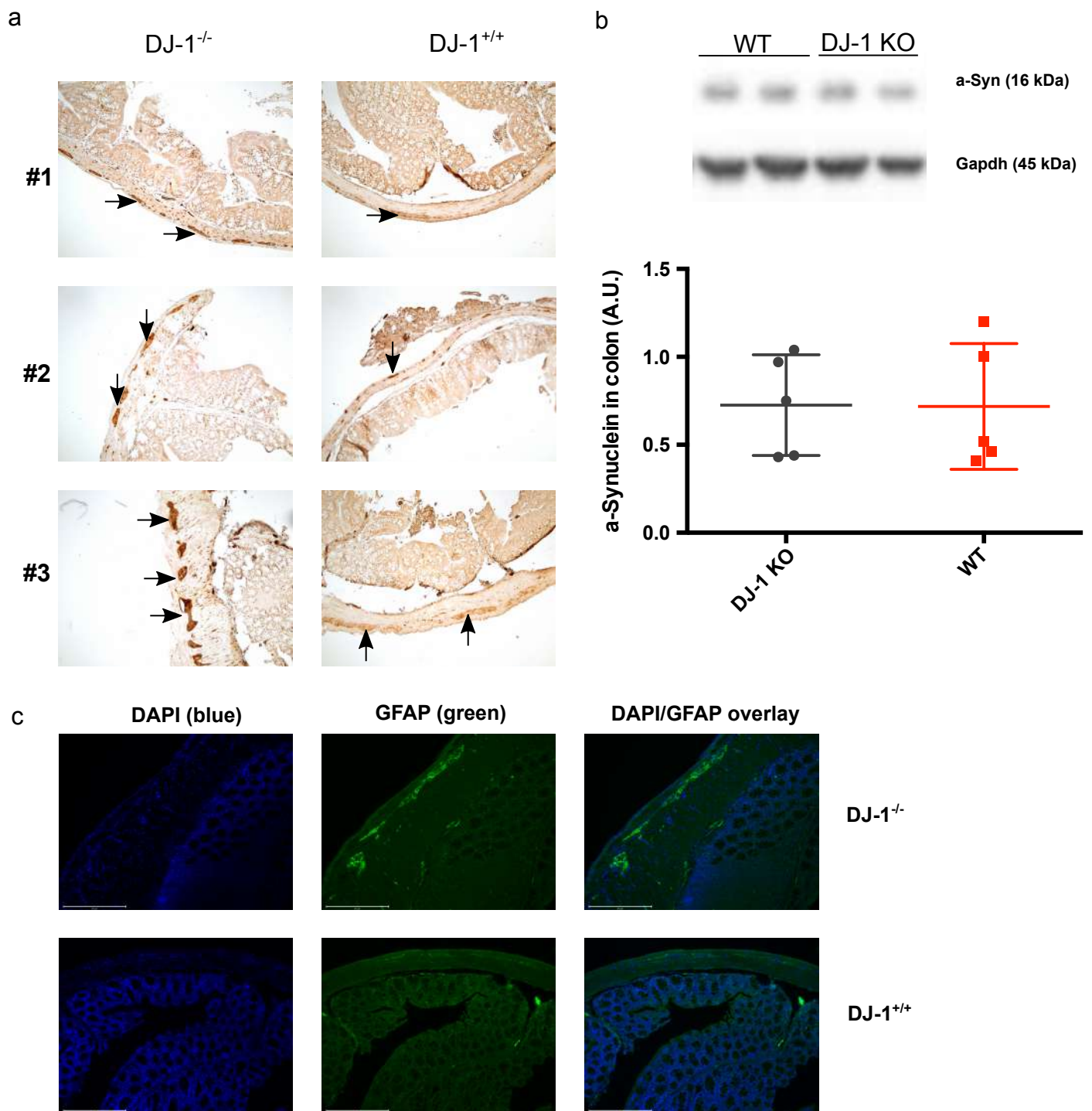
Suppl. Fig. 1



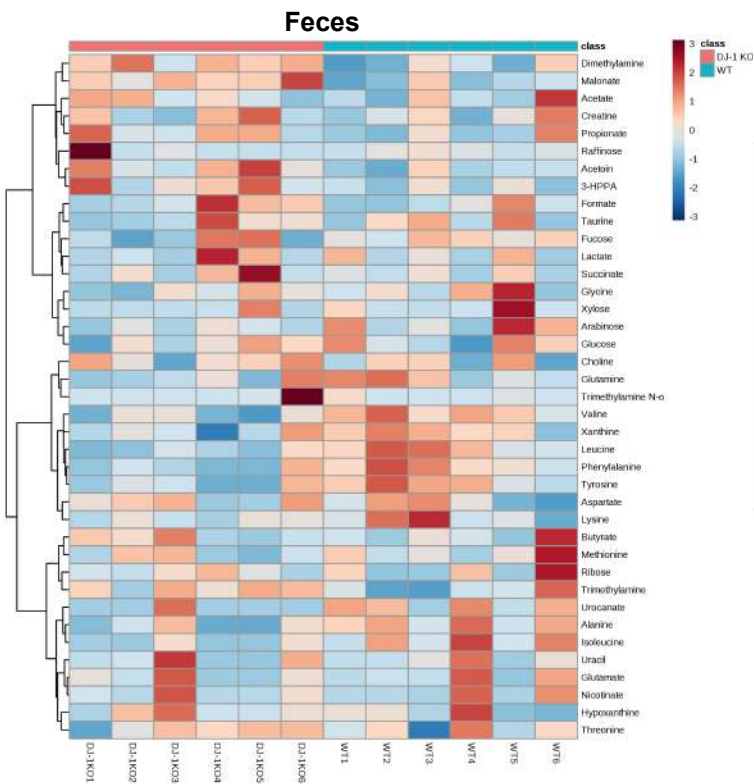
Suppl. Fig. 2



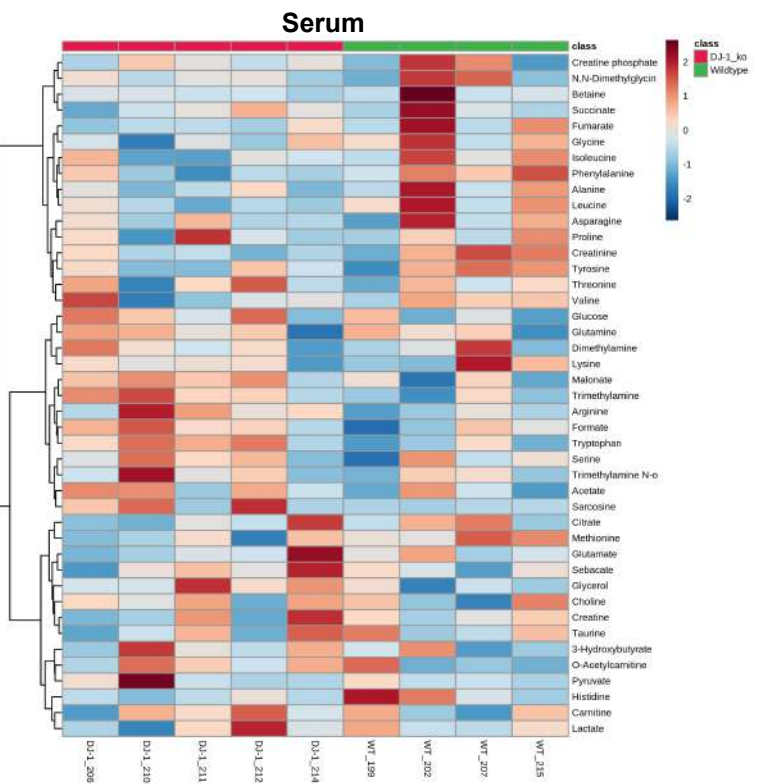
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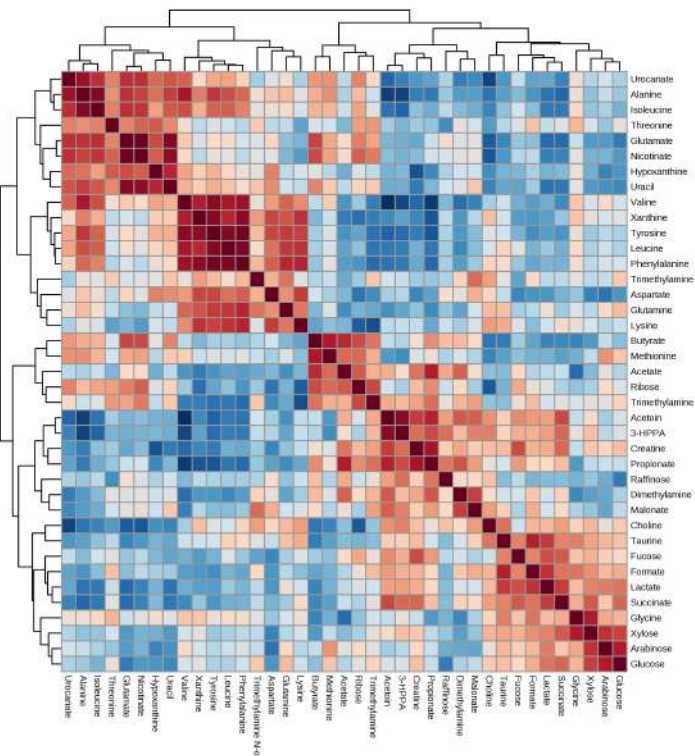
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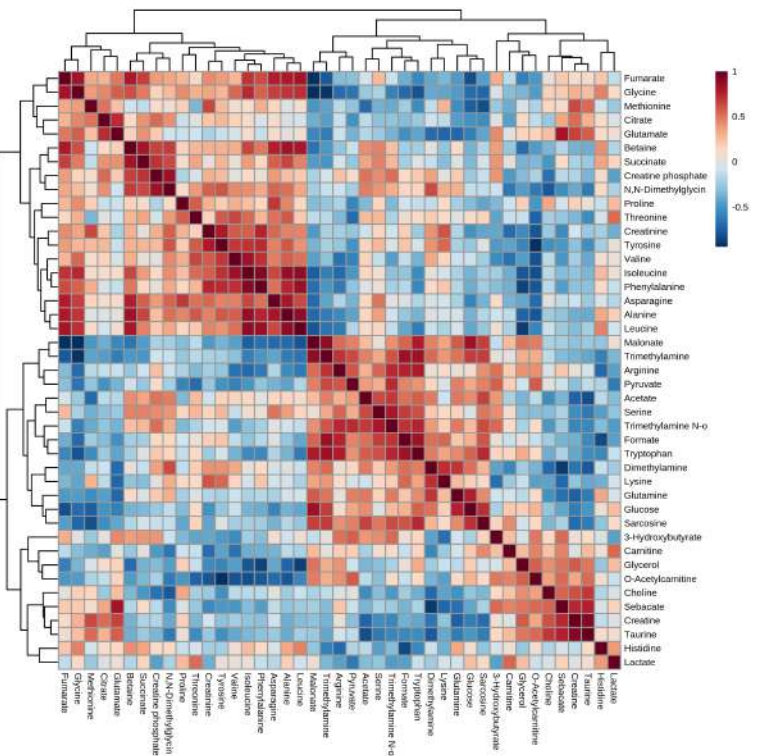
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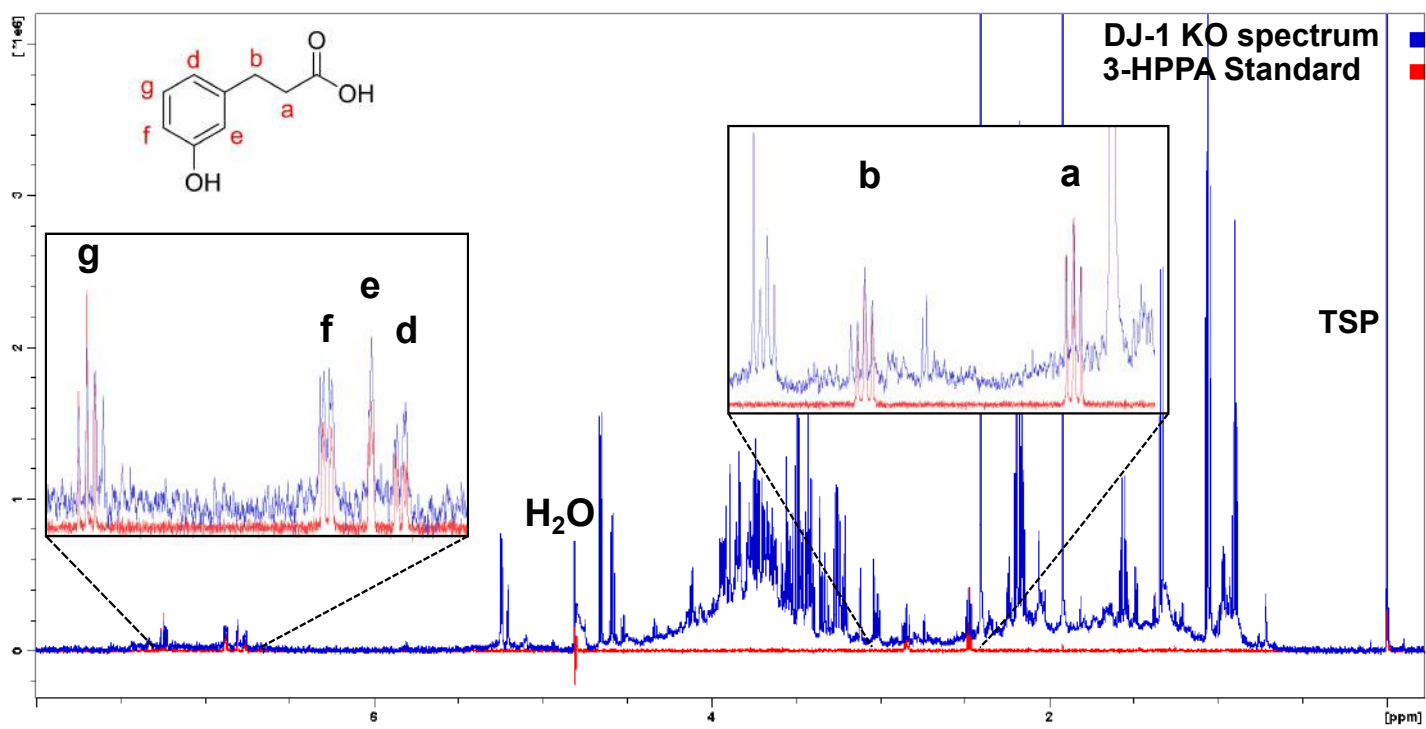
c



d



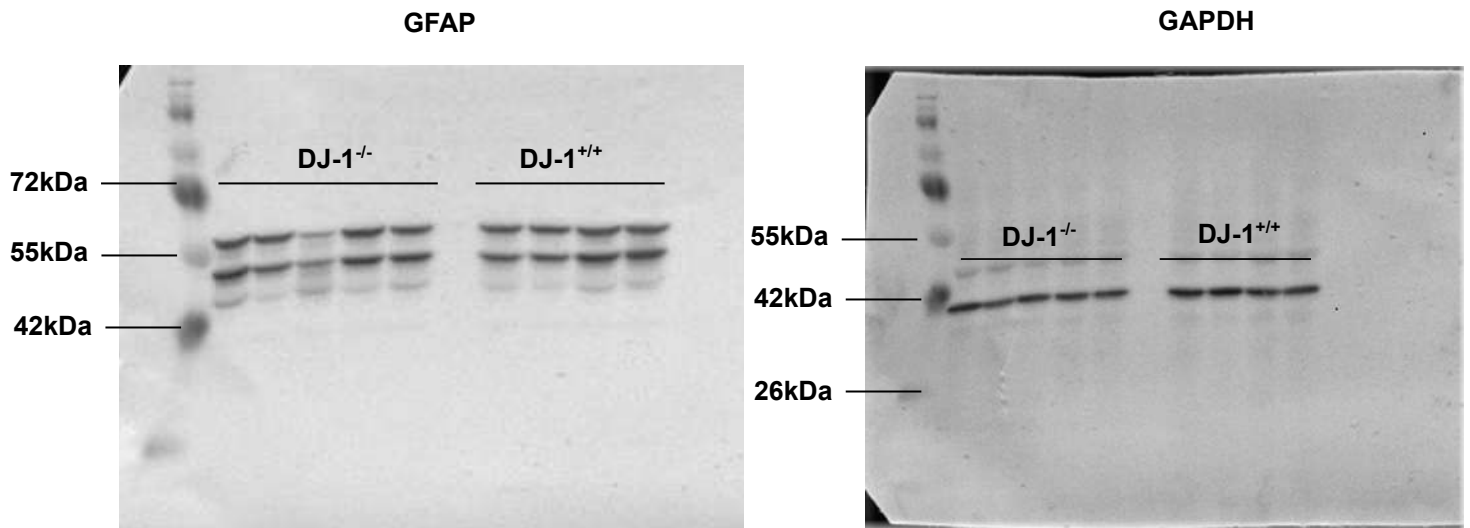
Suppl. Fig. 5



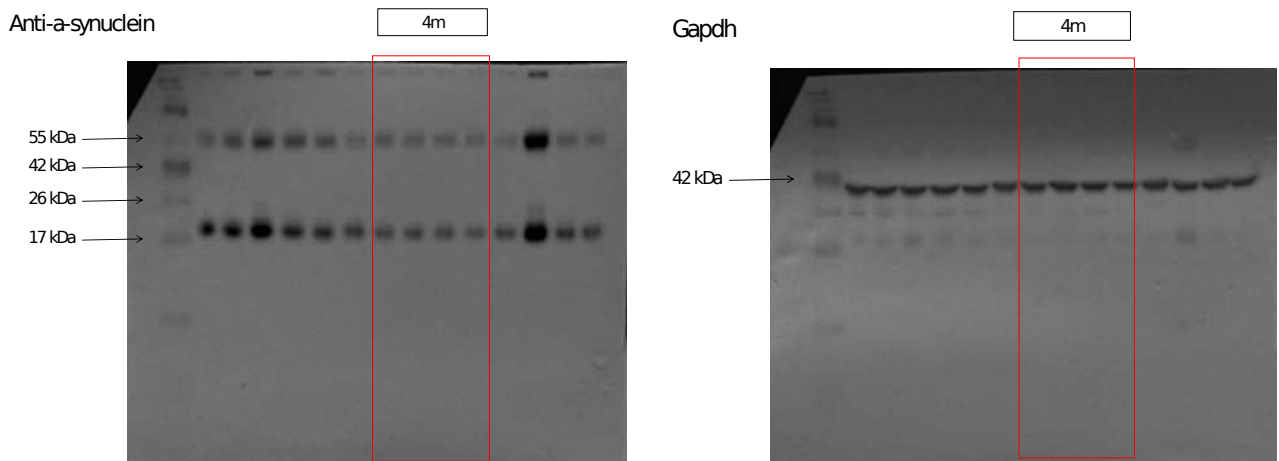
Suppl. Fig. 6

a

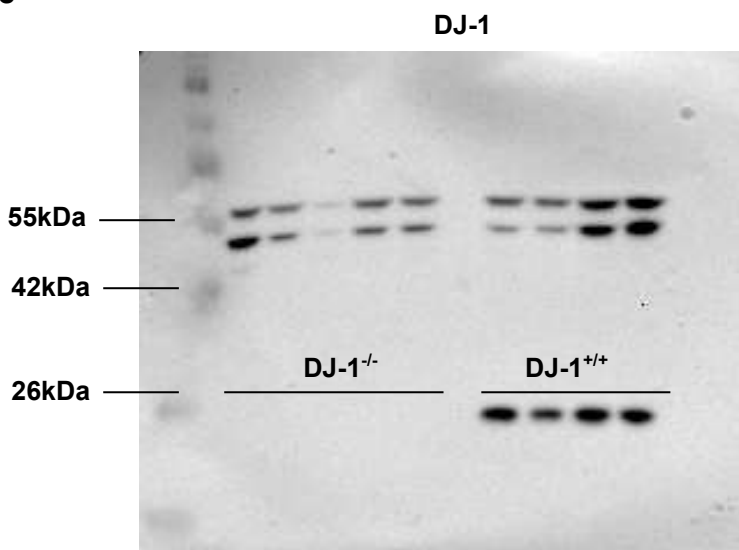
Original WBs



b



c



Suppl. Table 1 Samples

NameInternal	NameExternal	Group
20056a001_01	WT-1 (199)	wt
20056a002_01	WT-2 (202)	wt
20056a003_01	WT-3 (207)	wt
20056a004_01	WT-4 (215)	wt
20056a005_01	DJ-1 KO-1 (206)	ko
20056a006_01	DJ-1 KO-2 (210)	ko
20056a007_01	DJ-1 KO-3 ((211)	ko
20056a008_01	DJ-1 KO-4 (212)	ko
20056a009_01	DJ-1 KO-5 (214)	ko

Summary

Model: ~ Group

Filter: p-value < 0.05

Name	Description	up	down	total
ko	Knockout samples compare	275	254	529

Gene Overview

gene_id	symbol	ko	ko_logFC
ENSMUSG000000031075	Ano1	up	5.19
ENSMUSG000000005800	Mmp8	up	4.35
ENSMUSG000000033788	Dysf	up	4.21
ENSMUSG000000040681	Hmgn1	up	4.00
ENSMUSG000000085386	Gm13630	up	3.99
ENSMUSG000000064310	Zpld1	up	3.99
ENSMUSG000000026621	Marc1	up	3.85
ENSMUSG000000068220	Lgals1	up	3.66
ENSMUSG000000104445	Rhbg	up	3.13
ENSMUSG000000062319	Gm10115	up	3.12
ENSMUSG000000100484	Gm7133	up	2.97
ENSMUSG000000083087	Gm11249	up	2.88
ENSMUSG000000058290	Espl1	up	2.88
ENSMUSG000000106384	Gm43188	up	2.69
ENSMUSG000000104257	Gm20172	up	2.57
ENSMUSG000000109982	Gm45520	up	2.46
ENSMUSG000000105940	Gm42635	up	2.45
ENSMUSG000000062393	Dgkk	up	2.33
ENSMUSG000000099422	Gm4275	up	2.32
ENSMUSG000000108046	Gm43924	up	2.32
ENSMUSG000000048371	Pdp2	up	2.32
ENSMUSG000000093277	Gm26236	up	2.30
ENSMUSG000000059183	Mtfmt	up	2.30
ENSMUSG000000031503	Col4a2	up	2.29
ENSMUSG000000073209	Klf14	up	2.25
ENSMUSG000000005983	1700037C18Rik	up	2.22

ENSMUSG00000031078	Cttn	up	2.20
ENSMUSG00000067795	4930444P10Rik	up	2.18
ENSMUSG00000058486	Wdr91	up	2.18
ENSMUSG00000027224	Duoxa1	up	2.18
ENSMUSG00000110394	Gm18991	up	2.18
ENSMUSG00000060427	Zfp868	up	2.18
ENSMUSG00000100396	Gm29367	up	2.17
ENSMUSG00000040253	Gbp7	up	2.13
ENSMUSG00000049409	Prokr1	up	2.12
ENSMUSG00000105107	Gm43412	up	2.11
ENSMUSG00000113689	AC159239.2	up	2.04
ENSMUSG00000025876	Unc5a	up	2.03
ENSMUSG00000069301	Hist1h2ag	up	2.03
ENSMUSG00000060224	Pyroxd2	up	2.03
ENSMUSG00000036931	Nfkbid	up	2.03
ENSMUSG00000064609	Gm25635	up	2.02
ENSMUSG00000110465	Gm45832	up	1.96
ENSMUSG00000086000	Gm12493	up	1.95
ENSMUSG00000106707	Gm43748	up	1.95
ENSMUSG00000021609	Slc6a3	up	1.93
ENSMUSG00000085033	Gm11646	up	1.93
ENSMUSG00000114064	AC155260.1	up	1.93
ENSMUSG00000017204	Gsdma	up	1.92
ENSMUSG00000040521	Tsfm	up	1.92
ENSMUSG00000112304	AC158633.1	up	1.92
ENSMUSG00000040146	Rgl3	up	1.91
ENSMUSG00000055633	Zfp580	up	1.88
ENSMUSG00000014602	Kif1a	up	1.82
ENSMUSG00000036721	Zscan12	up	1.79
ENSMUSG00000026860	Sh3glb2	up	1.72
ENSMUSG00000091514	Gm17484	up	1.72
ENSMUSG00000074483	Bglap	up	1.68
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ENSMUSG00000112597	AC153974.2	up	1.63
ENSMUSG00000086234	Usp46os2	up	1.63
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ENSMUSG00000108659	Gm34121	up	1.58
ENSMUSG00000114066	AC158354.2	up	1.57
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ENSMUSG00000036196	Slc26a8	up	1.40
ENSMUSG00000086206	Gm13783	up	1.39
ENSMUSG00000117982		up	1.36
ENSMUSG00000024295	Cyp4f41-ps	up	1.35
ENSMUSG00000073838	Tufm	up	1.34
ENSMUSG00000103059	Gm18186	up	1.32
ENSMUSG00000061374	Fiz1	up	1.29
ENSMUSG00000097885	5031434O11Rik	up	1.28
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ENSMUSG00000054764	Mtnr1a	up	1.10
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ENSMUSG00000026036	Nif3l1	down	-0.19
ENSMUSG00000028436	Dcaf12	down	-0.19
ENSMUSG00000052387	Trpm3	down	-0.19
ENSMUSG00000027380	Acox1	down	-0.19
ENSMUSG00000083844	Ube2d-ps	down	-0.19
ENSMUSG00000042211	Fbxo38	down	-0.19
ENSMUSG00000020235	Fzr1	down	-0.19
ENSMUSG00000055301	Adh7	down	-0.19
ENSMUSG000000115338		down	-0.20
ENSMUSG00000062433	Krtap6-2	down	-0.20
ENSMUSG00000058835	Abi1	down	-0.20
ENSMUSG00000097164	Cep83os	down	-0.20
ENSMUSG00000090291	Lrrc10b	down	-0.20
ENSMUSG00000024845	Tmem134	down	-0.20
ENSMUSG00000035840	Lysmd3	down	-0.20
ENSMUSG00000068205	MacroD2	down	-0.20
ENSMUSG000000115264		down	-0.20
ENSMUSG00000026697	Myoc	down	-0.20
ENSMUSG00000028226	Mmp16	down	-0.21
ENSMUSG00000001436	Slc19a1	down	-0.21
ENSMUSG00000021903	Galnt15	down	-0.21
ENSMUSG00000069539	Scyl2	down	-0.21
ENSMUSG000000113903	CT485612.11	down	-0.21
ENSMUSG00000019774	Mtrf1l	down	-0.21
ENSMUSG00000028369	Svep1	down	-0.21
ENSMUSG00000019718	L3hypdh	down	-0.21
ENSMUSG00000003549	Erc1	down	-0.21
ENSMUSG00000032942	Ucp3	down	-0.21
ENSMUSG00000034317	Trim59	down	-0.21
ENSMUSG00000038550	Ciart	down	-0.21
ENSMUSG00000043019	Edem3	down	-0.21
ENSMUSG00000020850	Prpf8	down	-0.21
ENSMUSG00000035722	Abca7	down	-0.22
ENSMUSG00000038150	Ormdl3	down	-0.22
ENSMUSG00000018322	Tomm34	down	-0.22
ENSMUSG00000069844	Sco1	down	-0.22
ENSMUSG00000054312	Mrps21	down	-0.22
ENSMUSG00000020519	Sap30l	down	-0.22
ENSMUSG00000020062	Slc5a8	down	-0.22
ENSMUSG00000020124	Usp15	down	-0.22
ENSMUSG00000069814	Ccdc92b	down	-0.23
ENSMUSG00000027669	Gnb4	down	-0.23
ENSMUSG00000069893	9930111J21Rik1	down	-0.23
ENSMUSG00000039097	Rln1	down	-0.24
ENSMUSG00000085845	Gm13944	down	-0.24
ENSMUSG00000041731	Pgm5	down	-0.24
ENSMUSG000000118274		down	-0.24

ENSMUSG00000099874	Gm29629	down	-0.24
ENSMUSG00000071054	Safb	down	-0.24
ENSMUSG00000025925	Terf1	down	-0.24
ENSMUSG00000025609	Mkln1	down	-0.24
ENSMUSG00000050737	Ptges	down	-0.24
ENSMUSG00000028199	Cryz	down	-0.24
ENSMUSG00000038128	Camk4	down	-0.25
ENSMUSG00000020799	Tekt1	down	-0.25
ENSMUSG00000062198	2700097O09Rik	down	-0.25
ENSMUSG00000020844	Nxn	down	-0.25
ENSMUSG00000040841	Six5	down	-0.25
ENSMUSG00000045763	Basp1	down	-0.25
ENSMUSG00000038871	Bpgm	down	-0.25
ENSMUSG00000054728	Phactr1	down	-0.25
ENSMUSG00000071660	Ttc9c	down	-0.25
ENSMUSG00000020736	Nt5c	down	-0.26
ENSMUSG00000035890	Rnf126	down	-0.26
ENSMUSG00000037935	Smarce1	down	-0.26
ENSMUSG00000000296	Tpd52l1	down	-0.26
ENSMUSG00000071713	Csf2rb	down	-0.26
ENSMUSG00000104362	Gm37928	down	-0.26
ENSMUSG00000022594	Lynx1	down	-0.26
ENSMUSG00000028016	Ints12	down	-0.27
ENSMUSG00000060923	Acyp2	down	-0.27
ENSMUSG00000015599	Ttbk1	down	-0.27
ENSMUSG00000069094	Pde7a	down	-0.27
ENSMUSG00000079259	Trim71	down	-0.27
ENSMUSG00000065922	n-R5-8s1	down	-0.27
ENSMUSG00000047787	Flrt1	down	-0.27
ENSMUSG00000025816	Sec61a2	down	-0.27
ENSMUSG00000025102	3110040N11Rik	down	-0.27
ENSMUSG00000085067	Gm15631	down	-0.27
ENSMUSG00000067158	Col4a4	down	-0.28
ENSMUSG00000077350	n-R5s31	down	-0.28
ENSMUSG00000071356	Reg3b	down	-0.29
ENSMUSG00000116348		down	-0.29
ENSMUSG00000085176	Gm15397	down	-0.30
ENSMUSG00000018761	Mpdu1	down	-0.31
ENSMUSG00000028524	Sgip1	down	-0.31
ENSMUSG00000105636	Gm43625	down	-0.32
ENSMUSG00000005553	Atp4a	down	-0.33
ENSMUSG00000097804	Gm16685	down	-0.33
ENSMUSG00000103713	Gm2136	down	-0.34
ENSMUSG00000021565	Slc6a19	down	-0.34
ENSMUSG00000022565	Plec	down	-0.34
ENSMUSG00000024906	Mus81	down	-0.34
ENSMUSG00000040966	Slc22a2	down	-0.34
ENSMUSG00000007872	Id3	down	-0.34
ENSMUSG00000010721	Lmbr1	down	-0.34
ENSMUSG00000004667	Polr2e	down	-0.35
ENSMUSG00000030982	9030624J02Rik	down	-0.37
ENSMUSG00000040987	Mill2	down	-0.37

ENSMUSG00000078808	Vmn1r58	down	-0.38
ENSMUSG00000002833	Hdgfl2	down	-0.39
ENSMUSG00000024427	Spry4	down	-0.40
ENSMUSG000000116597		down	-0.41
ENSMUSG000000108798	Gm9521	down	-0.42
ENSMUSG00000030806	Stx1b	down	-0.44
ENSMUSG00000030726	Pold3	down	-0.45
ENSMUSG00000003382	Etv3	down	-0.45
ENSMUSG000000104969	Gm43445	down	-0.49
ENSMUSG00000022658	Tagln3	down	-0.50
ENSMUSG000000118207		down	-0.51
ENSMUSG00000028776	Tinagl1	down	-0.51
ENSMUSG000000105906	Iglc1	down	-0.52
ENSMUSG00000042102	Dmgdh	down	-0.53
ENSMUSG00000004344	Gpx5	down	-0.54
ENSMUSG000000054423	Cadps	down	-0.56
ENSMUSG000000089941	Gm16168	down	-0.56
ENSMUSG00000041891	Lman1	down	-0.57
ENSMUSG000000079465	Col4a3	down	-0.58
ENSMUSG000000030666	Calcb	down	-0.60
ENSMUSG00000028609	Magoh	down	-0.61
ENSMUSG00000042788	Fam166b	down	-0.61
ENSMUSG00000042167	Papd4	down	-0.64
ENSMUSG00000073489	Ifi204	down	-0.64
ENSMUSG000000102309	Gm38189	down	-0.64
ENSMUSG000000038840	Birc7	down	-0.66
ENSMUSG000000099034	2810039B14Rik	down	-0.68
ENSMUSG00000073295	Nudt11	down	-0.69
ENSMUSG00000027487	Cdk5rap1	down	-0.69
ENSMUSG000000105021	Gm8234	down	-0.70
ENSMUSG00000020152	Actr2	down	-0.73
ENSMUSG00000021099	Six6	down	-0.79
ENSMUSG000000057614	Gnai1	down	-0.80
ENSMUSG00000002550	Uck1	down	-0.87
ENSMUSG000000117350		down	-0.88
ENSMUSG000000112481	AC155710.1	down	-0.88
ENSMUSG000000105294	Gm43304	down	-0.89
ENSMUSG000000052403	Fcnaos	down	-0.91
ENSMUSG000000097456	Gm16958	down	-0.92
ENSMUSG00000028991	Mtor	down	-0.93
ENSMUSG00000003435	Supt5	down	-0.94
ENSMUSG000000097442	Gm26632	down	-0.94
ENSMUSG00000030747	Dgat2	down	-0.94
ENSMUSG00000027997	Casp6	down	-0.96
ENSMUSG00000000686	Abhd15	down	-0.96
ENSMUSG00000037086	Prr32	down	-0.99
ENSMUSG00000033323	Ctdp1	down	-1.00
ENSMUSG000000083142	Gm12288	down	-1.00
ENSMUSG00000006763	Saal1	down	-1.05
ENSMUSG00000015013	Trappc2l	down	-1.05
ENSMUSG000000064585	Gm25129	down	-1.06
ENSMUSG00000073007	Fam46d	down	-1.10

ENSMUSG00000048411	Gm597	down	-1.13
ENSMUSG00000006154	Eps8l1	down	-1.13
ENSMUSG00000031176	Dynlt3	down	-1.18
ENSMUSG00000079410	Gm2897	down	-1.18
ENSMUSG00000044442	N6amt1	down	-1.18
ENSMUSG00000025350	Rdh5	down	-1.18
ENSMUSG00000003420	Fcgrt	down	-1.21
ENSMUSG00000110065	Gm45588	down	-1.23
ENSMUSG00000034112	Atp2c2	down	-1.24
ENSMUSG00000089679	Gm16299	down	-1.25
ENSMUSG00000112941	AC164441.1	down	-1.26
ENSMUSG00000028648	Ndufs5	down	-1.29
ENSMUSG00000063129	Aldoart2	down	-1.30
ENSMUSG00000061288	Taok3	down	-1.34
ENSMUSG00000117910		down	-1.36
ENSMUSG00000029068	Ccnl2	down	-1.36
ENSMUSG00000085316	D330050G23Rik	down	-1.38
ENSMUSG00000111834	AL928687.1	down	-1.41
ENSMUSG00000071604	Fam189a2	down	-1.42
ENSMUSG00000000628	Hk2	down	-1.46
ENSMUSG00000029238	Clock	down	-1.47
ENSMUSG00000035168	Tanc1	down	-1.47
ENSMUSG00000030785	Cox6a2	down	-1.49
ENSMUSG00000029575	Mmab	down	-1.49
ENSMUSG00000078580	E430018J23Rik	down	-1.49
ENSMUSG00000029670	Ing3	down	-1.49
ENSMUSG00000064063	BC048507	down	-1.50
ENSMUSG00000023031	Cela1	down	-1.56
ENSMUSG00000109127	Gm31135	down	-1.56
ENSMUSG00000033904	Ccp110	down	-1.62
ENSMUSG00000048355	Arxes1	down	-1.63
ENSMUSG00000021012	Zc3h14	down	-1.63
ENSMUSG00000109727	Gm45464	down	-1.64
ENSMUSG00000025534	Gusb	down	-1.65
ENSMUSG00000091735	Gpr62	down	-1.71
ENSMUSG00000026098	Pms1	down	-1.72
ENSMUSG00000045010	Gm4779	down	-1.80
ENSMUSG00000033227	Wnt6	down	-1.83
ENSMUSG00000069188	Gm13192	down	-1.85
ENSMUSG00000024665	Fads2	down	-1.85
ENSMUSG00000009108	Gnat2	down	-1.85
ENSMUSG00000080773	Gm12955	down	-1.85
ENSMUSG00000029020	Mfn2	down	-1.97
ENSMUSG00000026473	Glul	down	-2.00
ENSMUSG00000029056	Pank4	down	-2.01
ENSMUSG00000086953	Aknaos	down	-2.03
ENSMUSG00000040283	Btnl9	down	-2.03
ENSMUSG00000025014	Dntt	down	-2.03
ENSMUSG00000105528	Gm43519	down	-2.05
ENSMUSG00000103011	Gm8860	down	-2.07
ENSMUSG00000052698	Tln2	down	-2.07
ENSMUSG00000109628	BC024386	down	-2.08

ENSMUSG00000098854	Gm5118	down	-2.08
ENSMUSG00000060882	Kcnd2	down	-2.11
ENSMUSG00000021972	Hmbox1	down	-2.19
ENSMUSG00000041707	1810011H11Rik	down	-2.19
ENSMUSG00000086679	Gm15551	down	-2.20
ENSMUSG00000031154	Otud5	down	-2.20
ENSMUSG00000093073	Mir124a-2	down	-2.21
ENSMUSG00000029992	Gfpt1	down	-2.23
ENSMUSG00000099869	1700030F04Rik	down	-2.26
ENSMUSG00000100862	Gm10925	down	-2.26
ENSMUSG00000045414	1190002N15Rik	down	-2.26
ENSMUSG00000016409	Nkap	down	-2.26
ENSMUSG00000081059	Gm11945	down	-2.26
ENSMUSG00000006262	Mob1b	down	-2.27
ENSMUSG00000074384	Al429214	down	-2.33
ENSMUSG00000014470	Rnf166	down	-2.38
ENSMUSG00000024603	Dctn4	down	-2.46
ENSMUSG00000073481	Marc2	down	-2.46
ENSMUSG00000109055	Gm2676	down	-2.50
ENSMUSG00000003657	Calb2	down	-2.50
ENSMUSG00000033152	Podxl2	down	-2.50
ENSMUSG00000052295	8030423F21Rik	down	-2.50
ENSMUSG00000007646	Rad51c	down	-2.52
ENSMUSG00000118087		down	-2.53
ENSMUSG00000112023	Lilr4b	down	-2.71
ENSMUSG00000005846	Rsl1d1	down	-2.72
ENSMUSG00000042613	Pbxip1	down	-2.76
ENSMUSG00000086238	Gm14258	down	-2.89
ENSMUSG00000026356	Dars	down	-3.27
ENSMUSG00000085222	Gm13974	down	-3.29
ENSMUSG00000090381	Gm6158	down	-3.29
ENSMUSG00000114218	AC159195.1	down	-3.55
ENSMUSG00000035354	Uvrag	down	-3.58
ENSMUSG00000085541	Gm16010	down	-3.82
ENSMUSG00000048000	Gigyf2	down	-4.46

Suppl. Table 2

Inguenuity Canonical Pathways	-log(p-value)	Ratio	z-score	Molecules
Upregulated pathways				
Signaling by Rho Family GTPases	1,82E00	2,87E-02	1,342	ACTR2,ARPC1A,CDH20,CDH5,GNAI1,GNAT2,LIMK1
Cardiac Hypertrophy Signaling	9,59E-01	2,08E-02	1,000	ADCY2,GNAI1,GNAT2,MAP3K3,MTOR
Sirtuin Signaling Pathway	4,37E-01	1,37E-02	1,000	CLOCK,GABPA,MTOR,PARP1
Insulin Secretion Signaling Pathway	1,36E00	2,47E-02	0,816	ADCY2,Arxes1/Arxes2,MTOR,NSF,SRP54,STAT5A
Estrogen Receptor Signaling	1,23E00	2,13E-02	0,378	ADCY2,GNAI1,GNAT2,LIMK1,MED23,MMP8,MTOR
Downregulated pathways				
Ephrin Receptor Signaling	1,38E00	2,78E-02	-0,447	ACTR2,ARPC1A,GNAI1,GNAT2,LIMK1
fMLP Signaling in Neutrophils	1,47E00	3,45E-02	-1,000	ACTR2,ARPC1A,GNAI1,NFKBID
Endocannabinoid Cancer Inhibition Pathway	1,19E00	2,8E-02	-1,000	ADCY2,CASP6,GNAI1,MTOR
RhoGDI Signaling	2,52E00	3,89E-02	-1,342	ACTR2,ARPC1A,CDH20,CDH5,GNAI1,GNAT2,LIMK1
Endothelin-1 Signaling	8,63E-01	2,13E-02	-2,000	ADCY2,CASP6,GNAI1,GNAT2
Hepatic Fibrosis Signaling Pathway	2,65E-01	1,09E-02	-2,000	GNAI1,MTOR,NFKBID,WNT6
No change in pathways but a trend				
Synaptogenesis Signaling Pathway	2,74E00	3,21E-02	0,000	ACTR2,ADCY2,ARPC1A,CDH20,CDH5,LIMK1,MTOR,NSF,STX1B,STXBP6
Death Receptor Signaling	1,81E00	4,4E-02	0,000	CASP6,LIMK1,NFKBID,PARP1
NER Pathway	1,63E00	3,88E-02	0,000	HMG1,POLD3,POLE,POLR2E
Reelin Signaling in Neurons	1,32E00	3,1E-02	0,000	ACTR2,ARPC1A,LIMK1,MTOR
Leukocyte Extravasation Signaling	1,24E00	2,54E-02	0,000	CDH5,CTNNA3,CTTN,GNAI1,MMP8
Actin Cytoskeleton Signaling	1,09E00	2,29E-02	0,000	ACTR2,ARPC1A,LIMK1,NCKAP1L,TLN2
Natural Killer Cell Signaling	8,12E-01	2,03E-02	0,000	LIMK1,MAP3K3,MICB,MTOR
HIF1 α Signaling	7,7E-01	1,95E-02	0,000	HK2,MMP8,MTOR,NAA10
Integrin Signaling	7,28E-01	1,88E-02	0,000	ACTR2,ARPC1A,CTTN,TLN2
Cardiac Hypertrophy Signaling (Enhanced)	3,93E-01	1,23E-02	0,000	ADCY2,GNAI1,MAP3K3,MTOR,PDE1A,WNT6
Neuroinflammation Signaling Pathway	0.00E+00	1.00E-02	0,000	BIRC7,CALB2,GLUL
Glutamine Biosynthesis I	1,98E00	1.00E+00	0,000	GLUL
IL-1 Signaling	1,81E00	4,4E-02	0,000	ADCY2,GNAI1,GNAT2,NFKBID
Glutamine Degradation I	1,68E00	5.00E-01	0,000	GLS2