Supplementary table 2 Full list of KEGG pathways enriched by the differentially expressed genes in the transcriptome analysis. The data is displayed per day and includes the up- and down-regulated genes enriching each pathway. Pathways were sorted based on corrected P-value. Days 1, 2 and 4 are presented for the horse inoculated with rAHSV-5 (NS4) and days 1 and 2 for the horses inoculated with rAHSV-5minNS4 (minNS4).

		KEGG pathway	ID	Corrected P-Value	Number of DEGs	Upregulated genes	Downregulated genes
NS4_D1	1	Measles	ecb05162	0.065201878	3	MX1, OAS2, OAS3	-
	2	Influenza A	ecb05164	0.065552255	3	MX1, OAS2, OAS3	-
	3	Leukocyte transendothelial migration	ecb04670	0.175553071	2	-	ROCK1, ITGA4
	4	Hepatitis C	ecb05160	0.175553071	2	OAS2, OAS3	-
	5	Non-homologous end-joining	ecb03450	0.175553071	1	-	RAD50
	6	Protein export	ecb03060	0.197192851	1	-	SEC62
	7	Herpes simplex infection	ecb05168	0.197192851	2	OAS2, OAS3	-
	8	Homologous recombination	ecb03440	0.197192851	1	-	RAD50
	9	Regulation of actin cytoskeleton	ecb04810	0.197192851	2	-	ROCK1, ITGA4
	10	Focal adhesion	ecb04510	0.197192851	2	-	ROCK1, ITGA4
	11	Intestinal immune network for IgA production	ecb04672	0.243196298	1	-	ITGA4
	12	Notch signaling pathway	ecb04330	0.243196298	1	-	CIR1
	13	Leishmaniasis	ecb05140	0.258108332	1	-	ITGA4
	14	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	ecb05412	0.258108332	1	-	ITGA4
	15	TGF-beta signaling pathway	ecb04350	0.258108332	1	-	ROCK1
	16	Hypertrophic cardiomyopathy (HCM)	ecb05410	0.258108332	1	-	ITGA4
	17	Salmonella infection	ecb05132	0.258108332	1	-	ROCK1
	18	Dilated cardiomyopathy	ecb05414	0.258108332	1	-	ITGA4
	19	ECM-receptor interaction	ecb04512	0.258108332	1	-	ITGA4
	20	Hematopoietic cell lineage	ecb04640	0.258108332	1	-	ITGA4
	21	Systemic lupus erythematosus	ecb05322	0.295681	1	-	SSB
	22	Vascular smooth muscle contraction	ecb04270	0.295681	1	-	ROCK1
	23	Platelet activation	ecb04611	0.295681	1	-	ROCK1
	24	Axon guidance	ecb04360	0.295681	1	-	ROCK1
	25	Cell adhesion molecules (CAMs)	ecb04514	0.315122573	1	-	ITGA4
	26	Oxytocin signaling pathway	ecb04921	0.315122573	1	-	ROCK1
	27	RNA transport	ecb03013	0.315122573	1	-	EIF5B
	28	cGMP-PKG signaling pathway	ecb04022	0.315122573	1	-	ROCK1

	29	Protein processing in endoplasmic reticulum	ecb04141	0.315122573	1	-	SEC62
	30	Chemokine signaling pathway	ecb04062	0.32159637	1	-	ROCK1
	31	Proteoglycans in cancer	ecb05205	0.331003533	1	-	ROCK1
	32	cAMP signaling pathway	ecb04024	0.331003533	1	-	ROCK1
	33	MicroRNAs in cancer	ecb05206	0.381141052	1	-	ROCK1
	34	PI3K-Akt signaling pathway	ecb04151	0.464519106	1	-	ITGA4
NS4_D2	1	Influenza A	ecb05164	1.21E-09	20	PML, CXCL10, STAT1, ENSECAG00000023195, TNFSF10, IFIH1, CYCS, ADAR, IRF7, EIF2AK2, MX1, STAT2, OAS1, OAS3, ENSECAG00000024430, SOCS3, DDX58, IRF9, OAS2, RSAD2	-
	2	Measles	ecb05162	6.28E-09	17	TNFSF10, STAT2, STAT1, IFIH1, ADAR, IRF7, EIF2AK2, MX1, TLR2, OAS1, OAS3, DDX58, ENSECAG00000023677, OAS2, IRF9	ENSECAG00000007258, ENSECAG00000009556
	3	Herpes simplex infection	ecb05168	2.42E-05	15	PML, Novel02002, STAT1, IFIH1, STAT2, CYCS, IRF7, EIF2AK2, TLR2, OAS1, OAS3, SOCS3, DDX58, OAS2, IRF9	-
	4	Hepatitis C	ecb05160	4.83E-05	12	Novel02002, STAT1, IRF9, IRF7, EIF2AK2, STAT2, OAS1, OAS3, SOCS3, DDX58, OAS2, IRF1	-
	5	RIG-I-like receptor signaling pathway	ecb04622	0.000343088	8	CXCL10, IFIH1, ENSECAG00000023195, ISG15, IRF7, ENSECAG00000024430, DDX58, DHX58	-
	6	Cytosolic DNA-sensing pathway	ecb04623	0.009446535	6	CXCL10, ZBP1, MB21D1, ADAR, IRF7, DDX58	-
	7	Hepatitis B	ecb05161	0.009446535	9	STAT1, IFIH1, STAT2, CYCS, IRF7, TLR2, EGR2, DDX58	MMP9
	8	NF-kappa B signaling pathway	ecb04064	0.054535477	6	ENSECAG00000023195, TNFSF13B, ENSECAG00000024430, DDX58	ENSECAG00000007258, ENSECAG00000009556
	9	Osteoclast differentiation	ecb04380	0.062440113	7	ENSECAG00000011895, STAT2, SOCS3, IRF9	-
	10	Intestinal immune network for IgA production	ecb04672	0.092975475	4	TNFSF13B, CD86	ENSECAG00000007258, ENSECAG00000009556
	11	Asthma	ecb05310	0.129139498	3	CCL2	ENSECAG00000007258, ENSECAG00000009556
	12	Rheumatoid arthritis	ecb05323	0.129139498	5	TNFSF13B, TLR2, CD86,	ENSECAG00000007258, ENSECAG00000009556
	13	Nicotinate and nicotinamide metabolism	ecb00760	0.129139498	3	ENSECAG00000022042, NAMPT, ENSECAG00000007830	-
	14	Viral myocarditis	ecb05416	0.154429847	4	CYCS, CD86	ENSECAG00000007258, ENSECAG00000009556

15	African trypanosomiasis	ecb05143	0.154429847	3	IDO1	ENSECAG00000007258, ENSECAG00000009556
16	Toll-like receptor signaling pathway	ecb04620	0.154429847	5	TLR2, IRF7, STAT1, CD86, CXCL10	-
17	Leishmaniasis	ecb05140	0.175714563	4	TLR2, STAT1	ENSECAG00000007258, ENSECAG00000009556
18	Glycosaminoglycan biosynthesis - keratan sulfate	ecb00533	0.205563547	2	B3GNT2	CHST2
19	Systemic lupus erythematosus	ecb05322	0.224976433	5	TRIM21, C2, CD86	ENSECAG00000007258, ENSECAG00000009556
20	Allograft rejection	ecb05330	0.225267543	3	CD86	ENSECAG00000007258, ENSECAG00000009556
21	Transcriptional misregulation in cancer	ecb05202	0.235808544	6	PML, CD86	ENSECAG00000007258, ETV7, ENSECAG00000009556, MMP9
22	Staphylococcus aureus infection	ecb05150	0.250389067	3	C2	ENSECAG00000007258, ENSECAG00000009556
23	Histidine metabolism	ecb00340	0.263636964	2	CNDP2	ALDH3A1
24	Autoimmune thyroid disease	ecb05320	0.263636964	3	CD86	ENSECAG00000007258, ENSECAG00000009556
25	Tuberculosis	ecb05152	0.268541959	6	STAT1, CYCS, TLR2, ENSECAG00000023677	ENSECAG00000007258, ENSECAG00000009556
26	beta-Alanine metabolism	ecb00410	0.401698572	2	CNDP2	ALDH3A1
27	Phagosome	ecb04145	0.405154253	5	TLR2, ENSECAG00000023677, CYBB	ENSECAG00000007258, ENSECAG00000009556
28	TNF signaling pathway	ecb04668	0.405154253	4	MLKL, CXCL10, SOCS3	MMP9
29	Prolactin signaling pathway	ecb04917	0.423070078	3	SOCS3, STAT1, IRF1	-
30	Tyrosine metabolism	ecb00350	0.423070078	2	ENSECAG00000007830	ALDH3A1
31	Amoebiasis	ecb05146	0.423070078	4	TLR2	ENSECAG00000007258, FN1, ENSECAG00000009556
32	Viral carcinogenesis	ecb05203	0.423070078	6	IRF7, EIF2AK2, EGR2, GTF2E2, IRF9	GSN
33	Primary immunodeficiency	ecb05340	0.423070078	2	-	ENSECAG00000009556, ENSECAG00000007258
34	Bladder cancer	ecb05219	0.428641414	2	DAPK1	MMP9
35	Vitamin B6 metabolism	ecb00750	0.451257411	1	ENSECAG00000007830	-
36	Fc gamma R-mediated phagocytosis	ecb04666	0.47913	3	-	ENSECAG00000009556, ENSECAG00000007258, GSN
37	Drug metabolism - cytochrome P450	ecb00982	0.47913	2	ENSECAG00000007830	ALDH3A1
38	Tryptophan metabolism	ecb00380	0.483543283	2	IDO1, ENSECAG00000007830	-
39	Ubiquitin mediated proteolysis	ecb04120	0.502236346	4	PML,UBE2L6, SOCS3, UBA7	-
40	Parkinson's disease	ecb05012	0.502236346	4	UBE2L6, CYCS, UBA7	Novel02103
41	Sulfur metabolism	ecb00920	0.502236346	1	CYCS	-
42	Epstein-Barr virus infection	ecb05169	0.519602246	5	DDX58, GTF2E2, EIF2AK2	ENSECAG00000007258, ENSECAG00000009556
43	Metabolism of xenobiotics by cytochrome P450	ecb00980	0.519602246	2	HSD11B1	ALDH3A1

44	Cell adhesion molecules (CAMs)	ecb04514	0.525987851	4	SIGLEC1, CD86, CD274	LRRC4B
45	Fatty acid biosynthesis	ecb00061	0.525987851	1	ACSL1	-
46	Jak-STAT signaling pathway	ecb04630	0.540600051	4	STAT2, STAT1, SOCS3, IRF9	-
47	Legionellosis	ecb05134	0.57672304	2	TLR2, CYCS	-
48	Arginine and proline metabolism	ecb00330	0.579036572	2	LAP3, CNDP2	-
49	Natural killer cell mediated cytotoxicity	ecb04650	0.583453965	3	SOCS3	ENSECAG00000007258, ENSECAG00000009556
50	Chemical carcinogenesis	ecb05204	0.583453965	2	HSD11B1,	ALDH3A1
51	Toxoplasmosis	ecb05145	0.614208946	3	TLR2, STAT1, CYCS	-
52	Inflammatory bowel disease (IBD)	ecb05321	0.614208946	2	TLR2, STAT1	-
53	Fc epsilon RI signaling pathway	ecb04664	0.629910943	2	-	ENSECAG00000007258, ENSECAG00000009556
54	p53 signaling pathway	ecb04115	0.629910943	2	CYCS, SHISA5	-
55	Phenylalanine metabolism	ecb00360	0.637756994	1	-	ALDH3A1
56	Chemokine signaling pathway	ecb04062	0.645222887	4	CXCL10, CCL2, STAT1, STAT2	-
57	B cell receptor signaling pathway	ecb04662	0.645222887	2	-	ENSECAG00000007258, ENSECAG00000009556
58	Adipocytokine signaling pathway	ecb04920	0.645970824	2	ACSL1, SOCS3	-
59	Dorso-ventral axis formation	ecb04320	0.658752165	1	ETV7	-
60	Pertussis	ecb05133	0.658752165	2	C2, IRF1	-
61	Pathways in cancer	ecb05200	0.712917274	6	PML, STAT1, CYCS, DAPK1	FN1,MMP9
62	Apoptosis	ecb04210	0.712917274	2	CYCS, SOCS3	-
63	Dilated cardiomyopathy	ecb05414	0.712917274	2	-	ENSECAG00000007258, ENSECAG00000009556
64	Small cell lung cancer	ecb05222	0.712917274	2	CYCS	FN1
65	Glycosphingolipid biosynthesis - lacto and neolacto series	ecb00601	0.712917274	1	B3GNT2	-
66	Hematopoietic cell lineage	ecb04640	0.731205405	2	-	ENSECAG00000007258, ENSECAG00000009556
67	PI3K-Akt signaling pathway	ecb04151	0.748072152	6	TLR2, NR4A1	ENSECAG00000007258, FN1, ENSECAG00000009556,DDIT4
68	Prion diseases	ecb05020	0.779814242	1	EGR1	-
69	Cytokine-cytokine receptor interaction	ecb04060	0.782317032	4	TNFSF13B, CXCL10, CCL2, TNFSF10	-
70	Fatty acid degradation	ecb00071	0.782317032	1	ACSL1	-
71	Pyrimidine metabolism	ecb00240	0.782317032	2	ENSECAG00000022042, CMPK2	-
72	Graft-versus-host disease	ecb05332	0.782317032	1	CD86	-
73	Basal transcription factors	ecb03022	0.782317032	1	GTF2E2	-

74	Calcium signaling pathway	ecb04020	0.782317032	3	-	ENSECAG00000009556, ENSECAG00000007258, Novel02103
75	Notch signaling pathway	ecb04330	0.782317032	1	DTX3L	-
76	Type II diabetes mellitus	ecb04930	0.782317032	1	SOCS3	-
77	Fatty acid metabolism	ecb01212	0.782317032	1	ACSL1	-
78	Glutathione metabolism	ecb00480	0.782317032	1	LAP3	-
79	Malaria	ecb05144	0.782317032	1	TLR2	-
80	Valine, leucine and isoleucine degradation	ecb00280	0.782317032	1	ENSECAG00000007830	-
81	Cocaine addiction	ecb05030	0.782317032	1	FOSB	-
82	Type I diabetes mellitus	ecb04940	0.782317032	1	CD86	-
83	Retinol metabolism	ecb00830	0.782317032	1	ENSECAG00000007830	-
84	Leukocyte transendothelial migration	ecb04670	0.782317032	2	CYBB	MMP9
85	Steroid hormone biosynthesis	ecb00140	0.782317032	1	HSD11B1	-
86	Amyotrophic lateral sclerosis (ALS)	ecb05014	0.782317032	1	CYCS	-
87	Acute myeloid leukemia	ecb05221	0.816276795	1	PML	-
88	Proteoglycans in cancer	ecb05205	0.816276795	3	TLR2,	MMP9, FN1
89	Glycolysis / Gluconeogenesis	ecb00010	0.818927687	1	-	ALDH3A1
90	mTOR signaling pathway	ecb04150	0.826424574	1	-	DDIT4
91	Colorectal cancer	ecb05210	0.82729257	1	CYCS	-
92	Amphetamine addiction	ecb05031	0.82729257	1	FOSB	-
93	Aminoacyl-tRNA biosynthesis	ecb00970	0.82729257	1	WARS	-
94	Pancreatic cancer	ecb05212	0.82729257	1	STAT1	-
95	PPAR signaling pathway	ecb03320	0.82729257	1	ACSL1	-
96	Non-alcoholic fatty liver disease (NAFLD)	ecb04932	0.843221466	2	CYCS, SOCS3	-
97	Complement and coagulation cascades	ecb04610	0.843498135	1	C2	-
98	Bacterial invasion of epithelial cells	ecb05100	0.865373808	1	-	FN1
99	Peroxisome	ecb04146	0.879153374	1	ACSL1	-
100	ECM-receptor interaction	ecb04512	0.905828228	1	-	FN1
101	Huntington's disease	ecb05016	0.905828228	2	CYCS	Novel02103
102	HTLV-I infection	ecb05166	0.905828228	3	EGR1, EGR2	Novel02103
103	Estrogen signaling pathway	ecb04915	0.926312598	1	-	MMP9
104	HIF-1 signaling pathway	ecb04066	0.926312598	1	CYBB	-
105	Chagas disease (American trypanosomiasis)	ecb05142	0.935684006	1	TLR2	-
106	Regulation of actin cytoskeleton	ecb04810	0.944044065	2	-	FN1, GSN

	107	Thyroid hormone signaling pathway	ecb04919	0.944044065	1	STAT1	-
	108	Cell cycle	ecb04110	0.955662386	1	STAG3	-
	109	Tight junction	ecb04530	0.955662386	1	EPB41L2	-
	110	FoxO signaling pathway	ecb04068	0.955662386	1	SOCS3	-
	111	Insulin signaling pathway	ecb04910	0.955662386	1	SOCS3	-
	112	MicroRNAs in cancer	ecb05206	0.955662386	2	-	DDIT4, MMP9
	113	MAPK signaling pathway	ecb04010	0.955662386	2	DUSP6, NR4A1	-
	114	Oxytocin signaling pathway	ecb04921	0.955662386	1	TRPM2	-
	115	Alcoholism	ecb05034	0.955662386	1	FOSB	-
	116	Alzheimer's disease	ecb05010	0.955662386	1	CYCS	-
	117	cGMP-PKG signaling pathway	ecb04022	0.955662386	1	-	Novel02103
	118	Protein processing in endoplasmic reticulum	ecb04141	0.955662386	1	EIF2AK2	-
	119	Purine metabolism	ecb00230	0.956687584	1	ENSECAG00000022042	-
	120	Metabolic pathways	ecb01100	0.964645306	12	LAP3, ACSL1, ENSECAG00000007830, CNDP2, ENSECAG00000022042, NAMPT, HSD11B1, IDO1, CMPK2, B3GNT2, CYCS	ALDH3A1,
	121	Focal adhesion	ecb04510	0.964645306	1	-	FN1
	122	Endocytosis	ecb04144	0.964645306	1	PML	-
NS4_D4							
	1	Measles	ecb05162	0.007617168	21	ENSECAG00000009474, STAT2, STAT1, IFIH1, HSPA6, IGHE, ADAR, MYD88, EIF2AK2, MX1, TLR2, OAS1, NFKBIA, IRF7, DDX58, OAS3, ENSECAG00000023677, OAS2, IRF9	ENSECAG00000007258, ENSECAG00000009556
	2	Influenza A	ecb05164	0.007617168	24	HSPA6, EIF2AK2, OAS1, ENSECAG00000024430, SOCS3, STAT1, ENSECAG00000023195, JUN, PML, CXCL10, RSAD2, IFIH1, FDPS, MX1, STAT2, NFKBIA, OAS2, IRF9, MYD88, ADAR, IRF7, OAS3, DDX58	IVNS1ABP
	3	Herpes simplex infection	ecb05168	0.027554524	24	Novel02002, EIF2AK2, OAS1, PER1, SOCS3, ENSECAG00000021110, ENSECAG00000021750, STAT1, JUN, PML, IFIH1, TAP1, STAT2, NFKBIA, OAS2, IRF9, MYD88, ENSECAG00000003845, IRF7, CFP, TLR2, OAS3, DDX58	PPP1CB
	4	Asthma	ecb05310	0.03356545	8	ENSECAG00000009474, CCL2, IGHE, FCER1G	ENSECAG00000007258, ENSECAG00000009556, MS4A2, FCER1A,

5	Hepatitis C	ecb05160	0.072390652	17	STAT2, NR1H3, Novel02002, STAT1, OAS3, IRF1, CDKN1A, IRF7, EIF2AK2, LDLR, OAS1, NFKBIA, SOCS3, DDX58, OAS2, IRF9	EIF3E
6	Primary immunodeficiency	ecb05340	0.074145627	8	ENSECAG00000009474, TAP1, IGHE, CD8B, ADA	ENSECAG00000007258, ENSECAG00000009556, PTPRC
7	Antigen processing and presentation	ecb04612	0.155967743	10	PSME2, ENSECAG00000021750, HSPA6, ENSECAG00000021750, TAP1, PSME1, CD8B, CTSB	Novel01595,HSPA4
8	RIG-I-like receptor signaling pathway	ecb04622	0.155967743	10	CXCL10, IFIH1, ENSECAG00000023195, ISG15, IRF7, NFKBIA, ENSECAG00000024430, DDX58, DHX58,	MAP3K1
9	NF-kappa B signaling pathway	ecb04064	0.159961507	12	ENSECAG00000009474, ENSECAG00000023195, IGHE, MYD88, NFKBIA, ENSECAG00000024430, DDX58	ENSECAG00000007258, ENSECAG00000009556, MALT1, SMC3, ATM
10	Leishmaniasis	ecb05140	0.159961507	10	ENSECAG00000009474, STAT1, IGHE, JUN, NCF4, TLR2, NFKBIA, MYD88	ENSECAG00000007258, ENSECAG00000009556
11	Osteoclast differentiation	ecb04380	0.159961507	15	ENSECAG00000010990, ENSECAG00000011895, FOSB, SOCS1, JUN, CYBB, NCF4, CSF1R, STAT2, NFKBIA, SPI1, SOCS3, ILT11A, STAT1, IRF9	-
12	Epstein-Barr virus infection	ecb05169	0.159961507	20	ENSECAG00000009474, ENSECAG00000021750, IL10RA, HSPA6, IGHE, JUN, FGR, EIF2AK2, NFKBIE, NFKBIA, SPI1, HSPB1, ENTPD3, DDX58, ENSECAG00000003845, CDKN1A	ENSECAG00000007258, ENSECAG00000009556, PRKX, SMC3
13	Hepatitis B	ecb05161	0.162514216	16	STAT1, IFIH1, STAT2, E2F2, CDKN1A, JUN, IRF7, MYD88, TLR2, NFKBIA, EGR2, DDX58	PTEN, STAT4,MMP9, MAP3K1
14	Staphylococcus aureus infection	ecb05150	0.162514216	8	ENSECAG00000009474, C2, IGHE, C1R, SELP, C3AR1	ENSECAG00000007258, ENSECAG00000009556
15	Tuberculosis	ecb05152	0.174951304	18	ENSECAG00000009474, ATP6V0D1, FCER1G, SPHK1, ITGAX, IGHE, TCIRG1, TLR2, NOD2, ENSECAG00000019726, ENSECAG00000019765,	ENSECAG00000007258, ENSECAG00000009556, MALT1
16	Rheumatoid arthritis	ecb05323	0.192352436	11	ENSECAG00000009474, ATP6V0D1, IGHE, JUN, TCIRG1, TLR2, CCL3, CD86	ENSECAG00000007258, ENSECAG00000009556, MMP1,
17	p53 signaling pathway	ecb04115	0.232855148	9	CDKN1A, SHISA5	CCNG1, ATM, SESN3, PTEN, SESN1, THBS1,ATR
18	Allograft rejection	ecb05330	0.243416959	7	ENSECAG00000009474, ENSECAG00000021750, IGHE, ENSECAG00000003845, CD86	ENSECAG00000007258, ENSECAG00000009556

19	Transcriptional misregulation in cancer	ecb05202	0.243416959	16	ENSECAG00000009474, PML, CSF1R, IGHE, ETV7, SPI1, ENSECAG00000019726, ENSECAG00000019765, CD86, CDKN1A	ENSECAG00000007258, ENSECAG00000009556, JMJD1C, MLLT3, MMP9, ATM,
20	B cell receptor signaling pathway	ecb04662	0.243416959	9	ENSECAG00000009474, IGHE, NFKBIE, NFKBIA, JUN	ENSECAG00000007258, ENSECAG00000009556, MALT1, SMC3
21	Cytosolic DNA-sensing pathway	ecb04623	0.243416959	8	CXCL10, ZBP1, RIPK3, ADAR, IRF7, TREX1, NFKBIA, DDX58	
22	Bladder cancer	ecb05219	0.243416959	6	CDKN1A, E2F2, DAPK1,	MMP9, MMP1, THBS1
23	TNF signaling pathway	ecb04668	0.243416959	12	CXCL10, RIPK3, MLKL, JUN, TNFRSF1B, NOD2, NFKBIA, SOCS3, ENSECAG00000019726, ENSECAG00000019765	MMP9,ITCH
24	Malaria	ecb05144	0.243416959	7	SELP, LRP1, MYD88, TLR2	KLRK1, THBS1, Novel01642
25	Parkinson's disease	ecb05012	0.25620552	14	UBE2J2, UBA7, UBE2L6, ENSECAG00000006913, COX7A1	ND1, COX2, PRKX, ND3, ND2, GNAI3, ND4L, LRRK2, ND4
26	Phagosome	ecb04145	0.266279187	15	ENSECAG00000009474, ATP6V0D1, ENSECAG00000021750, CYBB, IGHE, ENSECAG00000003845, TAP1, TCIRG1, C1R, TLR2, ENSECAG00000023677, NCF4	ENSECAG00000007258, ENSECAG00000009556, THBS1
27	Autoimmune thyroid disease	ecb05320	0.304160397	7	ENSECAG00000009474, ENSECAG00000021750, IGHE, ENSECAG00000003845, CD86	ENSECAG00000007258, ENSECAG00000009556
28	Fc epsilon RI signaling pathway	ecb04664	0.341605109	8	ENSECAG00000009474, IGHE, FCER1G	ENSECAG00000007258, MS4A2, SMC3, FCER1A, ENSECAG00000009556
29	Ubiquitin mediated proteolysis	ecb04120	0.381459605	13	PML, UBE2J2, UBA7, SOCS1, UBE2L6, SOCS3	HERC3, CUL3, UBE3A, ITCH, HERC4, UBA2, MAP3K1
30	Cell cycle	ecb04110	0.391339985	12	CDKN1A, E2F2	SMC3, RBL2, Novel02165, STAG2, PRKDC, ATM, RBL1, STAG1, RAD21, ATR
31	Protein export	ecb03060	0.391339985	4	-	SEC62, SRP72, SRP54, SEC63
32	Viral carcinogenesis	ecb05203	0.407497937	18	ATP6V0D1, ENSECAG00000021750, CDKN1A, JUN, BAK1, EIF2AK2, NFKBIA, EGR2, IRF7, UBR4, ENSECAG00000003845, IRF9	IL6ST, PRKX, SMC3, UBE3A, RBL1, RBL2
33	African trypanosomiasis	ecb05143	0.410761919	5	IGHE, ENSECAG00000009474, MYD88	ENSECAG00000007258, ENSECAG00000009556
34	Intestinal immune network for IgA production	ecb04672	0.410761919	6	ENSECAG00000009474, IGHE, ENSECAG00000008912, CD86	ENSECAG00000007258, ENSECAG00000009556
35	Pertussis	ecb05133	0.450966896	8	ENSECAG00000013486, NOD1, C2, JUN, MYD88, C1R, IRF1	GNAI3

36	Viral myocarditis	ecb05416	0.482649246	7	ENSECAG00000009474, ENSECAG00000021750, IGHE, ENSECAG00000003845, CD86	ENSECAG00000007258, ENSECAG00000009556
37	Glycosaminoglycan biosynthesis - keratan sulfate	ecb00533	0.482649246	3	B4GALT1, B3GNT7	CHST2
38	Glycosaminoglycan biosynthesis - chondroitin sulfate / dermatan sulfate	ecb00532	0.532121905	3	CHST15	DSE, CHSY1
39	Insulin signaling pathway	ecb04910	0.614778077	12	PYGL, EIF4E1B, SOCS1, SREBF1, HK3, FASN, SOCS3	PRKX, PDE3B, PPP1CB, RPS6KB1, PHKB
40	Fc gamma R-mediated phagocytosis	ecb04666	0.614778077	8	ENSECAG00000009474, SPHK1, IGHE	ENSECAG00000007258, SMC3, ENSECAG00000009556, PTPRC, RPS6KB1
41	Toll-like receptor signaling pathway	ecb04620	0.614778077	9	CXCL10, STAT1, JUN, IRF7, MYD88, TLR2, NFKBIA, CCL3, CD86	-
42	Lysosome	ecb04142	0.643983994	10	ATP6V0D1, PSAP, CD68, ENSECAG00000011466, TCIRG1, NPC2, GM2A, CTSZ, CTSB	GNPTAB
43	Chemokine signaling pathway	ecb04062	0.73133279	14	CXCL10, GNGT2, STAT2, ENSECAG00000001214, ENSECAG00000024882, FGR, NFKBIA, CCL3, CCL2, STAT1	ROCK1, PRKX, SMC3, GNAI3
44	Fatty acid metabolism	ecb01212	0.740452152	5	FASN, MECR, ACOX3	ACADM, ACSL4
45	Protein processing in endoplasmic reticulum	ecb04141	0.792640389	13	UBE2J2, HSPA6, BAK1, EIF2AK2, HYOU1, SSR1, RRBP1	STT3B, SEC63, LMAN1, ERLEC1, DNAJC10, SEC62
46	Non-homologous end-joining	ecb03450	0.937016827	2		RAD50, PRKDC
47	Fatty acid biosynthesis	ecb00061	0.937016827	2	FASN	ACSL4
48	Systemic lupus erythematosus	ecb05322	0.938026039	9	ENSECAG00000009474, C2, IGHE, C1R, TRIM21, CD86	ENSECAG00000007258, ENSECAG00000009556, SSB
49	Toxoplasmosis	ecb05145	0.938026039	9	IL10RA, LDLR, SOCS1, HSPA6, MYD88, TLR2, NFKBIA, STAT1	GNAI3
50	Amoebiasis	ecb05146	0.979400885	9	ENSECAG00000009474, IGHE, TLR2, HSPB1	ENSECAG00000007258, FN1, ENSECAG00000009556, PRKX, SERPINB10
51	Hematopoietic cell lineage	ecb04640	1	7	ENSECAG00000009474, CSF3R, IGHE, CSF1R, CD8B	ENSECAG00000007258, ENSECAG00000009556
52	Mineral absorption	ecb04978	1	4	ENSECAG00000013276, ATP1A1, Novel00194, HMOX1	-
53	Galactose metabolism	ecb00052	1	3	HK3, B4GALT1, PFKP	-
54	Nicotinate and nicotinamide metabolism	ecb00760	1	3	ENSECAG00000022042, NAMPT, NADK	-
55	Natural killer cell mediated cytotoxicity	ecb04650	1	8	ENSECAG00000009474, IGHE, SH3BP2, FCER1G	ENSECAG00000007258, Novel01595, KLRK1, ENSECAG00000009556

56	Platelet activation	ecb04611	1	9	FCER1G	ROCK1, PPP1R12A, PRKX, SMC3, ITPR2, GNAI3, PPP1CB, RASGRP1
57	Butirosin and neomycin biosynthesis	ecb00524	1	1	HK3	-
58	Oxidative phosphorylation	ecb00190	1	9	ATP6V0D1, TCIRG1, COX7A1	ND4, ND4L, COX2, ND1, ND3, ND2
59	Inflammatory bowel disease (IBD)	ecb05321	1	5	TLR2, JUN, NOD2, STAT1	STAT4
60	Cocaine addiction	ecb05030	1	4	FOSB, JUN	PRKX, GNAI3
61	Cell adhesion molecules (CAMs)	ecb04514	1	10	ENSECAG00000021750, ENSECAG00000003845, ENSECAG00000008912, SELP, CD86, ENSECAG00000019873, SDC3, CD8B, SIGLEC1	PTPRC
62	Amphetamine addiction	ecb05031	1	5	FOSB, JUN	SIRT1, PRKX, PPP1CB
63	PPAR signaling pathway	ecb03320	1	5	NR1H3, ACOX3	MMP1, ACADM, ACSL4
64	NOD-like receptor signaling pathway	ecb04621	1	4	NOD1, NOD2, NFKBIA, NLRP1	-
65	T cell receptor signaling pathway	ecb04660	1	7	JUN, NFKBIE, NFKBIA, CD8B	RASGRP1, PTPRC, MALT1
66	Terpenoid backbone biosynthesis	ecb00900	1	2	FDPS	FNTA
67	Fatty acid degradation	ecb00071	1	3	ACOX3	ACADM, ACSL4
68	Adipocytokine signaling pathway	ecb04920	1	5	NFKBIE, NFKBIA, TNFRSF1B, SOCS3	ACSL4
69	Vitamin B6 metabolism	ecb00750	1	1	PDXK	-
70	Legionellosis	ecb05134	1	4	MYD88, TLR2, NFKBIA, HSPA6	-
71	Acute myeloid leukemia	ecb05221	1	4	PML, SPI1, TCF7L2	RPS6KB1
72	Dorso-ventral axis formation	ecb04320	1	2	ETV7, ETS2	-
73	Arginine and proline metabolism	ecb00330	1	4	CKB, SAT1, CNDP2, GLUL	-
74	Starch and sucrose metabolism	ecb00500	1	3	HK3, PYGL	AGL
75	Graft-versus-host disease	ecb05332	1	3	ENSECAG00000003845, ENSECAG00000021750, CD86	-
76	Proteoglycans in cancer	ecb05205	1	12	CDKN1A, TLR2	FN1, ROCK1, PDCD4, PPP1R12A, PRKX, ITPR2, PPP1CB, RPS6KB1, THBS1, MMP9
77	Endocytosis	ecb04144	1	13	PML, ENSECAG00000021750, HSPA6, ENSECAG00000003845, EHD4, CYTH4, CSF1R, LDLR	ARFGEF1, ARAP2, ACAP2, USP8, ITCH
78	mTOR signaling pathway	ecb04150	1	4	DDIT4, EIF4E1B	RPS6KB1, PTEN
79	Jak-STAT signaling pathway	ecb04630	1	9	IL10RA, CSF3R, SOCS1, STAT2, SOCS3, STAT1, IRF9	IL6ST, STAT4
80	HTLV-I infection	ecb05166	1	15	EGR1, ENSECAG00000021750, CDKN1A, E2F2, ENSECAG00000003845, NFKBIA, EGR2, FDPS, SPI1, ETS2, JUN	ATR, PRKX, ATM, MAP3K1
81	Proteasome	ecb03050	1	3	PSME2, PSMF1, PSME1	

82	ABC transporters	ecb02010	1	3	ABCD1, TAP1	ENSECAG00000007288
83	Collecting duct acid secretion	ecb04966	1	2	ATP6V0D1, TCIRG1	-
84	Peroxisome	ecb04146	1	5	ABCD1, ACOX3	FAR1, HSD17B4, ACSL4
85	Estrogen signaling pathway	ecb04915	1	6	HSPA6, JUN	PRKX, MMP9, ITPR2, GNAI3
86	HIF-1 signaling pathway	ecb04066	1	6	TIMP1, EIF4E1B, CYBB, HK3, CDKN1A	RPS6KB1
87	Oxytocin signaling pathway	ecb04921	1	9	JUN, TRPM2, CDKN1A	ROCK1, PRKX, ITPR2, GNAI3, PPP1CB, PPP1R12A
88	Thyroid cancer	ecb05216	1	2	TCF7L2	TPR
89	Notch signaling pathway	ecb04330	1	3	APH1A, DTX3L	CIR1
90	Type II diabetes mellitus	ecb04930	1	3	SOCS1, HK3, SOCS3	-
91	MicroRNAs in cancer	ecb05206	1	14	SOCS1, CDKN1A, BAK1, E2F2, DDIT4, ST14	SIRT1, ROCK1, PDCD4, MMP9, CCNG1, ATM, PTEN, THBS1
92	RNA transport	ecb03013	1	9	EIF4E1B	ENSECAG00000008458, EIF3A, EIF5B, EIF3E, THOC2, TPR, PNN, UPF2
93	Riboflavin metabolism	ecb00740	1	1	ACP2	-
94	Dilated cardiomyopathy	ecb05414	1	5	IGHE, ENSECAG00000009474	ENSECAG00000007258, PRKX, ENSECAG00000009556
95	Fructose and mannose metabolism	ecb00051	1	2	HK3, PFKP	-
96	beta-Alanine metabolism	ecb00410	1	2	CNDP2	ACADM
97	Circadian rhythm	ecb04710	1	2	BHLHE40, PER1	-
98	Mucin type O-Glycan biosynthesis	ecb00512	1	2	-	C1GALT1, GALNT1
99	Spliceosome	ecb03040	1	7	HSPA6	U2SURP, PRPF40A, DHX15, AQR, DDX46, THOC2
100	Chagas disease (American trypanosomiasis)	ecb05142	1	6	JUN, MYD88, TLR2, NFKBIA, CCL3	GNAI3
101	Fanconi anemia pathway	ecb03460	1	3	-	REV3L, USP1, ATR
102	Type I diabetes mellitus	ecb04940	1	3	ENSECAG00000003845, ENSECAG00000021750, CD86	-
103	Prostate cancer	ecb05215	1	5	E2F2, NFKBIA, CDKN1A, TCF7L2	PTEN
104	cAMP signaling pathway	ecb04024	1	11	JUN, ATP1A1, NFKBIA, ACOX3	ROCK1, ATP2B1, PRKX, PDE3B, GNAI3, PPP1CB, PPP1R12A
105	Lysine degradation	ecb00310	1	3	PLOD1, ENSECAG00000017946	KMT5B
106	RNA degradation	ecb03018	1	4	BTG2	XRN1, TTC37, SKIV2L2
107	Complement and coagulation cascades	ecb04610	1	4	ENSECAG00000013486, C1R, C3AR1, C2	-
108	Prolactin signaling pathway	ecb04917	1	4	SOCS1, STAT1, SOCS3, IRF1	-
109	cGMP-PKG signaling pathway	ecb04022	1	9	ATP1A1	ROCK1, ATP2B1, PPP1R12A, PDE3B, ITPR2, GNAI3, PPP1CB, MEF2A
110	N-Glycan biosynthesis	ecb00510	1	3	B4GALT1	STT3B, MAN2A1

111	Glycosphingolipid biosynthesis - ganglio series	ecb00604	1	1	ENSECAG00000011466	-
112	Pathways in cancer	ecb05200	1	17	PML, STAT1, CSF3R, E2F2, CDKN1A, JUN, TCF7L2, CSF1R, DAPK1, NFKBIA, SPI1	FN1, STK4, PTEN, MMP1, TPR, MMP9
113	Gastric acid secretion	ecb04971	1	4	ATP1A1	GNAI3, ITPR2, PRKX
114	Non-small cell lung cancer	ecb05223	1	3	E2F2	STK4, EML4
115	Primary bile acid biosynthesis	ecb00120	1	1	-	HSD17B4
116	Nitrogen metabolism	ecb00910	1	1	GLUL	-
117	Glycosphingolipid biosynthesis - globo series	ecb00603	1	1	ENSECAG00000011466	-
118	Prion diseases	ecb05020	1	2	EGR1	PRKX
119	TGF-beta signaling pathway	ecb04350	1	4	-	RPS6KB1, THBS1, ROCK1, RBL1
120	Glycosaminoglycan degradation	ecb00531	1	1	ENSECAG00000011466	-
121	Salivary secretion	ecb04970	1	4	ATP1A1	ATP2B1, ITPR2, PRKX
122	Long-term depression	ecb04730	1	3	-	ITPR2, GNAI3, SMC3
123	Other glycan degradation	ecb00511	1	1	ENSECAG00000011466	-
124	Carbohydrate digestion and absorption	ecb04973	1	2	HK3, ATP1A1	-
125	Calcium signaling pathway	ecb04020	1	9	ENSECAG00000009474, SPHK1, IGHE	ENSECAG00000007258, ATP2B1, PRKX, ENSECAG00000009556, ITPR2, PHKB
126	VEGF signaling pathway	ecb04370	1	3	HSPB1, MAPKAPK3, SPHK1	-
127	PI3K-Akt signaling pathway	ecb04151	1	17	ENSECAG00000009474, CSF3R, GNGT2, IGHE, CSF1R, TLR2, CDKN1A, DDIT4, NR4A1, EIF4E1B	ENSECAG00000007258, FN1, ENSECAG00000009556, RBL2, PTEN, RPS6KB1, THBS1,
128	Salmonella infection	ecb05132	1	4	JUN, CCL3, MYD88	ROCK1
129	GABAergic synapse	ecb04727	1	4	GNGT2, GLUL	PRKX, GNAI3
130	Apoptosis	ecb04210	1	4	NFKBIA, MYD88	PRKX, ATM
131	AMPK signaling pathway	ecb04152	1	6	PFKP, RAB8A, SREBF1, FASN	SIRT1, RPS6KB1
132	Biosynthesis of unsaturated fatty acids	ecb01040	1	1	ACOX3	-
133	Small cell lung cancer	ecb05222	1	4	E2F2, NFKBIA	FN1, PTEN
134	Proximal tubule bicarbonate reclamation	ecb04964	1	1	ATP1A1	-
135	Non-alcoholic fatty liver disease (NAFLD)	ecb04932	1	7	NR1H3, SREBF1, SOCS3, COX7A1, JUN	COX2, ITCH
136	Glioma	ecb05214	1	3	E2F2, CDKN1A	PTEN
137	Nucleotide excision repair	ecb03420	1	2	-	RFC1, ENSECAG00000010668
138	Oocyte meiosis	ecb04114	1	5	-	SLK, SMC3, ITPR2, PRKX, PPP1CB
139	Fatty acid elongation	ecb00062	1	1	MECR	-
140	Histidine metabolism	ecb00340	1	1	CNDP2	-

141	Endocrine and other factor-regulated calcium reabsorption	ecb04961	1	2	ATP1A1	PRKX
142	GnRH signaling pathway	ecb04912	1	4	JUN	ITPR2, PRKX, MAP3K1
143	Cardiac muscle contraction	ecb04260	1	3	COX7A1, ATP1A1	COX2
144	MAPK signaling pathway	ecb04010	1	12	DUSP2, HSPA6, JUN, MAPKAPK3, HSPB1, DUSP5, DUSP6, NR4A1	PRKX, STK4, RASGRP1, MAP3K1
145	FoxO signaling pathway	ecb04068	1	6	CDKN1A	SIRT1, STK4, ATM, RBL2, PTEN
146	Amino sugar and nucleotide sugar metabolism	ecb00520	1	2	HK3, ENSECAG00000011466	-
147	Ovarian steroidogenesis	ecb04913	1	2	LDLR	PRKX
148	Mismatch repair	ecb03430	1	1	-	RFC1
149	alpha-Linolenic acid metabolism	ecb00592	1	1	ACOX3	-
150	Morphine addiction	ecb05032	1	4	GNGT2	PRKX, GNAI3, PDE3B
151	Long-term potentiation	ecb04720	1	3	-	ITPR2, PRKX, PPP1CB
152	Glutamatergic synapse	ecb04724	1	5	GNGT2, GLUL	GNAI3, ITPR2, PRKX
153	mRNA surveillance pathway	ecb03015	1	4	-	UPF2, PNN, PPP1CB, PCF11
154	Bile secretion	ecb04976	1	3	LDLR, ATP1A1	PRKX
155	Melanoma	ecb05218	1	3	E2F2, CDKN1A	PTEN
156	Glyoxylate and dicarboxylate metabolism	ecb00630	1	1	GLUL	-
157	Glycosaminoglycan biosynthesis - heparan sulfate / heparin	ecb00534	1	1	-	HS3ST1
158	Thyroid hormone synthesis	ecb04918	1	3	ATP1A1	ITPR2, PRKX
159	Pancreatic secretion	ecb04972	1	4	RAB8A, ATP1A1	ATP2B1, ITPR2
160	Retinol metabolism	ecb00830	1	2	DHRS3	ALDH1A1
161	Pentose phosphate pathway	ecb00030	1	1	PFKP	-
162	Propanoate metabolism	ecb00640	1	1	-	ACADM
163	Vascular smooth muscle contraction	ecb04270	1	5	-	PPP1R12A, ITPR2, PRKX, PPP1CB, ROCK1
164	Circadian entrainment	ecb04713	1	4	GNGT2, PER1	PRKX, GNAI3
165	Leukocyte transendothelial migration	ecb04670	1	5	NCF4, CYBB	MMP9, GNAI3, ROCK1
166	Endometrial cancer	ecb05213	1	2	TCF7L2	PTEN
167	Chronic myeloid leukemia	ecb05220	1	3	E2F2, NFKBIA, CDKN1A	-
168	Homologous recombination	ecb03440	1	1	-	RAD50
169	Porphyrin and chlorophyll metabolism	ecb00860	1	1	HMOX1	-
170	Retrograde endocannabinoid signaling	ecb04723	1	4	GNGT2	GNAI3, ITPR2, PRKX
171	Glycosphingolipid biosynthesis - lacto and neolacto series	ecb00601	1	1	B4GALT1	-

172	Pyrimidine metabolism	ecb00240	1	4	ENSECAG00000022042, CMPK2, CDA, ENTPD3	-
173	Phosphatidylinositol signaling system	ecb04070	1	3	-	INPP4B, ITPR2, PTEN
174	Ribosome biogenesis in eukaryotes	ecb03008	1	3	-	XRN1, WDR43, BMS1
175	Other types of O-glycan biosynthesis	ecb00514	1	1	B4GALT1	-
176	Dopaminergic synapse	ecb04728	1	5	GNGT2	GNAI3, ITPR2, PRKX, PPP1CB
177	Glycolysis / Gluconeogenesis	ecb00010	1	2	HK3, PFKP	-
178	Drug metabolism - other enzymes	ecb00983	1	1	CDA	-
179	Inositol phosphate metabolism	ecb00562	1	2	-	INPP4B, PTEN
180	Cholinergic synapse	ecb04725	1	4	GNGT2	GNAI3, ITPR2, PRKX
181	Alanine, aspartate and glutamate metabolism	ecb00250	1	1	GLUL	-
182	Cytokine-cytokine receptor interaction	ecb04060	1	9	CXCL10, IL10RA, CSF3R, ENSECAG00000001214, TNFRSF1B, CSF1R, CCL2, CCL3	IL6ST
183	ErbB signaling pathway	ecb04012	1	3	JUN, CDKN1A	RPS6KB1
184	Gap junction	ecb04540	1	3	-	GNAI3, ITPR2, PRKX
185	Progesterone-mediated oocyte maturation	ecb04914	1	3	-	PRKX, GNAI3, PDE3B
186	Taste transduction	ecb04742	1	1	-	PRKX
187	ECM-receptor interaction	ecb04512	1	3	-	AGRN, THBS1, FN1
188	Glycerophospholipid metabolism	ecb00564	1	3	LPCAT3, CHKA, AGPAT3	-
189	Synaptic vesicle cycle	ecb04721	1	2	ATP6V0D1, TCIRG1	-
190	Colorectal cancer	ecb05210	1	2	JUN, TCF7L2	-
191	Serotonergic synapse	ecb04726	1	4	GNGT2	GNAI3, ITPR2, PRKX
192	DNA replication	ecb03030	1	1	-	RFC1
193	Base excision repair	ecb03410	1	1	-	HMGB1
194	Pancreatic cancer	ecb05212	1	2	E2F2, STAT1	-
195	Aldosterone-regulated sodium reabsorption	ecb04960	1	1	ATP1A1	-
196	Adrenergic signaling in cardiomyocytes	ecb04261	1	5	ATP1A1	ATP2B1, PRKX, GNAI3, PPP1CB
197	Basal transcription factors	ecb03022	1	1	-	TAF2
198	Adherens junction	ecb04520	1	2	PTPRJ, TCF7L2	-
199	Neurotrophin signaling pathway	ecb04722	1	4	JUN, NFKBIA, NFKBIE	MAP3K1
200	Melanogenesis	ecb04916	1	3	TCF7L2	PRKX, GNAI3,
201	Axon guidance	ecb04360	1	4	PLXNA1, SRGAP2	GNAI3, ROCK1
202	Biosynthesis of amino acids	ecb01230	1	2	PFKP, GLUL	-
203	Vasopressin-regulated water reabsorption	ecb04962	1	1	-	PRKX

204	Purine metabolism	ecb00230	1	6	AMPD3, ENSECAG00000022042, ENTPD3, ADA	PDE3B, PAICS,
205	Hedgehog signaling pathway	ecb04340	1	1	-	PRKX
206	Carbon metabolism	ecb01200	1	3	HK3, PFKP	ACADM
207	Inflammatory mediator regulation of TRP channels	ecb04750	1	3	-	ITPR2, PRKX, PPP1CB
208	Sphingolipid metabolism	ecb00600	1	1	SPHK1	-
209	Valine, leucine and isoleucine degradation	ecb00280	1	1	-	ACADM
210	Metabolism of xenobiotics by cytochrome P450	ecb00980	1	1	HSD11B1	-
211	Signaling pathways regulating pluripotency of stem cells	ecb04550	1	4	KLF4	IL6ST, RIF1, REST
212	Alcoholism	ecb05034	1	5	FOSB, GNGT2	GNAI3, PPP1CB, HAT1
213	Focal adhesion	ecb04510	1	7	JUN	FN1, ROCK1, PPP1R12A, PPP1CB, PTEN, THBS1
214	Basal cell carcinoma	ecb05217	1	1	TCF7L2	-
215	Steroid hormone biosynthesis	ecb00140	1	1	HSD11B1	-
216	Amyotrophic lateral sclerosis (ALS)	ecb05014	1	1	TNFRSF1B	-
217	Glycerolipid metabolism	ecb00561	1	1	AGPAT3	-
218	Thyroid hormone signaling pathway	ecb04919	1	3	STAT1, ATP1A1	PRKX
219	Insulin secretion	ecb04911	1	2	ATP1A1	PRKX
220	Alzheimer's disease	ecb05010	1	5	LRP1, COX7A1, APH1A	COX2, ITPR2
221	Ras signaling pathway	ecb04014	1	7	GNGT2, RGL1, CSF1R, ETS2	PRKX,STK4,RASGRP1,
222	Huntington's disease	ecb05016	1	5	TGM2, COX7A1	COX2, REST, IFT57
223	Chemical carcinogenesis	ecb05204	1	1	HSD11B1	-
224	Arachidonic acid metabolism	ecb00590	1	1	ENSECAG00000015010	-
225	Rap1 signaling pathway	ecb04015	1	6	SIPA1L1, CSF1R	PRKD3, GNAI3, ENSECAG00000021067, THBS1
226	Wnt signaling pathway	ecb04310	1	3	JUN, TCF7L2	PRKX
227	Aminoacyl-tRNA biosynthesis	ecb00970	1	1	WARS	-
228	Tight junction	ecb04530	1	3	EPB41L2	GNAI3, PTEN
229	Ribosome	ecb03010	1	3	-	RPL7, ENSECAG00000021065, RPS3A
230	Renal cell carcinoma	ecb05211	1	1	JUN	-
231	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	ecb05412	1	1	TCF7L2	-

	232	Metabolic pathways	ecb01100	1	49	ATP6V0D1, PYGL, CNDP2, B4GALT1, ENSECAG00000022042, NAMPT, GLUL, ENSECAG00000011466, CHKA, AGPAT3, ENSECAG00000015010, FASN, MECR, DHRS3, ACOX3, CKB, HK3, CDA, SAT1, SPHK1, CMPK2, FDPS, PDXK, TCIRG1, PFKP, AMPD3, HSD11B1, NADK, ADA	CHSY1,STT3B, ND1, ND2, C1GALT1, ACSL4, MAN2A1, REV3L, ACADM, ND4, GALNT1, AGL, PAICS, INPP4B, HSD17B4, DSE, COX2, ND3, ALDH1A1, ND4L
	233	Bacterial invasion of epithelial cells	ecb05100	1	1	-	FN1
	234	Regulation of actin cytoskeleton	ecb04810	1	5	ITGAX	PPP1R12A, FN1, PPP1CB,ROCK1
	235	Protein digestion and absorption	ecb04974	1	1	ATP1A1	-
	236	Hippo signaling pathway	ecb04390	1	2	TCF7L2	PPP1CB
	237	Neuroactive ligand-receptor interaction	ecb04080	1	3	LTB4R, C3AR1	NR3C1
	238	Olfactory transduction	ecb04740	1	1	-	PRKX
minNS4_D1	1	Measles	ecb05162	2.35E-05	7	STAT1, IRF7, MX1, OAS1, OAS2, OAS3, DDX58	-
	2	Influenza A	ecb05164	5.90E-05	7	STAT1, IRF7, MX1, OAS1, OAS2, OAS3, DDX58	-
	3	Hepatitis C	ecb05160	0.000114112	6	STAT1, IRF7, OAS1, OAS2, OAS3, DDX58	-
	4	Herpes simplex infection	ecb05168	0.00072149	6	STAT1, IRF7, OAS1, OAS2, OAS3, DDX58	-
	5	Staphylococcus aureus infection	ecb05150	0.111172028	2	C1R, C2	-
	6	Hepatitis B	ecb05161	0.111172028	3	STAT1, IRF7, DDX58	-
	7	Cytosolic DNA-sensing pathway	ecb04623	0.127954872	2	IRF7, DDX58	-
	8	RIG-I-like receptor signaling pathway	ecb04622	0.129765318	2	IRF7, DDX58	-
	9	Complement and coagulation cascades	ecb04610	0.134871746	2	C1R, C2	-
	10	Pertussis	ecb05133	0.134871746	2	C1R, C2	-
	11	Toll-like receptor signaling pathway	ecb04620	0.198244523	2	STAT1, IRF7	-
	12	Systemic lupus erythematosus	ecb05322	0.236981825	2	C1R, C2	-
	13	Tuberculosis	ecb05152	0.43706218	2	STAT1, SPHK1	-
	14	Notch signaling pathway	ecb04330	0.447839821	1	DTX3L	-
	15	Sphingolipid metabolism	ecb00600	0.447839821	1	SPHK1	-
	16	Metabolism of xenobiotics by cytochrome P450	ecb00980	0.447839821	1	HSD11B1	-
	17	Steroid hormone biosynthesis	ecb00140	0.447839821	1	HSD11B1	-
	18	Chemical carcinogenesis	ecb05204	0.447839821	1	HSD11B1	-
	19	VEGF signaling pathway	ecb04370	0.447839821	1	SPHK1	-

	20	Inflammatory bowel disease (IBD)	ecb05321	0.447839821	1	STAT1	-
	21	Pancreatic cancer	ecb05212	0.447839821	1	STAT1	-
	22	Leishmaniasis	ecb05140	0.447839821	1	STAT1	-
	23	Prolactin signaling pathway	ecb04917	0.447839821	1	STAT1	-
	24	Bacterial invasion of epithelial cells	ecb05100	0.450527472	1	-	FN1
	25	Fc gamma R-mediated phagocytosis	ecb04666	0.450527472	1	SPHK1	-
	26	Small cell lung cancer	ecb05222	0.450527472	1	-	FN1
	27	ECM-receptor interaction	ecb04512	0.450527472	1	-	FN1
	28	NF-kappa B signaling pathway	ecb04064	0.450527472	1	DDX58	-
	29	Pyrimidine metabolism	ecb00240	0.467747264	1	CMPK2	-
	30	Pathways in cancer	ecb05200	0.467747264	2	STAT1	FN1
	31	Thyroid hormone signaling pathway	ecb04919	0.467747264	1	STAT1	-
	32	Toxoplasmosis	ecb05145	0.467747264	1	STAT1	-
	33	Amoebiasis	ecb05146	0.467747264	1	-	FN1
	34	Osteoclast differentiation	ecb04380	0.491316029	1	STAT1	-
	35	Cell adhesion molecules (CAMs)	ecb04514	0.515913886	1	SIGLEC1	-
	36	Jak-STAT signaling pathway	ecb04630	0.515913886	1	STAT1	-
	37	Phagosome	ecb04145	0.515913886	1	C1R	-
	38	Calcium signaling pathway	ecb04020	0.547452321	1	SPHK1	-
	39	Chemokine signaling pathway	ecb04062	0.547452321	1	STAT1	-
	40	Epstein-Barr virus infection	ecb05169	0.547452321	1	DDX58	-
	41	Proteoglycans in cancer	ecb05205	0.547452321	1	-	FN1
	42	Regulation of actin cytoskeleton	ecb04810	0.547452321	1	-	FN1
	43	Focal adhesion	ecb04510	0.547452321	1	-	FN1
	44	Viral carcinogenesis	ecb05203	0.547452321	1	IRF7	-
	45	PI3K-Akt signaling pathway	ecb04151	0.706722704	1	-	FN1
	46	Metabolic pathways	ecb01100	0.785556943	3	CMPK2, HSDB11B1, SPHK1	-
minNS4_D2							
	1	Bladder cancer	ecb05219	0.015545681	2	-	MMP1, MMP9
	2	Hepatitis C	ecb05160	0.056020984	2	OAS2, OAS3	-
	3	Measles	ecb05162	0.056020984	2	OAS2, OAS3	-
	4	Influenza A	ecb05164	0.067546136	2	OAS2, OAS3	-
	5	Herpes simplex infection	ecb05168	0.068167003	2	OAS2, OAS3	-

	6	Pathways in cancer	ecb05200	0.14577185	2	-	MMP1, MMP9
	7	PPAR signaling pathway	ecb03320	0.190800701	1	-	MMP1
	8	Rheumatoid arthritis	ecb05323	0.190946074	1	-	MMP1
	9	Estrogen signaling pathway	ecb04915	0.190946074	1	-	MMP9
	10	Pyrimidine metabolism	ecb00240	0.190946074	1	-	MMP1
	11	TNF signaling pathway	ecb04668	0.190946074	1	-	MMP9
	12	Leukocyte transendothelial migration	ecb04670	0.190946074	1	-	MMP9
	13	Hepatitis B	ecb05161	0.198359626	1	-	MMP9
	14	Cell adhesion molecules (CAMs)	ecb04514	0.198359626	1	SIGLEC1	-
	15	Transcriptional misregulation in cancer	ecb05202	0.201566982	1	-	MMP9
	16	Proteoglycans in cancer	ecb05205	0.229656734	1	-	MMP9
	17	MicroRNAs in cancer	ecb05206	0.25222777	1	-	MMP9
	18	MAPK signaling pathway	ecb04010	0.25222777	1	-	DUSP1
	19	Metabolic pathways	ecb01100	0.728357043	1	CMPK2	-