

Pathway identifier	Pathway name	Proteins found	Total Proteins Pathway
R-HSA-164843	2-LTR circle formation	6	13
R-HSA-73843	5-Phosphoribose 1-diphosphate biosynthesis	2	3
R-HSA-1971475	A tetrasaccharide linker sequence is required for GAG synthesis	2	26
R-HSA-2161541	Abacavir metabolism	2	5
R-HSA-2161517	Abacavir transmembrane transport	1	5
R-HSA-2161522	Abacavir transport and metabolism	3	10
R-HSA-73930	Abasic sugar-phosphate removal via the single-nucleotide replacement pathway	1	2
R-HSA-5619084	ABC transporter disorders	46	77
R-HSA-1369062	ABC transporters in lipid homeostasis	1	18
R-HSA-382556	ABC-family proteins mediated transport	56	103
R-HSA-2978092	Abnormal conversion of 2-oxoglutarate to 2-hydroxyglutarate	1	1
R-HSA-167242	Abortive elongation of HIV-1 transcript in the absence of Tat	21	23
R-HSA-264642	Acetylcholine Neurotransmitter Release Cycle	3	17
R-HSA-399997	Acetylcholine regulates insulin secretion	5	10
R-HSA-1300645	Acrosome Reaction and Sperm:Oocyte Membrane Binding	1	6
R-HSA-2122948	Activated NOTCH1 Transmits Signal to the Nucleus	6	31
R-HSA-9032845	Activated NTRK2 signals through CDK5	2	6
R-HSA-9028731	Activated NTRK2 signals through FRS2 and FRS3	4	12
R-HSA-9032500	Activated NTRK2 signals through FYN	2	7
R-HSA-9028335	Activated NTRK2 signals through PI3K	1	7
R-HSA-9026527	Activated NTRK2 signals through PLCG1	1	4
R-HSA-9026519	Activated NTRK2 signals through RAS	3	11
R-HSA-9603381	Activated NTRK3 signals through PI3K	1	6
R-HSA-9034793	Activated NTRK3 signals through PLCG1	1	3
R-HSA-9034864	Activated NTRK3 signals through RAS	3	10
R-HSA-5625886	Activated PKN1 stimulates transcription of AR (androgen receptor) regulated genes KLK2 and KLK3	7	36
R-HSA-450302	activated TAK1 mediates p38 MAPK activation	9	23
R-HSA-111452	Activation and oligomerization of BAK protein	2	2
R-HSA-165158	Activation of AKT2	1	4
R-HSA-9619483	Activation of AMPK downstream of NMDARs	11	29
R-HSA-5617472	Activation of anterior HOX genes in hindbrain development during early embryogenesis	23	91
R-HSA-176814	Activation of APC/C and APC/C:Cdc20 mediated degradation of mitotic proteins	52	76
R-HSA-176187	Activation of ATR in response to replication stress	16	37
R-HSA-111447	Activation of BAD and translocation to mitochondria	9	15
R-HSA-114452	Activation of BH3-only proteins	10	30
R-HSA-139910	Activation of BMF and translocation to mitochondria	1	3
R-HSA-111459	Activation of caspases through apoptosome-mediated cleavage	4	6
R-HSA-1296041	Activation of G protein gated Potassium channels	4	25
R-HSA-991365	Activation of GABAB receptors	8	39
R-HSA-2426168	Activation of gene expression by SREBF (SREBP)	15	43
R-HSA-5619507	Activation of HOX genes during differentiation	23	91
R-HSA-936964	Activation of IRF3/IRF7 mediated by TBK1/IKK epsilon	5	17
R-HSA-451326	Activation of kainate receptors upon glutamate binding	7	30
R-HSA-1592389	Activation of Matrix Metalloproteinases	1	33
R-HSA-1169091	Activation of NF-kappaB in B cells	43	67
R-HSA-2980767	Activation of NIMA Kinases NEK9, NEK6, NEK7	4	7
R-HSA-442755	Activation of NMDA receptors and postsynaptic events	31	96
R-HSA-2151209	Activation of PPARGC1A (PGC-1alpha) by phosphorylation	3	10
R-HSA-428540	Activation of RAC1	5	13
R-HSA-9619229	Activation of RAC1 downstream of NMDARs	3	7
R-HSA-1169092	Activation of RAS in B cells	2	6
R-HSA-5635838	Activation of SMO	3	18
R-HSA-450341	Activation of the AP-1 family of transcription factors	4	10
R-HSA-72662	Activation of the mRNA upon binding of the cap-binding complex and eIFs, and subsequent binding to 43S	57	60
R-HSA-2485179	Activation of the phototransduction cascade	1	11
R-HSA-68962	Activation of the pre-replicative complex	19	33
R-HSA-8866907	Activation of the TFAP2 (AP-2) family of transcription factors	1	12

R-HSA-75108	Activation, myristoylation of BID and translocation to mitochondria	3	4
R-HSA-114294	Activation, translocation and oligomerization of BAX	2	2
R-HSA-1482798	Acyl chain remodeling of CL	4	6
R-HSA-1482883	Acyl chain remodeling of DAG and TAG	1	8
R-HSA-1482788	Acyl chain remodelling of PC	3	27
R-HSA-1482839	Acyl chain remodelling of PE	2	29
R-HSA-1482925	Acyl chain remodelling of PG	3	18
R-HSA-1482922	Acyl chain remodelling of PI	2	17
R-HSA-1482801	Acyl chain remodelling of PS	3	22
R-HSA-1280218	Adaptive Immune System	255	944
R-HSA-170660	Adenylate cyclase activating pathway	1	10
R-HSA-170670	Adenylate cyclase inhibitory pathway	4	14
R-HSA-418990	Adherens junctions interactions	10	33
R-HSA-418592	ADP signalling through P2Y purinoceptor 1	9	25
R-HSA-392170	ADP signalling through P2Y purinoceptor 12	8	22
R-HSA-400042	Adrenaline,noradrenaline inhibits insulin secretion	7	28
R-HSA-879415	Advanced glycosylation endproduct receptor signaling	8	13
R-HSA-5423646	Aflatoxin activation and detoxification	5	20
R-HSA-198323	AKT phosphorylates targets in the cytosol	3	14
R-HSA-198693	AKT phosphorylates targets in the nucleus	2	10
R-HSA-211163	AKT-mediated inactivation of FOXO1A	1	4
R-HSA-8964540	Alanine metabolism	1	2
R-HSA-112122	ALKBH2 mediated reversal of alkylation damage	1	1
R-HSA-112126	ALKBH3 mediated reversal of alkylation damage	3	4
R-HSA-1462054	Alpha-defensins	1	10
R-HSA-2046104	alpha-linolenic (omega3) and linoleic (omega6) acid metabolism	9	13
R-HSA-2046106	alpha-linolenic acid (ALA) metabolism	9	13
R-HSA-389599	Alpha-oxidation of phytanate	4	6
R-HSA-9645460	Alpha-protein kinase 1 signaling pathway	3	11
R-HSA-4839748	AMER1 mutants destabilize the destruction complex	7	14
R-HSA-140179	Amine Oxidase reactions	1	4
R-HSA-352230	Amino acid transport across the plasma membrane	9	34
R-HSA-9639288	Amino acids regulate mTORC1	22	55
R-HSA-163680	AMPK inhibits chREBP transcriptional activation activity	1	8
R-HSA-141444	Amplification of signal from unattached kinetochores via a MAD2 inhibitory signal	48	94
R-HSA-141424	Amplification of signal from the kinetochores	48	94
R-HSA-977225	Amyloid fiber formation	15	80
R-HSA-5620912	Anchoring of the basal body to the plasma membrane	34	97
R-HSA-193048	Androgen biosynthesis	1	11
R-HSA-983695	Antigen activates B Cell Receptor (BCR) leading to generation of second messengers	6	95
R-HSA-983170	Antigen Presentation: Folding, assembly and peptide loading of class I MHC	32	93
R-HSA-1236975	Antigen processing-Cross presentation	72	169
R-HSA-983168	Antigen processing: Ubiquitination & Proteasome degradation	114	309
R-HSA-6803157	Antimicrobial peptides	5	95
R-HSA-1169410	Antiviral mechanism by IFN-stimulated genes	54	89
R-HSA-5467337	APC truncation mutants have impaired AXIN binding	7	14
R-HSA-179409	APC-Cdc20 mediated degradation of Nek2A	12	25
R-HSA-179419	APC:Cdc20 mediated degradation of cell cycle proteins prior to satisfaction of the cell cycle checkpoint	51	73
R-HSA-174143	APC/C-mediated degradation of cell cycle proteins	57	86
R-HSA-174048	APC/C:Cdc20 mediated degradation of Cyclin B	11	23
R-HSA-176409	APC/C:Cdc20 mediated degradation of mitotic proteins	52	75
R-HSA-174154	APC/C:Cdc20 mediated degradation of Securin	47	67
R-HSA-174178	APC/C:Cdh1 mediated degradation of Cdc20 and other APC/C:Cdh1 targeted proteins in late mitosis/early G1	49	72
R-HSA-5649702	APEX1-Independent Resolution of AP Sites via the Single Nucleotide Replacement Pathway	3	7
R-HSA-180689	APOBEC3G mediated resistance to HIV-1 infection	4	12
R-HSA-109581	Apoptosis	98	180
R-HSA-140342	Apoptosis induced DNA fragmentation	8	13
R-HSA-351906	Apoptotic cleavage of cell adhesion proteins	7	11
R-HSA-111465	Apoptotic cleavage of cellular proteins	22	38

R-HSA-75153	Apoptotic execution phase	31	52
R-HSA-111471	Apoptotic factor-mediated response	12	18
R-HSA-445717	Aquaporin-mediated transport	13	53
R-HSA-426048	Arachidonate production from DAG	1	5
R-HSA-2142753	Arachidonic acid metabolism	10	59
R-HSA-5624958	ARL13B-mediated ciliary trafficking of INPP5E	1	3
R-HSA-170984	ARMS-mediated activation	4	7
R-HSA-8937144	Aryl hydrocarbon receptor signalling	3	7
R-HSA-446203	Asparagine N-linked glycosylation	160	305
R-HSA-8963693	Aspartate and asparagine metabolism	5	12
R-HSA-9609736	Assembly and cell surface presentation of NMDA receptors	12	43
R-HSA-8963889	Assembly of active LPL and LIPC lipase complexes	1	19
R-HSA-2022090	Assembly of collagen fibrils and other multimeric structures	6	61
R-HSA-175474	Assembly Of The HIV Virion	6	24
R-HSA-68616	Assembly of the ORC complex at the origin of replication	1	6
R-HSA-68867	Assembly of the pre-replicative complex	47	68
R-HSA-168316	Assembly of Viral Components at the Budding Site	2	7
R-HSA-390471	Association of TriC/CCT with target proteins during biosynthesis	17	39
R-HSA-210455	Astrocytic Glutamate-Glutamine Uptake And Metabolism	3	4
R-HSA-4608870	Asymmetric localization of PCP proteins	41	64
R-HSA-380994	ATF4 activates genes in response to endoplasmic reticulum stress	12	27
R-HSA-381183	ATF6 (ATF6-alpha) activates chaperone genes	3	10
R-HSA-381033	ATF6 (ATF6-alpha) activates chaperones	3	12
R-HSA-162791	Attachment of GPI anchor to uPAR	5	7
R-HSA-3371568	Attenuation phase	10	14
R-HSA-450408	AUF1 (hnRNP D0) binds and destabilizes mRNA	45	56
R-HSA-8854518	AURKA Activation by TPX2	30	72
R-HSA-174084	Autodegradation of Cdh1 by Cdh1:APC/C	46	63
R-HSA-349425	Autodegradation of the E3 ubiquitin ligase COP1	41	52
R-HSA-177539	Autointegration results in viral DNA circles	3	9
R-HSA-9612973	Autophagy	62	119
R-HSA-5467340	AXIN missense mutants destabilize the destruction complex	7	14
R-HSA-4839735	AXIN mutants destabilize the destruction complex, activating WNT signaling	7	14
R-HSA-422475	Axon guidance	254	558
R-HSA-193634	Axonal growth inhibition (RHOA activation)	3	9
R-HSA-209563	Axonal growth stimulation	2	4
R-HSA-5250924	B-WICH complex positively regulates rRNA expression	20	60
R-HSA-73884	Base Excision Repair	31	73
R-HSA-73929	Base-Excision Repair, AP Site Formation	7	45
R-HSA-210991	Basigin interactions	10	25
R-HSA-5620922	BBSome-mediated cargo-targeting to cilium	7	23
R-HSA-77352	Beta oxidation of butanoyl-CoA to acetyl-CoA	3	5
R-HSA-77346	Beta oxidation of decanoyl-CoA to octanoyl-CoA-CoA	6	6
R-HSA-77350	Beta oxidation of hexanoyl-CoA to butanoyl-CoA	5	5
R-HSA-77310	Beta oxidation of lauroyl-CoA to decanoyl-CoA-CoA	4	5
R-HSA-77285	Beta oxidation of myristoyl-CoA to lauroyl-CoA	2	3
R-HSA-77348	Beta oxidation of octanoyl-CoA to hexanoyl-CoA	5	5
R-HSA-77305	Beta oxidation of palmitoyl-CoA to myristoyl-CoA	3	3
R-HSA-3858494	Beta-catenin independent WNT signaling	68	144
R-HSA-196299	Beta-catenin phosphorylation cascade	8	17
R-HSA-389887	Beta-oxidation of pristanoyl-CoA	3	9
R-HSA-390247	Beta-oxidation of very long chain fatty acids	6	11
R-HSA-111453	BH3-only proteins associate with and inactivate anti-apoptotic BCL-2 members	2	9
R-HSA-425381	Bicarbonate transporters	1	10
R-HSA-194068	Bile acid and bile salt metabolism	8	43
R-HSA-173107	Binding and entry of HIV virion	1	12
R-HSA-2173782	Binding and Uptake of Ligands by Scavenger Receptors	11	129
R-HSA-4411364	Binding of TCF/LEF:CTNNB1 to target gene promoters	1	8
R-HSA-141333	Biogenic amines are oxidatively deaminated to aldehydes by MAOA and MAOB	1	2
R-HSA-211859	Biological oxidations	61	222
R-HSA-9020265	Biosynthesis of aspirin-triggered D-series resolvins	1	3
R-HSA-9018676	Biosynthesis of D-series resolvins	1	4

R-HSA-9018677	Biosynthesis of DHA-derived SPMs	1	17
R-HSA-9023661	Biosynthesis of E-series 18(R)-resolvins	1	4
R-HSA-9018896	Biosynthesis of E-series 18(S)-resolvins	1	5
R-HSA-9018679	Biosynthesis of EPA-derived SPMs	1	6
R-HSA-9018681	Biosynthesis of protectins	1	4
R-HSA-9018678	Biosynthesis of specialized proresolving mediators (SPMs)	2	19
R-HSA-446193	Biosynthesis of the N-glycan precursor (dolichol lipid-linked oligosaccharide, LLO) and transfer to a nascent protein	28	78
R-HSA-196780	Biotin transport and metabolism	8	11
R-HSA-1368108	BMAL1:CLOCK,NPAS2 activates circadian gene expression	4	27
R-HSA-70895	Branched-chain amino acid catabolism	18	19
R-HSA-352238	Breakdown of the nuclear lamina	2	3
R-HSA-162588	Budding and maturation of HIV virion	16	36
R-HSA-450385	Butyrate Response Factor 1 (BRF1) binds and destabilizes mRNA	11	17
R-HSA-5621481	C-type lectin receptors (CLRs)	63	174
R-HSA-75102	C6 deamination of adenosine	1	2
R-HSA-111996	Ca-dependent events	12	36
R-HSA-4086398	Ca2+ pathway	15	60
R-HSA-2025928	Calcineurin activates NFAT	4	9
R-HSA-111933	Calmodulin induced events	10	34
R-HSA-901042	Calnexin/calreticulin cycle	15	26
R-HSA-111997	CaM pathway	10	34
R-HSA-111932	CaMK IV-mediated phosphorylation of CREB	3	10
R-HSA-72737	Cap-dependent Translation Initiation	112	120
R-HSA-8955332	Carboxyterminal post-translational modifications of tubulin	10	43
R-HSA-5576891	Cardiac conduction	16	140
R-HSA-5694530	Cargo concentration in the ER	19	33
R-HSA-8856825	Cargo recognition for clathrin-mediated endocytosis	48	105
R-HSA-5620920	Cargo trafficking to the periciliary membrane	23	51
R-HSA-71262	Carnitine synthesis	2	4
R-HSA-5218900	CASP8 activity is inhibited	4	14
R-HSA-140534	Caspase activation via Death Receptors in the presence of ligand	4	19
R-HSA-418889	Caspase activation via Dependence Receptors in the absence of ligand	2	10
R-HSA-5357769	Caspase activation via extrinsic apoptotic signalling pathway	6	29
R-HSA-264870	Caspase-mediated cleavage of cytoskeletal proteins	9	12
R-HSA-426117	Cation-coupled Chloride cotransporters	2	7
R-HSA-5621575	CD209 (DC-SIGN) signaling	6	22
R-HSA-389356	CD28 co-stimulation	10	33
R-HSA-389357	CD28 dependent PI3K/Akt signaling	4	22
R-HSA-389359	CD28 dependent Vav1 pathway	5	12
R-HSA-174184	Cdc20:Phospho-APC/C mediated degradation of Cyclin A	51	72
R-HSA-68689	CDC6 association with the ORC:origin complex	1	11
R-HSA-69017	CDK-mediated phosphorylation and removal of Cdc6	48	72
R-HSA-68827	CDT1 association with the CDC6:ORC:origin complex	41	59
R-HSA-1640170	Cell Cycle	284	622
R-HSA-69620	Cell Cycle Checkpoints	138	274
R-HSA-69278	Cell Cycle, Mitotic	250	515
R-HSA-204998	Cell death signalling via NUAGE, NRIF and NADE	16	76
R-HSA-446728	Cell junction organization	22	92
R-HSA-202733	Cell surface interactions at the vascular wall	24	246
R-HSA-1500931	Cell-Cell communication	33	130
R-HSA-421270	Cell-cell junction organization	11	65
R-HSA-446353	Cell-extracellular matrix interactions	10	18
R-HSA-3371556	Cellular response to heat stress	65	95
R-HSA-1234174	Cellular response to hypoxia	48	75
R-HSA-8953897	Cellular responses to external stimuli	218	473
R-HSA-2262752	Cellular responses to stress	218	459
R-HSA-2559583	Cellular Senescence	44	164
R-HSA-380287	Centrosome maturation	35	81
R-HSA-418457	cGMP effects	2	16
R-HSA-9613829	Chaperone Mediated Autophagy	11	22
R-HSA-390466	Chaperonin-mediated protein folding	44	96
R-HSA-380108	Chemokine receptors bind chemokines	1	57

R-HSA-75035	Chk1/Chk2(Cds1) mediated inactivation of Cyclin B:Cdk1 complex	9	13
R-HSA-447041	CHL1 interactions	5	9
R-HSA-191273	Cholesterol biosynthesis	15	26
R-HSA-6807047	Cholesterol biosynthesis via desmosterol	3	4
R-HSA-6807062	Cholesterol biosynthesis via lathosterol	3	4
R-HSA-6798163	Choline catabolism	1	6
R-HSA-1793185	Chondroitin sulfate/dermatan sulfate metabolism	4	50
R-HSA-163765	ChREBP activates metabolic gene expression	4	8
R-HSA-3247509	Chromatin modifying enzymes	58	240
R-HSA-4839726	Chromatin organization	58	240
R-HSA-73886	Chromosome Maintenance	34	90
R-HSA-8963888	Chylomicron assembly	2	10
R-HSA-5617833	Cilium Assembly	69	202
R-HSA-400253	Circadian Clock	15	68
R-HSA-71403	Citric acid cycle (TCA cycle)	21	22
R-HSA-373076	Class A/1 (Rhodopsin-like receptors)	6	333
R-HSA-373080	Class B/2 (Secretin family receptors)	8	97
R-HSA-983169	Class I MHC mediated antigen processing & presentation	157	441
R-HSA-9603798	Class I peroxisomal membrane protein import	10	20
R-HSA-8856828	Clathrin-mediated endocytosis	75	145
R-HSA-110331	Cleavage of the damaged purine	6	38
R-HSA-110329	Cleavage of the damaged pyrimidine	6	42
R-HSA-5607763	CLEC7A (Dectin-1) induces NFAT activation	5	11
R-HSA-5607764	CLEC7A (Dectin-1) signaling	57	98
R-HSA-5660668	CLEC7A/inflammasome pathway	1	6
R-HSA-196741	Cobalamin (Cbl, vitamin B12) transport and metabolism	6	21
R-HSA-196783	Coenzyme A biosynthesis	4	8
R-HSA-2470946	Cohesin Loading onto Chromatin	6	10
R-HSA-1650814	Collagen biosynthesis and modifying enzymes	13	67
R-HSA-8948216	Collagen chain trimerization	1	44
R-HSA-1442490	Collagen degradation	5	64
R-HSA-1474290	Collagen formation	18	90
R-HSA-8948700	Competing endogenous RNAs (ceRNAs) regulate PTEN translation	1	8
R-HSA-166658	Complement cascade	2	146
R-HSA-6799198	Complex I biogenesis	52	55
R-HSA-2514853	Condensation of Prometaphase Chromosomes	10	11
R-HSA-2299718	Condensation of Prophase Chromosomes	15	45
R-HSA-2219530	Constitutive Signaling by Aberrant PI3K in Cancer	8	86
R-HSA-5674400	Constitutive Signaling by AKT1 E17K in Cancer	7	26
R-HSA-5637810	Constitutive Signaling by EGFRvIII	7	16
R-HSA-1236382	Constitutive Signaling by Ligand-Responsive EGFR Cancer Variants	9	20
R-HSA-2691232	Constitutive Signaling by NOTCH1 HD Domain Mutants	3	15
R-HSA-2894862	Constitutive Signaling by NOTCH1 HD+PEST Domain Mutants	14	59
R-HSA-2644606	Constitutive Signaling by NOTCH1 PEST Domain Mutants	14	59
R-HSA-2660826	Constitutive Signaling by NOTCH1 t(7;9)(NOTCH1:M1580_K2555) Translocation Mutant	1	7
R-HSA-176407	Conversion from APC/C:Cdc20 to APC/C:Cdh1 in late anaphase	7	19
R-HSA-6814122	Cooperation of PDCL (PhLP1) and TRIC/CCT in G-protein beta folding	20	42
R-HSA-389958	Cooperation of Prefoldin and TriC/CCT in actin and tubulin folding	23	33
R-HSA-6811434	COPI-dependent Golgi-to-ER retrograde traffic	56	103
R-HSA-6811436	COPI-independent Golgi-to-ER retrograde traffic	35	53
R-HSA-6807878	COPI-mediated anterograde transport	68	102
R-HSA-204005	COPII-mediated vesicle transport	43	68
R-HSA-388841	Costimulation by the CD28 family	18	88
R-HSA-71288	Creatine metabolism	3	10
R-HSA-199920	CREB phosphorylation	1	7
R-HSA-442742	CREB1 phosphorylation through NMDA receptor-mediated activation of RAS signaling	7	29
R-HSA-442720	CREB1 phosphorylation through the activation of Adenylate Cyclase	4	12

R-HSA-442729	CREB1 phosphorylation through the activation of CaMKII/CaMKK/CaMKIV cascade	2	8
R-HSA-8949613	Cristae formation	26	31
R-HSA-399956	CRMPs in Sema3A signaling	6	16
R-HSA-1236973	Cross-presentation of particulate exogenous antigens (phagosomes)	1	8
R-HSA-1236978	Cross-presentation of soluble exogenous antigens (endosomes)	38	50
R-HSA-2024101	CS/DS degradation	2	14
R-HSA-389513	CTLA4 inhibitory signaling	9	21
R-HSA-69656	Cyclin A:Cdk2-associated events at S phase entry	48	85
R-HSA-69273	Cyclin A/B1/B2 associated events during G2/M transition	12	25
R-HSA-69231	Cyclin D associated events in G1	16	44
R-HSA-69202	Cyclin E associated events during G1/S transition	48	83
R-HSA-1614603	Cysteine formation from homocysteine	2	3
R-HSA-111461	Cytochrome c-mediated apoptotic response	8	13
R-HSA-211897	Cytochrome P450 - arranged by substrate type	4	65
R-HSA-1280215	Cytokine Signaling in Immune system	241	954
R-HSA-2564830	Cytosolic iron-sulfur cluster assembly	7	13
R-HSA-1834949	Cytosolic sensors of pathogen-associated DNA	28	63
R-HSA-156584	Cytosolic sulfonation of small molecules	9	25
R-HSA-379716	Cytosolic tRNA aminoacylation	24	24
R-HSA-1489509	DAG and IP3 signaling	14	40
R-HSA-2172127	DAP12 interactions	9	47
R-HSA-2424491	DAP12 signaling	7	30
R-HSA-180024	DARPP-32 events	12	24
R-HSA-418885	DCC mediated attractive signaling	6	14
R-HSA-168928	DDX58/IFIH1-mediated induction of interferon-alpha/beta	19	77
R-HSA-3769402	Deactivation of the beta-catenin transactivating complex	12	42
R-HSA-429947	Deadenylation of mRNA	20	25
R-HSA-429914	Deadenylation-dependent mRNA decay	46	56
R-HSA-73887	Death Receptor Signalling	32	147
R-HSA-5607761	Dectin-1 mediated noncanonical NF-kB signaling	45	60
R-HSA-5621480	Dectin-2 family	1	61
R-HSA-5578997	Defective AHCY causes Hypermethioninemia with S-adenosylhomocysteine hydrolase deficiency (HMAHCHD)	1	1
R-HSA-4549380	Defective ALG1 causes ALG1-CDG (CDG-1k)	1	1
R-HSA-4720489	Defective ALG12 causes ALG12-CDG (CDG-1g)	1	1
R-HSA-5633231	Defective ALG14 causes congenital myasthenic syndrome (ALG14-CMS)	1	2
R-HSA-4720475	Defective ALG3 causes ALG3-CDG (CDG-1d)	1	1
R-HSA-4724289	Defective ALG6 causes ALG6-CDG (CDG-1c)	1	1
R-HSA-4720454	Defective ALG9 causes ALG9-CDG (CDG-1l)	1	1
R-HSA-4420332	Defective B3GALT6 causes EDSP2 and SEMDJL1	1	20
R-HSA-5083635	Defective B3GALTL causes Peters-plus syndrome (PpS)	1	38
R-HSA-3560801	Defective B3GAT3 causes JDSSDHD	2	20
R-HSA-3560783	Defective B4GALT7 causes EDS, progeroid type	1	20
R-HSA-5678895	Defective CFTR causes cystic fibrosis	46	61
R-HSA-5579026	Defective CYP11A1 causes Adrenal insufficiency, congenital, with 46,XY sex reversal (AICSR)	2	4
R-HSA-4717374	Defective DPM1 causes DPM1-CDG (CDG-1e)	2	3
R-HSA-4719377	Defective DPM2 causes DPM2-CDG (CDG-1u)	2	3
R-HSA-4719360	Defective DPM3 causes DPM3-CDG (CDG-1o)	2	3
R-HSA-3656253	Defective EXT1 causes exostoses 1, TRPS2 and CHDS	1	14
R-HSA-3656237	Defective EXT2 causes exostoses 2	1	14
R-HSA-5609977	Defective GALE can cause Epimerase-deficiency galactosemia (EDG)	1	1
R-HSA-5609976	Defective GALK1 can cause Galactosemia II (GALCT2)	1	1
R-HSA-5578999	Defective GCLC causes Hemolytic anemia due to gamma-glutamylcysteine synthetase deficiency (HAGGSD)	2	2
R-HSA-4085023	Defective GFPT1 causes CMSTA1	1	1
R-HSA-5579022	Defective GGT1 causes Glutathionuria (GLUTH)	1	1
R-HSA-9035968	Defective GGT1 causes Glutathionuria (GLUTH)	1	1
R-HSA-5579006	Defective GSS causes Glutathione synthetase deficiency (GSS deficiency)	1	1
R-HSA-3656234	Defective HEXA causes GM2G1	1	1
R-HSA-3656248	Defective HEXB causes GM2G2	1	1

R-HSA-5619056	Defective HK1 causes hexokinase deficiency (HK deficiency)	1	1
R-HSA-3371599	Defective HLCS causes multiple carboxylase deficiency	6	7
R-HSA-9645722	Defective Intrinsic Pathway for Apoptosis Due to p14ARF Loss of Function	2	2
R-HSA-5083627	Defective LARGE causes MDDGA6 and MDDGB6	1	2
R-HSA-4793950	Defective MAN1B1 causes MRT15	1	1
R-HSA-5579012	Defective MAOA causes Brunner syndrome (BRUNS)	1	1
R-HSA-4793952	Defective MGAT2 causes MGAT2-CDG (CDG-2a)	1	1
R-HSA-5545483	Defective Mismatch Repair Associated With MLH1	1	2
R-HSA-5632928	Defective Mismatch Repair Associated With MSH2	3	3
R-HSA-5632927	Defective Mismatch Repair Associated With MSH3	2	2
R-HSA-5632968	Defective Mismatch Repair Associated With MSH6	2	2
R-HSA-5632987	Defective Mismatch Repair Associated With PMS2	1	2
R-HSA-3359475	Defective MMAA causes methylmalonic aciduria type cblA	1	2
R-HSA-3359471	Defective MMAB causes methylmalonic aciduria type cblB	1	1
R-HSA-4793954	Defective MOGS causes MOGS-CDG (CDG-2b)	1	1
R-HSA-4687000	Defective MPDU1 causes MPDU1-CDG (CDG-1f)	1	1
R-HSA-4043916	Defective MPI causes MPI-CDG (CDG-1b)	1	1
R-HSA-3359469	Defective MTR causes methylmalonic aciduria and homocystinuria type cblG	1	2
R-HSA-3359467	Defective MTRR causes methylmalonic aciduria and homocystinuria type cblE	1	2
R-HSA-3359478	Defective MUT causes methylmalonic aciduria mut type	1	2
R-HSA-4341670	Defective NEU1 causes sialidosis	2	3
R-HSA-3560796	Defective PAPSS2 causes SEMD-PA	1	1
R-HSA-5609974	Defective PGM1 causes PGM1-CDG (CDG1t)	1	1
R-HSA-4043911	Defective PMM2 causes PMM2-CDG (CDG-1a)	1	1
R-HSA-5083628	Defective POMGNT1 causes MDDGA3, MDDGB3 and MDDGC3	1	2
R-HSA-5083633	Defective POMT1 causes MDDGA1, MDDGB1 and MDDGC1	1	3
R-HSA-5083629	Defective POMT2 causes MDDGA2, MDDGB2 and MDDGC2	1	3
R-HSA-4570571	Defective RFT1 causes RFT1-CDG (CDG-1n)	1	1
R-HSA-5619070	Defective SLC16A1 causes symptomatic deficiency in lactate transport (SDLT)	2	2
R-HSA-5619035	Defective SLC17A5 causes Salla disease (SD) and ISSD	1	1
R-HSA-5619062	Defective SLC1A3 causes episodic ataxia 6 (EA6)	1	1
R-HSA-3560792	Defective SLC26A2 causes chondrodysplasias	1	1
R-HSA-5619108	Defective SLC27A4 causes ichthyosis prematurity syndrome (IPS)	1	1
R-HSA-5619061	Defective SLC33A1 causes spastic paraplegia 42 (SPG42)	1	1
R-HSA-5660862	Defective SLC7A7 causes lysinuric protein intolerance (LPI)	1	2
R-HSA-5619110	Defective SLCO1B1 causes hyperbilirubinemia, Rotor type (HBLRR)	1	2
R-HSA-5619058	Defective SLCO1B3 causes hyperbilirubinemia, Rotor type (HBLRR)	1	2
R-HSA-5578995	Defective TPMT causes Thiopurine S-methyltransferase deficiency (TPMT deficiency)	1	1
R-HSA-5619107	Defective TPR may confer susceptibility towards thyroid papillary carcinoma (TPC)	23	36
R-HSA-3323169	Defects in biotin (B7n) metabolism	6	8
R-HSA-3296469	Defects in cobalamin (B12) metabolism	3	14
R-HSA-3296482	Defects in vitamin and cofactor metabolism	9	22
R-HSA-1461973	Defensins	1	49
R-HSA-4641257	Degradation of AXIN	40	55
R-HSA-195253	Degradation of beta-catenin by the destruction complex	55	82
R-HSA-1614558	Degradation of cysteine and homocysteine	6	14
R-HSA-4641258	Degradation of DVL	43	57
R-HSA-916853	Degradation of GABA	2	2
R-HSA-5610780	Degradation of GLI1 by the proteasome	45	60
R-HSA-5610783	Degradation of GLI2 by the proteasome	45	60
R-HSA-1474228	Degradation of the extracellular matrix	18	140
R-HSA-4419969	Depolymerisation of the Nuclear Lamina	9	16
R-HSA-606279	Deposition of new CENPA-containing nucleosomes at the centromere	10	54
R-HSA-73927	Depurination	6	38
R-HSA-73928	Depyrimidination	6	42
R-HSA-8862803	Deregulated CDK5 triggers multiple neurodegenerative pathways in Alzheimer's disease models	12	22

R-HSA-3299685	Detoxification of Reactive Oxygen Species	23	39
R-HSA-5688426	Deubiquitination	107	282
R-HSA-1266738	Developmental Biology	308	1076
R-HSA-3134963	DEx/H-box helicases activate type I IFN and inflammatory cytokines production	2	7
R-HSA-8935690	Digestion	1	22
R-HSA-8963743	Digestion and absorption	1	27
R-HSA-69416	Dimerization of procaspase-8	4	11
R-HSA-4641262	Disassembly of the destruction complex and recruitment of AXIN to the membrane	9	31
R-HSA-1643685	Disease	440	1173
R-HSA-3560782	Diseases associated with glycosaminoglycan metabolism	6	41
R-HSA-5609975	Diseases associated with glycosylation precursor biosynthesis	10	18
R-HSA-3781860	Diseases associated with N-glycosylation of proteins	11	17
R-HSA-3906995	Diseases associated with O-glycosylation of proteins	3	71
R-HSA-5602358	Diseases associated with the TLR signaling cascade	2	27
R-HSA-5663084	Diseases of carbohydrate metabolism	14	34
R-HSA-9630747	Diseases of Cellular Senescence	4	4
R-HSA-3781865	Diseases of glycosylation	30	146
R-HSA-5260271	Diseases of Immune System	2	27
R-HSA-5668914	Diseases of metabolism	33	104
R-HSA-5423599	Diseases of Mismatch Repair (MMR)	4	5
R-HSA-9645723	Diseases of Programmed Cell Death	2	2
R-HSA-5663202	Diseases of signal transduction	144	393
R-HSA-114516	Disinhibition of SNARE formation	3	5
R-HSA-5619115	Disorders of transmembrane transporters	79	181
R-HSA-110357	Displacement of DNA glycosylase by APEX1	3	10
R-HSA-75205	Dissolution of Fibrin Clot	3	13
R-HSA-73893	DNA Damage Bypass	27	48
R-HSA-5696394	DNA Damage Recognition in GG-NER	21	38
R-HSA-73942	DNA Damage Reversal	6	8
R-HSA-2559586	DNA Damage/Telomere Stress Induced Senescence	14	61
R-HSA-5693606	DNA Double Strand Break Response	22	60
R-HSA-5693532	DNA Double-Strand Break Repair	55	148
R-HSA-5334118	DNA methylation	6	34
R-HSA-73894	DNA Repair	121	312
R-HSA-69306	DNA Replication	84	127
R-HSA-68952	DNA replication initiation	8	8
R-HSA-69002	DNA Replication Pre-Initiation	59	85
R-HSA-69190	DNA strand elongation	27	32
R-HSA-379401	Dopamine clearance from the synaptic cleft	2	4
R-HSA-212676	Dopamine Neurotransmitter Release Cycle	5	23
R-HSA-8863795	Downregulation of ERBB2 signaling	9	32
R-HSA-1358803	Downregulation of ERBB2:ERBB3 signaling	4	14
R-HSA-1253288	Downregulation of ERBB4 signaling	5	11
R-HSA-2173795	Downregulation of SMAD2/3:SMAD4 transcriptional activity	9	23
R-HSA-2173788	Downregulation of TGF-beta receptor signaling	11	26
R-HSA-186763	Downstream signal transduction	11	31
R-HSA-1168372	Downstream signaling events of B Cell Receptor (BCR)	49	82
R-HSA-5654687	Downstream signaling of activated FGFR1	5	35
R-HSA-5654696	Downstream signaling of activated FGFR2	5	35
R-HSA-5654708	Downstream signaling of activated FGFR3	5	28
R-HSA-5654716	Downstream signaling of activated FGFR4	5	29
R-HSA-202424	Downstream TCR signaling	47	116
R-HSA-376172	DSCAM interactions	3	11
R-HSA-5696400	Dual Incision in GG-NER	23	41
R-HSA-6782135	Dual incision in TC-NER	41	65
R-HSA-113510	E2F mediated regulation of DNA replication	10	22
R-HSA-113507	E2F-enabled inhibition of pre-replication complex formation	3	9
R-HSA-8866654	E3 ubiquitin ligases ubiquitinate target proteins	26	60
R-HSA-162594	Early Phase of HIV Life Cycle	10	22
R-HSA-3000178	ECM proteoglycans	9	76
R-HSA-114508	Effects of PIP2 hydrolysis	3	27
R-HSA-182971	EGFR downregulation	12	31
R-HSA-212718	EGFR interacts with phospholipase C-gamma	2	9
R-HSA-2179392	EGFR Transactivation by Gastrin	5	10
R-HSA-1566948	Elastic fibre formation	3	45

R-HSA-2395516	Electron transport from NADPH to Ferredoxin	2	3
R-HSA-139853	Elevation of cytosolic Ca2+ levels	3	16
R-HSA-211976	Endogenous sterols	3	27
R-HSA-917729	Endosomal Sorting Complex Required For Transport (ESCRT)	18	31
R-HSA-1236977	Endosomal/Vacuolar pathway	20	79
R-HSA-380972	Energy dependent regulation of mTOR by LKB1-AMPK	16	29
R-HSA-203615	eNOS activation	5	11
R-HSA-168275	Entry of Influenza Virion into Host Cell via Endocytosis	2	11
R-HSA-379397	Enzymatic degradation of dopamine by COMT	2	3
R-HSA-379398	Enzymatic degradation of Dopamine by monoamine oxidase	2	2
R-HSA-3928665	EPH-ephrin mediated repulsion of cells	17	51
R-HSA-2682334	EPH-Ephrin signaling	44	92
R-HSA-3928663	EPHA-mediated growth cone collapse	8	29
R-HSA-3928662	EPHB-mediated forward signaling	26	42
R-HSA-3928664	Ephrin signaling	10	19
R-HSA-212165	Epigenetic regulation of gene expression	39	117
R-HSA-901032	ER Quality Control Compartment (ERQC)	10	21
R-HSA-199977	ER to Golgi Anterograde Transport	100	155
R-HSA-1236974	ER-Phagosome pathway	69	153
R-HSA-8847993	ERBB2 Activates PTK6 Signaling	1	16
R-HSA-6785631	ERBB2 Regulates Cell Motility	4	18
R-HSA-427389	ERCC6 (CSB) and EHMT2 (G9a) positively regulate rRNA expression	17	45
R-HSA-198753	ERK/MAPK targets	9	22
R-HSA-202670	ERKs are inactivated	7	13
R-HSA-1237044	Erythrocytes take up carbon dioxide and release oxygen	3	12
R-HSA-1247673	Erythrocytes take up oxygen and release carbon dioxide	2	8
R-HSA-9027277	Erythropoietin activates Phospholipase C gamma (PLCG)	2	7
R-HSA-9027284	Erythropoietin activates RAS	4	15
R-HSA-8939211	ESR-mediated signaling	65	196
R-HSA-5662853	Essential pentosuria	1	1
R-HSA-2468052	Establishment of Sister Chromatid Cohesion	6	11
R-HSA-193144	Estrogen biosynthesis	1	6
R-HSA-9018519	Estrogen-dependent gene expression	43	120
R-HSA-9634638	Estrogen-dependent nuclear events downstream of ESR-membrane signaling	6	24
R-HSA-9634635	Estrogen-stimulated signaling through PRK CZ	3	7
R-HSA-71384	Ethanol oxidation	4	12
R-HSA-156842	Eukaryotic Translation Elongation	86	95
R-HSA-72613	Eukaryotic Translation Initiation	112	120
R-HSA-72764	Eukaryotic Translation Termination	86	94
R-HSA-9630791	Evasion of Oncogene Induced Senescence Due to Defective p16INK4A binding to CDK4	2	2
R-HSA-9630794	Evasion of Oncogene Induced Senescence Due to Defective p16INK4A binding to CDK4 and CDK6	3	3
R-HSA-9646303	Evasion of Oncogene Induced Senescence Due to p14ARF Defects	1	1
R-HSA-9630750	Evasion of Oncogene Induced Senescence Due to p16INK4A Defects	3	3
R-HSA-9632697	Evasion of Oxidative Stress Induced Senescence Due to Defective p16INK4A binding to CDK4	2	2
R-HSA-9632700	Evasion of Oxidative Stress Induced Senescence Due to Defective p16INK4A binding to CDK4 and CDK6	3	3
R-HSA-9646304	Evasion of Oxidative Stress Induced Senescence Due to p14ARF Defects	1	1
R-HSA-9632693	Evasion of Oxidative Stress Induced Senescence Due to p16INK4A Defects	3	3
R-HSA-168274	Export of Viral Ribonucleoproteins from Nucleus	25	43
R-HSA-180786	Extension of Telomeres	24	30
R-HSA-9009391	Extra-nuclear estrogen signaling	21	80
R-HSA-1474244	Extracellular matrix organization	47	301
R-HSA-983231	Factors involved in megakaryocyte development and platelet production	54	160
R-HSA-6783310	Fanconi Anemia Pathway	12	38
R-HSA-75157	FasL/ CD95L signaling	3	5
R-HSA-8978868	Fatty acid metabolism	73	179

R-HSA-434316	Fatty Acids bound to GPR40 (FFAR1) regulate insulin secretion	3	8
R-HSA-75105	Fatty acyl-CoA biosynthesis	20	37
R-HSA-8854050	FBXL7 down-regulates AURKA during mitotic entry and in early mitosis	43	55
R-HSA-2644605	FBXW7 Mutants and NOTCH1 in Cancer	3	6
R-HSA-2454202	Fc epsilon receptor (FCERI) signaling	64	218
R-HSA-2871809	FCERI mediated Ca+2 mobilization	8	117
R-HSA-2871796	FCERI mediated MAPK activation	12	119
R-HSA-2871837	FCERI mediated NF-kB activation	47	167
R-HSA-2029480	Fcgamma receptor (FCGR) dependent phagocytosis	40	175
R-HSA-2029481	FCGR activation	1	101
R-HSA-1187000	Fertilization	1	26
R-HSA-1839124	FGFR1 mutant receptor activation	10	33
R-HSA-6803529	FGFR2 alternative splicing	22	26
R-HSA-1839126	FGFR2 mutant receptor activation	15	38
R-HSA-1566977	Fibronectin matrix formation	2	6
R-HSA-9607240	FLT3 Signaling	85	278
R-HSA-390450	Folding of actin by CCT/TriC	9	10
R-HSA-72689	Formation of a pool of free 40S subunits	95	102
R-HSA-196025	Formation of annular gap junctions	6	11
R-HSA-111458	Formation of apoptosome	6	11
R-HSA-163210	Formation of ATP by chemiosmotic coupling	13	18
R-HSA-77042	Formation of editosomes by ADAR proteins	1	2
R-HSA-140877	Formation of Fibrin Clot (Clotting Cascade)	3	39
R-HSA-167152	Formation of HIV elongation complex in the absence of HIV Tat	30	48
R-HSA-167200	Formation of HIV-1 elongation complex containing HIV-1 Tat	29	47
R-HSA-5696395	Formation of Incision Complex in GG-NER	19	43
R-HSA-112382	Formation of RNA Pol II elongation complex	38	61
R-HSA-2559584	Formation of Senescence-Associated Heterochromatin Foci (SAHF)	5	16
R-HSA-6781823	Formation of TC-NER Pre-Incision Complex	34	53
R-HSA-173599	Formation of the active cofactor, UDP-glucuronate	2	3
R-HSA-201722	Formation of the beta-catenin:TCF transactivating complex	16	60
R-HSA-6809371	Formation of the cornified envelope	5	129
R-HSA-113418	Formation of the Early Elongation Complex	22	33
R-HSA-75094	Formation of the Editosome	1	8
R-HSA-167158	Formation of the HIV-1 Early Elongation Complex	22	33
R-HSA-72695	Formation of the ternary complex, and subsequently, the 43S complex	50	52
R-HSA-389960	Formation of tubulin folding intermediates by CCT/TriC	16	26
R-HSA-5661270	Formation of xylulose-5-phosphate	3	5
R-HSA-444473	Formyl peptide receptors bind formyl peptides and many other ligands	3	9
R-HSA-9614085	FOXO-mediated transcription	14	66
R-HSA-9617828	FOXO-mediated transcription of cell cycle genes	1	17
R-HSA-9614657	FOXO-mediated transcription of cell death genes	1	16
R-HSA-9615017	FOXO-mediated transcription of oxidative stress, metabolic and neuronal genes	6	30
R-HSA-400451	Free fatty acids regulate insulin secretion	5	11
R-HSA-5654693	FRS-mediated FGFR1 signaling	4	26
R-HSA-5654700	FRS-mediated FGFR2 signaling	4	29
R-HSA-5654706	FRS-mediated FGFR3 signaling	4	22
R-HSA-5654712	FRS-mediated FGFR4 signaling	4	23
R-HSA-170968	Frs2-mediated activation	7	12
R-HSA-5652227	Fructose biosynthesis	2	2
R-HSA-70350	Fructose catabolism	1	5
R-HSA-5652084	Fructose metabolism	3	7
R-HSA-416482	G alpha (12/13) signalling events	16	80
R-HSA-418594	G alpha (i) signalling events	50	407
R-HSA-416476	G alpha (q) signalling events	23	220
R-HSA-418555	G alpha (s) signalling events	16	577
R-HSA-418597	G alpha (z) signalling events	12	49
R-HSA-8964315	G beta:gamma signalling through BTK	5	18
R-HSA-8964616	G beta:gamma signalling through CDC42	7	20
R-HSA-392451	G beta:gamma signalling through PI3Kgamma	7	25

R-HSA-418217	G beta:gamma signalling through PLC beta	7	20
R-HSA-1296059	G protein gated Potassium channels	4	25
R-HSA-202040	G-protein activation	8	28
R-HSA-397795	G-protein beta:gamma signalling	11	32
R-HSA-112040	G-protein mediated events	20	53
R-HSA-1538133	G0 and Early G1	6	27
R-HSA-69236	G1 Phase	16	44
R-HSA-69615	G1/S DNA Damage Checkpoints	44	68
R-HSA-69206	G1/S Transition	77	131
R-HSA-69205	G1/S-Specific Transcription	9	28
R-HSA-68911	G2 Phase	1	5
R-HSA-69481	G2/M Checkpoints	82	151
R-HSA-69473	G2/M DNA damage checkpoint	33	78
R-HSA-69478	G2/M DNA replication checkpoint	3	5
R-HSA-69275	G2/M Transition	98	198
R-HSA-180292	GAB1 signalosome	5	17
R-HSA-977444	GABA B receptor activation	8	39
R-HSA-977443	GABA receptor activation	9	56
R-HSA-888590	GABA synthesis, release, reuptake and degradation	5	19
R-HSA-70370	Galactose catabolism	3	5
R-HSA-163841	Gamma carboxylation, hypusine formation and arylsulfatase activation	11	39
R-HSA-159740	Gamma-carboxylation of protein precursors	1	10
R-HSA-159854	Gamma-carboxylation, transport, and amino-terminal cleavage of proteins	1	11
R-HSA-190861	Gap junction assembly	8	38
R-HSA-190873	Gap junction degradation	7	12
R-HSA-190828	Gap junction trafficking	15	49
R-HSA-157858	Gap junction trafficking and regulation	17	51
R-HSA-5696397	Gap-filling DNA repair synthesis and ligation in GG-NER	20	25
R-HSA-6782210	Gap-filling DNA repair synthesis and ligation in TC-NER	43	64
R-HSA-881907	Gastrin-CREB signalling pathway via PKC and MAPK	8	19
R-HSA-6787639	GDP-fucose biosynthesis	2	6
R-HSA-8950505	Gene and protein expression by JAK-STAT signaling after Interleukin-12 stimulation	31	37
R-HSA-74160	Gene expression (Transcription)	417	1498
R-HSA-211000	Gene Silencing by RNA	50	110
R-HSA-202433	Generation of second messenger molecules	4	52
R-HSA-212436	Generic Transcription Pathway	291	1234
R-HSA-5610785	GLI3 is processed to GLI3R by the proteasome	45	60
R-HSA-5696399	Global Genome Nucleotide Excision Repair (GG-NER)	46	84
R-HSA-163359	Glucagon signaling in metabolic regulation	12	34
R-HSA-381676	Glucagon-like Peptide-1 (GLP1) regulates insulin secretion	15	43
R-HSA-420092	Glucagon-type ligand receptors	7	34
R-HSA-70263	Gluconeogenesis	20	34
R-HSA-70326	Glucose metabolism	59	98
R-HSA-156588	Glucuronidation	3	24
R-HSA-8964539	Glutamate and glutamine metabolism	10	15
R-HSA-399721	Glutamate binding, activation of AMPA receptors and synaptic plasticity	11	31
R-HSA-210500	Glutamate Neurotransmitter Release Cycle	7	24
R-HSA-156590	Glutathione conjugation	19	37
R-HSA-174403	Glutathione synthesis and recycling	7	13
R-HSA-1483206	Glycerophospholipid biosynthesis	35	129
R-HSA-6814848	Glycerophospholipid catabolism	2	7
R-HSA-6783984	Glycine degradation	3	4
R-HSA-70221	Glycogen breakdown (glycogenolysis)	10	15
R-HSA-8982491	Glycogen metabolism	15	27
R-HSA-3828062	Glycogen storage disease type 0 (muscle GYS1)	2	2
R-HSA-3229133	Glycogen storage disease type Ib (SLC37A4)	1	1
R-HSA-5357609	Glycogen storage disease type II (GAA)	2	2
R-HSA-3814836	Glycogen storage disease type XV (GYG1)	2	2
R-HSA-3229121	Glycogen storage diseases	6	16
R-HSA-3322077	Glycogen synthesis	7	16
R-HSA-70171	Glycolysis	47	78
R-HSA-1630316	Glycosaminoglycan metabolism	16	124
R-HSA-1660662	Glycosphingolipid metabolism	13	46

R-HSA-389661	Glyoxylate metabolism and glycine degradation	17	31
R-HSA-432722	Golgi Associated Vesicle Biogenesis	43	56
R-HSA-162658	Golgi Cisternae Pericentriolar Stack Reorganization	10	14
R-HSA-8856688	Golgi-to-ER retrograde transport	83	137
R-HSA-430116	GP1b-IX-V activation signalling	3	12
R-HSA-388396	GPCR downstream signalling	75	1154
R-HSA-500792	GPCR ligand binding	14	470
R-HSA-114604	GPVI-mediated activation cascade	6	35
R-HSA-179812	GRB2 events in EGFR signaling	4	14
R-HSA-1963640	GRB2 events in ERBB2 signaling	4	19
R-HSA-354194	GRB2:SOS provides linkage to MAPK signaling for Integrins	6	15
R-HSA-982772	Growth hormone receptor signaling	5	24
R-HSA-72706	GTP hydrolysis and joining of the 60S ribosomal subunit	106	113
R-HSA-3214847	HATs acetylate histones	22	108
R-HSA-3214815	HDACs deacetylate histones	19	60
R-HSA-8963896	HDL assembly	2	8
R-HSA-8964011	HDL clearance	2	5
R-HSA-8964058	HDL remodeling	1	11
R-HSA-3214842	HDMs demethylate histones	7	26
R-HSA-5685942	HDR through Homologous Recombination (HRR)	22	66
R-HSA-5693567	HDR through Homologous Recombination (HRR) or Single Strand Annealing (SSA)	40	114
R-HSA-5685939	HDR through MMEJ (alt-NHEJ)	6	10
R-HSA-5685938	HDR through Single Strand Annealing (SSA)	13	37
R-HSA-5610787	Hedgehog 'off' state	63	114
R-HSA-5632684	Hedgehog 'on' state	47	85
R-HSA-5358346	Hedgehog ligand biogenesis	45	65
R-HSA-189451	Heme biosynthesis	7	11
R-HSA-189483	Heme degradation	3	5
R-HSA-109582	Hemostasis	172	723
R-HSA-1638091	Heparan sulfate/heparin (HS-GAG) metabolism	7	55
R-HSA-5387390	Hh mutants abrogate ligand secretion	44	59
R-HSA-5362768	Hh mutants that don't undergo autocatalytic processing are degraded by ERAD	44	56
R-HSA-167287	HIV elongation arrest and recovery	27	36
R-HSA-162906	HIV Infection	153	248
R-HSA-162587	HIV Life Cycle	91	165
R-HSA-167169	HIV Transcription Elongation	29	47
R-HSA-167161	HIV Transcription Initiation	19	47
R-HSA-5693579	Homologous DNA Pairing and Strand Exchange	12	42
R-HSA-5693538	Homology Directed Repair	44	120
R-HSA-162909	Host Interactions of HIV factors	101	144
R-HSA-168253	Host Interactions with Influenza Factors	31	50
R-HSA-2022928	HS-GAG biosynthesis	2	31
R-HSA-2024096	HS-GAG degradation	5	22
R-HSA-3371511	HSF1 activation	11	12
R-HSA-3371571	HSF1-dependent transactivation	15	24
R-HSA-3371497	HSP90 chaperone cycle for steroid hormone receptors (SHR)	35	57
R-HSA-450520	HuR (ELAVL1) binds and stabilizes mRNA	6	8
R-HSA-2142845	Hyaluronan metabolism	4	17
R-HSA-2160916	Hyaluronan uptake and degradation	4	12
R-HSA-1483115	Hydrolysis of LPC	1	9
R-HSA-204626	Hypusine synthesis from eIF5A-lysine	3	4
R-HSA-2428924	IGF1R signaling cascade	8	62
R-HSA-5603029	IkBA variant leads to EDA-ID	1	7
R-HSA-5602636	IKBKB deficiency causes SCID	1	3
R-HSA-5603027	IKBKG deficiency causes anhidrotic ectodermal dysplasia with immunodeficiency (EDA-ID) (via TLR)	1	3
R-HSA-937041	IKK complex recruitment mediated by RIP1	7	23
R-HSA-168256	Immune System	641	2373
R-HSA-198933	Immunoregulatory interactions between a Lymphoid and a non-Lymphoid cell	22	297
R-HSA-200425	Import of palmitoyl-CoA into the mitochondrial matrix	2	14
R-HSA-141430	Inactivation of APC/C via direct inhibition of the APC/C complex	10	20
R-HSA-428543	Inactivation of CDC42 and RAC1	4	8

R-HSA-2514859	inactivation, recovery and regulation of the phototransduction cascade	6	33
R-HSA-400508	Incretin synthesis, secretion, and inactivation	6	23
R-HSA-5663205	Infectious disease	266	463
R-HSA-622312	Inflammasomes	4	24
R-HSA-168254	Influenza Infection	135	171
R-HSA-168255	Influenza Life Cycle	129	160
R-HSA-168273	Influenza Viral RNA Transcription and Replication	121	151
R-HSA-168277	Influenza Virus Induced Apoptosis	1	4
R-HSA-997272	Inhibition of voltage gated Ca ²⁺ channels via Gbeta/gamma subunits	4	25
R-HSA-168315	Inhibition of Host mRNA Processing and RNA Silencing	1	3
R-HSA-169131	Inhibition of PKR	1	2
R-HSA-113501	Inhibition of replication initiation of damaged DNA by RB1/E2F1	7	13
R-HSA-5638303	Inhibition of Signaling by Overexpressed EGFR	1	8
R-HSA-141405	Inhibition of the proteolytic activity of APC/C required for the onset of anaphase by mitotic spindle checkpoint components	10	20
R-HSA-165181	Inhibition of TSC complex formation by PKB	1	3
R-HSA-2995383	Initiation of Nuclear Envelope Reformation	11	14
R-HSA-8876493	InIA-mediated entry of <i>Listeria monocytogenes</i> into host cells	5	10
R-HSA-8875360	InIB-mediated entry of <i>Listeria monocytogenes</i> into host cell	8	17
R-HSA-168249	Innate Immune System	382	1186
R-HSA-1483249	Inositol phosphate metabolism	13	48
R-HSA-9609523	Insertion of tail-anchored proteins into the endoplasmic reticulum membrane	14	22
R-HSA-163754	Insulin effects increased synthesis of Xylulose-5-Phosphate	2	2
R-HSA-264876	Insulin processing	15	27
R-HSA-77387	Insulin receptor recycling	14	26
R-HSA-74751	Insulin receptor signalling cascade	9	61
R-HSA-428359	Insulin-like Growth Factor-2 mRNA Binding Proteins (IGF2BPs/IMPs/VICKZs) bind RNA	3	3
R-HSA-163685	Integration of energy metabolism	38	109
R-HSA-162592	Integration of provirus	8	15
R-HSA-175567	Integration of viral DNA into host genomic DNA	3	9
R-HSA-354192	Integrin alpha11b beta3 signaling	10	28
R-HSA-216083	Integrin cell surface interactions	9	85
R-HSA-9006921	Integrin signaling	10	28
R-HSA-445095	Interaction between L1 and Ankyrins	6	31
R-HSA-177243	Interactions of Rev with host cellular proteins	30	42
R-HSA-176034	Interactions of Tat with host cellular proteins	2	3
R-HSA-176033	Interactions of Vpr with host cellular proteins	30	47
R-HSA-880009	Interconversion of 2-oxoglutarate and 2-hydroxyglutarate	1	3
R-HSA-499943	Interconversion of nucleotide di- and triphosphates	24	30
R-HSA-909733	Interferon alpha/beta signaling	26	137
R-HSA-877300	Interferon gamma signaling	28	172
R-HSA-913531	Interferon Signaling	84	289
R-HSA-912526	Interleukin receptor SHC signaling	2	27
R-HSA-446652	Interleukin-1 family signaling	61	141
R-HSA-9020702	Interleukin-1 signaling	56	102
R-HSA-6783783	Interleukin-10 signaling	2	45
R-HSA-447115	Interleukin-12 family signaling	36	56
R-HSA-9020591	Interleukin-12 signaling	33	46
R-HSA-8983432	Interleukin-15 signaling	2	14
R-HSA-448424	Interleukin-17 signaling	23	71
R-HSA-451927	Interleukin-2 family signaling	5	45
R-HSA-8854691	Interleukin-20 family signaling	3	25
R-HSA-9020958	Interleukin-21 signaling	2	10
R-HSA-9020933	Interleukin-23 signaling	2	9
R-HSA-9020956	Interleukin-27 signaling	3	11
R-HSA-512988	Interleukin-3, Interleukin-5 and GM-CSF signaling	9	48
R-HSA-8984722	Interleukin-35 Signalling	3	12
R-HSA-9008059	Interleukin-37 signaling	5	21
R-HSA-6785807	Interleukin-4 and Interleukin-13 signaling	11	111
R-HSA-6783589	Interleukin-6 family signaling	4	28
R-HSA-1059683	Interleukin-6 signaling	4	15
R-HSA-1266695	Interleukin-7 signaling	3	25

R-HSA-8985947	Interleukin-9 signaling	2	9
R-HSA-6811442	Intra-Golgi and retrograde Golgi-to-ER traffic	121	206
R-HSA-6811438	Intra-Golgi traffic	25	44
R-HSA-434313	Intracellular metabolism of fatty acids regulates insulin secretion	2	3
R-HSA-9006925	Intracellular signaling by second messengers	113	315
R-HSA-5620924	Intraflagellar transport	17	54
R-HSA-109606	Intrinsic Pathway for Apoptosis	25	53
R-HSA-140837	Intrinsic Pathway of Fibrin Clot Formation	3	22
R-HSA-1296065	Inwardly rectifying K+ channels	4	31
R-HSA-983712	Ion channel transport	37	184
R-HSA-5578775	Ion homeostasis	15	54
R-HSA-6803544	Ion influx/efflux at host-pathogen interface	3	4
R-HSA-936837	Ion transport by P-type ATPases	14	55
R-HSA-937039	IRAK1 recruits IKK complex	6	14
R-HSA-975144	IRAK1 recruits IKK complex upon TLR7/8 or 9 stimulation	6	14
R-HSA-937042	IRAK2 mediated activation of TAK1 complex	3	10
R-HSA-975163	IRAK2 mediated activation of TAK1 complex upon TLR7/8 or 9 stimulation	3	15
R-HSA-381070	IRE1 alpha activates chaperones	27	50
R-HSA-1606341	IRF3 mediated activation of type I IFN	1	5
R-HSA-3270619	IRF3-mediated induction of type I IFN	7	13
R-HSA-917937	Iron uptake and transport	26	58
R-HSA-74713	IRS activation	1	5
R-HSA-112399	IRS-mediated signalling	6	55
R-HSA-2428928	IRS-related events triggered by IGF1R	8	59
R-HSA-1169408	ISG15 antiviral mechanism	51	80
R-HSA-450321	JNK (c-Jun kinases) phosphorylation and activation mediated by activated human TAK1	8	22
R-HSA-5689877	Josephin domain DUBs	5	12
R-HSA-2022854	Keratan sulfate biosynthesis	1	28
R-HSA-2022857	Keratan sulfate degradation	4	13
R-HSA-1638074	Keratan sulfate/keratin metabolism	5	34
R-HSA-6805567	Keratinization	5	217
R-HSA-74182	Ketone body metabolism	4	10
R-HSA-983189	Kinesins	23	64
R-HSA-450604	KSRP (KHSRP) binds and destabilizes mRNA	13	17
R-HSA-156827	L13a-mediated translational silencing of Ceruloplasmin expression	105	112
R-HSA-373760	L1CAM interactions	53	121
R-HSA-69186	Lagging Strand Synthesis	17	20
R-HSA-3000157	Laminin interactions	7	30
R-HSA-162599	Late Phase of HIV Life Cycle	82	152
R-HSA-1222499	Latent infection - Other responses of Mtb to phagocytosis	1	35
R-HSA-8964038	LDL clearance	12	19
R-HSA-69109	Leading Strand Synthesis	12	14
R-HSA-2046105	Linoleic acid (LA) metabolism	4	8
R-HSA-9613354	Lipophagy	4	9
R-HSA-8876384	Listeria monocytogenes entry into host cells	11	23
R-HSA-446343	Localization of the PINCH-ILK-PARVIN complex to focal adhesions	3	4
R-HSA-9620244	Long-term potentiation	3	25
R-HSA-2644607	Loss of Function of FBXW7 in Cancer and NOTCH1 Signaling	3	6
R-HSA-9005891	Loss of function of MECP2 in Rett syndrome	4	13
R-HSA-3304349	Loss of Function of SMAD2/3 in Cancer	1	7
R-HSA-3304347	Loss of Function of SMAD4 in Cancer	1	3
R-HSA-3656534	Loss of Function of TGFBR1 in Cancer	2	7
R-HSA-9022538	Loss of MECP2 binding ability to 5mC-DNA	2	4
R-HSA-9022537	Loss of MECP2 binding ability to the NCoR/SMRT complex	1	8
R-HSA-380259	Loss of Nlp from mitotic centrosomes	30	69
R-HSA-9022535	Loss of phosphorylation of MECP2 at T308	1	5
R-HSA-380284	Loss of proteins required for interphase microtubule organization from the centrosome	30	69
R-HSA-3134973	LRR FLII-interacting protein 1 (LRRFIP1) activates type I IFN production	4	5
R-HSA-71064	Lysine catabolism	7	12
R-HSA-8853383	Lysosomal oligosaccharide catabolism	1	4

R-HSA-432720	Lysosome Vesicle Biogenesis	24	37
R-HSA-68886	M Phase	189	371
R-HSA-1632852	Macroautophagy	52	95
R-HSA-6791226	Major pathway of rRNA processing in the nucleolus and cytosol	133	183
R-HSA-450294	MAP kinase activation	23	63
R-HSA-5674135	MAP2K and MAPK activation	20	41
R-HSA-5684264	MAP3K8 (TPL2)-dependent MAPK1/3 activation	7	16
R-HSA-5683057	MAPK family signaling cascades	94	306
R-HSA-450282	MAPK targets/ Nuclear events mediated by MAP kinases	10	31
R-HSA-112411	MAPK1 (ERK2) activation	3	10
R-HSA-5684996	MAPK1/MAPK3 signaling	84	267
R-HSA-110056	MAPK3 (ERK1) activation	4	11
R-HSA-5687128	MAPK6/MAPK4 signaling	51	89
R-HSA-2465910	MASTL Facilitates Mitotic Progression	5	10
R-HSA-9022699	MECP2 regulates neuronal receptors and channels	6	18
R-HSA-9022707	MECP2 regulates transcription factors	1	6
R-HSA-9022702	MECP2 regulates transcription of neuronal ligands	2	9
R-HSA-1500620	Meiosis	27	88
R-HSA-912446	Meiotic recombination	14	56
R-HSA-1221632	Meiotic synapsis	17	60
R-HSA-174490	Membrane binding and targetting of GAG proteins	5	15
R-HSA-199991	Membrane Trafficking	331	635
R-HSA-8851907	MET activates PI3K/AKT signaling	2	6
R-HSA-8874081	MET activates PTK2 signaling	7	30
R-HSA-8865999	MET activates PTPN11	3	5
R-HSA-8875555	MET activates RAP1 and RAC1	8	11
R-HSA-8851805	MET activates RAS signaling	4	12
R-HSA-8875791	MET activates STAT3	2	3
R-HSA-8875513	MET interacts with TNS proteins	2	5
R-HSA-8875878	MET promotes cell motility	14	41
R-HSA-6806942	MET Receptor Activation	1	6
R-HSA-8875656	MET receptor recycling	6	10
R-HSA-5579029	Metabolic disorders of biological oxidation enzymes	9	36
R-HSA-1430728	Metabolism	882	2135
R-HSA-71291	Metabolism of amino acids and derivatives	223	374
R-HSA-2022377	Metabolism of Angiotensinogen to Angiotensins	4	18
R-HSA-71387	Metabolism of carbohydrates	108	300
R-HSA-8978934	Metabolism of cofactors	9	19
R-HSA-6806667	Metabolism of fat-soluble vitamins	5	48
R-HSA-196757	Metabolism of folate and pterines	9	18
R-HSA-2408550	Metabolism of ingested H2SeO4 and H2SeO3 into H2Se	4	4
R-HSA-5263617	Metabolism of ingested MeSeO2H into MeSeH	1	1
R-HSA-2408508	Metabolism of ingested SeMet, Sec, MeSec into H2Se	4	8
R-HSA-556833	Metabolism of lipids	223	748
R-HSA-202131	Metabolism of nitric oxide: eNOS activation and regulation	7	15
R-HSA-194441	Metabolism of non-coding RNA	44	57
R-HSA-15869	Metabolism of nucleotides	57	103
R-HSA-351202	Metabolism of polyamines	40	59
R-HSA-189445	Metabolism of porphyrins	10	16
R-HSA-392499	Metabolism of proteins	848	2012
R-HSA-8953854	Metabolism of RNA	478	675
R-HSA-380612	Metabolism of serotonin	2	2
R-HSA-196071	Metabolism of steroid hormones	7	35
R-HSA-8957322	Metabolism of steroids	46	153
R-HSA-6806664	Metabolism of vitamin K	1	3
R-HSA-196854	Metabolism of vitamins and cofactors	61	192
R-HSA-196849	Metabolism of water-soluble vitamins and cofactors	48	126
R-HSA-425410	Metal ion SLC transporters	5	26
R-HSA-6799990	Metal sequestration by antimicrobial proteins	1	6
R-HSA-5689901	Metalloprotease DUBs	11	31
R-HSA-1237112	Methionine salvage pathway	6	6
R-HSA-156581	Methylation	10	14
R-HSA-5657655	MGMT-mediated DNA damage reversal	1	1
R-HSA-2132295	MHC class II antigen presentation	65	142
R-HSA-9615710	Microautophagy	16	34
R-HSA-203927	MicroRNA (miRNA) biogenesis	17	24

R-HSA-190840	Microtubule-dependent trafficking of connexons from Golgi to the plasma membrane	8	20
R-HSA-164516	Minus-strand DNA synthesis	1	7
R-HSA-5223345	Miscellaneous transport and binding events	6	26
R-HSA-5358508	Mismatch Repair	11	15
R-HSA-5358606	Mismatch repair (MMR) directed by MSH2:MSH3 (MutSbeta)	10	14
R-HSA-5358565	Mismatch repair (MMR) directed by MSH2:MSH6 (MutSalpha)	10	14
R-HSA-5339716	Misspliced GSK3beta mutants stabilize beta-catenin	8	15
R-HSA-1369007	Mitochondrial ABC transporters	2	4
R-HSA-1592230	Mitochondrial biogenesis	43	96
R-HSA-8949215	Mitochondrial calcium ion transport	18	23
R-HSA-77289	Mitochondrial Fatty Acid Beta-Oxidation	27	38
R-HSA-77286	mitochondrial fatty acid beta-oxidation of saturated fatty acids	8	11
R-HSA-77288	mitochondrial fatty acid beta-oxidation of unsaturated fatty acids	5	6
R-HSA-1362409	Mitochondrial iron-sulfur cluster biogenesis	8	13
R-HSA-1268020	Mitochondrial protein import	51	65
R-HSA-163282	Mitochondrial transcription initiation	2	3
R-HSA-5368287	Mitochondrial translation	90	94
R-HSA-5389840	Mitochondrial translation elongation	86	88
R-HSA-5368286	Mitochondrial translation initiation	84	88
R-HSA-5419276	Mitochondrial translation termination	86	88
R-HSA-379726	Mitochondrial tRNA aminoacylation	20	21
R-HSA-5205647	Mitophagy	20	29
R-HSA-68882	Mitotic Anaphase	118	202
R-HSA-453279	Mitotic G1-G1/S phases	83	149
R-HSA-453274	Mitotic G2-G2/M phases	98	200
R-HSA-2555396	Mitotic Metaphase and Anaphase	118	203
R-HSA-68877	Mitotic Prometaphase	95	199
R-HSA-68875	Mitotic Prophase	61	119
R-HSA-69618	Mitotic Spindle Checkpoint	55	110
R-HSA-68884	Mitotic Telophase/Cytokinesis	6	13
R-HSA-2129379	Molecules associated with elastic fibres	2	38
R-HSA-947581	Molybdenum cofactor biosynthesis	6	8
R-HSA-2206307	MPS IIIA - Sanfilippo syndrome A	1	1
R-HSA-2206282	MPS IIIB - Sanfilippo syndrome B	1	1
R-HSA-2206305	MPS IIID - Sanfilippo syndrome D	1	1
R-HSA-2206308	MPS IV - Morquio syndrome B	1	1
R-HSA-2206292	MPS VII - Sly syndrome	1	1
R-HSA-72187	mRNA 3'-end processing	40	57
R-HSA-72086	mRNA Capping	19	29
R-HSA-429958	mRNA decay by 3' to 5' exoribonuclease	15	16
R-HSA-430039	mRNA decay by 5' to 3' exoribonuclease	11	15
R-HSA-75072	mRNA Editing	2	10
R-HSA-75064	mRNA Editing: A to I Conversion	1	2
R-HSA-72200	mRNA Editing: C to U Conversion	1	8
R-HSA-72172	mRNA Splicing	155	188
R-HSA-72163	mRNA Splicing - Major Pathway	155	180
R-HSA-72165	mRNA Splicing - Minor Pathway	43	52
R-HSA-1222449	Mtb iron assimilation by chelation	1	6
R-HSA-165159	mTOR signalling	23	40
R-HSA-166208	mTORC1-mediated signalling	17	23
R-HSA-2206281	Mucopolysaccharidoses	5	11
R-HSA-427601	Multifunctional anion exchangers	1	9
R-HSA-397014	Muscle contraction	33	209
R-HSA-975871	MyD88 cascade initiated on plasma membrane	27	85
R-HSA-975155	MyD88 dependent cascade initiated on endosome	27	91
R-HSA-166166	MyD88-independent TLR4 cascade	32	97
R-HSA-166058	MyD88:MAL(TIRAP) cascade initiated on plasma membrane	27	96
R-HSA-3785653	Myoclonic epilepsy of Lafora	4	9
R-HSA-525793	Myogenesis	7	29
R-HSA-975576	N-glycan antennae elongation in the medial/trans-Golgi	3	26
R-HSA-964739	N-glycan trimming and elongation in the cis-Golgi	1	5
R-HSA-532668	N-glycan trimming in the ER and Calnexin/Calreticulin cycle	22	35
R-HSA-442660	Na+/Cl- dependent neurotransmitter transporters	1	19
R-HSA-205025	NADE modulates death signalling	2	6

R-HSA-389542	NADPH regeneration	1	1
R-HSA-375165	NCAM signaling for neurite out-growth	11	64
R-HSA-419037	NCAM1 interactions	2	42
R-HSA-420597	Nectin/Necl trans heterodimerization	2	7
R-HSA-8951664	Neddylation	89	236
R-HSA-164944	Nef and signal transduction	2	9
R-HSA-167590	Nef Mediated CD4 Down-regulation	7	10
R-HSA-182218	Nef Mediated CD8 Down-regulation	6	8
R-HSA-164939	Nef mediated downregulation of CD28 cell surface expression	1	3
R-HSA-164940	Nef mediated downregulation of MHC class I complex cell surface expression	7	11
R-HSA-164938	Nef-mediates down modulation of cell surface receptors by recruiting them to clathrin adapters	14	22
R-HSA-5250941	Negative epigenetic regulation of rRNA expression	22	78
R-HSA-5674499	Negative feedback regulation of MAPK pathway	4	6
R-HSA-8866904	Negative regulation of activity of TFAP2 (AP-2) family transcription factors	3	11
R-HSA-5654726	Negative regulation of FGFR1 signaling	9	35
R-HSA-5654727	Negative regulation of FGFR2 signaling	9	37
R-HSA-5654732	Negative regulation of FGFR3 signaling	9	30
R-HSA-5654733	Negative regulation of FGFR4 signaling	9	31
R-HSA-5675221	Negative regulation of MAPK pathway	18	41
R-HSA-6807004	Negative regulation of MET activity	10	21
R-HSA-9617324	Negative regulation of NMDA receptor-mediated neuronal transmission	5	21
R-HSA-9604323	Negative regulation of NOTCH4 signaling	44	55
R-HSA-5368598	Negative regulation of TCF-dependent signaling by DVL-interacting proteins	1	5
R-HSA-199418	Negative regulation of the PI3K/AKT network	24	122
R-HSA-936440	Negative regulators of DDX58/IFIH1 signaling	10	34
R-HSA-168333	NEP/NS2 Interacts with the Cellular Export Machinery	25	42
R-HSA-373753	Nephrin family interactions	7	23
R-HSA-418886	Netrin mediated repulsion signals	2	8
R-HSA-373752	Netrin-1 signaling	13	50
R-HSA-6794361	Neurexins and neuroligins	8	60
R-HSA-8863678	Neurodegenerative Diseases	12	22
R-HSA-447043	Neurofascin interactions	1	7
R-HSA-112316	Neuronal System	78	420
R-HSA-194306	Neurophilin interactions with VEGF and VEGFR	1	4
R-HSA-168799	Neurotoxicity of clostridium toxins	2	22
R-HSA-112311	Neurotransmitter clearance	3	10
R-HSA-112314	Neurotransmitter receptors and postsynaptic signal transmission	52	208
R-HSA-112310	Neurotransmitter release cycle	13	51
R-HSA-112313	Neurotransmitter uptake and metabolism In glial cells	3	4
R-HSA-6798695	Neutrophil degranulation	232	480
R-HSA-933543	NF-kB activation through FADD/RIP-1 pathway mediated by caspase-8 and -10	5	12
R-HSA-209560	NF-kB is activated and signals survival	4	13
R-HSA-197264	Nicotinamide salvaging	2	19
R-HSA-196807	Nicotinate metabolism	4	31
R-HSA-5676590	NIK-->noncanonical NF-kB signaling	45	59
R-HSA-392154	Nitric oxide stimulates guanylate cyclase	2	23
R-HSA-168638	NOD1/2 Signaling Pathway	11	35
R-HSA-3000171	Non-integrin membrane-ECM interactions	12	59
R-HSA-9017802	Noncanonical activation of NOTCH3	3	8
R-HSA-5693571	Nonhomologous End-Joining (NHEJ)	22	52
R-HSA-975957	Nonsense Mediated Decay (NMD) enhanced by the Exon Junction Complex (EJC)	98	117
R-HSA-975956	Nonsense Mediated Decay (NMD) independent of the Exon Junction Complex (EJC)	88	96
R-HSA-927802	Nonsense-Mediated Decay (NMD)	98	117
R-HSA-427413	NoRC negatively regulates rRNA expression	21	75
R-HSA-181430	Norepinephrine Neurotransmitter Release Cycle	4	18
R-HSA-203754	NOSIP mediated eNOS trafficking	1	2
R-HSA-203641	NOSTRIN mediated eNOS trafficking	1	5
R-HSA-350054	Notch-HLH transcription pathway	5	28

R-HSA-2122947	NOTCH1 Intracellular Domain Regulates Transcription	12	48
R-HSA-2979096	NOTCH2 Activation and Transmission of Signal to the Nucleus	5	22
R-HSA-2197563	NOTCH2 intracellular domain regulates transcription	1	12
R-HSA-9013507	NOTCH3 Activation and Transmission of Signal to the Nucleus	8	25
R-HSA-9013508	NOTCH3 Intracellular Domain Regulates Transcription	3	25
R-HSA-9013700	NOTCH4 Activation and Transmission of Signal to the Nucleus	4	11
R-HSA-9013695	NOTCH4 Intracellular Domain Regulates Transcription	2	20
R-HSA-9029558	NR1H2 & NR1H3 regulate gene expression linked to lipogenesis	2	9
R-HSA-9024446	NR1H2 and NR1H3-mediated signaling	6	48
R-HSA-9029569	NR1H3 & NR1H2 regulate gene expression linked to cholesterol transport and efflux	4	38
R-HSA-193648	NRAGE signals death through JNK	9	59
R-HSA-205043	NRIF signals cell death from the nucleus	5	16
R-HSA-168276	NS1 Mediated Effects on Host Pathways	30	46
R-HSA-9032759	NTRK2 activates RAC1	1	5
R-HSA-9603505	NTRK3 as a dependence receptor	2	3
R-HSA-2980766	Nuclear Envelope Breakdown	36	58
R-HSA-2995410	Nuclear Envelope Reassembly	11	14
R-HSA-198725	Nuclear Events (kinase and transcription factor activation)	9	25
R-HSA-180746	Nuclear import of Rev protein	27	39
R-HSA-3301854	Nuclear Pore Complex (NPC) Disassembly	27	40
R-HSA-383280	Nuclear Receptor transcription pathway	3	86
R-HSA-1251985	Nuclear signaling by ERBB4	4	34
R-HSA-8956320	Nucleobase biosynthesis	12	15
R-HSA-8956319	Nucleobase catabolism	12	39
R-HSA-774815	Nucleosome assembly	10	54
R-HSA-5696398	Nucleotide Excision Repair	64	110
R-HSA-8956321	Nucleotide salvage	10	23
R-HSA-168643	Nucleotide-binding domain, leucine rich repeat containing receptor (NLR) signaling pathways	15	58
R-HSA-5173214	O-glycosylation of TSR domain-containing proteins	1	39
R-HSA-5173105	O-linked glycosylation	7	114
R-HSA-913709	O-linked glycosylation of mucins	2	65
R-HSA-1480926	O2/CO2 exchange in erythrocytes	3	12
R-HSA-8983711	OAS antiviral response	3	10
R-HSA-381753	Olfactory Signaling Pathway	4	432
R-HSA-2559585	Oncogene Induced Senescence	10	34
R-HSA-6802957	Oncogenic MAPK signaling	35	71
R-HSA-111885	Opioid Signalling	33	89
R-HSA-68949	Orc1 removal from chromatin	52	71
R-HSA-1852241	Organelle biogenesis and maintenance	112	298
R-HSA-428643	Organic anion transporters	3	10
R-HSA-449836	Other interleukin signaling	5	24
R-HSA-416700	Other semaphorin interactions	3	19
R-HSA-5689896	Ovarian tumor domain proteases	9	38
R-HSA-2559580	Oxidative Stress Induced Senescence	25	94
R-HSA-1234176	Oxygen-dependent proline hydroxylation of Hypoxia-inducible Factor Alpha	46	66
R-HSA-372708	p130Cas linkage to MAPK signaling for integrins	6	15
R-HSA-171007	p38MAPK events	5	14
R-HSA-69563	p53-Dependent G1 DNA Damage Response	44	66
R-HSA-69580	p53-Dependent G1/S DNA damage checkpoint	44	66
R-HSA-69610	p53-Independent DNA Damage Response	41	52
R-HSA-69613	p53-Independent G1/S DNA damage checkpoint	41	52
R-HSA-193704	p75 NTR receptor-mediated signalling	23	99
R-HSA-193670	p75NTR negatively regulates cell cycle via SC1	2	6
R-HSA-209543	p75NTR recruits signalling complexes	5	14
R-HSA-193697	p75NTR regulates axonogenesis	3	10
R-HSA-193639	p75NTR signals via NF-kB	5	17
R-HSA-171306	Packaging Of Telomere Ends	5	33
R-HSA-6802955	Paradoxical activation of RAF signaling by kinase inactive BRAF	21	47
R-HSA-167290	Pausing and recovery of HIV elongation	27	36
R-HSA-167238	Pausing and recovery of Tat-mediated HIV elongation	26	35
R-HSA-5651801	PCNA-Dependent Long Patch Base Excision Repair	18	21
R-HSA-4086400	PCP/CE pathway	54	92

R-HSA-389948	PD-1 signaling	2	42
R-HSA-165160	PDE3B signalling	1	2
R-HSA-210990	PECAM1 interactions	4	12
R-HSA-71336	Pentose phosphate pathway	11	15
R-HSA-6791465	Pentose phosphate pathway disease	2	2
R-HSA-156902	Peptide chain elongation	83	90
R-HSA-2980736	Peptide hormone metabolism	25	89
R-HSA-375276	Peptide ligand-binding receptors	6	198
R-HSA-381042	PERK regulates gene expression	16	32
R-HSA-390918	Peroxisomal lipid metabolism	13	29
R-HSA-9033241	Peroxisomal protein import	30	64
R-HSA-9005895	Pervasive developmental disorders	4	13
R-HSA-5576892	Phase 0 - rapid depolarisation	2	45
R-HSA-5576893	Phase 2 - plateau phase	1	28
R-HSA-5576890	Phase 3 - rapid repolarisation	1	8
R-HSA-211945	Phase I - Functionalization of compounds	20	105
R-HSA-156580	Phase II - Conjugation of compounds	40	110
R-HSA-8963691	Phenylalanine and tyrosine metabolism	5	11
R-HSA-8964208	Phenylalanine metabolism	3	6
R-HSA-2393930	Phosphate bond hydrolysis by NUDT proteins	5	10
R-HSA-111995	phospho-PLA2 pathway	2	2
R-HSA-5654221	Phospholipase C-mediated cascade; FGFR2	1	21
R-HSA-5654227	Phospholipase C-mediated cascade; FGFR3	1	14
R-HSA-5654228	Phospholipase C-mediated cascade; FGFR4	1	15
R-HSA-5654219	Phospholipase C-mediated cascade: FGFR1	1	18
R-HSA-1483257	Phospholipid metabolism	60	212
R-HSA-202427	Phosphorylation of CD3 and TCR zeta chains	1	41
R-HSA-176417	Phosphorylation of Emi1	2	6
R-HSA-69200	Phosphorylation of proteins involved in G1/S transition by active Cyclin E:Cdk2 complexes	1	4
R-HSA-170145	Phosphorylation of proteins involved in the G2/M transition by Cyclin A:Cdc2 complexes	1	3
R-HSA-176412	Phosphorylation of the APC/C	9	19
R-HSA-4839743	phosphorylation site mutants of CTNNB1 are not targeted to the proteasome by the destruction complex	8	15
R-HSA-1483196	PI and PC transport between ER and Golgi membranes	1	1
R-HSA-1483255	PI Metabolism	26	84
R-HSA-5654689	PI-3K cascade:FGFR1	2	23
R-HSA-5654695	PI-3K cascade:FGFR2	2	26
R-HSA-5654710	PI-3K cascade:FGFR3	2	19
R-HSA-5654720	PI-3K cascade:FGFR4	2	20
R-HSA-109704	PI3K Cascade	4	50
R-HSA-1963642	PI3K events in ERBB2 signaling	2	18
R-HSA-198203	PI3K/AKT activation	1	9
R-HSA-2219528	PI3K/AKT Signaling in Cancer	16	113
R-HSA-6811555	PI5P Regulates TP53 Acetylation	6	9
R-HSA-6811558	PI5P, PP2A and IER3 Regulate PI3K/AKT Signaling	22	115
R-HSA-5205685	Pink/Parkin Mediated Mitophagy	14	22
R-HSA-1257604	PIP3 activates AKT signaling	99	276
R-HSA-5601884	PIWI-interacting RNA (piRNA) biogenesis	13	29
R-HSA-163615	PKA activation	5	17
R-HSA-164378	PKA activation in glucagon signalling	7	18
R-HSA-111931	PKA-mediated phosphorylation of CREB	5	19
R-HSA-163358	PKA-mediated phosphorylation of key metabolic factors	1	5
R-HSA-109703	PKB-mediated events	1	2
R-HSA-3214841	PKMTs methylate histone lysines	12	47
R-HSA-8963898	Plasma lipoprotein assembly	4	19
R-HSA-174824	Plasma lipoprotein assembly, remodeling, and clearance	20	72
R-HSA-8964043	Plasma lipoprotein clearance	14	33
R-HSA-8963899	Plasma lipoprotein remodeling	2	33
R-HSA-75896	Plasmalogen biosynthesis	3	3
R-HSA-76002	Platelet activation, signaling and aggregation	80	262
R-HSA-75892	Platelet Adhesion to exposed collagen	3	15
R-HSA-76009	Platelet Aggregation (Plug Formation)	10	40
R-HSA-418360	Platelet calcium homeostasis	7	28
R-HSA-114608	Platelet degranulation	44	128
R-HSA-418346	Platelet homeostasis	24	88

R-HSA-432142	Platelet sensitization by LDL	9	17
R-HSA-112043	PLC beta mediated events	20	52
R-HSA-167021	PLC-gamma1 signalling	1	3
R-HSA-1251932	PLCG1 events in ERBB2 signaling	2	4
R-HSA-164525	Plus-strand DNA synthesis	1	7
R-HSA-110362	POLB-Dependent Long Patch Base Excision Repair	6	8
R-HSA-156711	Polo-like kinase mediated events	4	16
R-HSA-69091	Polymerase switching	12	14
R-HSA-174411	Polymerase switching on the C-strand of the telomere	12	14
R-HSA-5250913	Positive epigenetic regulation of rRNA expression	32	75
R-HSA-438064	Post NMDA receptor activation events	27	84
R-HSA-389977	Post-chaperonin tubulin folding pathway	13	23
R-HSA-163125	Post-translational modification: synthesis of GPI-anchored proteins	11	94
R-HSA-597592	Post-translational protein modification	487	1417
R-HSA-8957275	Post-translational protein phosphorylation	23	107
R-HSA-1296071	Potassium Channels	4	99
R-HSA-2892247	POU5F1 (OCT4), SOX2, NANOG activate genes related to proliferation	1	13
R-HSA-163767	PP2A-mediated dephosphorylation of key metabolic factors	4	7
R-HSA-1989781	PPARA activates gene expression	22	118
R-HSA-212300	PRC2 methylates histones and DNA	8	42
R-HSA-1912422	Pre-NOTCH Expression and Processing	13	78
R-HSA-1912420	Pre-NOTCH Processing in Golgi	4	18
R-HSA-1912399	Pre-NOTCH Processing in the Endoplasmic Reticulum	1	6
R-HSA-1912408	Pre-NOTCH Transcription and Translation	8	62
R-HSA-389957	Prefoldin mediated transfer of substrate to CCT/TriC	23	28
R-HSA-196108	Pregnenolone biosynthesis	5	12
R-HSA-500657	Presynaptic function of Kainate receptors	7	21
R-HSA-5693616	Presynaptic phase of homologous DNA pairing and strand exchange	12	39
R-HSA-3215018	Processing and activation of SUMO	5	10
R-HSA-72203	Processing of Capped Intron-Containing Pre-mRNA	191	245
R-HSA-75067	Processing of Capped Intronless Pre-mRNA	18	28
R-HSA-5693607	Processing of DNA double-strand break ends	31	81
R-HSA-77595	Processing of Intronless Pre-mRNAs	13	19
R-HSA-8949664	Processing of SMDT1	13	16
R-HSA-174414	Processive synthesis on the C-strand of the telomere	8	11
R-HSA-69183	Processive synthesis on the lagging strand	12	15
R-HSA-5357801	Programmed Cell Death	98	185
R-HSA-964827	Progressive trimming of alpha-1,2-linked mannose residues from Man9/8/7GlcNAc2 to produce Man5GlcNAc2	1	3
R-HSA-1170546	Prolactin receptor signaling	4	15
R-HSA-70688	Proline catabolism	1	3
R-HSA-169893	Prolonged ERK activation events	9	15
R-HSA-71032	Propionyl-CoA catabolism	4	5
R-HSA-392851	Prostacyclin signalling through prostacyclin receptor	7	20
R-HSA-391251	Protein folding	49	102
R-HSA-9609507	Protein localization	104	166
R-HSA-8876725	Protein methylation	7	17
R-HSA-5676934	Protein repair	2	6
R-HSA-8852135	Protein ubiquitination	43	80
R-HSA-6794362	Protein-protein interactions at synapses	14	91
R-HSA-433692	Proton-coupled monocarboxylate transport	2	6
R-HSA-5674404	PTEN Loss of Function in Cancer	1	1
R-HSA-6807070	PTEN Regulation	75	139
R-HSA-8849474	PTK6 Activates STAT3	1	4
R-HSA-8849472	PTK6 Down-Regulation	1	3
R-HSA-8849473	PTK6 Expression	1	5
R-HSA-8857538	PTK6 promotes HIF1A stabilization	1	6
R-HSA-8849470	PTK6 Regulates Cell Cycle	2	6
R-HSA-8849468	PTK6 Regulates Proteins Involved in RNA Processing	2	5
R-HSA-8849471	PTK6 Regulates RHO GTPases, RAS GTPase and MAP kinases	8	15
R-HSA-8849469	PTK6 Regulates RTKs and Their Effectors AKT1 and DOK1	3	9
R-HSA-74259	Purine catabolism	10	21
R-HSA-73817	Purine ribonucleoside monophosphate biosynthesis	10	12
R-HSA-74217	Purine salvage	8	13

R-HSA-500753	Pyrimidine biosynthesis	2	3
R-HSA-73621	Pyrimidine catabolism	2	12
R-HSA-73614	Pyrimidine salvage	3	11
R-HSA-71737	Pyrophosphate hydrolysis	2	2
R-HSA-70268	Pyruvate metabolism	19	31
R-HSA-71406	Pyruvate metabolism and Citric Acid (TCA) cycle	40	55
R-HSA-5365859	RA biosynthesis pathway	6	22
R-HSA-8876198	RAB GEFs exchange GTP for GDP on RABs	38	90
R-HSA-8873719	RAB geranylgeranylation	31	65
R-HSA-9007101	Rab regulation of trafficking	49	123
R-HSA-5673000	RAF activation	16	31
R-HSA-112409	RAF-independent MAPK1/3 activation	7	24
R-HSA-5673001	RAF/MAP kinase cascade	82	260
R-HSA-392517	Rap1 signalling	6	16
R-HSA-442982	Ras activation upon Ca ²⁺ influx through NMDA receptor	4	21
R-HSA-9649913	RAS GTPase cycle mutants	2	3
R-HSA-6802953	RAS signaling downstream of NF1 loss-of-function variants	3	4
R-HSA-975578	Reactions specific to the complex N-glycan synthesis pathway	3	10
R-HSA-8934903	Receptor Mediated Mitophagy	7	11
R-HSA-388844	Receptor-type tyrosine-protein phosphatases	3	20
R-HSA-110330	Recognition and association of DNA glycosylase with site containing an affected purine	6	38
R-HSA-110328	Recognition and association of DNA glycosylase with site containing an affected pyrimidine	6	42
R-HSA-110314	Recognition of DNA damage by PCNA-containing replication complex	22	30
R-HSA-5693565	Recruitment and ATM-mediated phosphorylation of repair and signaling proteins at DNA double strand breaks	21	59
R-HSA-380270	Recruitment of mitotic centrosome proteins and complexes	35	81
R-HSA-380320	Recruitment of NuMA to mitotic centrosomes	39	95
R-HSA-159418	Recycling of bile acids and salts	1	16
R-HSA-72731	Recycling of eIF2:GDP	8	8
R-HSA-437239	Recycling pathway of L1	27	49
R-HSA-418359	Reduction of cytosolic Ca ⁺⁺ levels	4	12
R-HSA-5218859	Regulated Necrosis	6	23
R-HSA-193692	Regulated proteolysis of p75NTR	2	11
R-HSA-3371378	Regulation by c-FLIP	4	11
R-HSA-2029482	Regulation of actin dynamics for phagocytic cup formation	33	150
R-HSA-211733	Regulation of activated PAK-2p34 by proteasome mediated degradation	41	50
R-HSA-176408	Regulation of APC/C activators between G1/S and early anaphase	55	80
R-HSA-169911	Regulation of Apoptosis	42	53
R-HSA-186712	Regulation of beta-cell development	3	44
R-HSA-1655829	Regulation of cholesterol biosynthesis by SREBP (SREBF)	22	56
R-HSA-428542	Regulation of commissural axon pathfinding by SLIT and ROBO	2	10
R-HSA-977606	Regulation of Complement cascade	2	135
R-HSA-446388	Regulation of cytoskeletal remodeling and cell spreading by IPP complex components	3	8
R-HSA-9010553	Regulation of expression of SLITs and ROBOs	139	172
R-HSA-9617629	Regulation of FOXO transcriptional activity by acetylation	3	10
R-HSA-4641263	Regulation of FZD by ubiquitination	3	21
R-HSA-191650	Regulation of gap junction activity	2	3
R-HSA-1234158	Regulation of gene expression by Hypoxia-inducible Factor	2	11
R-HSA-210745	Regulation of gene expression in beta cells	1	23
R-HSA-210744	Regulation of gene expression in late stage (branching morphogenesis) pancreatic bud precursor cells	2	16
R-HSA-170822	Regulation of Glucokinase by Glucokinase Regulatory Protein	23	36
R-HSA-9634600	Regulation of glycolysis by fructose 2,6-bisphosphate metabolism	5	12
R-HSA-3371453	Regulation of HSF1-mediated heat shock response	51	75
R-HSA-912694	Regulation of IFNA signaling	4	26
R-HSA-877312	Regulation of IFNG signaling	4	14
R-HSA-3134975	Regulation of innate immune responses to cytosolic DNA	4	15
R-HSA-422356	Regulation of insulin secretion	26	79

R-HSA-381426	Regulation of Insulin-like Growth Factor (IGF) transport and uptake by Insulin-like Growth Factor Binding Proteins (IGFBPs)	23	124
R-HSA-1433559	Regulation of KIT signaling	3	16
R-HSA-400206	Regulation of lipid metabolism by Peroxisome proliferator-activated receptor alpha (PPARalpha)	23	120
R-HSA-9614399	Regulation of localization of FOXO transcription factors	5	12
R-HSA-9022692	Regulation of MECP2 expression and activity	11	32
R-HSA-453276	Regulation of mitotic cell cycle	57	86
R-HSA-450531	Regulation of mRNA stability by proteins that bind AU-rich elements	67	88
R-HSA-5675482	Regulation of necroptotic cell death	6	21
R-HSA-350562	Regulation of ornithine decarboxylase (ODC)	38	51
R-HSA-211728	Regulation of PAK-2p34 activity by PS-GAP/RHG10	1	2
R-HSA-2565942	Regulation of PLK1 Activity at G2/M Transition	38	87
R-HSA-8943724	Regulation of PTEN gene transcription	26	60
R-HSA-8948747	Regulation of PTEN localization	5	9
R-HSA-8943723	Regulation of PTEN mRNA translation	2	9
R-HSA-8948751	Regulation of PTEN stability and activity	47	69
R-HSA-204174	Regulation of pyruvate dehydrogenase (PDH) complex	9	16
R-HSA-5658442	Regulation of RAS by GAPs	46	69
R-HSA-8934593	Regulation of RUNX1 Expression and Activity	5	17
R-HSA-8939902	Regulation of RUNX2 expression and activity	47	74
R-HSA-8941858	Regulation of RUNX3 expression and activity	43	55
R-HSA-912631	Regulation of signaling by CBL	5	22
R-HSA-9627069	Regulation of the apoptosome activity	6	11
R-HSA-5686938	Regulation of TLR by endogenous ligand	1	19
R-HSA-5357905	Regulation of TNFR1 signaling	8	37
R-HSA-5633007	Regulation of TP53 Activity	58	160
R-HSA-6804758	Regulation of TP53 Activity through Acetylation	16	30
R-HSA-6804759	Regulation of TP53 Activity through Association with Co-factors	1	14
R-HSA-6804760	Regulation of TP53 Activity through Methylation	7	19
R-HSA-6804756	Regulation of TP53 Activity through Phosphorylation	30	92
R-HSA-6804757	Regulation of TP53 Degradation	17	36
R-HSA-6806003	Regulation of TP53 Expression and Degradation	17	37
R-HSA-111457	Release of apoptotic factors from the mitochondria	4	5
R-HSA-69166	Removal of the Flap Intermediate	11	14
R-HSA-174437	Removal of the Flap Intermediate from the C-strand	7	10
R-HSA-4641265	Repression of WNT target genes	4	12
R-HSA-1474165	Reproduction	28	114
R-HSA-73933	Resolution of Abasic Sites (AP sites)	26	39
R-HSA-110373	Resolution of AP sites via the multiple-nucleotide patch replacement pathway	21	25
R-HSA-110381	Resolution of AP sites via the single-nucleotide replacement pathway	3	4
R-HSA-5693537	Resolution of D-Loop Structures	4	33
R-HSA-5693568	Resolution of D-loop Structures through Holliday Junction Intermediates	4	32
R-HSA-5693554	Resolution of D-loop Structures through Synthesis-Dependent Strand Annealing (SDSA)	4	26
R-HSA-2500257	Resolution of Sister Chromatid Cohesion	64	126
R-HSA-611105	Respiratory electron transport	93	101
R-HSA-163200	Respiratory electron transport, ATP synthesis by chemiosmotic coupling, and heat production by uncoupling proteins.	106	124
R-HSA-76005	Response to elevated platelet cytosolic Ca ²⁺	47	133
R-HSA-8853659	RET signaling	6	41
R-HSA-975634	Retinoid metabolism and transport	4	44
R-HSA-177504	Retrograde neurotrophin signalling	8	14
R-HSA-6811440	Retrograde transport at the Trans-Golgi-Network	30	49
R-HSA-165054	Rev-mediated nuclear export of HIV RNA	28	40
R-HSA-73943	Reversal of alkylation damage by DNA dioxygenases	5	7
R-HSA-162589	Reverse Transcription of HIV RNA	1	7
R-HSA-1475029	Reversible hydration of carbon dioxide	2	12
R-HSA-194840	Rho GTPase cycle	26	141
R-HSA-195258	RHO GTPase Effectors	136	295
R-HSA-5625900	RHO GTPases activate CIT	10	20

R-HSA-5663220	RHO GTPases Activate Formins	71	141
R-HSA-5626467	RHO GTPases activate IQGAPs	18	32
R-HSA-5625970	RHO GTPases activate KTN1	9	11
R-HSA-5668599	RHO GTPases Activate NADPH Oxidases	7	24
R-HSA-5627123	RHO GTPases activate PAKs	12	21
R-HSA-5625740	RHO GTPases activate PKNs	23	63
R-HSA-5666185	RHO GTPases Activate Rhotekin and Rhophilins	2	9
R-HSA-5627117	RHO GTPases Activate ROCKs	11	19
R-HSA-5663213	RHO GTPases Activate WASPs and WAVEs	23	36
R-HSA-5627083	RHO GTPases regulate CFTR trafficking	1	3
R-HSA-72702	Ribosomal scanning and start codon recognition	57	59
R-HSA-1810476	RIP-mediated NFkB activation via ZBP1	3	17
R-HSA-5213460	RIPK1-mediated regulated necrosis	6	23
R-HSA-3214858	RMTs methylate histone arginines	18	49
R-HSA-77075	RNA Pol II CTD phosphorylation and interaction with CE	17	27
R-HSA-167160	RNA Pol II CTD phosphorylation and interaction with CE during HIV infection	17	27
R-HSA-73854	RNA Polymerase I Promoter Clearance	27	79
R-HSA-73772	RNA Polymerase I Promoter Escape	15	60
R-HSA-73728	RNA Polymerase I Promoter Opening	7	32
R-HSA-73864	RNA Polymerase I Transcription	27	80
R-HSA-73762	RNA Polymerase I Transcription Initiation	20	47
R-HSA-73863	RNA Polymerase I Transcription Termination	9	31
R-HSA-167162	RNA Polymerase II HIV Promoter Escape	19	47
R-HSA-674695	RNA Polymerase II Pre-transcription Events	43	84
R-HSA-73776	RNA Polymerase II Promoter Escape	19	47
R-HSA-6807505	RNA polymerase II transcribes snRNA genes	32	74
R-HSA-73857	RNA Polymerase II Transcription	357	1356
R-HSA-75955	RNA Polymerase II Transcription Elongation	38	61
R-HSA-75953	RNA Polymerase II Transcription Initiation	19	47
R-HSA-76042	RNA Polymerase II Transcription Initiation And Promoter Clearance	19	47
R-HSA-73779	RNA Polymerase II Transcription Pre-Initiation And Promoter Opening	19	47
R-HSA-73856	RNA Polymerase II Transcription Termination	45	66
R-HSA-749476	RNA Polymerase III Abortive And Retractive Initiation	18	41
R-HSA-73780	RNA Polymerase III Chain Elongation	12	18
R-HSA-74158	RNA Polymerase III Transcription	18	41
R-HSA-76046	RNA Polymerase III Transcription Initiation	17	36
R-HSA-76061	RNA Polymerase III Transcription Initiation From Type 1 Promoter	17	28
R-HSA-76066	RNA Polymerase III Transcription Initiation From Type 2 Promoter	17	27
R-HSA-76071	RNA Polymerase III Transcription Initiation From Type 3 Promoter	12	28
R-HSA-73980	RNA Polymerase III Transcription Termination	13	23
R-HSA-9010642	ROBO receptors bind AKAP5	3	9
R-HSA-428890	Role of ABL in ROBO-SLIT signaling	4	8
R-HSA-2730905	Role of LAT2/NTAL/LAB on calcium mobilization	1	102
R-HSA-2029485	Role of phospholipids in phagocytosis	6	114
R-HSA-418890	Role of second messengers in netrin-1 signaling	2	10
R-HSA-1368082	RORA activates gene expression	4	18
R-HSA-1222556	ROS and RNS production in phagocytes	12	36
R-HSA-5659996	RPIA deficiency: failed conversion of R5P to RU5P	1	1
R-HSA-6791461	RPIA deficiency: failed conversion of RU5P to R5P	1	1
R-HSA-6793080	rRNA modification in the mitochondrion	3	6
R-HSA-6790901	rRNA modification in the nucleus and cytosol	24	60
R-HSA-72312	rRNA processing	145	203
R-HSA-8868766	rRNA processing in the mitochondrion	7	10
R-HSA-8868773	rRNA processing in the nucleus and cytosol	138	193
R-HSA-444257	RSK activation	3	7
R-HSA-8877330	RUNX1 and FOXP3 control the development of regulatory T lymphocytes (Tregs)	1	10
R-HSA-8939243	RUNX1 interacts with co-factors whose precise effect on RUNX1 targets is not known	12	37
R-HSA-8931987	RUNX1 regulates estrogen receptor mediated transcription	1	6
R-HSA-8935964	RUNX1 regulates expression of components of tight junctions	3	5

R-HSA-8936459	RUNX1 regulates genes involved in megakaryocyte differentiation and platelet function	16	66
R-HSA-8939245	RUNX1 regulates transcription of genes involved in BCR signaling	1	6
R-HSA-8939236	RUNX1 regulates transcription of genes involved in differentiation of HSCs	49	99
R-HSA-8939242	RUNX1 regulates transcription of genes involved in differentiation of keratinocytes	2	8
R-HSA-8939246	RUNX1 regulates transcription of genes involved in differentiation of myeloid cells	1	8
R-HSA-8939247	RUNX1 regulates transcription of genes involved in interleukin signaling	1	5
R-HSA-8939256	RUNX1 regulates transcription of genes involved in WNT signaling	1	6
R-HSA-8941326	RUNX2 regulates bone development	6	32
R-HSA-8941284	RUNX2 regulates chondrocyte maturation	1	6
R-HSA-8941332	RUNX2 regulates genes involved in cell migration	3	9
R-HSA-8941333	RUNX2 regulates genes involved in differentiation of myeloid cells	1	5
R-HSA-8940973	RUNX2 regulates osteoblast differentiation	5	25
R-HSA-8949275	RUNX3 Regulates Immune Response and Cell Migration	1	6
R-HSA-8941856	RUNX3 regulates NOTCH signaling	2	14
R-HSA-8951936	RUNX3 regulates p14-ARF	3	9
R-HSA-8951911	RUNX3 regulates RUNX1-mediated transcription	1	2
R-HSA-8951430	RUNX3 regulates WNT signaling	1	8
R-HSA-69242	S Phase	95	161
R-HSA-5358747	S33 mutants of beta-catenin aren't phosphorylated	8	15
R-HSA-5358749	S37 mutants of beta-catenin aren't phosphorylated	8	15
R-HSA-5358751	S45 mutants of beta-catenin aren't phosphorylated	8	15
R-HSA-3000480	Scavenging by Class A Receptors	4	19
R-HSA-3000471	Scavenging by Class B Receptors	1	6
R-HSA-3000484	Scavenging by Class F Receptors	4	7
R-HSA-2168880	Scavenging of heme from plasma	3	99
R-HSA-174113	SCF-beta-TrCP mediated degradation of Emi1	42	55
R-HSA-187577	SCF(Skp2)-mediated degradation of p27/p21	45	60
R-HSA-2408522	Selenoamino acid metabolism	102	118
R-HSA-2408557	Selenocysteine synthesis	83	94
R-HSA-399954	Sema3A PAK dependent Axon repulsion	8	16
R-HSA-399955	SEMA3A-Plexin repulsion signaling by inhibiting Integrin adhesion	4	14
R-HSA-400685	Sema4D in semaphorin signaling	10	24
R-HSA-416572	Sema4D induced cell migration and growth-cone collapse	7	20
R-HSA-416550	Sema4D mediated inhibition of cell attachment and migration	4	8
R-HSA-373755	Semaphorin interactions	24	64
R-HSA-2559582	Senescence-Associated Secretory Phenotype (SASP)	23	79
R-HSA-5693548	Sensing of DNA Double Strand Breaks	4	6
R-HSA-2467813	Separation of Sister Chromatids	109	190
R-HSA-977347	Serine biosynthesis	5	9
R-HSA-380615	Serotonin clearance from the synaptic cleft	2	3
R-HSA-181429	Serotonin Neurotransmitter Release Cycle	3	18
R-HSA-5654688	SHC-mediated cascade:FGFR1	3	25
R-HSA-5654699	SHC-mediated cascade:FGFR2	3	28
R-HSA-5654704	SHC-mediated cascade:FGFR3	3	21
R-HSA-5654719	SHC-mediated cascade:FGFR4	3	22
R-HSA-2428933	SHC-related events triggered by IGF1R	4	12
R-HSA-180336	SHC1 events in EGFR signaling	4	15
R-HSA-1250196	SHC1 events in ERBB2 signaling	5	28
R-HSA-1250347	SHC1 events in ERBB4 signaling	3	17
R-HSA-4085001	Sialic acid metabolism	5	33
R-HSA-392518	Signal amplification	13	32
R-HSA-74749	Signal attenuation	4	10
R-HSA-391160	Signal regulatory protein family interactions	5	16
R-HSA-162582	Signal Transduction	530	2805
R-HSA-445144	Signal transduction by L1	15	21
R-HSA-1502540	Signaling by Activin	2	13
R-HSA-201451	Signaling by BMP	2	28
R-HSA-6802952	Signaling by BRAF and RAF fusions	33	66

R-HSA-1839117	Signaling by cytosolic FGFR1 fusion mutants	9	18
R-HSA-177929	Signaling by EGFR	20	51
R-HSA-1643713	Signaling by EGFR in Cancer	9	26
R-HSA-5637812	Signaling by EGFRvIII in Cancer	7	16
R-HSA-1227986	Signaling by ERBB2	18	56
R-HSA-1236394	Signaling by ERBB4	12	62
R-HSA-9006335	Signaling by Erythropoietin	6	26
R-HSA-190236	Signaling by FGFR	34	95
R-HSA-1226099	Signaling by FGFR in disease	28	73
R-HSA-5654736	Signaling by FGFR1	12	54
R-HSA-5655302	Signaling by FGFR1 in disease	13	41
R-HSA-5654738	Signaling by FGFR2	34	78
R-HSA-8851708	Signaling by FGFR2 IIIa TM	15	23
R-HSA-5655253	Signaling by FGFR2 in disease	19	49
R-HSA-5654741	Signaling by FGFR3	12	43
R-HSA-8853334	Signaling by FGFR3 fusions in cancer	3	11
R-HSA-5655332	Signaling by FGFR3 in disease	4	25
R-HSA-8853338	Signaling by FGFR3 point mutants in cancer	4	25
R-HSA-5654743	Signaling by FGFR4	12	43
R-HSA-5655291	Signaling by FGFR4 in disease	4	12
R-HSA-372790	Signaling by GPCR	78	1226
R-HSA-5358351	Signaling by Hedgehog	71	150
R-HSA-6802948	Signaling by high-kinase activity BRAF mutants	18	37
R-HSA-2028269	Signaling by Hippo	8	20
R-HSA-74752	Signaling by Insulin receptor	22	85
R-HSA-449147	Signaling by Interleukins	130	456
R-HSA-2586552	Signaling by Leptin	2	11
R-HSA-5637815	Signaling by Ligand-Responsive EGFR Variants in Cancer	9	20
R-HSA-6806834	Signaling by MET	28	80
R-HSA-6802946	Signaling by moderate kinase activity BRAF mutants	21	47
R-HSA-1181150	Signaling by NODAL	2	21
R-HSA-9006927	Signaling by Non-Receptor Tyrosine Kinases	19	58
R-HSA-157118	Signaling by NOTCH	69	205
R-HSA-1980143	Signaling by NOTCH1	16	74
R-HSA-2691230	Signaling by NOTCH1 HD Domain Mutants in Cancer	3	15
R-HSA-2894858	Signaling by NOTCH1 HD+PEST Domain Mutants in Cancer	14	59
R-HSA-2644603	Signaling by NOTCH1 in Cancer	14	59
R-HSA-2644602	Signaling by NOTCH1 PEST Domain Mutants in Cancer	14	59
R-HSA-2660825	Signaling by NOTCH1 t(7;9)(NOTCH1:M1580_K2555) Translocation Mutant	1	7
R-HSA-1980145	Signaling by NOTCH2	6	33
R-HSA-9012852	Signaling by NOTCH3	11	49
R-HSA-9013694	Signaling by NOTCH4	49	83
R-HSA-187037	Signaling by NTRK1 (TRKA)	32	82
R-HSA-9006115	Signaling by NTRK2 (TRKB)	8	27
R-HSA-9034015	Signaling by NTRK3 (TRKC)	7	19
R-HSA-166520	Signaling by NTRKs	38	106
R-HSA-9006931	Signaling by Nuclear Receptors	82	273
R-HSA-5638302	Signaling by Overexpressed Wild-Type EGFR in Cancer	1	8
R-HSA-186797	Signaling by PDGF	12	60
R-HSA-8853336	Signaling by plasma membrane FGFR1 fusions	1	3
R-HSA-8848021	Signaling by PTK6	19	58
R-HSA-6802949	Signaling by RAS mutants	21	47
R-HSA-9006934	Signaling by Receptor Tyrosine Kinases	147	490
R-HSA-5362517	Signaling by Retinoic Acid	14	43
R-HSA-194315	Signaling by Rho GTPases	157	426
R-HSA-376176	Signaling by ROBO receptors	158	218
R-HSA-1433557	Signaling by SCF-KIT	11	45
R-HSA-9006936	Signaling by TGF-beta family members	28	102
R-HSA-170834	Signaling by TGF-beta Receptor Complex	26	73
R-HSA-3304351	Signaling by TGF-beta Receptor Complex in Cancer	2	8
R-HSA-983705	Signaling by the B Cell Receptor (BCR)	55	176
R-HSA-2404192	Signaling by Type 1 Insulin-like Growth Factor 1 Receptor (IGF1R)	8	63
R-HSA-194138	Signaling by VEGF	41	107
R-HSA-195721	Signaling by WNT	111	298
R-HSA-4791275	Signaling by WNT in cancer	10	34

R-HSA-9649948	Signaling downstream of RAS mutants	21	47
R-HSA-187687	Signalling to ERKs	15	36
R-HSA-167044	Signalling to RAS	6	21
R-HSA-198745	Signalling to STAT3	1	3
R-HSA-427359	SIRT1 negatively regulates rRNA expression	6	37
R-HSA-77588	SLBP Dependent Processing of Replication-Dependent Histone Pre-mRNAs	7	11
R-HSA-111367	SLBP independent Processing of Histone Pre-mRNAs	7	10
R-HSA-5619102	SLC transporter disorders	33	104
R-HSA-425407	SLC-mediated transmembrane transport	38	251
R-HSA-8985586	SLIT2:ROBO1 increases RHOA activity	3	4
R-HSA-111463	SMAC (DIABLO) binds to IAPs	5	7
R-HSA-111469	SMAC, XIAP-regulated apoptotic response	5	8
R-HSA-111464	SMAC(DIABLO)-mediated dissociation of IAP:caspase complexes	5	7
R-HSA-3315487	SMAD2/3 MH2 Domain Mutants in Cancer	1	3
R-HSA-3304356	SMAD2/3 Phosphorylation Motif Mutants in Cancer	1	6
R-HSA-2173796	SMAD2/SMAD3:SMAD4 heterotrimer regulates transcription	8	32
R-HSA-3311021	SMAD4 MH2 Domain Mutants in Cancer	1	3
R-HSA-426486	Small interfering RNA (siRNA) biogenesis	4	9
R-HSA-445355	Smooth Muscle Contraction	14	39
R-HSA-191859	snRNP Assembly	44	57
R-HSA-425561	Sodium/Calcium exchangers	1	11
R-HSA-112412	SOS-mediated signalling	3	8
R-HSA-1660661	Sphingolipid de novo biosynthesis	15	44
R-HSA-428157	Sphingolipid metabolism	28	90
R-HSA-1295596	Spry regulation of FGF signaling	9	16
R-HSA-1799339	SRP-dependent cotranslational protein targeting to membrane	105	113
R-HSA-69541	Stabilization of p53	43	57
R-HSA-9645135	STAT5 Activation	2	7
R-HSA-211736	Stimulation of the cell death response by PAK-2p34	2	2
R-HSA-2672351	Stimuli-sensing channels	11	107
R-HSA-1834941	STING mediated induction of host immune responses	7	16
R-HSA-390522	Striated Muscle Contraction	6	36
R-HSA-1614517	Sulfide oxidation to sulfate	2	6
R-HSA-1614635	Sulfur amino acid metabolism	15	28
R-HSA-3108232	SUMO E3 ligases SUMOylate target proteins	64	174
R-HSA-3065676	SUMO is conjugated to E1 (UBA2:SAE1)	4	5
R-HSA-3065679	SUMO is proteolytically processed	2	6
R-HSA-3065678	SUMO is transferred from E1 to E2 (UBE2I, UBC9)	5	7
R-HSA-2990846	SUMOylation	66	180
R-HSA-4551638	SUMOylation of chromatin organization proteins	32	62
R-HSA-3108214	SUMOylation of DNA damage response and repair proteins	37	81
R-HSA-4655427	SUMOylation of DNA methylation proteins	4	16
R-HSA-4615885	SUMOylation of DNA replication proteins	32	50
R-HSA-4755510	SUMOylation of immune response proteins	2	11
R-HSA-4090294	SUMOylation of intracellular receptors	3	31
R-HSA-4570464	SUMOylation of RNA binding proteins	30	51
R-HSA-4085377	SUMOylation of SUMOylation proteins	26	39
R-HSA-3899300	SUMOylation of transcription cofactors	14	44
R-HSA-3232118	SUMOylation of transcription factors	6	20
R-HSA-3232142	SUMOylation of ubiquitylation proteins	25	43
R-HSA-5683826	Surfactant metabolism	2	30
R-HSA-69052	Switching of origins to a post-replicative state	59	90
R-HSA-8849932	Synaptic adhesion-like molecules	4	21
R-HSA-3000170	Syndecan interactions	9	27
R-HSA-174495	Synthesis And Processing Of GAG, GAGPOL Polyproteins	5	15
R-HSA-2142688	Synthesis of 5-icosatetraenoic acids	1	9
R-HSA-8866652	Synthesis of active ubiquitin: roles of E1 and E2 enzymes	22	30
R-HSA-192105	Synthesis of bile acids and bile salts	7	34
R-HSA-193775	Synthesis of bile acids and bile salts via 24-hydroxycholesterol	1	14
R-HSA-193368	Synthesis of bile acids and bile salts via 7alpha-hydroxycholesterol	4	24
R-HSA-5358493	Synthesis of diphthamide-EEF2	4	8
R-HSA-69239	Synthesis of DNA	84	119

R-HSA-446199	Synthesis of Dolichyl-phosphate	1	6
R-HSA-162699	Synthesis of dolichyl-phosphate mannose	2	3
R-HSA-480985	Synthesis of dolichyl-phosphate-glucose	1	2
R-HSA-446205	Synthesis of GDP-mannose	3	5
R-HSA-162710	Synthesis of glycosylphosphatidylinositol (GPI)	3	18
R-HSA-1855183	Synthesis of IP2, IP, and Ins in the cytosol	3	14
R-HSA-1855204	Synthesis of IP3 and IP4 in the cytosol	7	26
R-HSA-1855231	Synthesis of IPs in the ER lumen	1	1
R-HSA-77111	Synthesis of Ketone Bodies	3	8
R-HSA-2142691	Synthesis of Leukotrienes (LT) and Eoxins (EX)	4	21
R-HSA-2142700	Synthesis of Lipoxins (LX)	1	6
R-HSA-1483166	Synthesis of PA	10	39
R-HSA-1483191	Synthesis of PC	6	28
R-HSA-1483213	Synthesis of PE	4	13
R-HSA-1483148	Synthesis of PG	3	8
R-HSA-1483226	Synthesis of PI	1	5
R-HSA-1660516	Synthesis of PIPs at the early endosome membrane	3	16
R-HSA-1483248	Synthesis of PIPs at the ER membrane	3	5
R-HSA-1660514	Synthesis of PIPs at the Golgi membrane	7	18
R-HSA-1660517	Synthesis of PIPs at the late endosome membrane	2	11
R-HSA-1660499	Synthesis of PIPs at the plasma membrane	17	53
R-HSA-8847453	Synthesis of PIPs in the nucleus	3	4
R-HSA-2162123	Synthesis of Prostaglandins (PG) and Thromboxanes (TX)	4	15
R-HSA-1483101	Synthesis of PS	2	2
R-HSA-1855167	Synthesis of pyrophosphates in the cytosol	3	10
R-HSA-446219	Synthesis of substrates in N-glycan biosynthesis	19	63
R-HSA-446210	Synthesis of UDP-N-acetyl-glucosamine	5	8
R-HSA-75876	Synthesis of very long-chain fatty acyl-CoAs	11	24
R-HSA-422085	Synthesis, secretion, and deacylation of Ghrelin	5	20
R-HSA-381771	Synthesis, secretion, and inactivation of Glucagon-like Peptide-1 (GLP-1)	6	20
R-HSA-400511	Synthesis, secretion, and inactivation of Glucose-dependent Insulinotropic Polypeptide (GIP)	5	13
R-HSA-5358752	T41 mutants of beta-catenin aren't phosphorylated	8	15
R-HSA-445989	TAK1 activates NFkB by phosphorylation and activation of IKKs complex	10	32
R-HSA-6791462	TALDO1 deficiency: failed conversion of Fru(6)P, E4P to SH7P, GA3P	1	1
R-HSA-6791055	TALDO1 deficiency: failed conversion of SH7P, GA3P to Fru(6)P, E4P	1	1
R-HSA-167246	Tat-mediated elongation of the HIV-1 transcript	29	47
R-HSA-167243	Tat-mediated HIV elongation arrest and recovery	26	35
R-HSA-8854214	TBC/RABGAPs	19	45
R-HSA-201681	TCF dependent signaling in response to WNT	77	202
R-HSA-5339700	TCF7L2 mutants don't bind CTBP	2	3
R-HSA-202403	TCR signaling	52	137
R-HSA-174417	Telomere C-strand (Lagging Strand) Synthesis	21	24
R-HSA-174430	Telomere C-strand synthesis initiation	8	8
R-HSA-171319	Telomere Extension By Telomerase	3	6
R-HSA-157579	Telomere Maintenance	29	63
R-HSA-5656169	Termination of translesion DNA synthesis	19	32
R-HSA-1474151	Tetrahydrobiopterin (BH4) synthesis, recycling, salvage and regulation	4	10
R-HSA-8866910	TFAP2 (AP-2) family regulates transcription of growth factors and their receptors	1	13
R-HSA-8869496	TFAP2A acts as a transcriptional repressor during retinoic acid induced cell differentiation	3	5
R-HSA-2173789	TGF-beta receptor signaling activates SMADs	14	32
R-HSA-2173791	TGF-beta receptor signaling in EMT (epithelial to mesenchymal transition)	5	16
R-HSA-3656532	TGFBR1 KD Mutants in Cancer	1	6
R-HSA-3656535	TGFBR1 LBD Mutants in Cancer	1	4
R-HSA-1663150	The activation of arylsulfatases	1	13
R-HSA-2453902	The canonical retinoid cycle in rods (twilight vision)	1	23
R-HSA-1428517	The citric acid (TCA) cycle and respiratory electron transport	142	175
R-HSA-844456	The NLRP3 inflammasome	4	16
R-HSA-2514856	The phototransduction cascade	6	34

R-HSA-2187335	The retinoid cycle in cones (daylight vision)	1	7
R-HSA-8852276	The role of GTSE1 in G2/M progression after G2 checkpoint	53	79
R-HSA-164952	The role of Nef in HIV-1 replication and disease pathogenesis	16	29
R-HSA-8849175	Threonine catabolism	2	5
R-HSA-456926	Thrombin signalling through proteinase activated receptors (PARs)	10	32
R-HSA-428930	Thromboxane signalling through TP receptor	7	23
R-HSA-9013973	TICAM1-dependent activation of IRF3/IRF7	3	12
R-HSA-168927	TICAM1, RIP1-mediated IKK complex recruitment	6	19
R-HSA-9014325	TICAM1, TRAF6-dependent induction of TAK1 complex	3	11
R-HSA-210993	Tie2 Signaling	4	19
R-HSA-420029	Tight junction interactions	1	30
R-HSA-9013957	TLR3-mediated TICAM1-dependent programmed cell death	2	6
R-HSA-5676594	TNF receptor superfamily (TNFSF) members mediating non-canonical NF-kB pathway	1	17
R-HSA-75893	TNF signaling	10	47
R-HSA-5357956	TNFR1-induced NFkappaB signaling pathway	6	30
R-HSA-5357786	TNFR1-induced proapoptotic signaling	3	14
R-HSA-5626978	TNFR1-mediated ceramide production	1	6
R-HSA-5668541	TNFR2 non-canonical NF-kB pathway	46	102
R-HSA-168142	Toll Like Receptor 10 (TLR10) Cascade	27	85
R-HSA-181438	Toll Like Receptor 2 (TLR2) Cascade	27	99
R-HSA-168164	Toll Like Receptor 3 (TLR3) Cascade	31	93
R-HSA-166016	Toll Like Receptor 4 (TLR4) Cascade	35	129
R-HSA-168176	Toll Like Receptor 5 (TLR5) Cascade	27	85
R-HSA-168181	Toll Like Receptor 7/8 (TLR7/8) Cascade	27	91
R-HSA-168138	Toll Like Receptor 9 (TLR9) Cascade	29	95
R-HSA-168179	Toll Like Receptor TLR1:TLR2 Cascade	27	99
R-HSA-168188	Toll Like Receptor TLR6:TLR2 Cascade	27	96
R-HSA-168898	Toll-like Receptor Cascades	43	156
R-HSA-5250968	Toxicity of botulinum toxin type A (BoNT/A)	1	9
R-HSA-5250958	Toxicity of botulinum toxin type B (BoNT/B)	1	8
R-HSA-5250955	Toxicity of botulinum toxin type D (BoNT/D)	2	6
R-HSA-5250992	Toxicity of botulinum toxin type E (BoNT/E)	1	5
R-HSA-5250981	Toxicity of botulinum toxin type F (BoNT/F)	2	6
R-HSA-5250989	Toxicity of botulinum toxin type G (BoNT/G)	1	4
R-HSA-5250982	Toxicity of tetanus toxin (TeNT)	1	2
R-HSA-5628897	TP53 Regulates Metabolic Genes	57	88
R-HSA-6804115	TP53 regulates transcription of additional cell cycle genes whose exact role in the p53 pathway remain uncertain	11	21
R-HSA-6803207	TP53 Regulates Transcription of Caspase Activators and Caspases	3	12
R-HSA-6791312	TP53 Regulates Transcription of Cell Cycle Genes	20	49
R-HSA-5633008	TP53 Regulates Transcription of Cell Death Genes	10	44
R-HSA-6803211	TP53 Regulates Transcription of Death Receptors and Ligands	1	12
R-HSA-6796648	TP53 Regulates Transcription of DNA Repair Genes	36	65
R-HSA-6803204	TP53 Regulates Transcription of Genes Involved in Cytochrome C Release	4	20
R-HSA-6804116	TP53 Regulates Transcription of Genes Involved in G1 Cell Cycle Arrest	2	14
R-HSA-6804114	TP53 Regulates Transcription of Genes Involved in G2 Cell Cycle Arrest	7	18
R-HSA-6803205	TP53 regulates transcription of several additional cell death genes whose specific roles in p53-dependent apoptosis remain uncertain	3	14
R-HSA-918233	TRAF3-dependent IRF activation pathway	4	14
R-HSA-975138	TRAF6 mediated induction of NFkB and MAP kinases upon TLR7/8 or 9 activation	27	90
R-HSA-933541	TRAF6 mediated IRF7 activation	5	28
R-HSA-975110	TRAF6 mediated IRF7 activation in TLR7/8 or 9 signaling	5	14
R-HSA-933542	TRAF6 mediated NF-kB activation	7	24
R-HSA-937072	TRAF6-mediated induction of TAK1 complex within TLR4 complex	4	16
R-HSA-1679131	Trafficking and processing of endosomal TLR	6	13
R-HSA-399719	Trafficking of AMPA receptors	11	31
R-HSA-416993	Trafficking of GluR2-containing AMPA receptors	8	17

R-HSA-5624138	Trafficking of myristoylated proteins to the cilium	3	5
R-HSA-75158	TRAIL signaling	2	8
R-HSA-199992	trans-Golgi Network Vesicle Budding	55	74
R-HSA-75944	Transcription from mitochondrial promoters	2	4
R-HSA-1362277	Transcription of E2F targets under negative control by DREAM complex	4	19
R-HSA-1362300	Transcription of E2F targets under negative control by p107 (RBL1) and p130 (RBL2) in complex with HDAC1	3	16
R-HSA-167172	Transcription of the HIV genome	37	74
R-HSA-6781827	Transcription-Coupled Nucleotide Excision Repair (TC-NER)	53	78
R-HSA-2151201	Transcriptional activation of mitochondrial biogenesis	15	57
R-HSA-2173793	Transcriptional activity of SMAD2/SMAD3:SMAD4 heterotrimer	13	44
R-HSA-8953750	Transcriptional Regulation by E2F6	8	34
R-HSA-8986944	Transcriptional Regulation by MECP2	19	61
R-HSA-8878171	Transcriptional regulation by RUNX1	75	208
R-HSA-8878166	Transcriptional regulation by RUNX2	58	121
R-HSA-8878159	Transcriptional regulation by RUNX3	46	96
R-HSA-5578749	Transcriptional regulation by small RNAs	41	80
R-HSA-8864260	Transcriptional regulation by the AP-2 (TFAP2) family of transcription factors	9	37
R-HSA-3700989	Transcriptional Regulation by TP53	166	367
R-HSA-9616222	Transcriptional regulation of granulopoiesis	11	59
R-HSA-452723	Transcriptional regulation of pluripotent stem cells	2	24
R-HSA-381340	Transcriptional regulation of white adipocyte differentiation	14	84
R-HSA-917977	Transferrin endocytosis and recycling	15	31
R-HSA-72766	Translation	277	294
R-HSA-72649	Translation initiation complex formation	57	59
R-HSA-110320	Translesion Synthesis by POLH	14	19
R-HSA-5656121	Translesion synthesis by POLI	11	17
R-HSA-5655862	Translesion synthesis by POLK	11	17
R-HSA-110312	Translesion synthesis by REV1	11	16
R-HSA-110313	Translesion synthesis by Y family DNA polymerases bypasses lesions on DNA template	22	39
R-HSA-1445148	Translocation of SLC2A4 (GLUT4) to the plasma membrane	47	72
R-HSA-112315	Transmission across Chemical Synapses	67	274
R-HSA-174362	Transport and synthesis of PAPS	4	6
R-HSA-425366	Transport of bile salts and organic acids, metal ions and amine compounds	8	86
R-HSA-190872	Transport of connexons to the plasma membrane	8	21
R-HSA-804914	Transport of fatty acids	1	8
R-HSA-425393	Transport of inorganic cations/anions and amino acids/oligopeptides	18	107
R-HSA-159236	Transport of Mature mRNA derived from an Intron-Containing Transcript	53	78
R-HSA-159231	Transport of Mature mRNA Derived from an Intronless Transcript	32	46
R-HSA-159234	Transport of Mature mRNAs Derived from Intronless Transcripts	32	47
R-HSA-72202	Transport of Mature Transcript to Cytoplasm	58	87
R-HSA-83936	Transport of nucleosides and free purine and pyrimidine bases across the plasma membrane	6	12
R-HSA-727802	Transport of nucleotide sugars	2	9
R-HSA-879518	Transport of organic anions	1	12
R-HSA-168271	Transport of Ribonucleoproteins into the Host Nucleus	25	40
R-HSA-382551	Transport of small molecules	196	731
R-HSA-159230	Transport of the SLBP Dependant Mature mRNA	28	40
R-HSA-159227	Transport of the SLBP independent Mature mRNA	28	39
R-HSA-425397	Transport of vitamins, nucleosides, and related molecules	13	44
R-HSA-948021	Transport to the Golgi and subsequent modification	104	186
R-HSA-2562578	TRIF-mediated programmed cell death	2	9
R-HSA-937061	TRIF(TICAM1)-mediated TLR4 signaling	32	97
R-HSA-75109	Triglyceride biosynthesis	2	14
R-HSA-163560	Triglyceride catabolism	7	24
R-HSA-8979227	Triglyceride metabolism	9	38
R-HSA-450513	Tristetraprolin (TTP, ZFP36) binds and destabilizes mRNA	12	17
R-HSA-379724	tRNA Aminoacylation	41	42

R-HSA-6787450	tRNA modification in the mitochondrion	6	9
R-HSA-6782315	tRNA modification in the nucleus and cytosol	20	43
R-HSA-72306	tRNA processing	68	113
R-HSA-6785470	tRNA processing in the mitochondrion	5	5
R-HSA-6784531	tRNA processing in the nucleus	42	62
R-HSA-4839744	truncated APC mutants destabilize the destruction complex	7	14
R-HSA-5467348	Truncations of AMER1 destabilize the destruction complex	7	14
R-HSA-71240	Tryptophan catabolism	3	14
R-HSA-446107	Type I hemidesmosome assembly	3	11
R-HSA-8963684	Tyrosine catabolism	2	5
R-HSA-9033500	TYSND1 cleaves peroxisomal proteins	6	7
R-HSA-5689880	Ub-specific processing proteases	85	205
R-HSA-2142789	Ubiquinol biosynthesis	4	8
R-HSA-69601	Ubiquitin Mediated Degradation of Phosphorylated Cdc25A	41	52
R-HSA-75815	Ubiquitin-dependent degradation of Cyclin D	41	52
R-HSA-5689603	UCH proteinases	52	96
R-HSA-438066	Unblocking of NMDA receptors, glutamate binding and activation	2	21
R-HSA-5602415	UNC93B1 deficiency - HSE	1	2
R-HSA-162585	Uncoating of the HIV Virion	1	8
R-HSA-381119	Unfolded Protein Response (UPR)	44	92
R-HSA-176974	Unwinding of DNA	10	12
R-HSA-5339562	Uptake and actions of bacterial toxins	13	48
R-HSA-5210891	Uptake and function of anthrax toxins	6	16
R-HSA-5336415	Uptake and function of diphtheria toxin	5	7
R-HSA-70635	Urea cycle	2	10
R-HSA-77108	Utilization of Ketone Bodies	2	4
R-HSA-432040	Vasopressin regulates renal water homeostasis via Aquaporins	13	44
R-HSA-4420097	VEGFA-VEGFR2 Pathway	40	98
R-HSA-5218921	VEGFR2 mediated cell proliferation	9	20
R-HSA-5218920	VEGFR2 mediated vascular permeability	12	27
R-HSA-5653656	Vesicle-mediated transport	340	761
R-HSA-180585	Vif-mediated degradation of APOBEC3G	44	56
R-HSA-168325	Viral Messenger RNA Synthesis	36	52
R-HSA-192823	Viral mRNA Translation	83	101
R-HSA-168268	Virus Assembly and Release	2	11
R-HSA-2187338	Visual phototransduction	11	100
R-HSA-196819	Vitamin B1 (thiamin) metabolism	1	5
R-HSA-196843	Vitamin B2 (riboflavin) metabolism	3	7
R-HSA-199220	Vitamin B5 (pantothenate) metabolism	9	17
R-HSA-196836	Vitamin C (ascorbate) metabolism	3	8
R-HSA-196791	Vitamin D (calciferol) metabolism	3	11
R-HSA-964975	Vitamins B6 activation to pyridoxal phosphate	2	3
R-HSA-8866423	VLDL assembly	1	5
R-HSA-8964046	VLDL clearance	1	6
R-HSA-8866427	VLDLR internalisation and degradation	7	12
R-HSA-180897	Vpr-mediated induction of apoptosis by mitochondrial outer membrane permeabilization	3	4
R-HSA-180910	Vpr-mediated nuclear import of PICs	27	44
R-HSA-180534	Vpu mediated degradation of CD4	41	53
R-HSA-192905	vRNP Assembly	2	6
R-HSA-5620916	VxPx cargo-targeting to cilium	12	21
R-HSA-8848584	Wax and plasmalogen biosynthesis	4	7
R-HSA-9640463	Wax biosynthesis	1	4
R-HSA-3238698	WNT ligand biogenesis and trafficking	5	26
R-HSA-201688	WNT mediated activation of DVL	5	8
R-HSA-5140745	WNT5A-dependent internalization of FZD2, FZD5 and ROR2	7	13
R-HSA-5099900	WNT5A-dependent internalization of FZD4	8	15
R-HSA-381038	XBP1(S) activates chaperone genes	26	48
R-HSA-1606322	ZBP1(DAI) mediated induction of type I IFNs	4	21
R-HSA-435368	Zinc efflux and compartmentalization by the SLC30 family	1	7
R-HSA-442380	Zinc influx into cells by the SLC39 gene family	4	10
R-HSA-435354	Zinc transporters	5	17