

Supplementary Table 1. Original source of pathways from Pathways Commons V10, humans section.

Pathway	Source	Size
Aurora C signaling	pid	5
Class IB PI3K non-lipid kinase events	pid	5
Gamma-aminobutyric acid synthesis	panther	5
Tetrahydrofolate biosynthesis	panther	5
Adenine and hypoxanthine salvage pathway	panther	6
Alternative NF-kappaB pathway	pid	6
Arginine biosynthesis	panther	6
Coenzyme A biosynthesis	panther	6
EphrinB-EPHB pathway	pid	6
Formyltetrahydroformate biosynthesis	panther	6
IFN gamma signaling(JAK1 JAK2 STAT1)	inoh	6
IL-10 signaling(JAK1 TYK2 STAT3)	inoh	6
IL-6 signaling(JAK1 JAK2 STAT3)	inoh	6
Mannose metabolism	panther	6
mRNA splicing	panther	6
N-acetylglucosamine metabolism	panther	6
P53 pathway feedback loops 1	panther	6
PDGF receptor signaling network	pid	6
PLK3 signaling events	pid	6
5-arachidonylglycerol_biosynthesis	panther	7
BMP signaling in Drosophila	inoh	7
FGF signaling pathway (D. melanogaster)	inoh	7
IL-12 signaling(JAK2 TYK2 STAT4)	inoh	7
IL-2 signaling(JAK1 JAK3 STAT5)	inoh	7
IL-3 signaling(JAK1 JAK2 STAT5)	inoh	7
IL-4 signaling(JAK1 JAK3 STAT6)	inoh	7
Porphyrin metabolism	inoh	7
a4b7 Integrin signaling	pid	8
EphrinA-EPHA pathway	pid	8
Pentose phosphate pathway	panther	8
S1P5 pathway	pid	8
Vitamin D metabolism and pathway	panther	8
Androgen;estrogene;progesterone biosynthesis	Merged from multiple pathways	9
Circadian clock system	panther	9
Effects of Botulinum toxin	pid	9
EGFR-dependent Endothelin signaling events	pid	9
Fructose galactose metabolism	panther	9
Glypican 3 network	pid	9
Growth hormone signaling(JAK2 STAT5)	inoh	9
Nicotine_degradation	panther	9
De novo pyrimidine ribonucleotides biosynthesis	panther	10
Galactose metabolism	inoh	10
IL-13 signaling(JAK1 TYK2 STAT6)	inoh	10
LIF signaling(JAK1 JAK2 STAT3)	inoh	10
Pyrimidine Metabolism	panther	10
Rapid glucocorticoid signaling	pid	10
Salvage pyrimidine ribonucleotides	panther	10

TCA cycle	panther	10
VEGF and VEGFR signaling network	pid	10
ALK2 signaling events	pid	11
Alpha6 beta4 integrin-ligand interactions	pid	11
Heme biosynthesis	panther	11
IL-5 signaling(JAK1 JAK2 STAT1 STAT5)	inoh	11
Signaling mediated by p38-gamma and p38-delta	pid	11
Vasopressin synthesis	panther	11
Cholesterol biosynthesis	panther	12
De novo pyrimidine deoxyribonucleotide biosynthesis	panther	12
5HT3 type receptor mediated signaling pathway	panther	13
DNA-PK pathway in nonhomologous end joining	pid	13
Phenylalanine degradation	inoh	13
Atypical NF-kappaB pathway	pid	14
Cell cycle	panther	14
IL5-mediated signaling events	pid	14
JNK signaling in the CD4+ TCR pathway	pid	14
Ras signaling in the CD4+ TCR pathway	pid	14
S1P4 pathway	pid	14
Arf6 downstream pathway	pid	15
BMP2 signaling(through TAK1)	inoh	15
ErbB receptor signaling network	pid	15
General transcription by RNA polymerase I	panther	15
IL-1 signaling pathway (through NF-kappaB)	inoh	15
JAK;STAT signaling pathway	Merged from multiple pathways	15
PAR4-mediated thrombin signaling events	pid	15
Sumoylation by RanBP2 regulates transcriptional repression	pid	15
Validated nuclear estrogen receptor beta network	pid	15
Aminosugars metabolism	inoh	16
LPA4-mediated signaling events	pid	16
Plasminogen activating cascade	panther	16
Steroids metabolism	inoh	16
Beta5 beta6 beta7 and beta8 integrin cell surface interaction	pid	17
Butanoate metabolism	inoh	17
Circadian rhythm pathway	pid	17
Glycolysis	panther	17
5-Hydroxytryptamine degradation	panther	18
Axon guidance mediated by Slit;Robo	Merged from multiple pathways	18
Degradation of beta catenin	pid	18
DNA replication	panther	18
Axon guidance mediated by semaphorins	panther	19
EPHA2 forward signaling	pid	19
Glutamic acid and Glutamine metabolism	inoh	19
Hypoxia response via HIF activation	panther	19
Hypoxic and oxygen homeostasis regulation of HIF-1-alpha	pid	19
Regulation of cytoplasmic and nuclear SMAD2;3 signaling	Merged from multiple pathways	20
S1P1 pathway	pid	20
TGF-beta signaling(through TAK1)	inoh	20
Canonical Wnt signaling pathway	pid	21

E-cadherin signaling in keratinocytes	pid	21
IFN alpha signaling(JAK1 TYK2 STAT1 STAT2 STAT3)	inoh	21
Lysine degradation	inoh	21
NGF signaling pathway	inoh	21
Notch signaling pathway Diagram	inoh	21
p38 signaling mediated by MAPKAP kinases	pid	21
p53 pathway by glucose deprivation	panther	21
Sphingosine 1-phosphate (S1P) pathway	pid	21
Synaptic_vesicle_trafficking	panther	21
Alanine,Aspartic acid and Asparagine metabolism	inoh	22
Nicotinate and Nicotinamide metabolism	inoh	22
PDGFR-alpha signaling pathway	pid	22
Propanoate metabolism	inoh	22
Prostaglandin and Leukotriene metabolism	inoh	22
Alpha adrenergic receptor signaling pathway	panther	23
Histidine degradation	inoh	23
Insulin;IGF pathway-protein kinase B signaling cascade	Merged from multiple pathways	23
Methionine and Cysteine metabolism	inoh	23
Pentose phosphate cycle	inoh	23
Signaling events mediated by PRL	pid	23
Syndecan-3-mediated signaling events	pid	23
Canonical NF-kappaB pathway	pid	24
Endogenous_cannabinoid_signaling	panther	24
Fas(lowercase) signaling pathway	inoh	24
Metabotropic glutamate receptor group I pathway	panther	24
Plexin-D1 Signaling	pid	24
Signaling events mediated by the Hedgehog family	pid	24
Visual signal transduction; Cones	Merged from multiple pathways	24
Visual signal transduction; Rods	Merged from multiple pathways	24
Alpha9 beta1 integrin signaling events	pid	25
Cellular roles of Anthrax toxin	pid	25
C-MYC pathway	pid	25
S1P3 pathway	pid	25
Toll-like receptor signaling pathway (through JNK cascade)	inoh	25
TRAIL signaling pathway	pid	25
ALK1 signaling events	pid	26
De novo purine biosynthesis	panther	26
Endogenous TLR signaling	pid	26
Ephrin B reverse signaling	pid	26
Glypican 1 network	pid	26
IL27-mediated signaling events	pid	26
Integrin family cell surface interactions	pid	26
RXR and RAR heterodimerization with other nuclear receptors	pid	26
S1P2 pathway	pid	26
Toll-like receptor signaling pathway (p38 cascade)	inoh	26
Toll-like receptor signaling pathway (through ECSIT, MEKK1	inoh	26
Toll-like receptor signaling pathway (through ECSIT, MEKK1	inoh	26
VEGFR3 signaling in lymphatic endothelium	pid	26
Adrenaline and noradrenaline biosynthesis	panther	27

Citrate cycle	inoh	27
Folate metabolism	inoh	27
IL3-mediated signaling events	pid	27
Interferon-gamma signaling pathway	panther	27
Arf1 pathway	pid	28
EGF signaling pathway Diagram	inoh	28
Fructose and Mannose metabolism	inoh	28
GPCR GroupI metabotropic glutamate receptor signaling pa	inoh	28
Nephrin;Neph1 signaling in the kidney podocyte	Merged from multiple pathways	28
Nicotine pharmacodynamics pathway	panther	28
Reelin signaling pathway	pid	28
BARD1 signaling events	pid	29
Beta2 integrin cell surface interactions	pid	29
Calcium signaling in the CD4+ TCR pathway	pid	29
IL-1 signaling pathway (through p38 cascade)	inoh	29
Insulin;IGF pathway-mitogen activated protein kinase kina	Merged from multiple pathways	29
p38 MAPK signaling pathway	pid	29
VEGFR1 specific signals	pid	29
Wnt signaling network	pid	29
Axon guidance mediated by netrin	panther	30
General transcription regulation	panther	30
IGF1 pathway	pid	30
IL2 signaling events mediated by STAT5	pid	30
Insulin-mediated glucose transport	pid	30
Nectin adhesion pathway	pid	30
Retinoic acid receptors-mediated signaling	pid	30
Valine,Leucine and Isoleucine degradation	inoh	30
IL-1 signaling pathway (through JNK cascade)	inoh	31
Lisencephaly gene (LIS1) in neuronal migration and develo	pid	31
Nongenotropic Androgen signaling	pid	31
Regulation of CDC42 activity	pid	31
Regulation of p38-alpha and p38-beta	pid	31
Toll-like receptor signaling pathway (trough NF-kappaB)	inoh	31
Tyrosine metabolism	inoh	31
amb2 Integrin signaling	pid	32
Beta1 adrenergic receptor signaling pathway	panther	32
Netrin-mediated signaling events	pid	32
Osteopontin-mediated events	pid	32
p38 MAPK pathway	panther	32
Syndecan-4-mediated signaling events	pid	32
TNFR1 signaling pathway	inoh	32
Aurora A signaling	pid	33
Enkephalin release	panther	33
EPHA forward signaling	pid	33
EPO signaling pathway	pid	33
Hedgehog signaling pathway	inoh	33
Hedgehog signaling pathway	panther	33
HIV-1 Nef; Negative effector of Fas and TNF-alpha	Merged from multiple pathways	33
IL12 signaling mediated by STAT4	pid	33

Noncanonical Wnt signaling pathway	pid	33
Pyruvate metabolism	inoh	33
Pyruvate metabolism	panther	33
Alpha4 beta1 integrin signaling events	pid	34
Alpha-synuclein signaling	pid	34
ATM pathway	pid	34
HIF-2-alpha transcription factor network	pid	34
IL1-mediated signaling events	pid	34
Regulation of Ras family activation	pid	34
Trk receptor signaling mediated by the MAPK pathway	pid	34
Angiotensin_II-stimulated_signaling_through_G_proteins_;	panther	35
Class I PI3K signaling events mediated by Akt	pid	35
ErbB4 signaling events	pid	35
GABA-B_receptor_II_signaling	panther	35
Heterotrimeric G-protein signaling pathway-rod outer segm	panther	35
HGF signaling pathway	inoh	35
IL8- and CXCR2-mediated signaling events	pid	35
Signaling mediated by p38-alpha and p38-beta	pid	35
Arf6 signaling events	pid	36
CD40;CD40L signaling	Merged from multiple pathways	36
FAS (CD95) signaling pathway	pid	36
GPCR Adenosine A2A receptor signaling pathway	inoh	36
IGF1 signaling pathway	inoh	36
N-cadherin signaling events	pid	36
Trk receptor signaling mediated by PI3K and PLC-gamma	pid	36
E-cadherin signaling in the nascent adherens junction	pid	37
FAS(uppercase) signaling pathway	panther	37
IL23-mediated signaling events	pid	37
Validated transcriptional targets of AP1 family members Fr	pid	37
Blood coagulation	panther	38
CXCR3-mediated signaling events	pid	38
Glycine and Serine metabolism	inoh	38
GMCSF-mediated signaling events	pid	38
IL2 signaling events mediated by PI3K	pid	38
Internalization of ErbB1	pid	38
Syndecan-2-mediated signaling events	pid	38
ATR signaling pathway	pid	39
Regulation of RAC1 activity	pid	39
Signaling events regulated by Ret tyrosine kinase	pid	39
EPHB forward signaling	pid	40
Signaling events mediated by TCPTP	pid	40
Aurora B signaling	pid	41
ErbB2;ErbB3 signaling events	Merged from multiple pathways	41
Glycolysis and Gluconeogenesis	inoh	41
Signaling events mediated by HDAC Class III	pid	41
5HT1 type receptor mediated signaling pathway	panther	42
BMP receptor signaling	pid	42
FOXM1 transcription factor network	pid	42
Inositol phosphate metabolism	inoh	42

Ionotropic glutamate receptor pathway	panther	42
Metabotropic glutamate receptor group II pathway	panther	42
Plasma membrane estrogen receptor signaling	pid	42
Syndecan-1-mediated signaling events	pid	42
Urokinase-type plasminogen activator (uPA) and uPAR-mediated signaling events	pid	42
IFN-gamma pathway	pid	43
LKB1 signaling events	pid	43
p53 pathway feedback loops 2	panther	43
PAR1-mediated thrombin signaling events	pid	43
PI3 kinase pathway	panther	43
Stabilization and expansion of the E-cadherin adherens junctions	pid	43
Beta3 integrin cell surface interactions	pid	44
Toll receptor signaling pathway	panther	44
Ubiquitin proteasome pathway	panther	44
CD4 T cell receptor signaling (ERK cascade)	inoh	45
FOXA1 transcription factor network	pid	45
FOXA2 and FOXA3 transcription factor networks	pid	45
Oxidative stress response	panther	45
5HT2 type receptor mediated signaling pathway	panther	46
a6b1 and a6b4 Integrin signaling	pid	46
Class I PI3K signaling events	pid	46
Integrin-linked kinase signaling	pid	46
Presenilin action in Notch and Wnt signaling	pid	46
RhoA signaling pathway	pid	46
TNF receptor signaling pathway	pid	46
Insulin Pathway	pid	47
Transcription regulation by bZIP transcription factor	panther	47
Validated transcriptional targets of deltaNp63 isoforms	pid	47
Arf6 trafficking events	pid	48
Arginine and Proline metabolism	inoh	48
Fanconi anemia pathway	pid	48
IL6-mediated signaling events	pid	48
Notch-mediated HES;HEY network	Merged from multiple pathways	48
PLK1 signaling events	pid	48
Pyrimidine Nucleotides and Nucleosides metabolism	inoh	48
Regulation of RhoA activity	pid	48
Ceramide signaling pathway	pid	49
Hedgehog signaling events mediated by Gli proteins	pid	49
Angiotensin receptor Tie2-mediated signaling	pid	50
Calcineurin-regulated NFAT-dependent transcription in lymphocytes	pid	50
FoxO family signaling	pid	50
GPCR Dopamine D1like receptor signaling pathway	inoh	50
Posttranslational regulation of adherens junction stability and cell-cell adhesion	pid	50
PNAT	panther	51
CD4 T cell receptor signaling (JNK cascade)	inoh	53
Muscarinic acetylcholine receptor 2 and 4 signaling pathway	panther	53
Signaling events mediated by PTP1B	pid	53
Signaling events mediated by Stem cell factor receptor (c-KIT)	pid	53
TGF-beta receptor signaling	pid	53

IL2-mediated signaling events	pid	54
Muscarinic acetylcholine receptor 1 and 3 signaling pathway	panther	54
RAC1 signaling pathway	pid	54
Regulation of Androgen receptor activity	pid	54
Role of Calcineurin-dependent NFAT signaling in lymphocytes	pid	54
Validated transcriptional targets of TAp63 isoforms	pid	54
B cell activation	panther	56
TGF-beta_BMP Diagram(MolecularVariation)	inoh	56
Thromboxane A2 receptor signaling	pid	56
Thyrotropin-releasing hormone receptor signaling pathway	panther	56
Caspase Cascade in Apoptosis	pid	57
CD4 T cell receptor signaling (NF-kB cascade)	inoh	57
Notch signaling pathway	pid	58
Notch signaling pathway	panther	58
Signaling events mediated by HDAC Class II	pid	58
ATF-2 transcription factor network	pid	59
p53 pathway	pid	59
p53 pathway	panther	59
FGF signaling pathway	panther	60
FGF signaling pathway	pid	60
FGF signaling pathway	inoh	60
SHP2 signaling	pid	60
Coregulation of Androgen receptor activity	pid	61
IL12-mediated signaling events	pid	62
Alzheimer disease-amyloid secretase pathway	panther	63
Neurotrophic factor-mediated Trk receptor signaling	pid	63
Signaling events mediated by focal adhesion kinase	pid	63
Validated targets of C-MYC transcriptional repression	pid	63
Endothelins	pid	64
Fc-epsilon receptor I signaling in mast cells	pid	64
T cell activation	panther	64
Tryptophan degradation	inoh	64
LPA receptor mediated events	pid	65
Metabotropic glutamate receptor group III pathway	panther	65
Validated nuclear estrogen receptor alpha network	pid	65
IL4-mediated signaling events	pid	66
Integrins in angiogenesis	pid	66
mTOR signaling pathway	pid	66
HIF-1-alpha transcription factor network	pid	67
Regulation of retinoblastoma protein	pid	67
Downstream signaling in na??ve CD8+ T cells	pid	69
Signaling events mediated by VEGFR1 and VEGFR2	pid	69
TCR signaling in na??ve CD4+ T cells	pid	69
BCR signaling pathway	pid	70
Beta1 integrin cell surface interactions	pid	70
Cytoskeletal regulation by Rho GTPase	panther	70
Ras Pathway	panther	70
Regulation of Telomerase	pid	70
AP-1 transcription factor network	pid	71

CDC42 signaling events	pid	71
p75(NTR)-mediated signaling	pid	74
E2F transcription factor network	pid	77
Interleukin signaling pathway	panther	78
Insulin receptor signaling (C. elegans)	inoh	79
p73 transcription factor network	pid	80
Regulation of nuclear beta catenin signaling and target gene	pid	80
Signaling events mediated by Hepatocyte Growth Factor Re	pid	80
Validated targets of C-MYC transcriptional activation	pid	80
TGF-beta_super_family_signaling_pathway(canonical)	inoh	81
Insulin receptor signaling (Mammal)	inoh	82
Regulation of nuclear SMAD2;3 signaling	Merged from multiple pathways	82
Glucocorticoid receptor regulatory network	pid	85
Nicotinic acetylcholine receptor signaling pathway	panther	86
C-MYB transcription factor network	pid	87
CXCR4-mediated signaling events	pid	87
CD4 T cell receptor signaling	inoh	88
Parkinson disease	panther	89
Signaling events mediated by HDAC Class I	pid	89
Canonical Wnt signaling pathway Diagram	inoh	91
C. elegans endoderm induction Wnt signaling pathway Diag	inoh	91
Drosophila Wingless;Wnt signaling pathway Diagram	Merged from multiple pathways	91
Mammalian Wnt signaling pathway Diagram	inoh	91
TGF-beta signaling pathway	panther	91
Xenopus axis formation Wnt signaling pathway Diagram	inoh	91
B cell receptor signaling	inoh	92
Purine nucleotides and Nucleosides metabolism	inoh	104
ErbB1 downstream signaling	pid	105
Apoptosis signaling pathway	panther	108
Alzheimer disease-presenilin pathway	panther	111
EGF receptor signaling pathway	panther	115
Heterotrimeric G-protein signaling pathway-Gq alpha and G	panther	118
Huntington disease	panther	118
PDGFR-beta signaling pathway	pid	125
PDGF signaling pathway	panther	125
PDGF signaling pathway	inoh	125
Integrin signaling pathway	inoh	127
Direct p53 effectors	pid	140
Gastrin_CCK2R_240212	panther	149
Cadherin signaling pathway	panther	150
Angiogenesis	panther	152
Heterotrimeric G-protein signaling pathway-Gi alpha and Gs	panther	152
Integrin signalling pathway	panther	166
Inflammation mediated by chemokine and cytokine signalin	panther	197
Drosophila Toll-like receptor signaling	inoh	236