

Pathway identifier	Pathway name	# Entities	# Entities	Enrichment ratio	Enrichment score	Enrichment p-value	# Reactants	# Reactions	Reaction ratio	Species identifier	Species name	Submitted entities found
R-HSA-9006934	Signaling by Receptor Tyrosine Kinases	19	63	0.040	2.7	1.9	200	749	0.0508727	9606	Homo sapiens	ALK;PDGFRB;HDAC2;HSP90AA1;FLT1;HDAC3;DUSP3;ROCK2;SRC;SPHK1;PSEN2;BRAF;NCOR1;CHEK1;RAC1;JAK2;MET
R-HSA-5663202	Diseases of signal transduction by growth factor receptors and second messengers	170	540	0.091	3.7	1.6	136	512	0.0347755	9606	Homo sapiens	PDGFRB;ALK;HDAC4;HDAC2;HSP90AA1;HDAC3;SRC;PSEN2;BRAF;HDAC9;HDAC6;NCOR1;MDM2;RAC1;JAK2;MET
R-HSA-350054	Notch-HLH transcription pathway	68	201	0.081	9.7	2.3	1	2	1.36E+12	9606	Homo sapiens	HDAC4;HDAC2;NCOR1;HDAC3;HDAC9;HDAC6
R-HSA-162582	Signal Transduction	316	306	0.196	1.9	3.4	396	2539	0.1724512	9606	Homo sapiens	HDAC4;ALK;RET;HDAC2;HDAC3;FLT1;ROCK2;SRC;PSEN2;HDAC9;HDAC6;CHEK1;RAC1;JAK2;PDGFRB;HSP90AA1;MMP7;DUSP3;SYK;SPHK1;PLK1;MMP3;BRAF;NCOR1;CDK4;CDK2;MDM2;MET

R- H S A- 26 44 60 2	Signaling by NOTCH1 PEST Domain Mutants in Cancer	7	6	0.0 04 39 73 09 88 10 13 96 8	5, 3 6 E + 0 6	4, 1 8 E + 0 9	2	21	0.001 4263 3974 0542 009	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6
R- H S A- 26 44 60 6	Constitutiv e Signaling by NOTCH1 PEST Domain Mutants	7	6	0.0 04 39 73 09 88 10 13 96 8	5, 3 6 E + 0 6	4, 1 8 E + 0 9	2	21	0.001 4263 3974 0542 009	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6
R- H S A- 28 94 85 8	Signaling by NOTCH1 HD+PEST Domain Mutants in Cancer	7	6	0.0 04 39 73 09 88 10 13 96 8	5, 3 6 E + 0 6	4, 1 8 E + 0 9	2	21	0.001 4263 3974 0542 009	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6
R- H S A- 28 94 86 2	Constitutiv e Signaling by NOTCH1 HD+PEST Domain Mutants	7	6	0.0 04 39 73 09 88 10 13 96 8	5, 3 6 E + 0 6	4, 1 8 E + 0 9	2	21	0.001 4263 3974 0542 009	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6
R- H S A- 26 44 60 3	Signaling by NOTCH1 in Cancer	7	6	0.0 04 39 73 09 88 10 13 96 8	5, 3 6 E + 0 6	4, 1 8 E + 0 9	2	39	0.002 6489 1666 1006 5883	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6

R- H S A- 19 80 14 3	Signaling by NOTCH1	7	8	0.0 05 43 19 71 02 94 87 84 3	2, 2 5 8 E + 0 8 9	1, 5 8 E + 0 9	4	39	0.002 6489 1666 1006 5883	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;PSEN2;HDAC9;H DAC6
R- H S A- 21 22 94 7	NOTCH1 Intracellul ar Domain Regulates Transcripti on	6	5 7	0.0 03 68 59 80 34 14 38 17 9	6, 2 3 E + 0 7	3, 9 9 E + 0 9	1	18	0.001 2225 7692 0464 5793	960 6	Ho mo sapi ens	HDAC4;HDAC2;NCOR1; HDAC3;HDAC9;HDAC6
R- H S A- 20 15 56	Signaling by ALK	5	4 6	0.0 02 97 46 50 80 18 62 39	7, 1 6 E + 0 8	4, 2 2 E + 1 1	28	42	0.002 8526 7948 1084 018	960 6	Ho mo sapi ens	ALK;HDAC2;HDAC3;SRC
R- H S A- 15 67 11	Polo-like kinase mediated events	4	2 3	0.0 01 48 73 25 40 09 31 19 5	1, 5 7 E + 1 0	8, 4 8 E + 1 0	9	15	0.001 0188 1410 0387 1494	960 6	Ho mo sapi ens	PLK1;CDC25A
R- H S A- 16 43 68 5	Disease	2 4	2 6 3 7	0.1 70 52 50 90 53 28 50 5	3, 6 8 E + 0 9	1, 8 4 E + 1 2	186	192 7	0.130 8836 5142 9735 8	960 6	Ho mo sapi ens	PDGFRB;ALK;HDAC4;HD AC2;HSP90AA1;HDAC3;S YK;ROCK2;SRC;PSEN2;BR AF;CYP19A1;HDAC9;CDC 25A;HDAC6;NCOR1;CYP2 4A1;CDK4;CDK2;MDM2;R AC1;JAK2;MET
R- H S A-	Generic Transcripti on Pathway	1 8	1 5 8 6	0.1 02 56 07	5, 3 0 E	2, 4 9 E	73	884	0.060 0421 1098	960 6	Ho mo sapi ens	RET;HDAC4;HDAC2;HDA C3;SRC;HDAC9;HDAC6;N COR1;CDK4;CHEK1;CDK2 ;MDM2;MET

21				86	+	+			2816			
24				34	0	1			005			
36				24	9	1						
				72								
				84								
R- H S A- 67 85 80 7	Interleukin -4 and Interleukin -13 signaling	7 2 1 1	0.0 13 64 45 93 89 54 99 22 3	1, 0 1 E + 1 1 0	4, 4 3 E + 1 0		19 47	0.003 1922 8418 1213 068	960 6	Ho mo sapi ens	HSP90AA1;MMP3;PTGS2;J AK2	
R- H S A- 19 41 38	Signaling by VEGF	6 1 0	0.0 09 05 32 85 04 91 46 40 5	1, 0 9 E + 1 1 1	4, 4 7 E + 1 1 1		42 86	0.005 8412 0084 2219 656	960 6	Ho mo sapi ens	HSP90AA1;FLT1;ROCK2;S RC;SPHK1;RAC1	
R- H S A- 97 68 91 9	NPAS4 regulates expression of target genes	4 4 1	0.0 02 65 13 19 19 29 64 30 43	1, 5 1 E + 1 1 1	5, 9 0 E + 1 1 1		4 36	0.002 4451 5384 0929 1586	960 6	Ho mo sapi ens	RET;MDM2	
R- H S A- 73 85 7	RNA Polymeras e II Transcripti on	1 8 2 8	0.1 11 74 34 04 03 51 78 48	1, 7 4 E + 1 1 1	6, 0 1 E + 1 1 1		73 945	0.064 1852 8832 4390 41	960 6	Ho mo sapi ens	RET;HDAC4;HDAC2;HDA C3;SRC;HDAC9;HDAC6;N COR1;CDK4;CHEK1;CDK2 ;MDM2;MET	
R- H S A- 12 57 60 4	PIP3 activates AKT signaling	8 3 2 2	0.0 20 82 25 55 61 30 36	1, 8 0 E + 1 1 1	6, 0 1 E + 1 1 1		7 88	0.005 9770 4272 2271 276	960 6	Ho mo sapi ens	PDGFRB;HDAC2;HDAC3; SRC;MDM2;RAC1;MET	

				73									
				2									
R- H S A- 89 41 32 6	RUNX2 regulates bone developme nt	4 3	4 02 78 06 51 83 65 23 53 87	0.0 1, 8 2 E + 1 1 1 1 1 1 1	6, 0 1 E + 1 1 1 1 1 1 1	6 32	0.002 1734 7008 0825 9187	960 6	Ho mo sapi ens	HDAC4;HDAC3;SRC;HDA C6			
R- H S A- 74 16 0	Gene expression (Transcript ion)	1 9 1 7	1 9 96 53 38 85 15 26 12	0.1 23 9 E + 1 1 1 1 1 1 1	6, 0 4 E + 1 1 1 1 1 1 1	80 109 0	0.074 0338 2462 8132 85	960 6	Ho mo sapi ens	RET;HDAC4;HDAC2;HSP 90AA1;HDAC3;SRC;HDA C9;HDAC6;NCOR1;CDK4; CHEK1;CDK2;MDM2;MET			
R- H S A- 89 86 94 4	Transcripti onal Regulation by MECP2	5 0 0	1 06 46 66 32 17 79 61 71 7	0.0 3, 0 1 E + 1 1 1 1 1 1 1	8, 7 5 E + 1 1 1 1 1 1 1	8 77	0.005 2299 1238 1987 367	960 6	Ho mo sapi ens	HDAC2;NCOR1;HDAC3; MET			
R- H S A- 26 82 33 4	EPH- Ephrin signaling	5 0 2	1 06 59 59 64 82 15 20 95 2	0.0 3, 0 E + 1 0 1 1 1 1 1	8, 7 5 E + 1 1 1 1 1 1 1	52 56	0.003 8035 7264 1445 3576	960 6	Ho mo sapi ens	ROCK2;SRC;PSEN2;RAC1; EPHB4			

Table S8. 25 most relevant pathways sorted by p-value.