

Table S8. Enriched Reactome Pathways

_Reactome_ID	Description	GeneRatio	BgRatio	p.adjust	geneID	Count	FoldEnrich	RichFactor
R-HSA-9006931	Signaling by	0.1641791	298/11091	2.712E-14	FABP6/FOS	33	6.1104377	0.1107383
R-HSA-9018519	Estrogen-de	0.1094527	149/11091	9.411E-12	FOS/CDK9	22	8.1472503	0.147651
R-HSA-9031628	NGF-stimul	0.0646766	39/11091	2.267E-11	FOS/CREB	13	18.393035	0.3333333
R-HSA-383280	Nuclear Rec	0.0696517	52/11091	5.193E-11	NCOR1/NR	14	14.855913	0.2692308
R-HSA-9843745	Adipogenes	0.0895522	109/11091	1.337E-10	EP300/HDAC	18	9.1121457	0.1651376
R-HSA-8939211	ESR-mediat	0.119403	222/11091	1.989E-10	FOS/CDK9	24	5.9653086	0.1081081
R-HSA-3108232	SUMO E3 l	0.1094527	183/11091	1.989E-10	EP300/HDAC	22	6.6335535	0.1202186
R-HSA-8943724	Regulation c	0.0696517	61/11091	2.864E-10	HDAC1/JUN	14	12.664057	0.2295082
R-HSA-2990846	SUMOylati	0.1094527	189/11091	2.99E-10	EP300/HDAC	22	6.4229645	0.1164021
R-HSA-198725	Nuclear Eve	0.0646766	61/11091	3.876E-09	FOS/CREB	13	11.759481	0.2131148
R-HSA-452723	Transcriptio	0.0447761	24/11091	1.36E-08	KLF4/SMA	9	20.692164	0.375
R-HSA-8878166	Transcriptio	0.079602	120/11091	3.024E-08	CBFB/ESR	16	7.3572139	0.1333333
R-HSA-6807070	PTEN Regu	0.0845771	140/11091	3.47E-08	HDAC1/JUN	17	6.7003198	0.1214286
R-HSA-9616222	Transcriptio	0.0696517	89/11091	3.556E-08	CREB1/EP3	14	8.6798591	0.1573034
R-HSA-187037	Signaling by	0.0746269	115/11091	1.183E-07	FOS/CREB	15	7.1972745	0.1304348
R-HSA-381340	Transcriptio	0.0646766	84/11091	1.602E-07	EP300/NCC	13	8.5396233	0.1547619
R-HSA-8878171	Transcriptio	0.0995025	236/11091	4.616E-07	EP300/GAT	20	4.6761953	0.0847458
R-HSA-166520	Signaling by	0.0746269	134/11091	8.315E-07	FOS/CREB	15	6.1767654	0.1119403
R-HSA-9614085	FOXO-med	0.0547264	65/11091	8.667E-07	EP300/HDAC	11	9.3380023	0.1692308
R-HSA-5617472	Activation c	0.0696517	121/11091	1.414E-06	EP300/JUN	14	6.3843592	0.1157025
R-HSA-5619507	Activation c	0.0696517	121/11091	1.414E-06	EP300/JUN	14	6.3843592	0.1157025
R-HSA-9758941	Gastrulation	0.0696517	125/11091	2.05E-06	EP300/FOX	14	6.1800597	0.112
R-HSA-1257604	PIP3 activat	0.0995025	268/11091	2.892E-06	CREB1/HD	20	4.1178436	0.0746269
R-HSA-9024446	NR1H2 and	0.0447761	47/11091	4.53E-06	FABP6/EP3	9	10.566211	0.1914894
R-HSA-400206	Regulation c	0.0646766	119/11091	7.343E-06	EP300/NCC	13	6.0279694	0.1092437
R-HSA-2173793	Transcriptio	0.0447761	51/11091	8.769E-06	CDK9/EP30	9	9.737489	0.1764706
R-HSA-8864260	Transcriptio	0.039801	38/11091	9.442E-06	EP300/MYC	8	11.616654	0.2105263
R-HSA-9834899	Specificatio	0.0298507	17/11091	1.01E-05	MYB/TFAF	6	19.474978	0.3529412
R-HSA-1538133	G0 and Earl	0.0348259	27/11091	1.034E-05	HDAC1/MYC	7	14.305694	0.2592593
R-HSA-380994	ATF4 activ	0.0348259	27/11091	1.034E-05	CEBPB/NF	7	14.305694	0.2592593
R-HSA-1362277	Transcriptio	0.0298507	19/11091	1.941E-05	HDAC1/MYC	6	17.42498	0.3157895
R-HSA-9701898	STAT3 nucl	0.0248756	11/11091	1.985E-05	EP300/HDAC	5	25.081411	0.4545455
R-HSA-201556	Signaling by	0.0348259	30/11091	1.985E-05	EP300/HDAC	7	12.875124	0.2333333
R-HSA-4090294	SUMOylati	0.0348259	30/11091	1.985E-05	NR1H3/ESI	7	12.875124	0.2333333
R-HSA-9006925	Intracellular	0.0995025	310/11091	1.985E-05	CREB1/HD	20	3.5599422	0.0645161
R-HSA-157118	Signaling by	0.0845771	235/11091	2.808E-05	CREB1/EP3	17	3.9916799	0.0723404
R-HSA-1989781	PPARA acti	0.0597015	117/11091	2.864E-05	EP300/NCC	12	5.6593953	0.1025641
R-HSA-381042	PERK regul	0.0348259	32/11091	2.864E-05	CEBPB/NF	7	12.070429	0.21875
R-HSA-3247509	Chromatin r	0.0895522	270/11091	3.96E-05	EP300/HDAC	18	3.678607	0.0666667
R-HSA-4839726	Chromatin c	0.0895522	270/11091	3.96E-05	EP300/HDAC	18	3.678607	0.0666667
R-HSA-2122947	NOTCH1 Ir	0.039801	48/11091	4.01E-05	EP300/HDAC	8	9.1965174	0.1666667
R-HSA-9707616	Heme signal	0.039801	48/11091	4.01E-05	CREB1/EP3	8	9.1965174	0.1666667
R-HSA-2892247	POU5F1 (O	0.0248756	13/11091	4.062E-05	SALL4/NAI	5	21.222732	0.3846154
R-HSA-2559583	Cellular Ser	0.0746269	195/11091	4.655E-05	FOS/JUN/T	15	4.2445465	0.0769231
R-HSA-2173796	SMAD2/SM	0.0348259	36/11091	5.641E-05	CDK9/EP30	7	10.72927	0.1944444
R-HSA-6785807	Interleukin-	0.0547264	108/11091	6.996E-05	FOS/GATA	11	5.620094	0.1018519
R-HSA-400253	Circadian C	0.0447761	70/11091	7.703E-05	CREB1/EP3	9	7.0944563	0.1285714
R-HSA-449147	Signaling by	0.119403	473/11091	8.143E-05	FOS/CREB	24	2.7997854	0.05074
R-HSA-8939902	Regulation c	0.0447761	72/11091	9.373E-05	CBFB/ESR	9	6.8973881	0.125
R-HSA-1362300	Transcriptio	0.0248756	16/11091	0.0001134	HDAC1/E2F	5	17.24347	0.3125
R-HSA-8936459	RUNX1 reg	0.0497512	94/11091	0.0001184	EP300/HDAC	10	5.8701175	0.106383
R-HSA-9754189	Germ layer	0.0248756	17/11091	0.0001457	SMAD4/NA	5	16.229148	0.2941176

R-HSA-168142	Toll Like R	0.0497512	97/11091	0.0001457	FOS/CREB	10	5.6885675	0.1030928
R-HSA-168176	Toll Like R	0.0497512	97/11091	0.0001457	FOS/CREB	10	5.6885675	0.1030928
R-HSA-975871	MyD88 cas	0.0497512	97/11091	0.0001457	FOS/CREB	10	5.6885675	0.1030928
R-HSA-9843743	Transcriptio	0.0298507	30/11091	0.0001956	HDAC1/PP	6	11.035821	0.2
R-HSA-9844594	Transcriptio	0.0298507	30/11091	0.0001956	HDAC1/PP	6	11.035821	0.2
R-HSA-8986944	Transcriptio	0.039801	62/11091	0.0002077	CREB1/HD	8	7.1198844	0.1290323
R-HSA-9006936	Signaling by	0.0547264	124/11091	0.0002077	CDK9/EP30	11	4.8949206	0.0887097
R-HSA-450282	MAPK targ	0.0298507	31/11091	0.0002243	FOS/CREB	6	10.679827	0.1935484
R-HSA-975138	TRAF6 mec	0.0497512	103/11091	0.0002243	FOS/CREB	10	5.3571946	0.0970874
R-HSA-975155	MyD88 dep	0.0497512	104/11091	0.0002404	FOS/CREB	10	5.3056831	0.0961538
R-HSA-168181	Toll Like R	0.0497512	105/11091	0.000255	FOS/CREB	10	5.2551528	0.0952381
R-HSA-8941326	RUNX2 reg	0.0298507	32/11091	0.000255	CBFB/AR/	6	10.346082	0.1875
R-HSA-381183	ATF6 (ATF	0.0199005	10/11091	0.000255	NFYA/NFY	4	22.071642	0.4
R-HSA-168164	Toll Like R	0.0497512	106/11091	0.0002671	FOS/CREB	10	5.2055759	0.0943396
R-HSA-9022692	Regulation	0.0298507	33/11091	0.0002967	CREB1/HD	6	10.032564	0.1818182
R-HSA-168138	Toll Like R	0.0497512	108/11091	0.0003054	FOS/CREB	10	5.1091763	0.0925926
R-HSA-3700989	Transcriptio	0.0945274	362/11091	0.0003662	FOS/CDK9	19	2.8961408	0.0524862
R-HSA-9823739	Formation o	0.0199005	11/11091	0.0003662	NANOG/PC	4	20.065129	0.3636364
R-HSA-166166	MyD88-ind	0.0497512	111/11091	0.0003662	FOS/CREB	10	4.9710905	0.0900901
R-HSA-937061	TRIF (TIC	0.0497512	111/11091	0.0003662	FOS/CREB	10	4.9710905	0.0900901
R-HSA-8953750	Transcriptio	0.0298507	35/11091	0.0003872	RNF2/SUZ1	6	9.4592751	0.1714286
R-HSA-166058	MyD88:MA	0.0497512	113/11091	0.0004105	FOS/CREB	10	4.8831066	0.0884956
R-HSA-168188	Toll Like R	0.0497512	113/11091	0.0004105	FOS/CREB	10	4.8831066	0.0884956
R-HSA-381033	ATF6 (ATF	0.0199005	12/11091	0.0004947	NFYA/NFY	4	18.393035	0.3333333
R-HSA-168179	Toll Like R	0.0497512	116/11091	0.0004947	FOS/CREB	10	4.7568194	0.0862069
R-HSA-181438	Toll Like R	0.0497512	116/11091	0.0004947	FOS/CREB	10	4.7568194	0.0862069
R-HSA-9029569	NR1H3 & N	0.0298507	37/11091	0.0004972	EP300/NCC	6	8.9479629	0.1621622
R-HSA-170834	Signaling by	0.0447761	94/11091	0.000509	CDK9/EP30	9	5.2831057	0.0957447
R-HSA-1980143	Signaling by	0.039801	74/11091	0.0005551	EP300/HD	8	5.9653086	0.1081081
R-HSA-8878159	Transcriptio	0.0447761	96/11091	0.0005867	EP300/MYC	9	5.173041	0.09375
R-HSA-9759194	Nuclear eve	0.0447761	97/11091	0.000629	EP300/MYC	9	5.1197107	0.0927835
R-HSA-9013508	NOTCH3 Ir	0.0248756	25/11091	0.0007189	EP300/PBX	5	11.035821	0.2
R-HSA-2644602	Signaling by	0.0348259	58/11091	0.0007333	EP300/HD	7	6.6595471	0.1206897
R-HSA-2644603	Signaling by	0.0348259	58/11091	0.0007333	EP300/HD	7	6.6595471	0.1206897
R-HSA-2644606	Constitutive	0.0348259	58/11091	0.0007333	EP300/HD	7	6.6595471	0.1206897
R-HSA-2894858	Signaling by	0.0348259	58/11091	0.0007333	EP300/HD	7	6.6595471	0.1206897
R-HSA-2894862	Constitutive	0.0348259	58/11091	0.0007333	EP300/HD	7	6.6595471	0.1206897
R-HSA-9733709	Cardiogenes	0.0248756	27/11091	0.0009899	SMAD1/SM	5	10.218353	0.1851852
R-HSA-8866910	TFAP2 (AP	0.0199005	15/11091	0.0010904	YY1/ESR1/	4	14.714428	0.2666667
R-HSA-9648895	Response of	0.0199005	15/11091	0.0010904	CEBPB/AT	4	14.714428	0.2666667
R-HSA-69205	G1/S-Specif	0.0248756	28/11091	0.0011492	HDAC1/E2	5	9.8534115	0.1785714
R-HSA-9711123	Cellular res	0.0646766	215/11091	0.0012705	EP300/MYC	13	3.336411	0.0604651
R-HSA-3899300	SUMOylatio	0.0298507	45/11091	0.0012816	EP300/NRI	6	7.3572139	0.1333333
R-HSA-450294	MAP kinase	0.0348259	64/11091	0.0012816	FOS/CREB	7	6.0352146	0.109375
R-HSA-9615017	FOXO-med	0.0248756	29/11091	0.0013119	HDAC1/SR	5	9.5136387	0.1724138
R-HSA-9614657	FOXO-med	0.0199005	16/11091	0.0013455	EP300/NFY	4	13.794776	0.25
R-HSA-6804758	Regulation	0.0248756	30/11091	0.00152	EP300/HD	5	9.1965174	0.1666667
R-HSA-6791312	TP53 Regul	0.0298507	48/11091	0.0017571	EP300/TP5	6	6.8973881	0.125
R-HSA-5663202	Diseases of	0.0995025	459/11091	0.0020197	CREB1/EP	20	2.4043183	0.043573
R-HSA-168898	Toll-like Re	0.0547264	169/11091	0.0020197	FOS/CREB	11	3.5915393	0.0650888
R-HSA-6804114	TP53 Regul	0.0199005	18/11091	0.0020921	EP300/TP5	4	12.262023	0.2222222
R-HSA-448424	Interleukin-	0.0348259	72/11091	0.002483	FOS/CREB	7	5.3646352	0.0972222
R-HSA-9818027	NFE2L2 reg	0.0199005	19/11091	0.0025628	EP300/ATF	4	11.616654	0.2105263
R-HSA-166016	Toll Like R	0.0497512	147/11091	0.0025892	FOS/CREB	10	3.7536806	0.0680272
R-HSA-9634815	Transcriptio	0.0248756	34/11091	0.0025892	FOS/TNRC	5	8.1145742	0.1470588

R-HSA-453279	Mitotic G1 j	0.0497512	149/11091	0.0028526	HDAC1/MY	10	3.7032956	0.0671141
R-HSA-2559580	Oxidative S	0.0447761	124/11091	0.0031249	FOS/JUN/T	9	4.004935	0.0725806
R-HSA-9755511	KEAP1-NF	0.0447761	126/11091	0.0034836	EP300/MYC	9	3.9413646	0.0714286
R-HSA-8853884	Transcriptio	0.0248756	38/11091	0.0042078	TNRC6A/C	5	7.2604085	0.1315789
R-HSA-8939243	RUNX1 intr	0.0248756	38/11091	0.0042078	EP300/CBF	5	7.2604085	0.1315789
R-HSA-212165	Epigenetic r	0.0547264	187/11091	0.0043227	EP300/HDAC1	11	3.2458297	0.0588235
R-HSA-69206	G1/S Transi	0.0447761	131/11091	0.0044657	HDAC1/MY	9	3.7909308	0.0687023
R-HSA-450341	Activation c	0.0149254	10/11091	0.0045732	FOS/JUN/A	3	16.553731	0.3
R-HSA-8940973	RUNX2 reg	0.0199005	24/11091	0.0059243	CBFB/ARF	4	9.1965174	0.1666667
R-HSA-1234158	Regulation c	0.0149254	11/11091	0.0059962	EP300/ARN	3	15.048847	0.2727273
R-HSA-9818030	NFE2L2 reg	0.0149254	11/11091	0.0059962	EP300/NOI	3	15.048847	0.2727273
R-HSA-6796648	TP53 Regul	0.0298507	62/11091	0.0059962	FOS/CDK9	6	5.3399133	0.0967742
R-HSA-2426168	Activation c	0.0248756	42/11091	0.0062251	SREBF1/SF	5	6.568941	0.1190476
R-HSA-3769402	Deactivation	0.0248756	42/11091	0.0062251	HDAC1/SO	5	6.568941	0.1190476
R-HSA-933542	TRAF6 mec	0.0199005	25/11091	0.0066116	NFKB1/RE	4	8.8286567	0.16
R-HSA-9707564	Cytoprotect	0.0298507	64/11091	0.0068666	NCOR1/ST	6	5.173041	0.09375
R-HSA-8866907	Activation c	0.0149254	12/11091	0.0075096	EP300/TFA	3	13.794776	0.25
R-HSA-9827857	Specificatio	0.0149254	12/11091	0.0075096	TFAP2C/N	3	13.794776	0.25
R-HSA-9700206	Signaling by	0.0348259	91/11091	0.0083686	HDAC1/JU	7	4.2445465	0.0769231
R-HSA-9725370	Signaling by	0.0348259	91/11091	0.0083686	HDAC1/JU	7	4.2445465	0.0769231
R-HSA-1912408	Pre-NOTCH	0.0348259	92/11091	0.0088518	EP300/JUN	7	4.1984101	0.076087
R-HSA-9679506	SARS-CoV	0.0845771	414/11091	0.0089389	EP300/HDAC1	17	2.2658086	0.0410628
R-HSA-9768759	Regulation c	0.0149254	13/11091	0.0092622	TNRC6A/R	3	12.733639	0.2307692
R-HSA-350054	Notch-HLH	0.0199005	28/11091	0.0094939	HDAC1/NC	4	7.8827292	0.1428571
R-HSA-3214841	PKMTs met	0.0298507	69/11091	0.0094939	NFKB1/RE	6	4.798183	0.0869565
R-HSA-381119	Unfolded Pr	0.0348259	95/11091	0.0102675	CEBPB/NF	7	4.0658288	0.0736842
R-HSA-4551638	SUMOylatic	0.0298507	71/11091	0.0108446	HDAC1/HC	6	4.6630229	0.084507
R-HSA-6803205	TP53 regula	0.0149254	14/11091	0.011201	TP53/BCL6	3	11.824094	0.2142857
R-HSA-9012852	Signaling by	0.0248756	49/11091	0.0112079	EP300/PBX	5	5.6305209	0.1020408
R-HSA-2173795	Downregula	0.0199005	30/11091	0.0118848	HDAC1/NC	4	7.3572139	0.1333333
R-HSA-8957322	Metabolism	0.0447761	155/11091	0.0120079	FABP6/SRE	9	3.203948	0.0580645
R-HSA-3214842	HDMs dem	0.0248756	50/11091	0.0120079	KDM4A/KI	5	5.5179104	0.1
R-HSA-9679191	Potential the	0.0348259	99/11091	0.0123684	HDAC1/RE	7	3.9015528	0.0707071
R-HSA-8939236	RUNX1 reg	0.039801	129/11091	0.0138347	GATA3/CB	8	3.42196	0.0620155
R-HSA-844456	The NLRP3	0.0149254	16/11091	0.0159511	NFKB1/RE	3	10.346082	0.1875
R-HSA-2559585	Oncogene I	0.0199005	33/11091	0.0161839	TNRC6A/T	4	6.6883763	0.1212121
R-HSA-9725371	Nuclear eve	0.0199005	33/11091	0.0161839	HDAC1/JU	4	6.6883763	0.1212121
R-HSA-5688426	Deubiquitin	0.0646766	297/11091	0.0167012	EP300/GAT	13	2.415247	0.043771
R-HSA-1655829	Regulation c	0.0248756	55/11091	0.0174513	SREBF1/SF	5	5.0162822	0.0909091
R-HSA-1810476	RIP-mediate	0.0149254	17/11091	0.0180933	NFKB1/RE	3	9.737489	0.1764706
R-HSA-8934593	Regulation c	0.0149254	17/11091	0.0180933	CBFB/RUN	3	9.737489	0.1764706
R-HSA-9022699	MECP2 reg	0.0149254	17/11091	0.0180933	CREB1/HD	3	9.737489	0.1764706
R-HSA-9617828	FOXO-med	0.0149254	17/11091	0.0180933	KLF4/SMA	3	9.737489	0.1764706
R-HSA-2151201	Transcriptio	0.0248756	56/11091	0.01826	CREB1/NC	5	4.9267058	0.0892857
R-HSA-1912422	Pre-NOTCH	0.0348259	108/11091	0.0186214	EP300/JUN	7	3.5764234	0.0648148
R-HSA-983231	Factors invc	0.0447761	168/11091	0.0187626	GATA3/HC	9	2.9560235	0.0535714
R-HSA-447115	Interleukin-	0.0248756	57/11091	0.0193424	STAT3/ST	5	4.8402723	0.0877193
R-HSA-9856651	MITF-M-de	0.0298507	82/11091	0.019458	CREB1/HD	6	4.0374954	0.0731707
R-HSA-69202	Cyclin E ass	0.0298507	83/11091	0.0203399	MYC/PSMI	6	3.9888509	0.0722892
R-HSA-1839117	Signaling by	0.0149254	18/11091	0.0203399	STAT3/ST	3	9.1965174	0.1666667
R-HSA-9824594	Regulation c	0.0149254	18/11091	0.0203399	HDAC1/TN	3	9.1965174	0.1666667
R-HSA-9678108	SARS-CoV	0.039801	142/11091	0.0221324	EP300/RUN	8	3.1086819	0.056338
R-HSA-69656	Cyclin A:Cc	0.0298507	85/11091	0.0225171	MYC/PSMI	6	3.8949956	0.0705882
R-HSA-9730414	MITF-M-re	0.0348259	114/11091	0.0236967	CREB1/HD	7	3.3881906	0.0614035
R-HSA-3232118	SUMOylatic	0.0149254	20/11091	0.0268211	TP53/TFAP	3	8.2768657	0.15

R-HSA-9013695	NOTCH4 Ir	0.0149254	20/11091	0.0268211	EP300/HEY	3	8.2768657	0.15
R-HSA-9692916	SARS-CoV	0.0199005	40/11091	0.0287624	RUNX1/NF	4	5.5179104	0.1
R-HSA-1606322	ZBP1(DAI)	0.0149254	21/11091	0.0301388	NFKB1/RE	3	7.8827292	0.1428571
R-HSA-5621575	CD209 (DC	0.0149254	21/11091	0.0301388	EP300/NFK	3	7.8827292	0.1428571
R-HSA-622312	Inflammaso	0.0149254	21/11091	0.0301388	NFKB1/RE	3	7.8827292	0.1428571
R-HSA-186712	Regulation c	0.0199005	41/11091	0.0306797	EP300/HNF	4	5.3833273	0.097561
R-HSA-9692914	SARS-CoV	0.0298507	96/11091	0.0383878	EP300/RUN	6	3.448694	0.0625
R-HSA-445989	TAK1-depe	0.0199005	45/11091	0.0421771	NFKB1/RE	4	4.9048093	0.0888889
R-HSA-6783589	Interleukin-l	0.0149254	24/11091	0.0427951	STAT3/ST/	3	6.8973881	0.125
R-HSA-9634638	Estrogen-de	0.0149254	24/11091	0.0427951	FOS/CREB	3	6.8973881	0.125
R-HSA-9734009	Defective Ir	0.0149254	25/11091	0.0477139	JUN/TP53/I	3	6.6214925	0.12
R-HSA-73762	RNA Polym	0.0199005	47/11091	0.0479706	HDAC1/TB	4	4.696094	0.0851064