

Supplementary Table S6. Pathways enriched by targets of autophagy modulators.

All 294 Pathways								
Rank	Pathway	Class	Subclass	Targets	No. Targets	Drugs	No. Drugs	p-value
1	MAPK signaling pathway	Environmental Information Processing	Signal transduction	MAP3K13; TGFB1; IKBKB; MAP4K1; MAP2K6; PAK1; MAP4K3; FGFR1; CHUK; EGFR; MAP2K5; PDGFRA; CACNA1S; CACNA1F; IRAK1; MAPK11; MAP2K3; CACNA1A; TAOK1; KIT; CACNB4; BDNF; FGF4; CACNA2D3; JUN; CACNA2D2; RAF1; PRKCA; TP53; CACNA1H; PLA2G4A; MKNK1; PAK2; FGF19; FLT1; MAPK3; MAP2K2; CACNG1; MAPK9; MAP3K12; NFKB1; KDR; ERBB4; PRKACB; MAP3K6; BRAF; MAP3K1; CACNA2D1; MAP3K2; FGF1; MET; TEK; MAPK1; HSPB1; HSPA8; TAOK3; CSF1R; IRAK4; RPS6KA1; ZAK; PDGFRB; MAP3K3; PRKCG; FLT4; NTRK2; FGFR3; MAP4K4; CACNB3; CACNB1; FGFR4; TNF; CACNA1I; PRKCB; HSPA2; MAPK10; STK3; ERBB2; MAPK13; CACNA1G; AKT1; PRKACA; MAPKAPK5; MAP3K4; CACNA1E; HGF; TGFB2; MAPK14; CACNB2; FLNA; MKNK2; CACNA1D; NFKB2; EPHA2; INS; MAPT; NTRK1; RPS6KA3; CACNA1B; INSR; MAPK7; FGFR2; MAP3K11; FLT3; CACNA1C; RPS6KA6; TAOK2; FGF2; MAP4K2	108	Vemurafenib; Glucosamine; Nilotinib; Alvocidib; Dronedarone; Afatinib; Genistein; Sirolimus; Spironolactone; Felodipine; Fasudil; Fluspirilene; Nimodipine; Lacidipine; Dasatinib; Crizotinib; Verapamil; Thalidomide; Gefitinib; Fostamatinib; Amiodarone; Resveratrol; Perifosine; Quercetin; Regorafenib; Arteminol; Heparin; Azelnidipine; Copper; Lapatinib; Sulfasalazine; Ponatinib; Nitrendipine; Sorafenib; Flunarizine; Paclitaxel; Purvalanol A; Quizartinib; Pazopanib; Acetylsalicylic acid; Chloroquine; Nifedipine; Isradipine; Sulindac; Calcium; Lamotrigine; Tamoxifen; Vinblastine; Sunitinib; Quinacrine; Nicardipine; Imatinib; Zinc; Loperamide; Nilvadipine; Erlotinib	56	6.91E-18
2	Axon guidance	Organismal Systems	Development	PRKCA; LIMK2; GSK3B; EPHB2; EPHA4; LIMK1; PAK2; PAK1; MAPK3; CAMK2B; PAK5; PAK3; CAMK2D; PRKCZ; PTK2; FYN; ROCK2; ABL1; PIK3CB; EPHA2; SRC; EPHB4; PIK3R1; PAK4; CFL1; SMO; CDK5; EPHA5; PIK3CD; EPHA1; CAMK2G; ROCK1; EPHB1; PIK3CA; DPYSL2; BMP1B; EPHA7; CAMK2A; FES; EPHA3; RAF1; EPHA6; BMPR2; MET; MAPK1; EPHA8; EPHB6	47	Wortmannin; Dasatinib; Sulindac; Crizotinib; Nilotinib; Alvocidib; Copper; Tamoxifen; Ponatinib; Sorafenib; Fostamatinib; Purvalanol A; Regorafenib; Imatinib; Perifosine; Fasudil; Lithium; Arteminol; Vismodegib; XL765	20	2.35E-07
3	Ras signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; IKBKB; HTR7; MAPK9; PLA2G4A; CSF1R; PAK2; FGF19; PLA2G2A; PAK1; FLT1; MAPK3; FGFR1; NTRK1; PAK5; TBK1; PAK3; GRIN2B; PDGFRA; PLA2G1B; PDGFRB; MAP2K2; ABL1; PRKCG; PIK3CB; PRKACA; EPHA2; HGF; INS; PIK3R1; NTRK2; PAK4; ABL2; KDR; BDNF; FGFR3; NFKB1; CHUK; PIK3CD; PLA2G6; EGFR; PRKACB; INSR; GRIN1; FGFR4; GRIN2A; KIT; FLT4; PIK3CA; FGFR2; PRKCB; FLT3; FGF4; MAPK10; ZAP70; RAF1; FGF2; FGF1; MET; AKT1; TEK; MAPK1	62	Wortmannin; Nilotinib; Alvocidib; Quizartinib; Afatinib; Genistein; Sirolimus; Taurine; Fasudil; Dasatinib; Chlorpromazine; Crizotinib; Gefitinib; Fostamatinib; Maprotiline; Perifosine; Lapatinib; Regorafenib; Heparin; Thalidomide; Memantine; Sulfasalazine; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Olanzapine; Indomethacin; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Sunitinib; Quinacrine; Cabergoline; Imatinib; Zinc; Erlotinib	39	5.69E-07
4	Neurotrophin signaling pathway	Organismal Systems	Nervous system	TP53; GSK3B; IKBKB; IRAK1; NFKB1A; NTRK3; IRAK4; MAPK3; CAMK2B; AKT1; MAPK14; PIK3CB; RPS6KA1; MAP2K5; CAMK2D; PDPK1; TP73; MAP2K2; MAP3K3; ABL1; SH2B3; RIPK2; PIK3R1; CAMK2A; NTRK2; MAPK11; NTRK1; RPS6KA3; MAPK9; NFKB1; PIK3CD; CAMK2G; PRKCD; MAPK7; BRAF; MAP3K1; PIK3CA; BDNF; MAPK10; RPS6KA6; JUN; RAF1; BCL2; IRAK3; MATK; MAPK13; MAPK1	47	Wortmannin; Vemurafenib; Nilotinib; Genistein; Obatoclox; Lithium; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Paclitaxel; Sulfasalazine; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Purvalanol A; Imatinib; Zinc	26	5.69E-07
5	Regulation of actin cytoskeleton	Cellular Processes	Cell motility	LIMK2; PTK2; CHRM4; BDKRB1; ITGAL; INSR; FGFR3; LIMK1; PAK2; FGF19; GSN; PAK1; PFN1; MAPK3; MYLK4; ROCK2; FGFR1; PAK5; FGFR4; PAK3; ACTN1; PDGFRA; PDGFRB; MAP2K2; ITGB3; PIK3CB; MYLK2; FGF2; MYLK3; F2; PIK3R1; CHRM2; CHRM1; PAK4; CFL1; MYH9; IQGAP1; CHRM3; PIK3CD; MYLK; EGFR; CHRM5; BRAF; PIP4K2B; ITGA5; PIK3CA; FGFR2; ACTB; FGF4; PIP4K2C; ACTG1; ITGB2; RAF1; SRC; FGF1; ROCK1; INS; FN1; MAPK1	59	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Sirolimus; Trifluoromazine; Atropine; Fasudil; Simvastatin; Enalaprilat; Dasatinib; Chlorpromazine; Citalopram; Thalidomide; Gefitinib; Fostamatinib; Proflavine; Maprotiline; Perifosine; Quercetin; Regorafenib; Arteminol; Heparin; Copper; Lapatinib; Ponatinib; Sorafenib; Sulindac; Pazopanib; Olanzapine; Paroxetine; Resveratrol; Acetylcholine; XL765; Lamotrigine; Nortriptyline; Purvalanol A; Sunitinib; Nicardipine; Imatinib; Zinc; Erlotinib	42	2.57E-06

6	ErbB signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; GSK3B; PAK2; PAK1; MAPK3; CAMK2B; PAK5; EGFR; PAK3; CAMK2D; PTK2; MAP2K2; ABL1; PRKCG; PIK3CB; MAPK9; PIK3R1; CAMK2A; PAK4; ABL2; ERBB4; PIK3CD; CAMK2G; STAT5B; BRAF; MTOR; PIK3CA; PRKCB; MAPK10; JUN; RAF1; SRC; AKT1; ERBB2; MAPK1	35	Wortmannin; Vemurafenib; Nilotinib; Alvocidib; Afatinib; Genistein; Sirolimus; Lithium; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Everolimus; Lapatinib; Ponatinib; Sorafenib; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Purvalanol A; Imatinib; Erlotinib	27	4.08E-06
7	Rap1 signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; AKT1; PRKD1; CSF1R; MAP2K3; FGF19; MAP2K6; FLT1; PFN1; MAPK3; FGFR1; MAPK14; HGF; PIK3CA; GRIN2B; ITGAL; PDGFRA; DRD2; PDGFRB; MAP2K2; ITGB3; PRKCG; PIK3CB; EPHA2; FGF2; ITGB2; PIK3R1; ADORA2B; MAPK11; KDR; PRKCB; FGFR3; INS; PRKCI; PIK3CD; EGFR; INSR; GRIN1; BRAF; FGFR4; GRIN2A; KIT; FLT4; FGFR2; ACTB; FGF4; ACTG1; PRKCZ; RAF1; SRC; FGF1; MET; ADORA2A; TEK; MAPK13; MAPK1	56	Wortmannin; Vemurafenib; Nilotinib; Alvocidib; Afatinib; Sertindole; Sirolimus; Taurine; Triflupromazine; Fluspirilene; Simvastatin; Mefloquine; Dasatinib; Olanzapine; Chlorpromazine; Crizotinib; Pimozide; Gefitinib; Quercetin; Fostamatinib; Maprotiline; Perifosine; Lapatinib; Regorafenib; Arteminol; Heparin; Fluphenazine; Thalidomide; Memantine; Ponatinib; Sorafenib; Pazopanib; Adenosine; Genistein; Theophylline; Copper; Resveratrol; Sulindac; XL765; Lamotrigine; Tamoxifen; Sunitinib; Purvalanol A; Cabergoline; Imatinib; Zinc; Pentoxifylline; Thioridazine; Trifluoperazine; Nortriptyline; Erlotinib	51	6.57E-06
8	Epstein-Barr virus infection	Human Diseases	Infectious diseases: Viral	TP53; HSPB1; HSPA8; IKBKB; PRKACA; IRAK1; NFKBIA; CDK2; CSNK2A2; JAK3; MAP2K6; RIPK1; MAPK14; CSNK2A1; TBK1; PIK3CA; VIM; ITGAL; LYN; SYK; MAPK9; YWHAB; CDK1; HDAC1; PIK3R1; MAPK11; PIK3CB; JAK1; NFKB2; NFKB1; CHUK; PIK3CD; FGR; EIF2AK4; CSNK2B; MDM2; MAP2K3; HDAC4; HDAC2; TYK2; HSPA2; EIF2AK2; MAPK10; IFNG; HDAC5; JUN; GSK3B; BCL2; EIF2AK1; AKT1; MAPK13; PRKACB	52	Wortmannin; Acetylsalicylic acid; Alvocidib; Ruxolitinib; Vorinostat; Genistein; Emodin; Obatoclox; Fasudil; Simvastatin; Lithium; Dasatinib; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Arteminol; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Glucosamine; Theophylline; Copper; Resveratrol; XL765; Vinblastine; Panobinostat; Valproic Acid; Mocetinostat; Zinc	31	7.13E-06
9	Oxytocin signaling pathway	Organismal Systems	Endocrine system	NPR1; PRKCA; KCNJ5; PRKACA; PLA2G4A; PRKAB1; PRKAA2; CAMK1; CAMK1G; CAMK1D; PRKAG1; CAMKK2; MAPK3; MYLK4; CAMK2B; RYR2; EGFR; PRKAG2; MAP2K5; CAMK2D; PRKAG3; ROCK2; MAP2K2; CACNA1S; CACNG1; CACNA1D; PRKCG; CACNA1F; MYLK2; CACNA2D1; MYLK3; PRKCB; CACNB3; CACNB1; MYLK; CAMK2G; PRKACB; MAPK7; PRKAB2; CACNB2; CACNB4; PIK3CG; ACTB; PTGS2; RYR1; CACNA1C; CAMK2A; ACTG1; CACNA2D3; JUN; CACNA2D2; RAF1; SRC; ROCK1; GUCY1A2; PRKAA1; MAPK1	57	Wortmannin; Nitroprusside; Alvocidib; Naproxen; Dantrolene; Afatinib; Meloxicam; Felodipine; Fasudil; Glyburide; Metformin; Nimodipine; Lacidipine; Dasatinib; Verapamil; Gefitinib; Fostamatinib; Amiodarone; Resveratrol; Perifosine; Quercetin; LY-294002; Regorafenib; Arteminol; Isosorbide Mononitrate; Azelnidipine; Thalidomide; Lapatinib; Sulfasalazine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Purvalanol A; Acetylsalicylic acid; Salicylic acid; Indomethacin; Nifedipine; Isradipine; Sulindac; XL765; Copper; Tamoxifen; Vinblastine; Ponatinib; Quinacrine; Nicardipine; Sorafenib; Nilvadipine; Fluspirilene; Tetracaine; Erlotinib	52	8.16E-06
10	Type II diabetes mellitus	Human Diseases	Endocrine and metabolic diseases	IKKBK; CACNA1E; MAPK3; ABCC8; PIK3CA; KCNJ11; PRKCZ; MTOR; CACNA1D; PIK3CB; INS; PIK3R1; PRKCE; MAPK9; CACNA1B; CACNA1A; PIK3CD; PRKCD; INSR; TNF; CACNA1C; MAPK10; PKM; CACNA1G; MAPK1	25	Wortmannin; Glucosamine; Sirolimus; Felodipine; Glyburide; Nimodipine; Lacidipine; Chloroquine; Verapamil; Thalidomide; Fostamatinib; Perifosine; Lamotrigine; Everolimus; Nifedipine; Sulfasalazine; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Levosimendan; Temsirolimus; Ridaforolimus; Isradipine; Sulindac; XL765; Copper; Arteminol; Tamoxifen; Flunarizine; Nicardipine; Zinc; Loperamide; Nilvadipine	36	4.94E-05
11	Insulin resistance	Human Diseases	Endocrine and metabolic diseases	IKKBK; PYGB; NFKBIA; NR1H2; PRKAG3; PRKAA2; PRKCQ; NR1H3; PRKAG1; RPS6KA1; PRKAG2; PIK3CA; PDPK1; PYGM; PRKAB1; PRKCD; TNF; PRKAB2; PIK3CB; INS; PIK3R1; PRKCE; PYGL; RPS6KA3; MAPK9; NFKB1; PIK3CD; SLC2A1; PPARA; INSR; MTOR; PRKCB; PRKAA1; MAPK10; RPS6KA6; PRKCZ; GSK3B; CPT1A; AKT1	39	Wortmannin; Acetylsalicylic acid; Alvocidib; Genistein; Sirolimus; Glyburide; Lithium; Metformin; Chloroquine; Troglitazone; Fostamatinib; Perifosine; Everolimus; Thalidomide; Sulfasalazine; Fenofibrate; GW-501516; Glucosamine; Rhein; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; XL765; Tamoxifen; Valproic Acid; Purvalanol A; Zinc; Rosiglitazone	29	4.94E-05
12	Calcium signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; DRD5; CACNA1H; BDKRB1; NOS2; HTR7; AGTR1; EDNRA; CACNA1E; TNNC2; GRIN1; ADRA1B; HTR2B; DRD1; ADORA2A; RYR2; HTR6; PTK2B; HTR5A; RYR1; CAMK2D; MYLK4; ADRA1A; PDE1B; PDGFRB; CACNA1S; CACNA1D; PRKCG; HTR2C; PDE1A; MYLK2;	66	Dantrolene; Prazosin; Alvocidib; Rupatadine; Loperamide; Afatinib; Sertindole; Felodipine; Triflupromazine; Fasudil; Atropine; Nilvadipine; Clemastine; Enalaprilat; Lacidipine; Amiodarone; Dasatinib; Chlorpromazine; Tolvaptan; Fluoxetine; Verapamil; Gefitinib; Esmolol; Levosimendan;	73	4.94E-05

				PHKG1; TNNC1; HRH2; ADRB2; CACNA1B; ADORA2B; CAMK2B; CHRM1; CACNA1F; ERBB4; AVPR1A; CACNA1A; CHRM3; HTR2A; EGFR; CAMK2G; PRKACB; CHRM5; ADRB3; PTAFR; GRIN2A; CACNA1I; HRH1; ADRB1; PRKCB; MYLK3; MYLK; CACNA1C; CAMK2A; PDGFRA; PRKACA; CHRM2; ERBB2; CACNA1G; ADRA1D		Fostamatinib; Spermidine; Maprotiline; Salbutamol; Nimodipine; Perifosine; Lapatinib; Trifluoperazine; Mefloquine; Lamotrigine; Dexamethasone; Fluphenazine; Paroxetine; Ketanserin; Memantine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Acetylcholine; Pazopanib; Acetylsalicylic acid; Adenosine; Genistein; Regorafenib; Theophylline; Telmisartan; Tamoxifen; Pentoxifylline; Ponatinib; Propranolol; Sunitinib; Citalopram; Nicardipine; Cabergoline; Imatinib; Zinc; Sorafenib; Flunarizine; Thioridazine; Fluspirilene; Tetracaine; Nortriptyline; Erlotinib		
13	Thyroid hormone signaling pathway	Organismal Systems	Endocrine system	PRKCA; THRB; PRKACA; TP53; PRKCB; MAPK3; RXRG; HDAC1; ATP1A3; PIK3CA; PDPK1; MAP2K2; ITGB3; RAF1; PRKCG; PIK3CB; PIK3R1; BMP4; RXRA; ESR1; SLC2A1; PRKACB; HDAC3; PIK3CD; MTOR; NCOA2; MDM2; ACTB; NCOA1; HIF1A; THRA; RXRB; ACTG1; ATP1A1; GSK3B; SRC; HDAC2; AKT1; ATP1A2; MAPK1	40	Wortmannin; Afimoxifene; Vorinostat; Genistein; Sirolimus; 2-Methoxyestradiol; Estradiol; Fasudil; Lithium; Dasatinib; Theophylline; Ouabain; Fostamatinib; Amiodarone; Perifosine; Regorafenib; PX-478; Everolimus; Bexarotene; Quercetin; Ponatinib; Diazoxide; Sorafenib; Calcium; Raloxifene; Acetylsalicylic acid; Ciclopirox; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Copper; Arteminol; Tamoxifen; Panobinostat; Valproic Acid; Mocetinostat; Purvalanol A; Zinc; Melatonin; Rosiglitazone; Fulvestrant	43	7.47E-05
14	Nicotine addiction	Human Diseases	Substance dependence	GABRD; CHRNA6; GABRE; GABRA3; CHRN2; GABRB2; GABRG1; GRIN2B; GRIN2A; GABRP; GABRA2; CHRNA4; GABRG3; GABRA1; CACNA1B; CACNA1A; GABRA5; GRIA3; GRIN1; GABRB1; GRIN3A; GABRA4; GABRA6; GABRB3; GABRG2; GABRQ	26	Ivermectin; Nicotine; Lithium; Verapamil; Memantine; Loperamide; Carbamazepine; Spironolactone; Taurine; Estradiol; Atropine; Olanzapine; Lamotrigine	13	0.000119
15	Proteoglycans in cancer	Human Diseases	Cancers: Overview	PRKCA; TP53; PRKACA; CAMK2D; CTSL; PAK1; MAPK3; CAMK2B; FGFR1; SMO; MAPK14; HGF; FLNA; TNF; PDPK1; PTK2; MTOR; MAP2K2; ITGB3; PRKCG; PIK3CB; FGF2; PIK3R1; MAPK11; MMP9; KDR; PRKCB; ERBB4; IQGAP1; ESR1; EGFR; CAMK2G; PRKACB; MAPK13; DDX5; BRAF; PIK3CD; ROCK2; ITGA5; PIK3CA; MDM2; ACTB; HIF1A; LUM; CAMK2A; ACTG1; VTN; RAF1; SRC; ROCK1; MET; AKT1; ERBB2; FN1; RPS6; MAPK1	56	Wortmannin; Vemurafenib; Acetylsalicylic acid; Alvocidib; Afatinib; Genistein; Sirolimus; 2-Methoxyestradiol; Estradiol; Fasudil; Dasatinib; Crizotinib; Gefitinib; Fostamatinib; Perifosine; Lapatinib; Regorafenib; Arteminol; Heparin; Everolimus; Thalidomide; Quercetin; Chloroquine; Ponatinib; Sorafenib; Raloxifene; Pazopanib; Glucosamine; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Copper; PX-478; Tamoxifen; Afimoxifene; Fulvestrant; Sunitinib; Purvalanol A; Zinc; Melatonin; Vismodegib; Erlotinib	44	0.000218
16	Adrenergic signaling in cardiomyocytes	Organismal Systems	Circulatory system	PRKCA; ATP1A2; SCN5A; MAPK11; PRKACA; AGTR1; SCN7A; MAPK3; CAMK2B; RYR2; ATP1A3; CACNB2; PIK3CG; CAMK2D; ATP1A1; ADRA1A; CACNA1S; CACNG1; CACNA1D; CACNA1F; TNNC1; ADRA1D; MAPK14; SCN1B; CACNB3; CACNB1; ADRB2; TPM1; CAMK2G; PRKACB; ADRA1B; CACNB4; ADRB1; CACNA1C; CAMK2A; CACNA2D3; SCN4B; CACNA2D2; CACNA2D1; BCL2; MAPK1; MAPK13; AKT1	43	Wortmannin; Fluspirilene; Prazosin; Procainamide; Sertindole; Felodipine; Obatoclox; Fasudil; Nimodipine; Lacidipine; Amiodarone; Dasatinib; Chlorpromazine; Esmolol; Verapamil; Ouabain; Carbamazepine; Fostamatinib; Spermidine; Maprotiline; Salbutamol; Resveratrol; Perifosine; Paclitaxel; Trifluoperazine; LY-294002; Regorafenib; Lamotrigine; Ranolazine; Quercetin; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Calcium; Azelnidipine; Genistein; Olanzapine; Thioridazine; Ciclopirox; Clonidine; Nifedipine; Isradipine; Sulindac; XL765; Telmisartan; Tamoxifen; Doxazosin; Levosimendan; Propranolol; Valproic Acid; Citalopram; Nicardipine; Cabergoline; Nilvadipine; Tetracaine; Nortriptyline; Arteminol	58	0.000259
17	Viral carcinogenesis	Human Diseases	Cancers: Overview	RANBP1; TP53; PRKACA; HDAC9; NFKBIA; HDAC8; CDK2; JAK3; GSN; CDK6; MAPK3; HDAC1; PIK3CB; PIK3CA; HDAC7; ACTN1; LYN; SYK; YWHAB; CDK1; PIK3R1; HNRNPK; HDAC6; HDAC11; JAK1; NFKB2; NFKB1; PIK3CD; HDAC5; PRKACB; HDAC3; CHEK1; MDM2; POLB; HDAC4; HDAC2; CASP8; HDAC10; C3; EIF2AK2; JUN; STAT5B; SRC; CDK4; PKM; MAPK1	46	Wortmannin; Acetylsalicylic acid; Alvocidib; Panobinostat; Vorinostat; Fasudil; Dasatinib; Fostamatinib; Perifosine; Arteminol; Thalidomide; Bardoxolone; Ponatinib; Glucosamine; XL765; Copper; Sulindac; Theophylline; Cytarabine; Vinblastine; Ruxolitinib; Valproic Acid; Mocetinostat; Purvalanol A; Zinc	25	0.00031

18	GnRH signaling pathway	Organismal Systems	Endocrine system	PRKCA; CAMK2A; PRKACA; PLA2G4A; MAP3K4; MAP2K6; MAPK3; CAMK2B; MAPK14; EGFR; MAP3K1; CAMK2D; PRKCD; MAP2K2; MAP3K3; CACNA1S; CACNA1D; CACNA1F; MAPK11; MAP2K3; MAPK9; CAMK2G; PRKACB; MAPK7; PTK2B; PRKCB; CACNA1C; MAPK10; JUN; RAF1; SRC; MAP3K2; MAPK13; MAPK1	34	Alvocidib; Afatinib; Genistein; Felodipine; Fasudil; Nimodipine; Lacidipine; Dasatinib; Verapamil; Gefitinib; Fostamatinib; Purvalanol A; Perifosine; Regorafenib; Sorafenib; Lapatinib; Isradipine; Nitrendipine; Spironolactone; Calcium; Nifedipine; Dronedarone; Sulindac; Tamoxifen; Vinblastine; Ponatinib; Quinacrine; Nicardipine; Nilvadipine; Erlotinib	30	0.000395
19	Focal adhesion	Cellular Processes	Cellular community - eukaryotes	PRKCA; PTK2; PAK2; FLT4; PAK1; FLT1; MAPK3; MYLK4; ROCK2; PAK5; HGF; FLNA; PDPK1; PIK3CA; ACTN1; PDGFRA; FYN; PDGFRB; ITGB3; GSK3B; COMP; PRKCG; PIK3CB; MYLK2; MYLK3; PIK3R1; PAK4; ZYX; KDR; PRKCB; MAPK9; PIK3CD; MYLK; EGFR; BRAF; ITGA5; PAK3; ACTB; MAPK10; ACTG1; VTN; JUN; RAF1; SRC; BCL2; ROCK1; MET; AKT1; ERBB2; FN1; MAPK1	51	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Obatoclox; Fasudil; Lithium; Dasatinib; Crizotinib; Gefitinib; Fostamatinib; Perifosine; Quercetin; Regorafenib; Arteminol; Heparin; Lapatinib; Ponatinib; Sorafenib; Calcium; Paclitaxel; Pazopanib; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Sunitinib; Purvalanol A; Imatinib; Zinc; Erlotinib	34	0.000932
20	Progesterone-mediated oocyte maturation	Organismal Systems	Endocrine system	PRKACA; STK10; CDK2; HSP90AB1; MAPK3; RPS6KA1; MAPK14; PIK3CA; PKMYT1; PIK3CB; CDK1; PIK3R1; MAPK11; PGR; RPS6KA3; MAPK9; INS; PIK3CD; HSP90AA1; PRKACB; BRAF; PLK1; MAPK10; AURKA; RPS6KA6; RAF1; MAPK1; MAPK13; AKT1	29	Wortmannin; Vemurafenib; Alvocidib; AT9283; Genistein; Fasudil; Dasatinib; Dienogest; Fostamatinib; Mifepristone; Perifosine; Regorafenib; Sorafenib; Alisertib; Quercetin; Spironolactone; Acetylsalicylic acid; Copper; Resveratrol; Sulindac; XL765; Purvalanol A; Zinc; Geldanamycin	24	0.001325
21	mTOR signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; ULK2; IKBKB; ATP6V1A; PRKAA2; MAPK3; RPS6KA1; CHUK; PIK3CA; PDPK1; TNF; MAP2K2; RAF1; PRKCG; PIK3CB; PIK3R1; RPS6KA3; ULK1; INS; PIK3CD; INSR; BRAF; MTOR; PRKCB; PRKAA1; RPS6KA6; GSK3B; MAPK1; RPS6; AKT1	30	Wortmannin; Vemurafenib; Acetylsalicylic acid; Genistein; Sirolimus; Lithium; Chloroquine; Bafilomycin A1; Fostamatinib; Perifosine; Regorafenib; Arteminol; Everolimus; Thalidomide; Sulfasalazine; Sorafenib; Glucosamine; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Purvalanol A; Zinc	25	0.001325
22	Serotonergic synapse	Organismal Systems	Nervous system	PRKCA; KCNJ5; HTR7; PLA2G4A; HTR2B; MAPK3; SLC18A2; CYP2C8; GABRB2; HTR6; SLC18A1; HTR5A; ALOX15; HTR1B; ALOX5; CACNA1S; HTR1D; CACNA1D; PRKCG; HTR2C; PRKACA; HTR2A; SLC6A4; HTR1A; CACNA1F; CACNA1B; CACNA1A; HTR1E; PRKACB; CYP2C19; BRAF; GABRB1; PRKCB; HTR3A; PTGS2; CACNA1C; GABRB3; PTGS1; RAF1; APP; MAPK1	41	Fluspirilene; Isoniazid; Dronedarone; Sertindole; Taurine; Vemurafenib; Reserpine; Felodipine; Triflupromazine; Salicylic acid; Fasudil; Glyburide; Deferoxamine; Nimodipine; Lacidipine; Chlorpromazine; Fluoxetine; Verapamil; Citalopram; Indomethacin; Fostamatinib; Maprotiline; Perifosine; Ketanserin; Regorafenib; Lamotrigine; Minoxidil; Fluphenazine; Thalidomide; Paroxetine; Copper; Memantine; Sulfasalazine; Isradipine; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Rhein; Sorafenib; Olanzapine; Thioridazine; Ivermectin; Nifedipine; Resveratrol; Sulindac; Masoprocol; Tamoxifen; Meloxicam; Quinacrine; Nicardipine; Cabergoline; Zinc; Loperamide; Nortriptyline; Nilvadipine; Propranolol; Naproxen	58	0.001411
23	Autophagy - animal	Cellular Processes	Transport and catabolism	ULK2; PRKACA; PRKAA2; PRKCG; CTSL; CAMKK2; MAPK3; BECN1; PIK3CA; PDPK1; ERN1; PRKCD; MAP2K2; PIK3CB; PIK3R1; MAPK9; INS; PIK3CD; PRKACB; EIF2AK4; MTOR; DAPK2; ULK1; HIF1A; DAPK3; PRKAA1; MAPK10; RAF1; BCL2; MAPK1; DAPK1; AKT1	32	Wortmannin; Genistein; Sirolimus; 2-Methoxyestradiol; Estradiol; Obatoclox; Fasudil; Fostamatinib; Perifosine; Regorafenib; PX-478; Everolimus; Paclitaxel; Sorafenib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Zinc	22	0.001689
24	Cholinergic synapse	Organismal Systems	Nervous system	PRKCA; CHRN4; CHRM4; PRKACA; CHRN2; CHRNA6; MAPK3; CAMK2B; PIK3CG; CAMK2D; FYN; CACNA1S; CACNA1D; PRKCG; CACNA1F; CHRNA4; PIK3R1; CHRM2; CHRM1; PIK3CB; CACNA1B; CACNA1A; CHRM3; PIK3CD; CHAT; CAMK2G; PRKACB; CHRM5; PIK3CA; PRKCB; CHRNA3; CACNA1C; CAMK2A; JAK2; ACHE; BCL2; AKT1; MAPK1	38	Wortmannin; Triflupromazine; Acetylcholine; Genistein; Obatoclox; Felodipine; Estradiol; Atropine; Fasudil; Nimodipine; Lacidipine; Dasatinib; Chlorpromazine; Fluoxetine; Verapamil; Carbamazepine; Fostamatinib; Maprotiline; Resveratrol; Perifosine; Paclitaxel; LY-294002; Lamotrigine; Nifedipine; Quercetin; Dronedarone; Nitrendipine; Spironolactone; Calcium; Nicotine; Olanzapine; Paroxetine; Isradipine; Sulindac; XL765; Tamoxifen; Ruxolitinib; Citalopram; Nicardipine; Loperamide; Nilvadipine; Nortriptyline	42	0.001689
25	Human immunodeficiency virus 1 infection	0	0	PRKCA; LIMK2; WEE1; IKBKB; IRAK1; NFKBIA; LIMK1; PAK2; IRAK4; MAP2K6; PAK1; CYCS; MAPK3; RIPK1; MAPK14; MAP2K2; PAK5; TBK1; PAK3; PTK2; TNF; PDIA3; PRKCG; PIK3CB; CALR; CDK1; PIK3R1; MAPK11;	49	Wortmannin; Acetylsalicylic acid; Alvocidib; Genistein; Sirolimus; Obatoclox; Dasatinib; Thalidomide; Fostamatinib; Perifosine; Regorafenib; Arteminol; Everolimus; Copper; Paclitaxel; Sulfasalazine; Bardoxolone; Chloroquine;	29	0.001837

				PAK4; CFL1; B2M; MAP2K3; MAPK9; NFKB1; CHUK; PIK3CD; PTK2B; MTOR; PIK3CA; PRKCB; CHEK1; CASP8; MAPK10; JUN; RAF1; BCL2; AKT1; MAPK13; MAPK1		Sorafenib; Glucosamine; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Zinc; Melatonin		
26	Hypertrophic cardiomyopathy (HCM)	Human Diseases	Cardiovascular diseases	PRKAB1; PRKAA2; PRKAG1; CACNB2; RYR2; PRKAG2; ACE; PRKAG3; TNF; ITGB3; CACNA1S; CACNG1; CACNA1D; CACNA1F; TNNC1; CACNB3; CACNB1; TPM1; PRKAB2; ITGA5; CACNB4; ACTB; CACNA1C; ACTG1; CACNA2D3; CACNA2D2; CACNA2D1; PRKAA1	28	Acetylsalicylic acid; Dronedarone; Felodipine; Fluspirilene; Metformin; Enalaprilat; Lacidipine; Chloroquine; Verapamil; Fostamatinib; Amiodarone; Nimodipine; Azelnidipine; Arteminol; Thalidomide; Quercetin; Resveratrol; Nitrendipine; Spironolactone; Calcium; Glucosamine; Levosimendan; Nifedipine; Isradipine; Copper; Trifluoperazine; Nicardipine; Nilvadipine; Tetracaine	29	0.001975
27	Adipocytokine signaling pathway	Organismal Systems	Endocrine system	POMC; RXRB; IKBKB; NFKBIA; PRKAG3; PRKAA2; PRKCQ; PRKAG1; CAMKK2; RXRG; CHUK; PRKAG2; PRKAB1; TNF; PRKAB2; RXRA; MAPK9; NFKB1; SLC2A1; PPARA; MTOR; PRKAA1; MAPK10; JAK2; ACSL4; CPT1A; AKT1	27	Acetylsalicylic acid; Genistein; Sirolimus; Glyburide; Metformin; Chloroquine; Bexarotene; Troglitazone; Fostamatinib; Perifosine; Everolimus; Thalidomide; Sulfasalazine; Fenofibrate; GW-501516; Glucosamine; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; XL765; Tamoxifen; Ruxolitinib; Valproic Acid; Loperamide; Rosiglitazone	26	0.001996
28	IL-17 signaling pathway	Organismal Systems	Immune system	MAPK4; IKBKB; NFKBIA; S100A7; MAPK3; MAPK14; CHUK; TBK1; SRSF1; CEBPB; MAPK15; MAPK11; MMP9; HSP90AB1; S100A8; IKBKE; MAPK9; NFKB1; HSP90AA1; MAPK7; HSP90B1; TNF; CASP8; PTGS2; MAPK10; IFNG; JUN; GSK3B; S100A9; MAPK13; MAPK1	31	Acetylsalicylic acid; Meloxicam; Naproxen; Lithium; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Quercetin; Sulfasalazine; Bardoxolone; Chloroquine; Calcium; Glucosamine; Salicylic acid; Indomethacin; Copper; Resveratrol; Sulindac; Vinblastine; Zinc; Geldanamycin	23	0.002307
29	EGFR tyrosine kinase inhibitor resistance	Human Diseases	Drug resistance: Antineoplastic	PRKCA; FGFR3; MAPK3; HGF; PIK3CA; PDGFRA; PDGFRB; MAP2K2; RAF1; PRKCG; PIK3CB; FGF2; PIK3R1; KDR; JAK1; PIK3CD; EGFR; AXL; BRAF; MTOR; FGFR2; PRKCB; JAK2; GSK3B; SRC; BCL2; MET; AKT1; ERBB2; RPS6; MAPK1	31	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Obatoclox; Lithium; Dasatinib; Crizotinib; Gefitinib; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Arteminol; Heparin; Everolimus; Thalidomide; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Sunitinib; Purvalanol A; Imatinib; Erlotinib	34	0.002307
30	Gastric cancer	Human Diseases	Cancers: Specific types	TP53; TGFBR1; CDK2; FGF19; MAPK3; ABCB1; RXRG; TGFBR2; HGF; PIK3CA; MAP2K2; RAF1; PIK3CB; PIK3R1; RXRA; FGF1; PIK3CD; EGFR; BRAF; MTOR; CSNK1A1; FGFR2; FGF4; RXRB; GSK3B; FGF2; BCL2; JUP; MET; AKT1; ERBB2; MAPK1	32	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Obatoclox; Lithium; Crizotinib; Thalidomide; Gefitinib; Fostamatinib; Resveratrol; Perifosine; Paclitaxel; Regorafenib; Heparin; Everolimus; Bexarotene; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Concanamycin A; Sulindac; XL765; Zinc; Rosiglitazone; Voacamine; Erlotinib	33	0.002366
31	Prostate cancer	Human Diseases	Cancers: Specific types	TP53; IKBKB; INSRR; NFKBIA; CDK2; MAPK3; FGFR1; CHUK; EGFR; PIK3CA; PDPK1; PDGFRA; PDGFRB; MAP2K2; RAF1; PIK3CB; INS; PIK3R1; MDM2; MMP9; HSP90AB1; NFKB1; AR; PIK3CD; HSP90AA1; BRAF; KLK3; HSP90B1; MTOR; FGFR2; SRD5A2; GSTP1; GSK3B; BCL2; AKT1; ERBB2; MAPK1	37	Wortmannin; Vemurafenib; Acetylsalicylic acid; Alvocidib; Afatinib; Genistein; Sirolimus; Obatoclox; Lithium; Bicalutamide; Ridaforolimus; Dasatinib; Dienogest; Gefitinib; Troglitazone; Fostamatinib; Mifepristone; Perifosine; Quercetin; Regorafenib; Heparin; Fluphenazine; Everolimus; Thalidomide; Lapatinib; Sulfasalazine; Ponatinib; Sorafenib; Paclitaxel; Pazopanib; Glucosamine; Temsirolimus; Spironolactone; Resveratrol; Sulindac; XL765; Copper; Tamoxifen; Sunitinib; Enzalutamide; Imatinib; Zinc; Curcumin; Geldanamycin; Erlotinib	45	0.002366
32	cAMP signaling pathway	Environmental Information Processing	Signal transduction	NPR1; PDE4B; DRD5; AKT1; PRKACA; NFKBIA; PDE4A; EDNRA; PAK1; GRIN2A; MAPK3; DRD1; ADORA2A; RYR2; HTR6; ATP1A3; ATP1A1; PIK3CA; CAMK2D; GRIN2B; HTR1D; DRD2; CFTR; MAP2K2; CACNA1S; GABBR1; CACNA1D; CACNA1F; ROCK2; PIK3R1; CHRM2; CAMK2B; CHRM1; HTR1A; PIK3CB; MAPK9; NFKB1; HCAR2; HTR1E; ADRB2; PIK3CD; HCAR3; CAMK2A; CAMK2G; PPARA; GRIA3; GRIN1; BRAF; GRIN3A; ADORA1; ADRB1; BDNF; PDE3A; CACNA1C;	62	Niacin; Wortmannin; Nitroprusside; Vemurafenib; Dronedarone; Sertindole; Taurine; Felodipine; Triflupromazine; Atropine; Fasudil; Glyburide; Lithium; Nimodipine; Lacidipine; Amiodarone; Olanzapine; Chlorpromazine; Esmolol; Pimozide; Verapamil; Thalidomide; Ouabain; Troglitazone; Isradipine; Fostamatinib; Spermidine; Maprotiline; Salbutamol; Perifosine; Regorafenib; Mefloquine; Lamotrigine; Cilostazol; Fluphenazine; Paroxetine; Indomethacin; Memantine; Fenofibrate; Fluspirilene; Diazoxide; Nitrendipine; Spironolactone; Calcium; GW-	71	0.002442

				MAPK10; JUN; HTR1B; RAF1; ROCK1; MAPK1; ATP1A2; PRKACB		501516; Acetylcholine; Acetylsalicylic acid; Adenosine; Sorafenib; Genistein; Nilvadipine; Ciclopirox; XL765; Nifedipine; Resveratrol; Sulindac; Theophylline; Copper; Trifluoperazine; Nortriptyline; Vinblastine; Levosimendan; Valproic Acid; Citalopram; Nicardipine; Cabergoline; Pentoxifylline; Thioridazine; Rosiglitazone; Tetracaine; Propranolol		
33	Pathways in cancer	Human Diseases	Cancers: Overview	TGFBR1; NOS2; AGTR1; CDK2; EDNRA; ROCK2; FGFR1; CHUK; KLBK3; CAMK2D; PDGFRA; MTOR; IKKB; ABL1; BIRC5; HSP90AB1; SMO; JAK1; AR; CAMK2G; KIT; CASP8; FGF4; JAK2; JUN; GSK3B; NCOA1; FN1; PRKCA; TP53; BCR; FGFR3; CDK6; FGF19; MAPK3; RXRG; RET; MAP2K2; RAF1; BDKRB1; BMP4; MAPK9; ESR1; EGFR; PRKACB; BRAF; DAPK2; PPARG; IL3; RXRB; BCL2; FGF1; MET; MAPK1; CSF1R; CKS1B; FLT4; PDGFRB; PRKCG; PIK3CB; HDAC2; GSTA2; MDM2; MMP9; ALK; RXRA; NFKB2; PIK3CD; SLC2A1; HSP90AA1; FGFR4; ESR2; PRKCB; PTGS2; GSTP1; MAPK10; PIM1; CDK4; ROCK1; ERBB2; DAPK1; AKT1; PRKACA; JAK3; CYCS; HGF; HDAC1; PIK3CA; PTK2; CAMK2B; TGFBR2; PIK3R1; NTRK1; NFKB1; HSP90B1; FGFR2; HIF1A; DAPK3; FLT3; CAMK2A; IFNG; NFKBIA; STAT5B; FGF2; PPARG; JUP; TXNRD1	107	Wortmannin; Vemurafenib; Glucosamine; Nilotinib; Alvocidib; Vinblastine; Quizartinib; Vorinostat; Afimoxifene; Genistein; Sirolimus; 2-Methoxyestradiol; Reserpine; Naproxen; Estradiol; Obatoclox; Fasudil; Lithium; Bicalutamide; Panobinostat; Enalaprilat; Valproic Acid; Dasatinib; Crizotinib; Enzalutamide; Dienogest; Gefitinib; Troglitazone; Fostamatinib; Spermidine; Mifepristone; Perifosine; Lapatinib; LY-294002; Regorafenib; Arteminol; PX-478; Dexamethasone; Heparin; Fluphenazine; Everolimus; Thalidomide; Bexarotene; Quercetin; Sulfasalazine; Bardoxolone; Ponatinib; Theophylline; Sorafenib; Calcium; Paclitaxel; Raloxifene; Fenofibrate; Pazopanib; Acetylsalicylic acid; Salicylic acid; Curcumin; Chloroquine; Indomethacin; Spironolactone; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Afatinib; Copper; Amiodarone; Telmisartan; Tamoxifen; Fluoxetine; Ruxolitinib; GW-501516; Fulvestrant; Sunitinib; Berberine; Mocetinostat; Imatinib; Zinc; Meloxicam; Melatonin; Rosiglitazone; Vismodegib; Geldanamycin; Erlotinib	85	0.002572
34	Vascular smooth muscle contraction	Organismal Systems	Circulatory system	NPR1; PRKCA; PRKACA; AGTR1; PLA2G4A; ADRA1D; EDNRA; MAPK3; MYLK4; ROCK2; KCNMA1; PLA2G1B; ADRA1A; PRKCD; MAP2K2; CACNA1S; CACNA1D; PRKCG; CACNA1F; MYLK2; MYLK3; ADORA2A; AVPR1A; PLA2G6; MYLK; PRKACB; ADRA1B; BRAF; PLA2G2A; PRKCB; PRKCG; CACNA1C; PRKCE; RAF1; ROCK1; ADORA2B; GUCY1A2; MAPK1	38	Nitroprusside; Vemurafenib; Prazosin; Sertindole; Felodipine; Fasudil; Nilvadipine; Nimodipine; Lacidipine; Chlorpromazine; Tolvaptan; Verapamil; Citalopram; Indomethacin; Fostamatinib; Maprotiline; Perifosine; Regorafenib; Mefloquine; Lamotrigine; Isosorbide Mononitrate; Sulfasalazine; Isradipine; Diazoxide; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Adenosine; Sorafenib; Olanzapine; Thioridazine; Clonidine; Nifedipine; Dronedaron; Sulindac; Theophylline; Telmisartan; Tamoxifen; Quinacrine; Nicardipine; Cabergoline; Pentoxifylline; Doxazosin; Trifluoperazine; Nortriptyline	46	0.002791
35	Breast cancer	Human Diseases	Cancers: Specific types	TP53; PGR; CDK6; FGF19; FLT4; MAPK3; FGFR1; EGFR; PIK3CA; MTOR; MAP2K2; RAF1; PIK3CB; ESR2; PIK3R1; NFKB2; ESR1; BRAF; PIK3CD; KIT; CSNK1A1; NCOA1; FGF4; JUN; GSK3B; FGF2; CDK4; FGF1; MAPK1; ERBB2; AKT1	31	Wortmannin; Vemurafenib; Glucosamine; Alvocidib; Vinblastine; Afatinib; Genistein; Sirolimus; Estradiol; Lithium; Nilotinib; Dasatinib; Dienogest; Gefitinib; Fostamatinib; Mifepristone; Perifosine; Quercetin; Regorafenib; Heparin; Everolimus; Ridaforolimus; Lapatinib; Ponatinib; Spironolactone; Raloxifene; Pazopanib; Acetylsalicylic acid; Temsirolimus; Sorafenib; Resveratrol; Sulindac; XL765; Tamoxifen; Afimoxifene; Sunitinib; Imatinib; Zinc; Melatonin; Fulvestrant; Erlotinib	41	0.003296
36	Influenza A	Human Diseases	Infectious diseases: Viral	PRKCA; HSPA8; IKKB; JAK2; NFKBIA; MAP2K3; IRAK4; MAP2K6; CYCS; MAPK3; MAPK14; TBK1; PIK3CA; MAP2K2; JAK1; RAF1; PIK3CB; PIK3R1; MAPK11; DDX39B; PRKCB; IKBE; MAPK9; NFKB1; PIK3CD; EIF2AK2; EIF2AK4; PLG; TNF; FDPS; ACTB; TYK2; TLR7; HSPA2; MAPK10; IFNG; ACTG1; JUN; GSK3B; EIF2AK1; AKT1; MAPK13; MAPK1	43	Wortmannin; Acetylsalicylic acid; Vinblastine; Genistein; Lithium; Dasatinib; Fostamatinib; Perifosine; Hydroxychloroquine; Regorafenib; Arteminol; Thalidomide; Quercetin; Sulfasalazine; Chloroquine; Sorafenib; Glucosamine; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Imiquimod; Zoledronic acid	25	0.004282
37	PI3K-Akt signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; TP53; GSK3B; FN1; IKKB; CSF1R; CDK6; PRKAA2; FGF19; JAK3; BDNF; FLT1; MAPK3; ITGA5; NTRK1; CHUK; HGF; PIK3CG; PDPK1; PTK2; PDGFRA; PDGFRB; MAP2K2; ITGB3; MDM2; COMP; FGFR1; SYK;	74	Wortmannin; Nilotinib; Alvocidib; Quizartinib; Afatinib; Genistein; Sirolimus; Obatoclox; Trifluoperazine; Atropine; Lithium; Ridaforolimus; Dasatinib; Chlorpromazine; Crizotinib; Citalopram; Bexarotene; Gefitinib; Fostamatinib;	55	0.004282

				EPHA2; YWHAB; INS; PIK3R1; CHRM2; NTRK2; CHRM1; HSP90AB1; KDR; PIK3CB; RXRA; TEK; ERBB4; NFKB1; PKN2; PIK3CD; FGFR3; EGFR; HSP90AA1; MTOR; INSR; FGFR4; HSP90B1; KIT; FLT4; PIK3CA; FGFR2; CDK2; JAK1; FLT3; CDK4; IL3; FGF4; JAK2; VTN; RAF1; FGF2; BCL2; FGF1; PKN1; MET; AKT1; ERBB2; PRKAA1; RPS6; MAPK1		Maprotiline; Perifosine; Lapatinib; LY-294002; Regorafenib; Lamotrigine; Heparin; Everolimus; Thalidomide; Paroxetine; Quercetin; Sulfasalazine; Ponatinib; Sorafenib; Calcium; Paclitaxel; Acetylcholine; Pazopanib; Acetylsalicylic acid; Olanzapine; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; Arteminol; Tamoxifen; Ruxolitinib; Sunitinib; Nicardipine; Imatinib; Zinc; Rosiglitazone; Nortriptyline; Geldanamycin; Erlotinib		
38	Estrogen signaling pathway	Organismal Systems	Endocrine system	KRT10; KRT14; KCNJ5; TFF1; HSPA8; PRKACA; PGR; MAPK3; OPRM1; GPER1; EGFR; PIK3CA; PRKCD; MAP2K2; GABBR1; PIK3CB; PIK3R1; MMP9; HSP90AB1; ESR1; KRT9; HSP90AA1; PRKACB; PIK3CD; HSP90B1; ESR2; NCOA1; NCOA2; HSPA2; KRT16; JUN; RAF1; SRC; BCL2; AKT1; MAPK1	36	Wortmannin; Alvocidib; Vinblastine; Afatinib; Genistein; Taurine; Estradiol; Obatoclox; Fasudil; Glyburide; Dasatinib; Dienogest; Gefitinib; Fostamatinib; Mifepristone; Perifosine; Quercetin; Regorafenib; Arteminol; Lapatinib; Ponatinib; Spironolactone; Paclitaxel; Raloxifene; Glucosamine; Sorafenib; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Afimoxifene; Purvalanol A; Zinc; Loperamide; Melatonin; Fulvestrant; Geldanamycin; Erlotinib	39	0.004315
39	Apelin signaling pathway	Environmental Information Processing	Signal transduction	BECN1; NOS2; PRKACA; AGTR1; PRKAG3; PRKAA2; PRKAG1; MAPK3; MYLK4; TGFB1; RYR2; PRKAG2; PIK3CG; PRKAB1; MAP2K2; PRKAB2; MYLK2; MYLK3; PRKCE; SERPINE1; MYLK; HDAC5; PRKACB; MTOR; RYR1; HDAC4; PRKAA1; RAF1; AKT1; RPS6; MAPK1	31	Wortmannin; Dantrolene; Genistein; Sirolimus; Estradiol; Fasudil; Metformin; Troglitazone; Fostamatinib; Perifosine; LY-294002; Regorafenib; Arteminol; Dexamethasone; Everolimus; Ridaforolimus; Quercetin; Sorafenib; Acetylsalicylic acid; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; Telmisartan; Tamoxifen; Panobinostat; Zinc; Tetracaine	29	0.004319
40	Signaling pathways regulating pluripotency of stem cells	Cellular Processes	Cellular community - eukaryotes	ACVR1; FGFR3; JAK3; MAPK3; ACVR1B; FGFR1; ESRRB; MAPK14; PIK3CA; MAP2K2; RAF1; PIK3CB; PIK3R1; MAPK11; BMP4; JAK1; PIK3CD; BMPR2; FGFR4; FGFR2; BMPR1B; JAK2; GSK3B; FGF2; MAPK1; MAPK13; AKT1	27	Heparin; Wortmannin; Dasatinib; Sulindac; XL765; Calcium; Thalidomide; Ruxolitinib; Ponatinib; Genistein; Sorafenib; Fostamatinib; Resveratrol; Pazopanib; Perifosine; Sirolimus; Regorafenib; Lithium	18	0.004355
41	Insulin signaling pathway	Organismal Systems	Endocrine system	PRKAG3; IKKB; PRKACA; PYGB; MKNK1; PRKAB1; PRKAA2; PRKAG1; MAPK3; PRKAG2; PIK3CA; PDPK1; PYGM; MKNK2; MAP2K2; RAF1; PIK3CB; PIK3R1; PYGL; MAPK9; INS; PRKCI; PHKG1; PIK3CD; PRKACB; INSR; PRKAB2; BRAF; MTOR; PRKAA1; MAPK10; PRKCZ; GSK3B; AKT1; RPS6; MAPK1	36	Wortmannin; Vemurafenib; Alvocidib; Genistein; Sirolimus; Fasudil; Lithium; Metformin; Fostamatinib; Perifosine; Regorafenib; Arteminol; Everolimus; Sulfasalazine; Sorafenib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Zinc	23	0.004413
42	Endocrine resistance	Human Diseases	Drug resistance: Antineoplastic	TP53; PRKACA; MAPK3; MAPK14; GPER1; EGFR; PIK3CA; PTK2; MAP2K2; PIK3CB; PIK3R1; BCL2; MAPK11; MMP9; MAPK9; PIK3CD; PRKACB; BRAF; ESR1; MTOR; ESR2; MDM2; ABCB11; MAPK10; JUN; RAF1; SRC; CDK4; MAPK1; ERBB2; MAPK13; AKT1	32	Wortmannin; Vemurafenib; Acetylsalicylic acid; Alvocidib; Vinblastine; Afatinib; Genistein; Sirolimus; Estradiol; Obatoclox; Fasudil; Glyburide; Dasatinib; Gefitinib; Quercetin; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Everolimus; Lapatinib; Ponatinib; Sorafenib; Raloxifene; Glucosamine; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Afimoxifene; Purvalanol A; Zinc; Melatonin; Fulvestrant; Erlotinib	37	0.004485
43	Central carbon metabolism in cancer	Human Diseases	Cancers: Overview	TP53; FGFR3; NTRK3; MAPK3; FGFR1; MAP2K2; EGFR; PIK3CA; RET; PDGFRA; PDGFRB; PGAM1; PIK3CB; KIT; NTRK1; PIK3CD; SLC2A1; LDHA; PKM; MTOR; FGFR2; HIF1A; FLT3; RAF1; PIK3R1; G6PD; MET; MAPK1; ERBB2; AKT1	30	Wortmannin; Nilotinib; Alvocidib; Quizartinib; Afatinib; Genistein; Sirolimus; 2-Methoxyestradiol; Dasatinib; Crizotinib; Thalidomide; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Arteminol; Heparin; Everolimus; Ridaforolimus; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; PX-478; Sunitinib; Imatinib; Zinc; Erlotinib	34	0.004604
44	Prion diseases	Human Diseases	Neurodegenerative diseases	HSPA5; SOD1; MAPK3; C1QC; PRNP; PRKACA; FYN; MAP2K2; C1QB; C8B; PRKACB; C9; STIP1; C5; C8A; C8G; MAPK1	17	Copper; Dasatinib; Sulindac; Acetylsalicylic acid; Fostamatinib; Zinc; Fasudil; Perifosine	8	0.005393
45	Neuroactive ligand-receptor interaction	Environmental Information Processing	Signaling molecules and interaction	AGTR1; EDNRA; CHRN3; GABRB1; GRIN2B; DRD2; GABRP; GABBR1; CHRNA4; GABRG3; ADRB2; MLNR; GRIA3; CHRNA2; GLRA3; MTNR1B; ADRA2B; THRB; CHRNA6; CHRM1; HTR7; GABRE; GABRA3; DRD1; GABRB2; HTR6; DRD3; HTR5A; AVPR2; HTR1B; HTR2C; HRH2; F2; ADORA2A; BDKRB1; GLRA2; PLG; GRIN1;	89	Methylprednisolone; Prazosin; Estradiol; Dronedrone; Rupatadine; Sertindole; Taurine; Triflupromazine; Atropine; Lithium; Enalaprilat; Amiodarone; Clemastine; Chlorpromazine; Tolvaptan; Pimozide; Citalopram; Proflavine; Carbamazepine; Fostamatinib; Spermidine; Maprotiline; Salbutamol; Ketanserin; Mefloquine;	63	0.005419

				HRH4; GRIN3A; ADRB1; GABRA4; TRPV1; GABRB3; GABRQ; ADRA1D; ADORA3; ADRA2C; CHRM4; GABRD; CHRN2; CHRNA5; GLRA1; HTR2B; MTNR1A; GABRG1; ADRA1A; HTR1D; HTR2A; CHRM2; GABRA1; AVPR1A; HTR1E; CHRN4; GABRA5; CHRM5; ADRB3; DRD4; GRIN2A; NR3C1; CHRNA10; GABRG2; OPRK1; THRA; DRD5; OPRM1; CHRNA9; GABRA2; ADRA2A; ADORA2B; HTR1A; OPRD1; CHRM3; ADRA1B; PTAFR; ADORA1; HRH1; CHRNA3; GABRA6		Lamotrigine; Dexamethasone; Clonidine; Fluphenazine; Copper; Memantine; Resveratrol; Esmolol; Spironolactone; Loperamide; Acetylcholine; Erythromycin; Acetylsalicylic acid; Adenosine; Olanzapine; Dexmedetomidine; Melatonin; Ivermectin; Paroxetine; Fluspirilene; Nicotine; Capsaicin; Theophylline; Telmisartan; Nortriptyline; Fluoxetine; Doxazosin; Flunarizine; Rilmenidine; Verapamil; Nicardipine; Cabergoline; Zinc; Pentoxifylline; Mifepristone; Thioridazine; Trifluoperazine; Propranolol		
46	Circadian entrainment	Organismal Systems	Environmental adaptation	MTNR1B; PRKCA; KCNJ5; CACNA1H; PRKACA; MAPK3; CAMK2B; RYR2; PRKG2; RYR1; CAMK2D; GRIN2B; CACNA1D; PRKCG; MTNR1A; CAMK2G; PRKACB; GRIA3; GRIN1; GRIN2A; CACNA1I; PRKCB; CACNA1C; CAMK2A; GUCY1A2; CACNA1G; MAPK1	27	Dantrolene; Dronedarone; Taurine; Felodipine; Fasudil; Glyburide; Lithium; Nimodipine; Lacidipine; Verapamil; Fostamatinib; Amiodarone; Perifosine; Isosorbide Mononitrate; Memantine; Isradipine; Nitrendipine; Spironolactone; Calcium; Melatonin; Nifedipine; Resveratrol; Sulindac; Tamoxifen; Nicardipine; Flunarizine; Nilvadipine; Tetracaine	28	0.005419
47	Alcoholism	Human Diseases	Substance dependence	PRKACA; HDAC9; HDAC8; CAMKK2; MAPK3; DRD1; SLC18A2; HDAC1; SLC18A1; GRIN2B; GRIN2A; DRD2; HDAC11; HDAC2; ADORA2A; NTRK2; HDAC6; HDAC5; CAMKK1; HDAC3; GRIN1; BRAF; GRIN3A; SLC29A1; BDNF; HDAC4; HDAC10; HDAC7; PKIA; RAF1; ADORA2B; MAPK1	32	Vemurafenib; Vorinostat; Sertindole; Taurine; Reserpine; Triflupromazine; Fasudil; Chlorpromazine; Pimozide; Troglitazone; Fostamatinib; Maprotiline; Perifosine; Regorafenib; Mefloquine; Lamotrigine; Fluphenazine; Memantine; Sorafenib; Adenosine; Olanzapine; Copper; Fluspirilene; Sulindac; Theophylline; Nortriptyline; Panobinostat; Valproic Acid; Mocetinostat; Cabergoline; Zinc; Pentoxifylline; Thioridazine; Trifluoperazine	34	0.005536
48	MicroRNAs in cancer	Human Diseases	Cancers: Overview	PRKCA; TP53; IKBKB; FGFR3; PAK4; CDK6; ABCB1; HDAC1; EGFR; PIK3CA; PDGFRA; VIM; PDGFRB; MAP2K2; ITGB3; ABL1; PRKCG; PRKCE; HNRNP; MMP9; NFKB1; TPM1; BMPR2; MAPK7; ITGA5; MTOR; MDM2; PRKCB; HDAC4; DNMT1; PTGS2; CYP1B1; RAF1; PIM1; BCL2; ROCK1; MET; ERBB2; MAPK1	39	Wortmannin; Glucosamine; Nilotinib; Alvocidib; Vorinostat; Afatinib; Genistein; Sirolimus; 2-Methoxyestradiol; Meloxicam; Naproxen; Obatoclox; Fasudil; Dasatinib; Procainamide; Crizotinib; Gefitinib; Fostamatinib; Resveratrol; Perifosine; Quercetin; LY-294002; Regorafenib; Arteminol; Everolimus; Thalidomide; Lapatinib; Sulfasalazine; Ponatinib; Sorafenib; Paclitaxel; Pazopanib; Acetylsalicylic acid; Salicylic acid; Indomethacin; Temsirolimus; Ridaforolimus; Concanamycin A; Sulindac; XL765; Tamoxifen; Panobinostat; Sunitinib; Mocetinostat; Imatinib; Zinc; Voacamine; Erlotinib	48	0.005578
49	Non-small cell lung cancer	Human Diseases	Cancers: Specific types	PRKCA; TP53; JAK3; CDK6; MAPK3; RXRG; EGFR; PIK3CA; PDPK1; MAP2K2; PRKCG; PIK3CB; PIK3R1; ALK; RXRA; PIK3CD; STAT5B; BRAF; PRKCB; RXRB; RAF1; CDK4; MAPK1; ERBB2; AKT1	25	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Bexarotene; Lapatinib; Sorafenib; Crizotinib; Acetylsalicylic acid; Resveratrol; Sulindac; XL765; Tamoxifen; Zinc; Rosiglitazone; Erlotinib	22	0.005838
50	Glioma	Human Diseases	Cancers: Specific types	PRKCA; TP53; CDK6; MAPK3; CAMK2B; EGFR; PIK3CA; CAMK2D; PDGFRA; PDGFRB; MAP2K2; PRKCG; PIK3CB; PIK3R1; PIK3CD; CAMK2G; BRAF; MTOR; MDM2; PRKCB; CAMK2A; RAF1; CDK4; MAPK1; AKT1	25	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Everolimus; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Sunitinib; Imatinib; Zinc; Erlotinib	27	0.005838
51	HIF-1 signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; NOS2; MKNK1; CAMK2D; FLT1; MAPK3; CAMK2B; MAP2K2; EGFR; PIK3CA; ENO1; MKNK2; ALDOA; GAPDH; TF; PRKCG; PIK3CB; INS; PIK3R1; SERPINE1; NFKB1; PIK3CD; SLC2A1; CAMK2G; INSR; MTOR; PRKCB; HIF1A; TEK; CAMK2A; IFNG; PGK1; BCL2; LDHA; AKT1; ERBB2; RPS6; MAPK1	38	Wortmannin; Glucosamine; Alvocidib; Afatinib; Genistein; Sirolimus; 2-Methoxyestradiol; Obatoclox; Ridaforolimus; Gefitinib; Troglitazone; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Arteminol; Dexamethasone; Everolimus; Thalidomide; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; PX-478; Tamoxifen; Sunitinib; Zinc; Erlotinib	34	0.005955
52	Hepatitis C	Human Diseases	Infectious diseases: Viral	TP53; IKBKB; NFKB1A; NR1H3; MAPK3; RIPK1; MAPK14; CHUK; TBK1; PIK3CA; PDPK1; EIF2AK4; JAK1; RAF1; PIK3CB; PIK3R1; MAPK11; RXRA; IKBKE; MAPK9; NFKB1; PIK3CD; EIF2AK2; EGFR; PPARA; BRAF; TNF;	34	Wortmannin; Vemurafenib; Glucosamine; Alvocidib; Afatinib; Genistein; Lithium; Dasatinib; Bexarotene; Gefitinib; Troglitazone; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Lapatinib; Sulfasalazine; Fenofibrate;	32	0.005963

				TYK2; MAPK10; GSK3B; EIF2AK1; AKT1; MAPK13; MAPK1		Chloroquine; Sorafenib; GW-501516; Acetylsalicylic acid; Rhein; Indomethacin; Resveratrol; Sulindac; XL765; Ruxolitinib; Valproic Acid; Zinc; Rosiglitazone; Erlotinib		
53	Measles	Human Diseases	Infectious diseases: Viral	TP53; HSPA8; JAK2; NFKBIA; CDK6; CDK2; PRKCQ; JAK3; IRAK4; CSNK2A1; TBK1; PIK3CA; FYN; TP73; JAK1; PIK3CB; TLR9; PIK3R1; CDK4; IKBKE; NFKB1; CHUK; PIK3CD; EIF2AK2; EIF2AK4; CSNK2B; RACK1; TYK2; TLR7; HSPA2; CSNK2A2; IFNG; GSK3B; IRAK1; EIF2AK1; AKT1; STAT5B	37	Wortmannin; Acetylsalicylic acid; Alvocidib; Genistein; Emodin; Lithium; Dasatinib; Fostamatinib; Perifosine; Hydroxychloroquine; Arteminol; Thalidomide; Quercetin; Sulfasalazine; Chloroquine; Glucosamine; Copper; Resveratrol; XL765; Tamoxifen; Ruxolitinib; Zinc; Imiquimod	23	0.006229
54	Longevity regulating pathway - multiple species	Organismal Systems	Aging	HSPA8; PRKACA; PRKAG3; PRKAA2; PRKAG1; HDAC1; PRKAG2; PIK3CA; PRKAB1; PRKAB2; PIK3CB; HDAC2; INS; PIK3CD; PRKACB; INSR; MTOR; HSPA2; PRKAA1; SOD1; PIK3R1; AKT1	22	Wortmannin; Vorinostat; Genistein; Sirolimus; Fasudil; Metformin; XL765; Dasatinib; Fostamatinib; Perifosine; Arteminol; Everolimus; Ridaforolimus; Quercetin; Acetylsalicylic acid; Temsirolimus; Copper; Resveratrol; Theophylline; Panobinostat; Valproic Acid; Mocetinostat; Zinc	23	0.0068
55	GABAergic synapse	Organismal Systems	Nervous system	PRKCA; GABRD; PRKACA; PLCL1; GABRE; GABRA3; GABRQ; GABRB2; GABRG1; GABRP; CACNA1S; GABBR1; CACNA1D; PRKCG; CACNA1F; GABRA2; ABAT; GABRG3; GABRA1; CACNA1B; CACNA1A; GABRA5; PRKACB; GABRB1; PRKCB; GABRA4; GABRA6; CACNA1C; GABRB3; SRC; GABRG2	31	Taurine; Felodipine; Fasudil; Nimodipine; Lacidipine; Dasatinib; Verapamil; Fostamatinib; Purvalanol A; Perifosine; Lamotrigine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Olanzapine; Ivermectin; Nifedipine; Isradipine; Tamoxifen; Ponatinib; Valproic Acid; Quinacrine; Nicardipine; Loperamide; Nilvadipine	26	0.007601
56	Fc epsilon RI signaling pathway	Organismal Systems	Immune system	PRKCA; PLA2G4A; MAP2K6; MAPK3; MAPK14; ALOX5; PIK3CA; PDPK1; FYN; MAP2K2; LYN; PIK3CB; SYK; PIK3R1; MAPK11; BTK; MAPK9; PIK3CD; TNF; MAP2K3; MAPK10; RAF1; MAPK1; IL3; MAPK13; AKT1	26	Wortmannin; Dasatinib; Sulindac; Glucosamine; XL765; Thalidomide; Fostamatinib; Genistein; Tamoxifen; Sulfasalazine; Resveratrol; Ponatinib; Sorafenib; Quinacrine; Zinc; Perifosine; Rhein; Chloroquine; Regorafenib; Masoprocol	20	0.00783
57	Complement and coagulation cascades	Organismal Systems	Immune system	SERPINE1; KNG1; A2M; C4BPB; KLKB1; C1R; F12; CLU; VTN; F10; C1S; C4BPA; CFB; FGA; F2; SERPINC1; SERPIND1; C5; ITGB2; BDKRB1; C1QC; C1QB; C8B; PLG; C8G; C8A; SERPINA1; F13B; C3; SERPING1; CFI; SERPINF2; C9; CFH	34	Heparin; Copper; Troglitazone; Proflavine; Zinc; Simvastatin; Enalaprilat	7	0.007913
58	Morphine addiction	Human Diseases	Substance dependence	PDE4B; PRKCA; GABRD; KCNJ5; OPRM1; PRKACA; PDE4A; GABRQ; GABRE; GABRA3; DRD1; GABRB2; GABRG1; GABRP; GABBR1; PRKCG; PDE1A; GABRG3; CACNA1A; GABRA1; CACNA1B; GABRA2; PDE1B; GABRA5; PRKACB; GABRB1; ADORA1; PRKCB; GABRA4; GABRA6; PDE3A; GABRB3; GABRG2	33	Taurine; Felodipine; Triflupromazine; Fasudil; Glyburide; Cilostazol; Chlorpromazine; Verapamil; Fostamatinib; Perifosine; Lamotrigine; Fluphenazine; Spironolactone; Pentoxifylline; Adenosine; Olanzapine; Levosimendan; Ivermectin; Theophylline; Tamoxifen; Nicardipine; Cabergoline; Loperamide; Thioridazine	24	0.008618
59	Aldosterone synthesis and secretion	Organismal Systems	Endocrine system	NPR1; PRKCA; POMC; KCNJ5; CACNA1H; PRKD1; PRKACA; AGTR1; CAMK1D; CAMK2B; ATP1A3; CAMK2D; ATP1A1; CACNA1S; CACNA1D; PRKCG; CACNA1F; PRKCE; CYP11B2; CAMK2G; PRKACB; CAMK1; CACNA1I; PRKCB; CACNA1C; CAMK2A; CAMK1G; ATP1A2; CACNA1G	29	Nitroprusside; Felodipine; Fasudil; Glyburide; Nimodipine; Lacidipine; Verapamil; Ouabain; Fostamatinib; Amiodarone; Perifosine; Isradipine; Diazoxide; Nitrendipine; Spironolactone; Loperamide; Ciclopirox; Nifedipine; Dronedarone; Calcium; Telmisartan; Tamoxifen; Nicardipine; Flunarizine; Nilvadipine	25	0.008618
60	Gastric acid secretion	Organismal Systems	Digestive system	PRKCA; PRKACA; KCNJ1; MYLK4; CAMK2B; ATP1A3; CAMK2D; ATP1A1; CFTR; CA2; MYLK2; MYLK3; PRKCG; PRKCB; CHRM3; MYLK; CAMK2G; PRKACB; ACTB; HRH2; CAMK2A; ATP4A; ATP1A2; KCNK2	24	Acetazolamide; Esomeprazole; Pantoprazole; Omeprazole; Atropine; Fasudil; Glyburide; Chlorpromazine; Ouabain; Fostamatinib; Maprotiline; Perifosine; Lamotrigine; Quercetin; Diazoxide; Olanzapine; Ciclopirox; Minoxidil; Paroxetine; Dronedarone; Acetylcholine; Tamoxifen; Nicardipine; Nortriptyline	24	0.00866
61	Human papillomavirus infection	Human Diseases	Infectious diseases: Viral	TP53; IKBKB; PRKACA; HDAC9; HDAC8; CDK2; EGFR; CDK6; MAPK3; HDAC1; CHUK; TBK1; PIK3CA; TNF; PRKCZ; PTK2; PDGFRB; MAP2K2; ITGB3; GSK3B; COMP; HDAC11; JAK1; PIK3R1; HDAC6; PIK3CB; IKBKE; NFKB1; PRKCI; PIK3CD; TUBG1; HDAC5; ATP6V1A; PRKACB; HDAC3; TYK2; ITGA5; MTOR; CSNK1A1; MDM2; HDAC4; HDAC2; CASP8; PTGS2; HDAC10; EIF2AK2; VTN; HDAC7; RAF1; CDK4; PKM; AKT1; FN1; MAPK1	54	Wortmannin; Acetylsalicylic acid; Alvocidib; Ruxolitinib; Vorinostat; Afatinib; Genistein; Sirolimus; Meloxicam; Naproxen; Fasudil; Lithium; Valproic Acid; Chloroquine; Bafilomycin A1; Theophylline; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Arteminol; Everolimus; Thalidomide; Lapatinib; Sulfasalazine; Bardoxolone; Dasatinib; Sorafenib; Calcium; Pazopanib; Glucosamine; Salicylic acid; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Copper; Vinblastine; Tamoxifen;	47	0.009208

						Panobinostat; Sunitinib; Mocetinostat; Imatinib; Zinc; Erlotinib		
62	Renin secretion	Organismal Systems	Endocrine system	NPR1; AGT; AGTR1; EDNRA; KCNMA1; PRKG2; REN; ACE; AQP1; CACNA1S; CACNA1D; CACNA1F; PDE1A; ADRB2; PDE1B; PRKACB; ADRB3; ADORA1; ADRB1; PDE3A; CACNA1C; PRKACA; GUCY1A2	23	Nitroprusside; Isosorbide Mononitrate; Acetazolamide; Felodipine; Fasudil; Nimodipine; Lacidipine; Esmolol; Verapamil; Fostamatinib; Spermidine; Amiodarone; Salbutamol; Enalaprilat; Lamotrigine; Cilostazol; Nifedipine; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Adenosine; Olanzapine; Levosimendan; Minoxidil; Copper; Isradipine; Theophylline; Telmisartan; Nortriptyline; Nicardipine; Cabergoline; Zinc; Pentoxifylline; Nilvadipine; Propranolol	38	0.009208
63	Gap junction	Cellular Processes	Cellular community - eukaryotes	PRKCA; PRKACA; TUBB4A; TUBB1; HTR2B; MAPK3; DRD1; PRKG2; EGFR; MAP2K5; TUBB6; PDGFRA; DRD2; PDGFRB; MAP2K2; PRKCG; HTR2C; HTR2A; CDK1; TUBB; PRKACB; MAPK7; ADRB1; PRKCB; TUBA1A; RAF1; SRC; MAP3K2; TUBA4A; GUCY1A2; MAPK1	31	Colchicine; Alvocidib; Dronedarone; Afatinib; Sertindole; Vinorelbine; Triflupromazine; Fasudil; Amiodarone; Dasatinib; Chlorpromazine; Esmolol; Pimozide; Citalopram; Cabazitaxel; Gefitinib; Fostamatinib; Spermidine; Maprotiline; Salbutamol; Perifosine; Lapatinib; Ketanserin; Regorafenib; Lamotrigine; Memantine; Isosorbide Mononitrate; Fluphenazine; Copper; Paclitaxel; Ponatinib; Vincristine; Sorafenib; Pazopanib; Olanzapine; Paroxetine; Fluspirilene; Sulindac; Artenimol; Tamoxifen; Fluoxetine; Vinblastine; Propranolol; Sunitinib; Purvalanol A; Cabergoline; Imatinib; Thioridazine; Trifluoperazine; Nortriptyline; Erlotinib	51	0.009752
64	T cell receptor signaling pathway	Organismal Systems	Immune system	IKBKB; NFKBIA; PAK2; PRKCQ; PAK1; MAPK3; MAPK14; PAK5; PAK3; PDPK1; FYN; MAP2K2; RAF1; PIK3CB; PIK3R1; MAPK11; PAK4; ITK; MAPK9; NFKB1; CHUK; PIK3CD; TEC; TNF; PIK3CA; LCK; IFNG; JUN; ZAP70; GSK3B; CDK4; AKT1; MAPK13; MAPK1	34	Wortmannin; Dasatinib; Sulindac; Glucosamine; XL765; Alvocidib; Thalidomide; Tamoxifen; Sulfasalazine; Vinblastine; Chloroquine; Ponatinib; Sorafenib; Fostamatinib; Resveratrol; Pazopanib; Acetylsalicylic acid; Genistein; Regorafenib; Lithium; Perifosine	21	0.010071
65	FoxO signaling pathway	Environmental Information Processing	Signal transduction	TGFBR1; IKBKB; PLK4; PRKAG3; PRKAA2; PRKAG1; MAPK3; BRAF; TGFB2; MAPK14; CHUK; EGFR; PRKAG2; PIK3CA; PDPK1; PRKAB1; MAP2K2; PRKAB2; PIK3CB; MAPK9; PIK3R1; MAPK11; PLK1; INS; PIK3CD; INSR; PLK3; MDM2; CDK2; PRKAA1; MAPK10; RAF1; PLK2; AKT1; MAPK13; MAPK1	36	Wortmannin; Dasatinib; Sulindac; XL765; Alvocidib; Lapatinib; Sulfasalazine; Gefitinib; Resveratrol; Afatinib; Genistein; Sorafenib; Fostamatinib; Vemurafenib; Zinc; Acetylsalicylic acid; Perifosine; Regorafenib; Metformin; Erlotinib	20	0.011226
66	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	Human Diseases	Cardiovascular diseases	RYR2; ACTB; CACNB2; CACNA2D2; CACNA2D1; CACNA1C; CACNB3; CACNB1; ACTG1; CACNA2D3; ITGB3; CACNA1S; CACNG1; CACNA1D; CACNA1F; JUP; DSP; ITGA5; CACNB4	19	Lacidipine; Nifedipine; Isradipine; Copper; Zinc; Amiodarone; Verapamil; Quercetin; Resveratrol; Dronedarone; Nitrendipine; Spironolactone; Calcium; Nicardipine; Felodipine; Azelnidipine; Fluspirilene; Nilvadipine; Tetracaine; Nimodipine; Artenimol	21	0.01143
67	Melanoma	Human Diseases	Cancers: Specific types	TP53; FGF19; CDK6; HGF; FGFR1; MAPK3; PIK3CA; PDGFRA; PDGFRB; MAP2K2; PIK3CB; PIK3R1; PIK3CD; EGFR; BRAF; MDM2; FGF4; RAF1; FGF2; CDK4; FGF1; MET; MAPK1; AKT1	24	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Heparin; Lapatinib; Ponatinib; Sorafenib; Crizotinib; Acetylsalicylic acid; Resveratrol; Sulindac; XL765; Pazopanib; Sunitinib; Imatinib; Zinc; Erlotinib	25	0.012171
68	Inflammatory mediator regulation of TRP channels	Organismal Systems	Sensory system	PRKCA; CAMK2A; MAPK11; PRKACA; PLA2G4A; PRKCQ; MAP2K6; HTR2B; CAMK2B; MAPK14; PIK3CB; PIK3CA; CAMK2D; PRKCG; HTR2C; HTR2A; PIK3R1; PRKCE; BDKRB1; NTRK1; MAP2K3; MAPK9; PIK3CD; PLA2G6; CAMK2G; PRKACB; HRH1; PRKCB; TRPV1; MAPK10; SRC; MAPK13; PRKCD	33	Wortmannin; Sertindole; Triflupromazine; Fasudil; Clemastine; Enalaprilat; Dasatinib; Chlorpromazine; Fluoxetine; Citalopram; Fostamatinib; Maprotiline; Perifosine; Ketanserin; Regorafenib; Lamotrigine; Fluphenazine; Ponatinib; Rupatadine; Olanzapine; Paroxetine; Fluspirilene; Capsaicin; XL765; Tamoxifen; Quinacrine; Purvalanol A; Cabergoline; Imatinib; Zinc; Flunarizine; Thioridazine; Nortriptyline	33	0.014831
69	Dopaminergic synapse	Organismal Systems	Nervous system	PRKCA; DRD5; CAMK2A; KCNJ5; PRKACA; CALY; SCN1A; DRD1; DRD4; MAPK14; DRD3; CAMK2D; GRIN2B; DRD2; SLC18A2; CACNA1D; PRKCG; CAMK2B; MAPK11; MAPK9; CACNA1B; CACNA1A; SLC18A1; CAMK2G; PRKACB; GRIA3; GSK3A; GRIN2A; PRKCB; CACNA1C; MAPK10; COMT; GSK3B; MAPK13; AKT1	35	Sertindole; Taurine; 2-Methoxyestradiol; Reserpine; Felodipine; Triflupromazine; Fasudil; Glyburide; Lithium; Nimodipine; Lacidipine; Dasatinib; Chlorpromazine; Pimozide; Verapamil; Isradipine; Fostamatinib; Maprotiline; Resveratrol; Perifosine; Regorafenib; Lamotrigine; Fluphenazine; Memantine; Fluspirilene; Nitrendipine; Spironolactone; Calcium; Genistein; Olanzapine; Nilvadipine;	41	0.016264

						Nifedipine; Dronedarone; Nortriptyline; Valproic Acid; Nicardipine; Cabergoline; Loperamide; Thioridazine; Trifluoperazine; Tamoxifen		
70	Adherens junction	Cellular Processes	Cellular community - eukaryotes	ACTB; CSNK2A1; ACTN1; TGFBF1; FER; IQGAP1; INSR; FGFR1; ACTG1; CSNK2A2; EGFR; SRC; FYN; CSNK2B; TGFBF2; MET; MAPK3; ERBB2; YES1; MAPK1	20	Heparin; Copper; Resveratrol; Sulindac; Alvocidib; Quercetin; Dasatinib; Gefitinib; Ponatinib; Afatinib; Sorafenib; Fostamatinib; Purvalanol A; Emodin; Crizotinib; Perifosine; Lapatinib; Regorafenib; Arteminib; Erlotinib	20	0.016523
71	Aldosterone-regulated sodium reabsorption	Organismal Systems	Excretory system	PRKCB; ATP1A3; ATP1A1; PIK3CA; PRKCA; NR3C2; INS; PIK3CD; PDPK1; KCNJ1; PRKCG; PIK3CB; INSR; MAPK3; ATP1A2; PIK3R1; MAPK1	17	Minoxidil; Wortmannin; Sulindac; XL765; Tamoxifen; Ouabain; Diazoxide; Spironolactone; Fostamatinib; Nimodipine; Perifosine; Zinc; Ciclopirox; Felodipine	14	0.020247
72	Ribosome	Genetic Information Processing	Translation	RPS13; RPS5; RPL4; RPS8; RPS28; RPS2; RPS18; RPL23A; RPS9; RPS19; RPSA; RPL10; RPS17; RPL18; RPL35; RPS6; RPL14	17	Copper; Arteminib	2	0.020247
73	Taste transduction	Organismal Systems	Sensory system	SCN9A; PRKACA; GABRA3; HTR1B; HTR1D; SCN3A; PDE1A; HTR1A; GABRA1; CACNA1A; HTR1E; CHRM3; PDE1B; GABRA5; PRKACB; SCN2A; GABRA4; GABBR1; HTR3A; GABRA2; GABRA6; CACNA1C	22	Taurine; Felodipine; Atropine; Fasudil; Metergoline; Nimodipine; Lacidipine; Chlorpromazine; Verapamil; Fostamatinib; Maprotiline; Lamotrigine; Ranolazine; Nifedipine; Memantine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Olanzapine; Paroxetine; Isradipine; Acetylcholine; Nortriptyline; Valproic Acid; Nicardipine; Cabergoline; Loperamide; Nilvadipine; Propranolol	30	0.020624
74	Platelet activation	Organismal Systems	Immune system	PRKACA; PLA2G4A; MAPK3; MYLK4; ROCK2; MAPK14; PRKG2; PIK3CB; PIK3CG; PRKCZ; FYN; FGA; ITGB3; LYN; SYK; MYLK2; MYLK3; PIK3R1; TBXAS1; MAPK11; BTK; PRKCI; PIK3CD; MYLK; PRKACB; PIK3CA; ACTB; ACTG1; PTGS1; SRC; ROCK1; AKT1; GUCY1A2; MAPK13; MAPK1	35	Wortmannin; Genistein; Meloxicam; Naproxen; Fasudil; Dasatinib; Fostamatinib; Perifosine; LY-294002; Regorafenib; Arteminib; Isosorbide Mononitrate; Quercetin; Sulfasalazine; Ponatinib; Acetylsalicylic acid; Salicylic acid; Indomethacin; Minoxidil; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Quinacrine; Purvalanol A; Zinc	27	0.020624
75	Chronic myeloid leukemia	Human Diseases	Cancers: Specific types	TP53; TGFBF1; IKBKB; NFKBIA; CDK6; MAPK3; HDAC1; CHUK; PIK3CA; MAP2K2; ABL1; PIK3CB; TGFBF2; HDAC2; BCR; NFKB1; PIK3CD; STAT5B; BRAF; MDM2; PIK3R1; RAF1; CDK4; MAPK1; AKT1	25	Wortmannin; Vemurafenib; Nilotinib; Alvocidib; Vorinostat; Genistein; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Sulfasalazine; Ponatinib; Sorafenib; Acetylsalicylic acid; XL765; Resveratrol; Sulindac; Theophylline; Panobinostat; Valproic Acid; Mocetinostat; Imatinib; Zinc	24	0.021825
76	Pertussis	Human Diseases	Infectious diseases: Bacterial	NOS2; IRAK4; MAPK3; MAPK14; C1S; C4BPA; C1R; ITGA5; C4BPB; C5; ITGB2; IRAK1; MAPK11; CFL1; C1QC; C1QB; MAPK9; NFKB1; TNF; C3; MAPK10; SERPING1; JUN; MAPK13; MAPK1	25	Copper; Dasatinib; Sulindac; Glucosamine; Acetylsalicylic acid; Chloroquine; Thalidomide; Vinblastine; Resveratrol; Perifosine; Fostamatinib; Zinc; Simvastatin; Regorafenib; Arteminib; Dexamethasone	16	0.021825
77	cGMP-PKG signaling pathway	Environmental Information Processing	Signal transduction	PDE5A; ADRA2B; ADORA3; ADRA2C; AGTR1; ADRA1D; EDNRA; KCNJ8; MAPK3; MYLK4; ROCK2; KCNMA1; ATP1A3; PIK3CG; ATP1A1; ADRA1A; MAP2K2; CACNA1S; CACNA1D; CACNA1F; MYLK2; MYLK3; ADRA2A; PRKCE; OPRD1; INS; PRKG2; ADRB2; MYLK; NPR1; ADRA1B; INSR; ADRB3; ADORA1; ADRB1; PDE3A; CACNA1C; RAF1; ROCK1; AKT1; GUCY1A2; ATP1A2; MAPK1	43	Wortmannin; Nitroprusside; Prazosin; Isosorbide Mononitrate; Sertindole; Felodipine; Tamoxifen; Fasudil; Glyburide; Nilvadipine; Nimodipine; Lacidipine; Amiodarone; Chlorpromazine; Esmolol; Verapamil; Genistein; Ouabain; Isradipine; Fostamatinib; Spermidine; Maprotiline; Salbutamol; Resveratrol; Perifosine; LY-294002; Regorafenib; Lamotrigine; Cilostazol; Quercetin; Sildenafil; Diazoxide; Nitrendipine; Spironolactone; Loperamide; Acetylsalicylic acid; Adenosine; Sorafenib; Thioridazine; Olanzapine; Dexmedetomidine; Levosimendan; Ciclopirox; XL765; Clonidine; Nifedipine; Dronedarone; Sulindac; Theophylline; Calcium; Telmisartan; Nortriptyline; Propranolol; Citalopram; Nicardipine; Cabergoline; Zinc; Pentoxifylline; Doxazosin; Trifluoperazine; Rilmenidine	61	0.024675
78	Acute myeloid leukemia	Human Diseases	Cancers: Specific types	IKKBK; CSF1R; MAPK3; BRAF; CHUK; PIK3CA; KIT; MAP2K2; PIK3CB; PIK3R1; NFKB1; PIK3CD; STAT5B; MPO; MTOR; FLT3; RAF1; PIMI; PPARD; JUP; MAPK1; IL3; AKT1	23	Wortmannin; Vemurafenib; Nilotinib; Quizartinib; Genistein; Sirolimus; Valproic Acid; Dasatinib; Troglitazone; Fostamatinib; Perifosine; LY-294002; Regorafenib; Everolimus; Thalidomide; Quercetin; Sulfasalazine; Fenofibrate; Ponatinib; Sorafenib; GW-501516; Pazopanib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Sunitinib; Imatinib; Zinc; Melatonin; Rosiglitazone	33	0.026151

79	Herpes simplex infection	Human Diseases	Infectious diseases: Viral	TP53; IKBKB; IFNG; NFKBIA; CDK2; CSNK2A2; C1QBP; CYCS; CSNK2A1; TBK1; SRSF1; JAK1; CDK1; C5; TLR9; HNRNP; IKBKE; MAPK9; NFKB1; CHUK; EIF2AK2; EIF2AK4; SRSF4; CSNK2B; TYK2; TNF; CASP8; C3; MAPK10; JAK2; JUN; EIF2AK1	32	Bardoxolone; Copper; Resveratrol; Acetylsalicylic acid; Alvocidib; Thalidomide; Quercetin; Sulfasalazine; Ruxolitinib; Chloroquine; Fostamatinib; Vinblastine; Emodin; Zinc; Glucosamine; Hydroxychloroquine; Artenimol	17	0.02688
80	Chemokine signaling pathway	Organismal Systems	Immune system	IKBKB; PRKACA; NFKBIA; JAK3; PAK1; MAPK3; GSK3A; CHUK; PIK3CG; PRKCZ; PTK2; PRKCD; ROCK2; LYN; RAF1; PIK3CB; PIK3R1; ITK; NFKB1; PPBP; PIK3CD; FGR; PRKACB; STAT5B; BRAF; PTK2B; PIK3CA; PRKCB; PF4; JAK2; HCK; GSK3B; SRC; ROCK1; AKT1; MAPK1	36	Wortmannin; Vemurafenib; Genistein; Fasudil; Lithium; Dasatinib; Fostamatinib; Perifosine; LY-294002; Regorafenib; Heparin; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Purvalanol A	25	0.030294
81	Hepatitis B	Human Diseases	Infectious diseases: Viral	PRKCA; TP53; TGFBR1; IKBKB; NFKBIA; CDK2; CDK6; CYCS; MAPK3; CHUK; TBK1; PIK3CA; MAP2K2; JAK1; BIRC5; PRKCG; PIK3CB; YWHAB; PIK3R1; CDK4; MMP9; IKBKE; MAPK9; NFKB1; PIK3CD; STAT5B; PTK2B; TNF; MAP3K1; PRKCB; CASP8; MAPK10; JUN; RAF1; SRC; BCL2; AKT1; MAPK1	38	Wortmannin; Acetylsalicylic acid; Alvocidib; Vinblastine; Genistein; Reserpine; Obatoclax; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Artenimol; Thalidomide; Paclitaxel; Sulfasalazine; Bardoxolone; Chloroquine; Ponatinib; Sorafenib; Glucosamine; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Berberine; Purvalanol A; Zinc	29	0.031358
82	Toll-like receptor signaling pathway	Organismal Systems	Immune system	TLR8; IKBKB; NFKBIA; MAP2K6; IRAK4; MAPK3; RIPK1; MAPK14; CHUK; TBK1; PIK3CA; MAP2K2; PIK3CB; TLR9; PIK3R1; MAPK11; IKBKE; MAPK9; NFKB1; PIK3CD; TNF; MAP2K3; CASP8; TLR7; MAPK10; JUN; IRAK1; MAPK1; MAPK13; AKT1	30	Wortmannin; Dasatinib; Sulindac; Glucosamine; XL765; Thalidomide; Vinblastine; Sulfasalazine; Bardoxolone; Chloroquine; Genistein; Fostamatinib; Resveratrol; Acetylsalicylic acid; Regorafenib; Hydroxychloroquine; Imiquimod; Perifosine	18	0.032296
83	RIG-I-like receptor signaling pathway	Organismal Systems	Immune system	MAPK14; MAPK11; CHUK; TBK1; CASP8; MAP3K1; IKBKE; MAPK9; NFKB1; MAPK10; NFKBIA; TNF; IKBKB; MAPK13; RIPK1	15	Dasatinib; Glucosamine; Thalidomide; Sulfasalazine; Bardoxolone; Chloroquine; Fostamatinib; Acetylsalicylic acid; Regorafenib	9	0.033936
84	Tight junction	Cellular Processes	Cellular community - eukaryotes	PRKACA; PRKAB1; PRKAA2; PRKAG1; CFTR; PRKAG2; MAP3K1; PRKCZ; ACTN1; PRKAG3; ROCK2; PRKAB2; CACNA1D; PRKCE; MYH9; MAPK9; PRKCI; PRKACB; ACTB; TUBA1A; PRKAA1; MAPK10; ACTG1; JUN; SRC; CDK4; ROCK1; ERBB2; TUBA4A	29	Alvocidib; Afatinib; Felodipine; Fasudil; Glyburide; Metformin; Nimodipine; Lacidipine; Dasatinib; Verapamil; Cabazitaxel; Fostamatinib; Purvalanol A; Lapatinib; Artenimol; Nifedipine; Quercetin; Dronedarone; Ponatinib; Spironolactone; Acetylsalicylic acid; Nitrendipine; Vincristine; Copper; Isradipine; Tamoxifen; Vinblastine; Nicardipine; Nilvadipine	29	0.034397
85	C-type lectin receptor signaling pathway	Organismal Systems	Immune system	IKBKB; NFKBIA; PAK1; MAPK3; MAPK14; CHUK; PIK3CA; PIK3CB; MAPK9; PIK3R1; MAPK11; SYK; IKBKE; NFKB2; NFKB1; PIK3CD; PRKCD; PLK3; TNF; MDM2; CASP8; PTGS2; MAPK10; JUN; RAF1; SRC; MAPK1; MAPK13; AKT1	29	Wortmannin; Acetylsalicylic acid; Genistein; Meloxicam; Naproxen; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Sulfasalazine; Bardoxolone; Chloroquine; Ponatinib; Sorafenib; Glucosamine; Salicylic acid; Indomethacin; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Purvalanol A; Zinc	25	0.034397
86	Dilated cardiomyopathy (DCM)	Human Diseases	Cardiovascular diseases	PRKACA; RYR2; CACNB2; ITGA5; ITGB3; CACNA1S; CACNG1; CACNA1D; CACNA1F; TNNC1; CACNB3; CACNB1; TPM1; PRKACB; TNF; CACNB4; ADRB1; ACTB; CACNA1C; ACTG1; CACNA2D3; CACNA2D2; CACNA2D1	23	Fluspirilene; Dronedarone; Felodipine; Fasudil; Nimodipine; Lacidipine; Chloroquine; Esmolol; Verapamil; Fostamatinib; Spermidine; Amiodarone; Salbutamol; Azelnidipine; Artenimol; Thalidomide; Copper; Quercetin; Resveratrol; Nitrendipine; Spironolactone; Calcium; Glucosamine; Olanzapine; Levosimendan; Nifedipine; Isradipine; Lamotrigine; Tetracaine; Nortriptyline; Nicardipine; Cabergoline; Nilvadipine; Trifluoperazine; Propranolol	35	0.034802
87	Kaposi sarcoma-associated herpesvirus infection	Human Diseases	Infectious diseases: Viral	TP53; BECN1; IKBKB; NFKBIA; CDK6; MAP2K6; CYCS; MAPK3; MAPK14; CHUK; TBK1; PIK3CG; PIK3CA; MAP2K2; JAK1; LYN; RAF1; SYK; SRC; PIK3R1; MAPK11; PIK3CB; IKBKE; MAPK9; NFKB1; PIK3CD; EIF2AK2; TYK2; MTOR; HIF1A; CASP8; PTGS2; C3; MAPK10; JAK2; JUN; HCK; GSK3B; FGF2; CDK4; AKT1; MAPK13; MAPK1	43	Wortmannin; Alvocidib; Vinblastine; Genistein; Sirolimus; 2-Methoxyestradiol; Meloxicam; Naproxen; Estradiol; Lithium; Dasatinib; Fostamatinib; Perifosine; LY-294002; Regorafenib; Artenimol; Heparin; Everolimus; Thalidomide; Quercetin; Sulfasalazine; Bardoxolone; Ponatinib; Sorafenib; Acetylsalicylic acid; Salicylic acid; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Copper; PX-478; Ruxolitinib; Purvalanol A; Zinc	37	0.035519
88	Inositol phosphate metabolism	Metabolism	Carbohydrate metabolism	PIP4K2B; PIK3CG; PI4KB; PIP4K2C; PIK3CD; PIK3C2G; PIK3C2B; PIK3CB; TPI1; PI4K2B; IMPA2; IMPA1; PIK3CA	13	Wortmannin; Resveratrol; XL765; Quercetin; Fostamatinib; Zinc; LY-294002; Lithium; Artenimol	9	0.036606

89	Antigen processing and presentation	Organismal Systems	Immune system	HSPA5; HSP90AB1; HSPA2; HSPA8; IFNG; B2M; PDIA3; HSP90AA1; CTSL; CALR; CTSS; PSME1; TNF	13	Copper; Dasatinib; Glucosamine; Thalidomide; Quercetin; Chloroquine; Fostamatinib; Zinc; Acetylsalicylic acid; Melatonin; Artenimol; Geldanamycin	12	0.036606
90	Circadian rhythm	Organismal Systems	Environmental adaptation	PRKAG2; NR1D1; PRKAA1; PRKAG3; PRKAB1; PRKAA2; PRKAB2; PRKAG1	8	Fostamatinib; SR-9011; Metformin; Acetylsalicylic acid; SR-9009	5	0.040221
91	Wnt signaling pathway	Environmental Information Processing	Signal transduction	PRKCB; CSNK2A1; CAMK2A; CAMK2D; PRKCA; PRKACA; MAPK9; MAPK10; TP53; ROCK2; JUN; CSNK2A2; PPARC; GSK3B; CAMK2G; PRKACB; CSNK2B; SERPINF1; CSNK1A1; CAMK2B; PRKCG	21	Copper; Resveratrol; Sulindac; Zinc; Acetylsalicylic acid; Quercetin; Tamoxifen; Vinblastine; Troglitazone; Valproic Acid; Fostamatinib; GW-501516; Emodin; Perifosine; Fenofibrate; Fasudil; Rosiglitazone; Lithium	18	0.040221
92	VEGF signaling pathway	Environmental Information Processing	Signal transduction	MAPK14; PRKCB; MAPK11; MAPK3; HSPB1; KDR; PRKCA; PIK3CA; PLA2G4A; PIK3CD; MAP2K2; RAF1; SRC; PRKCG; PIK3CB; MAPK13; AKT1; MAPK1; PTK2; PIK3R1; PTGS2	21	Wortmannin; Genistein; Meloxicam; Naproxen; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Artenimol; Thalidomide; Sulfasalazine; Ponatinib; Sorafenib; Pazopanib; Acetylsalicylic acid; Salicylic acid; Indomethacin; Resveratrol; Sulindac; XL765; Tamoxifen; Sunitinib; Quinacrine; Purvalanol A	24	0.040274
93	Fc gamma R-mediated phagocytosis	Organismal Systems	Immune system	PRKCA; LIMK2; PLA2G4A; LIMK1; GSN; PAK1; MAPK3; PIK3CA; LYN; PRKCG; PIK3CB; PIK3R1; PRKCE; CFL1; SYK; PIK3CD; PLA2G6; PRKCD; PRKCB; HCK; RAF1; MAPK1; AKT1	23	Copper; Dasatinib; Sulindac; Perifosine; Quinacrine; Quercetin; Tamoxifen; Wortmannin; Ponatinib; Genistein; Sorafenib; Fostamatinib; Resveratrol; Zinc; Regorafenib; Artenimol; XL765	17	0.044959
94	Salivary secretion	Organismal Systems	Digestive system	ADRB1; PRKCB; ATP1A3; PRKCA; ATP1A1; GUCY1A2; ADRA1D; ADRA1A; PRKG2; CHRM3; KCNN4; PRKACB; ADRA1B; PRKACA; ADRB3; KCNMA1; ADRB2; ATP1A2; PRKCG	19	Prazosin; Maprotiline; Sertindole; Atropine; Fasudil; Chlorpromazine; Esmolol; Verapamil; Ouabain; Fostamatinib; Spermidine; Amiodarone; Salbutamol; Perifosine; Lamotrigine; Isosorbide Mononitrate; Clotrimazole; Diazoxide; Olanzapine; Thioridazine; Cyclopirox; Clonidine; Paroxetine; Dronedarone; Acetylcholine; Nortriptyline; Propranolol; Citalopram; Nicardipine; Cabergoline; Doxazosin; Trifluoperazine; Tamoxifen	33	0.048297
95	Apoptosis	Cellular Processes	Cell growth and death	TP53; AKT1; ERN1; IKBKB; NFKBIA; PARP3; CYCS; CTSS; MAPK3; RIPK1; CHUK; PIK3CA; PDPK1; MAP2K2; BIRC5; PIK3CB; PARP2; PIK3R1; NTRK1; MAPK9; NFKB1; PARP1; CTSL; PIK3CD; TNF; ACTB; CASP8; TUBA1A; MAPK10; ACTG1; JUN; RAF1; BCL2; MAPK1; IL3; TUBA4A	36	Wortmannin; Olaparib; Veliparib; Acetylsalicylic acid; Genistein; Reserpine; Obatoclox; Chloroquine; Cabazitaxel; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Artenimol; Thalidomide; Quercetin; Sulfasalazine; Bardoxolone; Vincristine; Sorafenib; Glucosamine; XL765; Copper; Resveratrol; Sulindac; Theophylline; Vinblastine; Berberine; Imatinib; Zinc	30	0.054784
96	Transcriptional misregulation in cancer	Human Diseases	Cancers: Overview	TP53; CSF1R; DDX5; FLT1; RXRG; HDAC1; CDK9; PTK2; CEBPB; TGFB2; HDAC2; MMP9; NTRK1; RXRA; NFKB1; GRIA3; MPO; BMP2K; MDM2; PPARG; FLT3; RXRB; NR4A3; JUP; MET; IL3	26	Acetylsalicylic acid; Alvocidib; Quizartinib; Vorinostat; Lithium; Sunitinib; Dasatinib; Bexarotene; Troglitazone; Fostamatinib; Amiodarone; Regorafenib; Artenimol; Thalidomide; Quercetin; Sulfasalazine; Fenofibrate; Ponatinib; Sorafenib; Pazopanib; Glucosamine; Curcumin; Indomethacin; Resveratrol; Theophylline; Telmisartan; Panobinostat; Valproic Acid; Mocetinostat; Imatinib; Zinc; Melatonin; Rosiglitazone; Crizotinib	34	0.057932
97	Regulation of lipolysis in adipocytes	Organismal Systems	Endocrine system	ADRB1; NPR1; PRKG2; PTGS2; PIK3R1; PIK3CA; INS; ADRB2; PTGS1; PRKACA; PRKACB; PIK3CB; INSR; ADRB3; PIK3CD; ADORA1; AKT1	17	Wortmannin; Nitroprusside; Genistein; Meloxicam; Naproxen; Fasudil; Esmolol; Fostamatinib; Spermidine; Amiodarone; Salbutamol; Perifosine; Lamotrigine; Thalidomide; Sulfasalazine; Resveratrol; Acetylsalicylic acid; Adenosine; Salicylic acid; Olanzapine; Indomethacin; Theophylline; Minoxidil; Dronedarone; Sulindac; XL765; Nortriptyline; Cabergoline; Zinc; Pentoxifylline; Propranolol	31	0.057932
98	Shigellosis	Human Diseases	Infectious diseases: Bacterial	MAPK14; ACTB; CHUK; MAPK11; IKBKB; MAPK9; NFKB1; MAPK10; NFKBIA; ACTG1; MAPK13; ABL1; SRC; ROCK2; ROCK1; MAPK3; RIPK2; ITGA5; PFN1; MAPK1	20	Copper; Dasatinib; Sulindac; Nilotinib; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Resveratrol; Fostamatinib; Purvalanol A; Imatinib; Acetylsalicylic acid; Fasudil; Regorafenib; Artenimol; Perifosine	17	0.059491
99	Mitophagy - animal	Cellular Processes	Transport and catabolism	ULK1; CSNK2A1; TBK1; BECN1; MAPK9; MAPK10; TP53; JUN; CSNK2A2; SRC; CSNK2B; HIF1A	12	Resveratrol; Estradiol; Acetylsalicylic acid; Quercetin; Dasatinib; Vinblastine; Ponatinib; Fostamatinib; 2-Methoxyestradiol; Purvalanol A; Emodin; Zinc; PX-478	13	0.059905
100	Prolactin signaling pathway	Organismal Systems	Endocrine system	MAPK3; MAPK14; PIK3CA; MAP2K2; RAF1; PIK3CB; INS; PIK3R1; MAPK11; MAPK9; NFKB1; PIK3CD; STAT5B;	22	Wortmannin; Ruxolitinib; Genistein; Estradiol; Lithium; Dasatinib; Fostamatinib; Perifosine; Regorafenib;	24	0.064003

				ESR1; ESR2; MAPK10; JAK2; GSK3B; SRC; MAPK1; MAPK13; AKT1		Thalidomide; Quercetin; Ponatinib; Sorafenib; Raloxifene; Acetylsalicylic acid; Resveratrol; Sulindac; XL765; Tamoxifen; Afimoxifene; Purvalanol A; Zinc; Melatonin; Fulvestrant		
101	Longevity regulating pathway	Organismal Systems	Aging	TP53; PRKACA; PRKAG3; PRKAA2; PRKAG1; CAMKK2; PRKAG2; PIK3CA; PRKAB1; PRKAB2; PIK3CB; NFKB1; PIK3R1; INS; PIK3CD; PRKACB; INSR; MTOR; ULK1; PPARG; PRKAA1; AKT1	22	Wortmannin; Genistein; Sirolimus; Fasudil; Metformin; Troglitazone; Fostamatinib; Amiodarone; Perifosine; Everolimus; Thalidomide; Sulfasalazine; Fenofibrate; Acetylsalicylic acid; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; XL765; Telmisartan; Valproic Acid; Zinc; Curcumin; Rosiglitazone	24	0.064003
102	Spliceosome	Genetic Information Processing	Transcription	HNRNPK; SF3B3; SRSF1; HSPA8; HSPA2; SF3A2; SNRPD2; SRSF4; DDX5; DDX39B	10	Quercetin; Dasatinib; Arteminol; Copper	4	0.067164
103	Necroptosis	Cellular Processes	Cell growth and death	CAMK2A; IFNG; PLA2G4A; JAK3; PARP3; PYGB; CAMK2B; PPIA; ALOX15; CAMK2D; PYGM; PARP2; RIPK1; BCL2; HSP90AB1; PYGL; JAK1; MAPK9; PARP1; EIF2AK2; CAMK2G; STAT5B; TYK2; TNF; CASP8; MAPK10; JAK2; SMPD1; HSP90AA1	29	Thalidomide; Copper; Olaparib; Veliparib; Theophylline; Alvocidib; Quinacrine; Paclitaxel; Dasatinib; Ruxolitinib; Resveratrol; Bardoxolone; Fostamatinib; Zinc; Glucosamine; Quercetin; Obatoclast; Chloroquine; Arteminol; Geldanamycin; Chlorpromazine	21	0.067164
104	Sphingolipid signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; ADORA3; TP53; MAPK3; ROCK2; MAPK14; PIK3CA; PDPK1; FYN; MAP2K2; PRKCG; PIK3CB; PIK3R1; BCL2; MAPK11; OPRD1; MAPK9; NFKB1; PIK3CD; TNF; ADORA1; PRKCB; MAPK10; PRKCZ; PRKCE; RAF1; SMPD1; ROCK1; MAPK1; MAPK13; AKT1	31	Wortmannin; Acetylsalicylic acid; Genistein; Obatoclast; Fasudil; Dasatinib; Chlorpromazine; Fostamatinib; Perifosine; Regorafenib; Lamotrigine; Thalidomide; Paclitaxel; Chloroquine; Sorafenib; Pentoxifylline; Glucosamine; Adenosine; XL765; Resveratrol; Sulindac; Theophylline; Tamoxifen; Zinc; Loperamide	25	0.067934
105	Linoleic acid metabolism	Metabolism	Lipid metabolism	ALOX15; PLA2G4A; PLA2G6; CYP2C8; CYP2C19; CYP3A4; PLA2G1B; PLA2G2A; CYP1A2	9	Quinacrine; Resveratrol; Isoniazid; Sulfasalazine; Indomethacin	5	0.070122
106	Epithelial cell signaling in Helicobacter pylori infection	Human Diseases	Infectious diseases: Bacterial	MAPK14; MAPK11; CHUK; ATP6V1A; IKBKB; MAPK9; NFKB1; MAPK10; NFKBIA; CSK; JUN; LYN; EGFR; SRC; PAK1; MET; MAPK13	17	Dasatinib; Alvocidib; Thalidomide; Bafilomycin A1; Gefitinib; Sulfasalazine; Vinblastine; Ponatinib; Afatinib; Fostamatinib; Purvalanol A; Crizotinib; Acetylsalicylic acid; Lapatinib; Regorafenib; Erlotinib	16	0.076891
107	NF-kappa B signaling pathway	Environmental Information Processing	Signal transduction	IKKB; NFKBIA; CSNK2A2; IRAK4; RIPK1; CSNK2A1; LYN; SYK; IRAK1; BTK; NFKB2; NFKB1; CHUK; PARP1; CSNK2B; TNF; PRKCB; PTGS2; LCK; PRKCQ; ZAP70; BCL2	22	Olaparib; Veliparib; Acetylsalicylic acid; Meloxicam; Naproxen; Obatoclast; Dasatinib; Fostamatinib; Paclitaxel; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Glucosamine; Salicylic acid; Chloroquine; Indomethacin; Resveratrol; Sulindac; Theophylline; Tamoxifen; Zinc; Emodin	23	0.081752
108	Th17 cell differentiation	Organismal Systems	Immune system	RXR; TGFB; IKBKB; IFNG; NFKBIA; PRKCQ; JAK3; MAPK3; RXRG; TGFB2; MAPK14; CHUK; AHR; MAPK11; HSP90AB1; RXRA; JAK1; MAPK9; NFKB1; HSP90AA1; STAT5B; MTOR; TYK2; HIF1A; LCK; MAPK10; JAK2; JUN; ZAP70; MAPK13; MAPK1	31	Glucosamine; Omeprazole; Vinblastine; Sirolimus; 2-Methoxyestradiol; Emodin; Cantharidin; Nimodipine; Ridaforolimus; Dasatinib; Bexarotene; Fostamatinib; Perifosine; Regorafenib; PX-478; Everolimus; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Acetylsalicylic acid; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Atorvastatin; Rosiglitazone; Geldanamycin	31	0.08302
109	Bladder cancer	Human Diseases	Cancers: Specific types	DAPK2; MDM2; MMP9; EGFR; DAPK3; FGFR3; TP53; MAP2K2; RAF1; SRC; CDK4; BRAF; MAPK3; ERBB2; DAPK1; MAPK1	16	Sulindac; Dasatinib; Vemurafenib; Zinc; Alvocidib; Acetylsalicylic acid; Lapatinib; Perifosine; Gefitinib; Ponatinib; Afatinib; Sorafenib; Fostamatinib; Purvalanol A; Pazopanib; Glucosamine; Regorafenib; Erlotinib	18	0.08367
110	Insulin secretion	Organismal Systems	Endocrine system	PRKCA; PRKACA; ABCC8; CAMK2B; RYR2; ATP1A3; CAMK2D; KCNJ11; ATP1A1; CACNA1S; CACNA1D; PRKCG; CACNA1F; KCNA1; INS; CHRM3; KCNN4; SLC2A1; CAMK2G; PRKACB; PRKCB; CACNA1C; CAMK2A; ATP1A2	24	Felodipine; Atropine; Fasudil; Glyburide; Nimodipine; Lacidipine; Chlorpromazine; Verapamil; Ouabain; Fostamatinib; Maprotiline; Resveratrol; Perifosine; Lamotrigine; Clotrimazole; Paroxetine; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Calcium; Olanzapine; Levosimendan; Ciclopirox; Nifedipine; Isradipine; Acetylcholine; Tamoxifen; Nicardipine; Zinc; Nilvadipine; Tetracaine; Nortriptyline	33	0.083922

111	Human cytomegalovirus infection	0	0	PRKCA; TP53; IKBKB; PRKACA; NFKBIA; CDK6; MAP2K6; CYCS; MAPK3; ROCK2; RIPK1; MAPK14; MAP2K2; CHUK; TBK1; PIK3CA; PTK2; PDGFRA; TNF; PDIA3; ITGB3; RAF1; PRKCG; PIK3CB; CALR; PIK3R1; MAPK11; B2M; JAK1; NFKB1; PIK3CD; EGFR; PRKACB; PTK2B; MTOR; MDM2; PRKCB; CASP8; PTGS2; GSK3B; SRC; CDK4; ROCK1; AKT1; MAPK13; MAPK1	46	Wortmannin; Acetylsalicylic acid; Alvocidib; Afatinib; Genistein; Sirolimus; Meloxicam; Naproxen; Fasudil; Lithium; Ridaforolimus; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Arteminol; Everolimus; Thalidomide; Lapatinib; Sulfasalazine; Bardoxolone; Ponatinib; Sorafenib; Pazopanib; Glucosamine; Salicylic acid; Chloroquine; Indomethacin; Temsirolimus; Copper; Resveratrol; Sulindac; XL765; Tamoxifen; Ruxolitinib; Sunitinib; Purvalanol A; Imatinib; Zinc; Melatonin; Erlotinib	42	0.085823
112	Endocrine and other factor-regulated calcium reabsorption	Organismal Systems	Excretory system	PRKCA; ATP1A3; VDR; PRKCB; ATP1A1; PRKACA; ESR1; PRKCG; ATP1A2; PRKACB	10	Afimoxifene; Resveratrol; Zinc; Estradiol; Quercetin; Tamoxifen; Ouabain; Diazoxide; Genistein; Fostamatinib; Raloxifene; Perifosine; Fasudil; Curcumin; Melatonin; Cyclopirox; Fulvestrant	17	0.103565
113	Toxoplasmosis	Human Diseases	Infectious diseases: Parasitic	HSPA8; NOS2; IFNG; NFKBIA; IRAK4; MAP2K6; CYCS; MAPK3; MAPK14; CHUK; PIK3CG; PDPK1; ALOX5; IKBKB; IRAK1; MAPK11; JAK1; MAPK9; NFKB1; TYK2; TNF; MAP2K3; CASP8; HSPA2; MAPK10; JAK2; BCL2; MAPK1; MAPK13; AKT1	30	Wortmannin; Acetylsalicylic acid; Genistein; Obatoclox; Dasatinib; Fostamatinib; Perifosine; Paclitaxel; LY-294002; Regorafenib; Arteminol; Dexamethasone; Thalidomide; Quercetin; Sulfasalazine; Bardoxolone; Chloroquine; Glucosamine; Rhein; Copper; Resveratrol; Sulindac; XL765; Masoprocol; Ruxolitinib	25	0.110751
114	Olfactory transduction	Organismal Systems	Sensory system	PRKG2; CAMK2D; PRKACA; CAMK2A; PDE1B; CAMK2G; PRKACB; PDE1A; CAMK2B	9	Fostamatinib; Nicardipine; Felodipine; Fasudil	4	0.111475
115	Hippo signaling pathway - multiple species	Environmental Information Processing	Signal transduction	STK3; LATS1; PAK1	3	Fostamatinib	1	0.111475
116	Long-term potentiation	Organismal Systems	Nervous system	PRKCB; MAPK3; RPS6KA1; CAMK2D; RPS6KA3; PRKCA; GRIN2B; PRKACA; CACNA1C; CAMK2A; RPS6KA6; MAP2K2; RAF1; CAMK2G; PRKACB; GRIN1; BRAF; MAPK1; GRIN2A; CAMK2B; PRKCG	21	Vemurafenib; Taurine; Felodipine; Fasudil; Nimodipine; Lacidipine; Verapamil; Fostamatinib; Nicardipine; Perifosine; Regorafenib; Sorafenib; Memantine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Nifedipine; Isradipine; Sulindac; Tamoxifen; Purvalanol A; Nilvadipine	24	0.112046
117	Small cell lung cancer	Human Diseases	Cancers: Specific types	TP53; NOS2; NFKBIA; CDK2; CYCS; CKS1B; CDK6; RXRG; CHUK; PIK3CA; PTK2; IKBKB; PIK3CB; PIK3R1; BCL2; RXRA; NFKB1; PIK3CD; PTGS2; RXRB; CDK4; FN1; AKT1	23	Wortmannin; Alvocidib; Genistein; Meloxicam; Naproxen; Obatoclox; Fluoxetine; Bexarotene; Fostamatinib; Perifosine; Arteminol; Dexamethasone; Thalidomide; Paclitaxel; Sulfasalazine; Acetylsalicylic acid; Salicylic acid; Indomethacin; Resveratrol; Sulindac; XL765; Zinc; Rosiglitazone	23	0.114889
118	Cell cycle	Cellular Processes	Cell growth and death	MDM2; PLK1; TP53; WEE1; CDK7; CHEK2; TTK; CHEK1; CDK2; ABL1; GSK3B; CDK4; PKMYT1; CDK6; YWHAB; CDK1; HDAC2; HDAC1	18	Wortmannin; Dasatinib; Lithium; Nilotinib; Alvocidib; Copper; Panobinostat; Theophylline; Vorinostat; Ponatinib; Valproic Acid; Fostamatinib; Mocetinostat; Zinc; Acetylsalicylic acid; Regorafenib; Imatinib	17	0.117573
119	Phosphatidylinositol signaling system	Environmental Information Processing	Signal transduction	PRKCB; PIK3C2G; PIK3CA; PIP4K2B; PRKCA; PI4KB; PIP4K2C; PIK3CD; IMPA1; PIK3C2B; PRKCG; PIK3CB; PI4K2B; IMPA2; PIK3R1	15	Wortmannin; Resveratrol; XL765; Tamoxifen; Fostamatinib; Perifosine; Lithium	7	0.12043
120	Systemic lupus erythematosus	Human Diseases	Immune diseases	C1QC; C1QB; GRIN2B; GRIN2A; C3; ACTN1; IFNG; C1R; C1S; C8B; C9; C8G; C5; C8A; TNF	15	Copper; Chloroquine; Zinc; Thalidomide; Memantine; Taurine; Glucosamine	7	0.12043
121	Renal cell carcinoma	Human Diseases	Cancers: Specific types	SLC2A1; PAK2; PAK5; HGF; PAK3; PIK3CA; HIF1A; PAK4; PIK3CD; MAP2K2; RAF1; PIK3CB; PAK1; AKT1; JUN; BRAF; MAPK3; MET; PIK3R1; MAPK1	20	Heparin; Wortmannin; Resveratrol; Vemurafenib; XL765; Vinblastine; Genistein; Sorafenib; Fostamatinib; 2-Methoxyestradiol; Sulindac; Crizotinib; Perifosine; Regorafenib; PX-478	15	0.120535
122	Chagas disease (American trypanosomiasis)	Human Diseases	Infectious diseases: Parasitic	TGFBR1; NOS2; NFKBIA; IRAK4; SERPINE1; MAPK3; TGFBR2; MAPK14; CHUK; PIK3CA; ACE; IKBKB; PIK3CB; CALR; TLR9; PIK3R1; MAPK11; C1QC; C1QB; MAPK9; NFKB1; PIK3CD; TNF; CASP8; C3; MAPK10; IFNG; JUN; IRAK1; MAPK1; MAPK13; AKT1	32	Wortmannin; Acetylsalicylic acid; Genistein; Enalaprilat; Dasatinib; Troglitazone; Fostamatinib; Perifosine; Hydroxychloroquine; Regorafenib; Dexamethasone; Thalidomide; Sulfasalazine; Bardoxolone; Chloroquine; Glucosamine; Copper; Resveratrol; Sulindac; XL765; Vinblastine; Zinc; Melatonin	23	0.1258

123	p53 signaling pathway	Cellular Processes	Cell growth and death	SIVA1; MDM2; TP53; SERPINE1; CHEK2; TP73; CDK2; CDK6; BCL2; CYCS; CASP8; CDK1; CHEK1; CDK4	14	Copper; Zinc; Alvocidib; Paclitaxel; Bardoxolone; Troglitazone; Fostamatinib; Acetylsalicylic acid; Obatoclox; Artenimol	10	0.131021
124	B cell receptor signaling pathway	Organismal Systems	Immune system	PRKCB; CHUK; GSK3B; BTK; PIK3CB; IKKBK; PIK3CA; NFKB1; NFKBIA; PIK3CD; MAP2K2; LYN; RAF1; SYK; AKT1; JUN; MAPK3; PIK3R1; MAPK1	19	Wortmannin; Dasatinib; Regorafenib; XL765; Thalidomide; Tamoxifen; Sulfasalazine; Vinblastine; Ponatinib; Genistein; Sorafenib; Fostamatinib; Sulindac; Resveratrol; Acetylsalicylic acid; Lithium; Perifosine	17	0.131021
125	Ribosome biogenesis in eukaryotes	Genetic Information Processing	Translation	CSNK2A1; RIOK2; EIF6; CSNK2A2; RIOK1; CSNK2B	6	Copper; Quercetin; Resveratrol; Emodin; Fostamatinib	5	0.131165
126	Protein processing in endoplasmic reticulum	Genetic Information Processing	Folding, sorting and degradation	HSPA5; HSP90AB1; HSPA2; HSPA8; MAPK9; MAPK10; ERN1; PDIA3; EIF2AK2; HSP90AA1; BCL2; CALR; EIF2AK1; P4HB; HSP90B1; EIF2AK4	16	Copper; Dasatinib; Zinc; Quercetin; Fostamatinib; Acetylsalicylic acid; Paclitaxel; Obatoclox; Melatonin; Artenimol; Geldanamycin	11	0.138247
127	Melanogenesis	Organismal Systems	Endocrine system	PRKCB; POMC; MAPK3; CAMK2D; PRKCA; PRKACA; CAMK2A; CAMK2B; MAP2K2; GSK3B; RAF1; CAMK2G; PRKACB; MAPK1; KIT; PRKCG	16	Sunitinib; Dasatinib; Sulindac; Nilotinib; Tamoxifen; Ponatinib; Sorafenib; Fostamatinib; Regorafenib; Pazopanib; Perifosine; Loperamide; Fasudil; Lithium; Imatinib	15	0.138247
128	African trypanosomiasis	Human Diseases	Infectious diseases: Parasitic	PRKCB; HBB; HPR; PRKCA; IFNG; APOL1; TNF; PRKCG; APOA1; TLR9	10	Copper; Chloroquine; Perifosine; Thalidomide; Tamoxifen; Fostamatinib; Zinc; Glucosamine; Hydroxychloroquine	9	0.141106
129	Glucagon signaling pathway	Organismal Systems	Endocrine system	PRKACA; PRKAG1; PRKAG3; PRKAA2; PYGB; CAMK2B; PRKAG2; LDHB; PYGM; PRKAB1; PGAM1; PRKAB2; PYGL; PHKG1; SLC2A1; CAMK2G; PRKACB; PPARA; SIK2; CAMK2D; PRKAA1; CAMK2A; CPT1A; LDHA; PKM; AKT1	26	Copper; Resveratrol; Perifosine; Alvocidib; Artenimol; Fenofibrate; Troglitazone; Genistein; Valproic Acid; Fostamatinib; GW-501516; Acetylsalicylic acid; Fasudil; Glyburide; Rosiglitazone; Metformin; Indomethacin	17	0.147107
130	Choline metabolism in cancer	Human Diseases	Cancers: Overview	PRKCA; PLA2G4A; MAPK3; EGFR; PIK3CA; PDPK1; PDGFRA; PDGFRB; MAP2K2; PRKCG; PIK3CB; PIK3R1; MAPK9; PIK3CD; MTOR; PRKCB; HIF1A; MAPK10; JUN; RAF1; MAPK1; AKT1	22	Wortmannin; Alvocidib; Afatinib; Genistein; Sirolimus; 2-Methoxyestradiol; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; PX-478; Everolimus; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Vinblastine; Sunitinib; Quinacrine; Imatinib; Erlotinib	28	0.147107
131	Leukocyte transendothelial migration	Organismal Systems	Immune system	PRKCA; PTK2; ITGAL; ROCK2; MAPK14; PIK3CA; ACTN1; PRKCG; PIK3CB; ITGB2; PIK3R1; MAPK11; MMP9; ITK; PRKCB; PIK3CD; PTK2B; TXK; ACTB; ACTG1; ROCK1; MAPK13	22	Wortmannin; Dasatinib; Glucosamine; XL765; Copper; Quercetin; Tamoxifen; Genistein; Fostamatinib; Zinc; Perifosine; Fasudil; Simvastatin; Regorafenib; Artenimol; Pazopanib	16	0.147763
132	AMPK signaling pathway	Environmental Information Processing	Signal transduction	PRKAG3; PRKAA2; PRKAG1; CAMKK2; CFTR; PRKAG2; PIK3CA; PDPK1; ADRA1A; PRKAB1; PRKAB2; PIK3CB; PIK3R1; HMGCR; INS; PIK3CD; INSR; MTOR; ULK1; PPARG; PRKAA1; CPT1A; AKT1	23	Wortmannin; Prazosin; Sertindole; Sirolimus; Indomethacin; Glyburide; Metformin; Simvastatin; Amiodarone; Fluvastatin; Chlorpromazine; Verapamil; Troglitazone; Rosuvastatin; Fostamatinib; Maprotiline; Perifosine; Lamotrigine; Everolimus; Sulfasalazine; Fenofibrate; Resveratrol; Acetylsalicylic acid; Genistein; Curcumin; Olanzapine; Thioridazine; Temsirolimus; Clonidine; Ridaforolimus; Dronedarone; Mevastatin; XL765; Telmisartan; Nortriptyline; Valproic Acid; Citalopram; Nicardipine; Cabergoline; Zinc; Atorvastatin; Doxazosin; Rosiglitazone; Trifluoperazine	44	0.158557
133	Pancreatic cancer	Human Diseases	Cancers: Specific types	TP53; TGFBR1; IKKBK; CDK6; MAPK3; TGFBR2; CHUK; EGFR; PIK3CA; PIK3CB; PIK3R1; JAK1; MAPK9; NFKB1; PIK3CD; BRAF; MTOR; MAPK10; RAF1; CDK4; MAPK1; ERBB2; AKT1	23	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Everolimus; Thalidomide; Lapatinib; Sulfasalazine; Sorafenib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Ruxolitinib; Zinc; Erlotinib	24	0.158557
134	Amphetamine addiction	Human Diseases	Substance dependence	PRKCB; SLC18A1; CAMK2D; PRKCA; GRIN2B; GRIN3A; CACNA1C; CAMK2A; CAMK2B; JUN; GRIN1; CAMK2G; PRKCG; PRKACA; GRIA3; CACNA1D; HDAC1; DRD1; SLC18A2; GRIN2A; PRKACB	21	Panobinostat; Vorinostat; Taurine; Reserpine; Felodipine; Trifluoperazine; Fasudil; Lithium; Nimodipine; Lacidipine; Chlorpromazine; Verapamil; Fostamatinib; Perifosine; Lamotrigine; Fluphenazine; Memantine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Olanzapine; Thioridazine; Nifedipine; Isradipine; Tamoxifen; Vinblastine; Mocetinostat; Nicardipine; Cabergoline; Zinc; Nilvadipine	32	0.159732

135	Oocyte meiosis	Cellular Processes	Cell growth and death	PLK1; AR; RPS6KA1; CAMK2A; RPS6KA3; PRKACA; INS; PGR; CAMK2D; AURKA; RPS6KA6; CDK2; SLK; PKMYT1; CAMK2G; PRKACB; YWHAB; CDK1; MAPK3; CAMK2B; MAPK1	21	Sulindac; Wortmannin; Perifosine; Fluphenazine; AT9283; Zinc; Alvocidib; Enzalutamide; Copper; Tamoxifen; Dienogest; Spironolactone; Fostamatinib; Mifepristone; Purvalanol A; Acetylsalicylic acid; Fasudil; Bicalutamide; Alisertib	19	0.16048
136	Cushing syndrome	Human Diseases	Endocrine and metabolic diseases	POMC; CACNA1H; PRKACA; AGTR1; CDK2; AHR; CDK6; MAPK3; CAMK2B; EGFR; CAMK2D; MAP2K2; CACNA1S; CACNA1D; CACNA1F; KCNK2; CAMK2G; CYP11B1; BRAF; CACNA1I; CACNA1C; CAMK2A; GSK3B; CDK4; MAPK1; CACNA1G; PRKACB	27	Vemurafenib; Cantharidin; Alvocidib; Dronedarone; Afatinib; Emodin; Felodipine; Omeprazole; Fasudil; Metyrapone; Lithium; Atorvastatin; Nimodipine; Lacidipine; Verapamil; Gefitinib; Fostamatinib; Amiodarone; Perifosine; Quercetin; Regorafenib; Sorafenib; Lapatinib; Resveratrol; Nitrendipine; Spironolactone; Loperamide; Nifedipine; Isradipine; Sulindac; Calcium; Telmisartan; Nifedipine; Flunarizine; Nilvadipine; Erlotinib	36	0.161127
137	AGE-RAGE signaling pathway in diabetic complications	Human Diseases	Endocrine and metabolic diseases	PRKCA; TGFB1; AGTR1; MAPK3; TGFB2; MAPK14; PIK3CA; PRKCZ; PRKCD; PIK3CB; PIK3R1; BCL2; MAPK11; SERPINE1; MAPK9; NFKB1; PIK3CD; STAT5B; TNF; PRKCB; MAPK10; JAK2; MAPK13; JUN; PRKCE; PIM1; CDK4; MAPK1; FN1; AKT1	30	Wortmannin; Acetylsalicylic acid; Alvocidib; Vinblastine; Genistein; Obatoclast; Dasatinib; Troglitazone; Fostamatinib; Perifosine; Quercetin; LY-294002; Regorafenib; Thalidomide; Paclitaxel; Chloroquine; Glucosamine; Copper; Resveratrol; Sulindac; XL765; Telmisartan; Tamoxifen; Ruxolitinib; Zinc	25	0.166764
138	Thyroid cancer	Human Diseases	Cancers: Specific types	PPARG; NTRK1; RXRA; RET; RXRB; TP53; MAP2K2; BRAF; MAPK3; RXRG; MAPK1	11	Sulindac; Sorafenib; Resveratrol; Regorafenib; Acetylsalicylic acid; Bexarotene; Telmisartan; Sulfasalazine; Fenofibrate; Ponatinib; Troglitazone; Valproic Acid; Fostamatinib; Vemurafenib; Amiodarone; Imatinib; Zinc; Curcumin; Rosiglitazone; Indomethacin; Perifosine	21	0.169327
139	Staphylococcus aureus infection	Human Diseases	Infectious diseases: Bacterial	KRT10; C5; C1QC; SELP; C1S; C1R; C3; CFB; CFI; ITGAL; PLG; CFH; ITGB2; PTAFR; C1QB	15	Heparin; Copper; Simvastatin; Zinc; Rupatadine	5	0.189061
140	Tuberculosis	Human Diseases	Infectious diseases: Bacterial	CAMK2A; NOS2; JAK2; IRAK4; CYCS; CTSS; MAPK3; CAMK2B; MAPK14; CAMK2D; CEBPB; SYK; HSPD1; RIPK2; TLR9; IRAK1; MAPK11; JAK1; MAPK9; NFKB1; CAMK2G; VDR; PLK3; TNF; CASP8; C3; MAPK10; IFNG; ITGB2; RAF1; SRC; BCL2; MAPK1; MAPK13; AKT1	35	Acetylsalicylic acid; Genistein; Obatoclast; Simvastatin; Dasatinib; Fostamatinib; Perifosine; Paclitaxel; Hydroxychloroquine; Regorafenib; Arteminib; Dexamethasone; Thalidomide; Quercetin; Bardoxolone; Chloroquine; Ponatinib; Sorafenib; Glucosamine; Copper; Resveratrol; Sulindac; Ruxolitinib; Purvalanol A; Zinc; Curcumin	26	0.197331
141	Osteoclast differentiation	Organismal Systems	Development	TGFB1; IKKB; CSF1R; MAP2K6; MAPK3; TGFB2; MAPK14; CHUK; PIK3CB; PIK3CA; FYN; ITGB3; SYK; MAPK9; PIK3R1; MAPK11; BTK; JAK1; NFKB2; NFKB1; PIK3CD; TEC; TNF; PPARG; TYK2; LCK; MAPK10; IFNG; NFKBIA; JUN; MAPK1; MAPK13; AKT1	33	Wortmannin; Acetylsalicylic acid; Vinblastine; Genistein; Valproic Acid; Dasatinib; Troglitazone; Fostamatinib; Amiodarone; Perifosine; Regorafenib; Thalidomide; Sulfasalazine; Fenofibrate; Chloroquine; Ponatinib; Glucosamine; Indomethacin; Resveratrol; Sulindac; XL765; Telmisartan; Ruxolitinib; Sunitinib; Imatinib; Curcumin; Rosiglitazone	27	0.20199
142	Colorectal cancer	Human Diseases	Cancers: Specific types	TP53; TGFB1; CYCS; MAPK3; TGFB2; EGFR; PIK3CA; MAP2K2; RAF1; BIRC5; PIK3CB; PIK3R1; MAPK9; PIK3CD; BRAF; MTOR; MAPK10; JUN; GSK3B; BCL2; MAPK1; AKT1	22	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Reserpine; Obatoclast; Lithium; Gefitinib; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Arteminib; Everolimus; Lapatinib; Sorafenib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Vinblastine; Berberine; Zinc; Erlotinib	28	0.209365
143	Arachidonic acid metabolism	Metabolism	Lipid metabolism	PLA2G6; HPGDS; ALOX15; PLA2G4A; EPHX2; PLA2G1B; PTGS1; ALOX5; CBR1; AKR1C3; CYP2C8; CYP2C19; PTGES3; TBXAS1; PLA2G2A; PTGS2	16	Minoxidil; Copper; Resveratrol; Sulindac; Thalidomide; Fostamatinib; Rutin; Sulfasalazine; Quercetin; Quinacrine; Isoniazid; Meloxicam; Naproxen; Acetylsalicylic acid; Rhein; Salicylic acid; Ebselen; Curcumin; Masoprocol; nocodazole; Indomethacin	21	0.210184
144	Hippo signaling pathway	Environmental Information Processing	Signal transduction	ACTB; SERPINE1; BMP4; BMP1B; TGFB1; PRKCI; ACTG1; TP73; PRKCZ; GSK3B; BMPR2; BIRC5; FGF1; YWHAB; TGFB2; LATS1; ITGB2; STK3	18	Heparin; Copper; Calcium; Quercetin; Tamoxifen; Troglitazone; Fostamatinib; Reserpine; Pazopanib; Zinc; Berberine; Simvastatin; Lithium; Arteminib	14	0.210184
145	Relaxin signaling pathway	Organismal Systems	Endocrine system	PRKCA; TGFB1; NOS2; PRKACA; NFKBIA; MAPK3; TGFB2; MAPK14; EGFR; PIK3CA; PRKCZ; MAP2K2; PIK3CB; PIK3R1; MAPK11; MMP9; MAPK9; NFKB1;	27	Wortmannin; Acetylsalicylic acid; Alvocidib; Afatinib; Genistein; Fasudil; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Regorafenib; Dexamethasone; Thalidomide; Lapatinib; Ponatinib; Sorafenib; Glucosamine; Resveratrol;	25	0.213773

				PIK3CD; PRKACB; MAPK10; JUN; RAF1; SRC; MAPK1; MAPK13; AKT1		Sulindac; XL765; Tamoxifen; Vinblastine; Purvalanol A; Zinc; Erlotinib		
146	Pentose and glucuronate interconversions	Metabolism	Carbohydrate metabolism	AKR1B1; AKR1B10; UGT1A1; AKR1A1; UGDH	5	Fostamatinib; Sulindac; Copper	3	0.218118
147	Protein export	Genetic Information Processing	Folding, sorting and degradation	HSPA5; SRP14	2	Copper; Artenimol; Acetylsalicylic acid	3	0.247985
148	Salmonella infection	Human Diseases	Infectious diseases: Bacterial	MAPK14; MYH9; FLNA; ACTB; NOS2; MAPK9; NFKB1; MAPK10; IFNG; PKN2; ACTG1; ROCK2; JUN; MAPK11; PKN1; ROCK1; MAPK3; MAPK13; PFN1; MAPK1	20	Copper; Dasatinib; Sulindac; Glucosamine; Thalidomide; Quercetin; Vinblastine; Perifosine; Fostamatinib; Acetylsalicylic acid; Fasudil; Regorafenib; Artenimol; Dexamethasone	14	0.249746
149	Hedgehog signaling pathway	Environmental Information Processing	Signal transduction	SMO; BCL2; PRKACA; GSK3B; PRKACB; CSNK1G3; CSNK1A1	7	Paclitaxel; Fostamatinib; Purvalanol A; Obatoclax; Fasudil; Lithium; Vismodegib	7	0.259873
150	Vibrio cholerae infection	Human Diseases	Infectious diseases: Bacterial	ACTB; PRKCA; PRKACA; ATP6V1A; ACTG1; PRKACB; CFTR	7	Copper; Bafilomycin A1; Quercetin; Tamoxifen; Fostamatinib; Perifosine; Fasudil; Glyburide; Artenimol	9	0.259873
151	Th1 and Th2 cell differentiation	Organismal Systems	Immune system	MAPK14; MAPK11; CHUK; TYK2; LCK; IKBKB; JAK2; NFKB1; MAPK10; IFNG; NFKBIA; JUN; PRKCQ; ZAP70; JAK3; STAT5B; MAPK9; JAK1; MAPK3; MAPK13; MAPK1	21	Dasatinib; Sulindac; Glucosamine; Thalidomide; Vinblastine; Tamoxifen; Sulfasalazine; Ruxolitinib; Ponatinib; Fostamatinib; Acetylsalicylic acid; Regorafenib; Perifosine	13	0.266164
152	Legionellosis	Human Diseases	Infectious diseases: Bacterial	EEF1A1; CASP8; HSPA2; HSPA8; NFKB2; NFKB1; NFKBIA; TNF; C3; CLK1; CYCS; HSPD1; ITGB2	13	Copper; Dasatinib; Glucosamine; Thalidomide; Acetylsalicylic acid; Quercetin; Bardoxolone; Chloroquine; Fostamatinib; Zinc; Simvastatin; Artenimol	12	0.279578
153	Natural killer cell mediated cytotoxicity	Organismal Systems	Immune system	PRKCA; ITGAL; PAK1; MAPK3; PIK3CA; FYN; MAP2K2; PRKCG; PIK3CB; ITGB2; PIK3R1; SYK; PIK3CD; BRAF; PTK2B; TNF; PRKCB; LCK; IFNG; ZAP70; RAF1; MAPK1	22	Wortmannin; Dasatinib; Sulindac; Glucosamine; XL765; Thalidomide; Tamoxifen; Chloroquine; Ponatinib; Genistein; Sorafenib; Fostamatinib; Vemurafenib; Perifosine; Simvastatin; Regorafenib	16	0.279578
154	Fluid shear stress and atherosclerosis	Human Diseases	Cardiovascular diseases	TP53; ACVR1; IKBKB; PRKAA2; MAP2K6; BMP4; MAPK14; CHUK; MAP2K5; PRKCZ; PTK2; ITGB3; GSTA2; PIK3CB; PIK3R1; MAPK11; MMP9; HSP90AB1; KDR; MAPK9; NFKB1; PIK3CD; BMPR2; CTSL; MAPK7; HSP90B1; TNF; PIK3CA; ACTB; BMPR1B; GSTP1; PRKAA1; MAPK10; IFNG; ACTG1; JUN; SRC; BCL2; HSP90AA1; MAPK13; AKT1	41	Wortmannin; Acetylsalicylic acid; Genistein; Obatoclax; Dasatinib; Troglitazone; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Artenimol; Thalidomide; Quercetin; Sulfasalazine; Ponatinib; Sorafenib; Calcium; Pazopanib; Glucosamine; Chloroquine; Copper; Resveratrol; XL765; Tamoxifen; Vinblastine; Sunitinib; Purvalanol A; Zinc; Curcumin; Geldanamycin	30	0.280882
155	Endometrial cancer	Human Diseases	Cancers: Specific types	TP53; GSK3B; PIK3CA; PDPK1; PIK3CD; MAP2K2; EGFR; RAF1; PIK3CB; AKT1; BRAF; MAPK3; ERBB2; PIK3R1; MAPK1	15	Sulindac; Wortmannin; Perifosine; Regorafenib; Zinc; Alvocidib; Lapatinib; Gefitinib; Resveratrol; Afatinib; Genistein; Sorafenib; Fostamatinib; Vemurafenib; Erlotinib; Acetylsalicylic acid; Lithium; XL765	18	0.281985
156	TNF signaling pathway	Environmental Information Processing	Signal transduction	IKKBK; NFKBIA; MAP2K6; MAPK3; RIPK1; MAPK14; CHUK; PIK3CA; CEBPB; PIK3CB; PIK3R1; MAPK11; MMP9; MAPK9; NFKB1; PIK3CD; TNF; MAP2K3; CASP8; PTGS2; MAPK10; JUN; MAPK1; MAPK13; AKT1	25	Wortmannin; Acetylsalicylic acid; Genistein; Meloxicam; Naproxen; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Quercetin; Sulfasalazine; Bardoxolone; Chloroquine; Glucosamine; Salicylic acid; Indomethacin; Resveratrol; Sulindac; XL765; Vinblastine; Zinc	22	0.287016
157	PPAR signaling pathway	Organismal Systems	Endocrine system	APOC3; NR1H3; RXRA; PDPK1; RXRB; PPARG; ACSL4; APOA2; PPARG; ACAA1; CPT1A; APOA1; RXRG; PPARG	14	Copper; Resveratrol; Sulindac; Bexarotene; Telmisartan; Sulfasalazine; Fenofibrate; Troglitazone; Valproic Acid; Fostamatinib; GW-501516; Amiodarone; Trimetazidine; Zinc; Rhein; Curcumin; Rosiglitazone; Glyburide; Indomethacin	19	0.307116
158	ABC transporters	Environmental Information Processing	Membrane transport	ABCB11; ABCA1; ABCC8; ABCC5; ABCC9; ABCB1; CFTR	7	Glyburide; Curcumin; Voacamine; Concanamycin A	4	0.348534
159	Bacterial invasion of epithelial cells	Human Diseases	Infectious diseases: Bacterial	ACTB; PIK3CA; PTK2; ACTG1; FN1; SRC; PIK3CB; MET; PIK3CD; ITGA5; PIK3R1	11	Copper; Dasatinib; XL765; Wortmannin; Quercetin; Ponatinib; Resveratrol; Fostamatinib; Purvalanol A; Crizotinib; Zinc; Artenimol	12	0.348534
160	Bile secretion	Organismal Systems	Digestive system	SLCO1B3; ATP1A3; SLCO1B1; HMGCR; RXRA; ATP1A1; PRKACA; ABCB11; ATP1A2; SLC2A1; AQP1; PRKACB; CYP3A4; ABCB1; CFTR; CA2	16	ginsenoside Rb1; Resveratrol; Isoniazid; Fluvastatin; Bexarotene; Ouabain; Voacamine; Diazoxide; Fostamatinib; Glyburide; Acetazolamide; Clarithromycin; Fasudil;	20	0.357986

						Atorvastatin; Mevastatin; Simvastatin; Rosiglitazone; Rosuvastatin; Ciclopirox; Concanamycin A		
161	Cellular senescence	Cellular Processes	Cell growth and death	TP53; TGFBR1; CDK2; MAP2K6; CDK6; MAPK3; TGFBR2; MAPK14; PIK3CA; MAP2K2; CACNA1D; PIK3CB; CDK1; PIK3R1; MAPK11; SERPINE1; NFKB1; PIK3CD; HIPK3; CHEK1; MTOR; MDM2; MAP2K3; CHEK2; HIPK2; RAF1; CDK4; MAPK1; MAPK13; AKT1	30	Wortmannin; Alvocidib; Genistein; Sirolimus; Felodipine; Nimodipine; Ridaforolimus; Lacidipine; Dasatinib; Verapamil; Thalidomide; Troglitazone; Fostamatinib; Resveratrol; Perifosine; Regorafenib; Sorafenib; Everolimus; Copper; Isradipine; Nitrendipine; Spironolactone; Acetylsalicylic acid; Temsirolimus; Nifedipine; Dronedarone; Sulindac; XL765; Nicardipine; Zinc; Nilvadipine	31	0.35943
162	RNA transport	Genetic Information Processing	Translation	EEF1A1; EIF4A1; DDX39B; EIF3F	4	Copper; Artenimol; Zinc; Quercetin	4	0.368899
163	Amoebiasis	Human Diseases	Infectious diseases: Parasitic	PRKCA; PTK2; HSPB1; NOS2; PRKACA; SERPINB9; PIK3CA; ACTN1; PRKCG; PIK3CB; ITGB2; PIK3R1; NFKB1; PIK3CD; C8B; PRKACB; C8G; C8A; TNF; PRKCB; IFNG; C9; FN1	23	Wortmannin; Chloroquine; Glucosamine; XL765; Copper; Acetylsalicylic acid; Tamoxifen; Thalidomide; Fostamatinib; Raloxifene; Zinc; Perifosine; Fasudil; Simvastatin; Artenimol; Dexamethasone	16	0.386964
164	Steroid hormone biosynthesis	Metabolism	Lipid metabolism	SRD5A1; AKR1C1; CYP1A2; SULT2B1; SRD5A2; CYP1B1; CYP1A1; CYP11B2; UGT1A1; CYP19A1; HSD17B2; COMT; AKR1C3; CYP11B1; CYP3A4	15	Isoniazid; Estradiol; Rutin; Quercetin; Genistein; Spironolactone; Fostamatinib; 2-Methoxyestradiol; Nicotine; Pregnenolone; Acetylsalicylic acid; Salicylic acid; Metyrapone; Indomethacin	14	0.387536
165	Long-term depression	Organismal Systems	Nervous system	PRKCB; PRKG2; CACNA1A; RYR1; PRKCA; PLA2G4A; MAP2K2; LYN; RAF1; PRKCG; GRIA3; BRAF; MAPK3; GUCY1A2; MAPK1	15	Sulindac; Sorafenib; Dantrolene; Lithium; Quinacrine; Verapamil; Tamoxifen; Dasatinib; Ponatinib; Spironolactone; Fostamatinib; Vemurafenib; Isosorbide Mononitrate; Perifosine; Loperamide; Regorafenib; Tetracaine	17	0.387536
166	Platinum drug resistance	Human Diseases	Drug resistance: Antineoplastic	MDM2; TP53; AKT1; CASP8; PIK3CA; PDPK1; GSTP1; TOP2A; PIK3CD; BIRC5; BCL2; PIK3CB; CYCS; TOP2B; GSTA2; MAPK3; ERBB2; PIK3R1; MAPK1	19	Wortmannin; Afatinib; Genistein; Reserpine; Obatoclast; Chloroquine; Fostamatinib; Dactinomycin; Troglitazone; Etoposide; Perifosine; Lapatinib; Artenimol; Paclitaxel; Bardoxolone; Idarubicin; Doxorubicin; Acetylsalicylic acid; Resveratrol; Sulindac; XL765; Daunorubicin; Berberine; Zinc; Curcumin	25	0.415963
167	NOD-like receptor signaling pathway	Organismal Systems	Immune system	IKKB; NFKBIA; IRAK4; MAPK3; RIPK1; MAPK14; CHUK; TBK1; BRCC3; JAK1; RIPK2; MAPK11; HSP90AB1; IKKBE; MAPK9; NFKB1; HSP90AA1; PRKCD; TYK2; TNF; CASP8; MAPK10; JUN; BCL2; MAPK13; MAPK1	26	Bardoxolone; Copper; Dasatinib; Sulindac; Glucosamine; Acetylsalicylic acid; Thalidomide; Quercetin; Tamoxifen; Sulfasalazine; Ruxolitinib; Chloroquine; Fostamatinib; Vinblastine; Zinc; Paclitaxel; Obatoclast; Regorafenib; Geldanamycin; Perifosine	20	0.430232
168	Ovarian steroidogenesis	Organismal Systems	Endocrine system	PRKACA; PTGS2; CYP1B1; CYP1A1; INS; PLA2G4A; CYP19A1; HSD17B2; ALOX5; AKR1C3; PRKACB; INSR	12	Resveratrol; Sulindac; Zinc; Thalidomide; Quercetin; Sulfasalazine; Rutin; Genistein; Masoprocol; Fostamatinib; 2-Methoxyestradiol; Nicotine; Meloxicam; Naproxen; Acetylsalicylic acid; Rhein; Salicylic acid; Fasudil; Quinacrine; Indomethacin; Estradiol	21	0.434273
169	TGF-beta signaling pathway	Environmental Information Processing	Signal transduction	ACVR1; BMP4; BMPR1B; TGFBR2; IFNG; BMPR2; TGFBR1; ROCK1; MAPK3; ACVR1B; TNF; MAPK1	12	Chloroquine; Sulindac; Perifosine; Thalidomide; Fostamatinib; Glucosamine; Fasudil; Calcium	8	0.434273
170	Proximal tubule bicarbonate reclamation	Organismal Systems	Excretory system	ATP1A3; MDH1; ATP1A1; AQP1; CA2; CA4; ATP1A2	7	Artenimol; Acetazolamide; Ouabain; Ciclopirox; Diazoxide	5	0.435831
171	Apoptosis - multiple species	Cellular Processes	Cell growth and death	CASP8; BECN1; MAPK9; MAPK10; BIRC5; BCL2; CYCS	7	Berberine; Paclitaxel; Bardoxolone; Fostamatinib; Reserpine; Estradiol; Obatoclast; Artenimol	8	0.435831
172	alpha-Linolenic acid metabolism	Metabolism	Lipid metabolism	PLA2G6; PLA2G4A; PLA2G2A; ACAA1; PLA2G1B	5	Quinacrine; Sulfasalazine; Trimetazidine; Indomethacin	4	0.436812
173	Hepatocellular carcinoma	Human Diseases	Cancers: Specific types	PRKCA; TP53; TGFBR1; CDK6; MAPK3; TGFBR2; HGF; PIK3CA; MTOR; MAP2K2; RAF1; GSTA2; PIK3CB; PIK3R1; PRKCG; PRKCB; PIK3CD; EGFR; BRAF; MET; CSNK1A1; ACTB; GSTP1; ACTG1; GSK3B; CDK4; TXNRD1; MAPK1; AKT1	29	Wortmannin; Vemurafenib; Alvocidib; Afatinib; Genistein; Sirolimus; Lithium; Chloroquine; Gefitinib; Troglitazone; Fostamatinib; Spermidine; Perifosine; Quercetin; Regorafenib; Artenimol; Heparin; Everolimus; Copper; Lapatinib; Sorafenib; Crizotinib; Acetylsalicylic acid; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Tamoxifen; Zinc; Curcumin; Erlotinib	32	0.460905

174	Cocaine addiction	Human Diseases	Substance dependence	NFKB1; BDNF; SLC18A1; GRIN2B; DRD1; CDK5; DRD2; JUN; PRKACB; PRKACA; GRIN2A; GRIN1; GRIN3A; SLC18A2	14	Alvocidib; Sertindole; Taurine; Reserpine; Triflupromazine; Fasudil; Chlorpromazine; Pimozide; Fostamatinib; Maprotiline; Lamotrigine; Fluphenazine; Thalidomide; Memantine; Acetylsalicylic acid; Olanzapine; Copper; Fluspirilene; Nortriptyline; Vinblastine; Cabergoline; Thioridazine; Trifluoperazine	23	0.484858
175	Cholesterol metabolism	Organismal Systems	Digestive system	ABCB11; SOAT1; ABCA1; APOE; APOC3; APOA2; APOH; APOC2; APOA1	9	Copper; Glyburide; Zinc; Ezetimibe	4	0.505814
176	Leishmaniasis	Human Diseases	Infectious diseases: Parasitic	MAPK14; PRKCB; NFKB1A; JAK1; PTGS2; TNF; MAPK11; NOS2; JAK2; NFKB1; IFNG; MAPK13; JUN; C3; IRAK4; MAPK3; ITGB2; IRAK1; MAPK1	19	Acetylsalicylic acid; Ruxolitinib; Meloxicam; Naproxen; Simvastatin; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Dexamethasone; Thalidomide; Sulfasalazine; Chloroquine; Glucosamine; Salicylic acid; Indomethacin; Copper; Resveratrol; Sulindac; Tamoxifen; Vinblastine; Zinc	22	0.517407
177	Cytosolic DNA-sensing pathway	Organismal Systems	Immune system	CHUK; TBK1; IKKBE; NFKB1; NFKBIA; IKKBK; RIPK1	7	Fostamatinib; Sulfasalazine; Acetylsalicylic acid; Thalidomide	4	0.528711
178	Carbohydrate digestion and absorption	Organismal Systems	Digestive system	PRKCB; ATP1A3; PIK3CA; ATP1A1; PIK3CD; CACNA1D; PIK3CB; ATP1A2; PIK3R1; AKT1	10	Lacidipine; Wortmannin; Isradipine; Resveratrol; XL765; Nimodipine; Nifedipine; Verapamil; Tamoxifen; Ouabain; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Fostamatinib; Nicardipine; Felodipine; Perifosine; Nilvadipine; Genistein; Ciclopirox	21	0.530282
179	Amyotrophic lateral sclerosis (ALS)	Human Diseases	Neurodegenerative diseases	MAPK14; MAPK11; TP53; CCS; MAP2K3; GRIN2B; TNF; SOD1; MAP2K6; BCL2; CYCS; GRIN1; GRIN2A; MAPK13	14	Dasatinib; Glucosamine; Zinc; Taurine; Memantine; Thalidomide; Chloroquine; Fostamatinib; Acetylsalicylic acid; Paclitaxel; Obatoclox; Regorafenib; Artenimol	13	0.547373
180	Synaptic vesicle cycle	Organismal Systems	Nervous system	CACNA1B; SLC18A1; ATP6V1A; CACNA1A; SLC18A2	5	Spironolactone; Verapamil; Reserpine; Loperamide; Bafilomycin A1	5	0.551026
181	Basal transcription factors	Genetic Information Processing	Transcription	CDK7	1	Alvocidib	1	0.572209
182	Autophagy - other	Cellular Processes	Transport and catabolism	BECN1; MTOR; ULK2	3	Everolimus; Ridaforolimus; XL765; Sirolimus; Fostamatinib; Estradiol; Temsirolimus	7	0.577347
183	Antifolate resistance	Human Diseases	Drug resistance: Antineoplastic	DHFR; CHUK; IKKBK; NFKB1; ABCC5; GART; TYMS; ATIC; TNF; SHMT2	10	Gemcitabine; Chloroquine; Glucosamine; Thalidomide; Sulfasalazine; Fostamatinib; Acetylsalicylic acid; Curcumin; Pemetrexed; Artenimol	10	0.60786
184	Nitrogen metabolism	Metabolism	Energy metabolism	CA7; CA3; CA2; CA4; CA1; CA12; CA14	7	Diazoxide; Acetazolamide	2	0.620942
185	Basal cell carcinoma	Human Diseases	Cancers: Specific types	TP53; GSK3B; BMP4; SMO	4	Zinc; Calcium; Fostamatinib; Acetylsalicylic acid; Lithium; Vismodegib	6	0.627066
186	Terpenoid backbone biosynthesis	Metabolism	Metabolism of terpenoids and polyketides	HMGCR; ACAT1; FDPS; GGPS1	4	Mevastatin; Sulfasalazine; Atorvastatin; Fluvastatin; Simvastatin; Rosuvastatin; Zoledronic acid	7	0.627066
187	Phospholipase D signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; AGTR1; PLA2G4A; MAPK3; EGFR; PIK3CG; AVPR2; PDGFRA; FYN; PDGFRB; MAP2K2; SYK; INS; PIK3R1; PIK3CB; AVPR1A; PIK3CD; INSR; PTK2B; MTOR; PIK3CA; RAF1; MAPK1; KIT; AKT1	25	Wortmannin; Nilotinib; Alvocidib; Afatinib; Genistein; Sirolimus; Dasatinib; Tolvaptan; Gefitinib; Fostamatinib; Perifosine; Quercetin; LY-294002; Regorafenib; Everolimus; Lapatinib; Ponatinib; Sorafenib; Pazopanib; Temsirolimus; Ridaforolimus; Resveratrol; Sulindac; XL765; Telmisartan; Tamoxifen; Sunitinib; Quinacrine; Imatinib; Zinc; Erlotinib	31	0.634354
188	Proteasome	Genetic Information Processing	Folding, sorting and degradation	PSME1; IFNG; PSMB8; PSMB5; PSMB10; PSMB9; PSMB1; PSMB2	8	Copper; Bortezomib; Glucosamine; Carfilzomib	4	0.636667
189	Viral myocarditis	Human Diseases	Cardiovascular diseases	ACTB; ABL2; CASP8; ITGAL; ACTG1; ABL1; FYN; CYCS; ITGB2	9	Copper; Dasatinib; Nilotinib; Quercetin; Bardoxolone; Ponatinib; Fostamatinib; Imatinib; Simvastatin; Regorafenib; Artenimol	11	0.657692
190	Cortisol synthesis and secretion	Organismal Systems	Endocrine system	POMC; NR0B1; CACNA1H; PRKACA; AGTR1; CACNA1G; CACNA1S; CACNA1I; PRKACB; CACNA1F; CACNA1D; CACNA1C; KCNK2; CYP11B1	14	Lacidipine; Nifedipine; Isradipine; Fostamatinib; Verapamil; Telmisartan; Dronedarone; Nitrendipine; Spironolactone; Flunarizine; Metyrapone; Amiodarone; Felodipine;	20	0.664636

						Nicardipine; Loperamide; Fasudil; Nilvadipine; Calcium; Nimodipine; Dexamethasone		
191	Malaria	Human Diseases	Infectious diseases: Parasitic	HBB; SELP; TNF; ITGAL; IFNG; TLR9; COMP; MET; HGF; ITGB2	10	Heparin; Copper; Chloroquine; Zinc; Thalidomide; Calcium; Crizotinib; Glucosamine; Fostamatinib; Simvastatin; Hydroxychloroquine	11	0.671754
192	Base excision repair	Genetic Information Processing	Replication and repair	POLB; MPG; NEIL2; NEIL1; PARP1; PARP3; PARP2	7	Copper; Olaparib; Veliparib; Theophylline; Cytarabine; Zinc	6	0.702923
193	Pathogenic Escherichia coli infection	Human Diseases	Infectious diseases: Bacterial	ACTB; PRKCA; TUBA1A; FYN; ROCK2; TUBB6; TUBB4A; ABL1; ACTG1; TUBB1; ROCK1; TUBB; TUBA4A	13	Copper; Dasatinib; Nilotinib; Quercetin; Tamoxifen; Cabazitaxel; Vinblastine; Ponatinib; Vincristine; Vinorelbine; Fostamatinib; Imatinib; Perifosine; Paclitaxel; Fasudil; Regorafenib; Artenimol; Colchicine	18	0.714454
194	Collecting duct acid secretion	Organismal Systems	Excretory system	ATP4A; ATP6V1A; CA2	3	Bafilomycin A1; Diazoxide; Esomeprazole; Acetazolamide; Omeprazole; Pantoprazole	6	0.716823
195	Retrograde endocannabinoid signaling	Organismal Systems	Nervous system	PRKCA; GABRD; MAPK10; KCNJ5; MAPK11; PRKACA; GABRQ; GABRE; GABRA3; MAPK3; MAPK14; GABRG1; GABRP; CACNA1S; CACNA1D; PRKCG; CACNA1F; GABRA2; GABRG3; GABRB2; GABRA1; MAPK9; CACNA1B; CACNA1A; GABRA5; PRKACB; GRIA3; GABRB1; PTGS2; PRKCB; GABRA4; GABRA6; FAAH; CACNA1C; GABRB3; GABRG2; MAPK13; MAPK1	38	Taurine; Meloxicam; Felodipine; Fasudil; Glyburide; Lithium; Nimodipine; Lacidipine; Dasatinib; Verapamil; Fostamatinib; Resveratrol; Perifosine; Regorafenib; Lamotrigine; Thalidomide; Sulfasalazine; Isradipine; Nitrendipine; Spironolactone; Calcium; Acetylsalicylic acid; Salicylic acid; Olanzapine; Indomethacin; Ivermectin; Nifedipine; Dronedarone; Sulindac; Tamoxifen; Nicardipine; Loperamide; Nilvadipine; Naproxen	34	0.728397
196	Renin-angiotensin system	Organismal Systems	Endocrine system	AGT; AGTR1; REN; ANPEP; ACE	5	Minoxidil; Copper; Telmisartan; Ezetimibe; Zinc; Enalaprilat	6	0.758027
197	Cardiac muscle contraction	Organismal Systems	Circulatory system	RYR2; ATP1A3; CACNA1S; CACNB2; CACNA2D2; ATP1A1; CACNA1C; CACNB3; CACNB1; CACNA2D3; TPM1; CACNG1; CACNA1D; CACNA1F; CACNA2D1; TNNC1; ATP1A2; CACNB4	18	Felodipine; Fluspirilene; Nimodipine; Lacidipine; Verapamil; Ouabain; Amiodarone; Azelnidipine; Artenimol; Dronedarone; Diazoxide; Nitrendipine; Spironolactone; Calcium; Levosimendan; Ciclopirox; Nifedipine; Isradipine; Tetracaine; Nicardipine; Nilvadipine; Trifluoperazine	22	0.758027
198	Thyroid hormone synthesis	Organismal Systems	Endocrine system	HSPA5; PRKCB; ATP1A3; SERPINA7; TTR; PRKCA; ATP1A1; PRKACA; ALB; PRKACB; GSR; HSP90B1; ATP1A2; PRKCG	14	Copper; Zinc; Acetylsalicylic acid; Geldanamycin; Tamoxifen; Ouabain; Diazoxide; Fostamatinib; Erythromycin; Perifosine; Fasudil; Artenimol; Ciclopirox	13	0.780585
199	Ferroptosis	Cellular Processes	Cell growth and death	TP53; ALOX15; GSS; ACSL4; SLC7A11; TF; CP; PRNP	8	Copper; Resveratrol; Zinc; Sulfasalazine; Troglitazone; Calcium; Acetylsalicylic acid; Rosiglitazone	8	0.791592
200	Ether lipid metabolism	Metabolism	Lipid metabolism	PLA2G6; PLA2G4A; PLA2G2A; PLA2G1B	4	Quinacrine; Sulfasalazine; Indomethacin	3	0.845751
201	Pentose phosphate pathway	Metabolism	Carbohydrate metabolism	ALDOA; G6PD; TKT; GPI	4	Copper; Artenimol; Zinc	3	0.845751
202	Ubiquitin mediated proteolysis	Genetic Information Processing	Folding, sorting and degradation	MDM2; MAP3K1; UBA1	3	Fostamatinib; Zinc; Quercetin	3	0.849475
203	Parathyroid hormone synthesis, secretion and action	Organismal Systems	Endocrine system	PDE4B; PRKCB; MAPK3; VDR; RXRA; PRKCA; PRKACA; RXRB; PDE4A; EGFR; PRKACB; RAF1; PRKCG; BRAF; MAPK1; RXRG; FGFR1; BCL2	18	Vemurafenib; Alvocidib; Afatinib; Obatoclast; Fasudil; Gefitinib; Fostamatinib; Perifosine; Paclitaxel; Regorafenib; Heparin; Bexarotene; Lapatinib; Ponatinib; Sorafenib; Sulindac; Theophylline; Tamoxifen; Pentoxifylline; Curcumin; Rosiglitazone; Erlotinib	22	0.854206
204	Primary immunodeficiency	Human Diseases	Immune diseases	IGLL1; ZAP70; JAK3; BTK; LCK	5	Copper; Dasatinib; Ponatinib; Fostamatinib	4	0.940221
205	One carbon pool by folate	Metabolism	Metabolism of cofactors and vitamins	DHFR; ATIC; TYMS; GART; SHMT2	5	Pemetrexed; Artenimol; Gemcitabine	3	0.940221
206	Fructose and mannose metabolism	Metabolism	Carbohydrate metabolism	AKR1B10; AKR1B1; TPI1; ALDOA	4	Sulindac; Artenimol; Zinc	3	0.941993

207	Ascorbate and aldarate metabolism	Metabolism	Carbohydrate metabolism	UGT1A1; ALDH7A1; UGDH	3	Fostamatinib; Artenimol; Copper	3	0.944834
208	Vasopressin-regulated water reabsorption	Organismal Systems	Excretory system	PRKACA; PRKACB; AVPR2	3	Fasudil; Tolvaptan; Fostamatinib	3	0.944834
209	Human T-cell leukemia virus 1 infection	Human Diseases	Infectious diseases: Viral	RANBP1; TP53; TGFBR1; IKBKB; PRKACA; NFKBIA; JAK3; TGFBR2; FDPS; CHUK; PIK3CA; ITGAL; PDGFRA; PDGFRB; MAP3K3; PIK3CB; CALR; ITGB2; PIK3R1; JAK1; NFKB2; NFKB1; PIK3CD; SLC2A1; PRKACB; CHEK1; TNF; MAP3K1; POLB; LCK; CHEK2; JUN; STAT5B; GSK3B; CDK4; AKT1	36	Wortmannin; Acetylsalicylic acid; Alvocidib; Vinblastine; Genistein; Fasudil; Simvastatin; Lithium; Dasatinib; Fostamatinib; Perifosine; Regorafenib; Thalidomide; Sulfasalazine; Ponatinib; Sorafenib; Pazopanib; Glucosamine; Chloroquine; Copper; Resveratrol; XL765; Cytarabine; Ruxolitinib; Sunitinib; Imatinib; Zinc; Melatonin; Zoledronic acid	29	0.982266
210	Oxidative phosphorylation	Metabolism	Energy metabolism	ATP5A1; ATP5C1; MT-ATP6; ATP6V1A; ATP5L; ATP5O; ATP5B; ATP4A	8	Omeprazole; Bafilomycin A1; Quercetin; Esomeprazole; Pantoprazole; Estradiol; Artenimol; PICEATANNOL	8	1
211	Metabolic pathways	Metabolism	Global and overview maps	NOS2; AKR1C3; PIK3C2B; PYGB; GGPS1; LDHB; AHCY; ALDOA; ALOX5; ABAT; NNMT; AOC1; RRM1; CYP1A1; GART; PTGES3; ACAT1; TPI1; CBR1; GAPDHS; PTGS2; EBP; GSS; PGK1; COMT; HIBCH; SMPD1; PRDX6; TYMS; MT-ATP6; PLA2G4A; ANPEP; AKR1B10; IMPA2; CYP2C8; FDPS; ALDH5A1; IDH3A; GAPDH; OGDH; ATP5B; UGDH; PI4KB; CYP11B2; UGT1A1; POLA1; QPRT; PLA2G6; ACY1; CYP11B1; ACAA1; PSPH; PI4K2B; DNMT1; ENO1; ALDH7A1; ATP5L; ATP5O; G6PD; PLA2G1B; PYGM; GPI; ATP6V1A; EPHX2; MDH1; ASMT; HPRT1; ATIC; GOT1; HPGDS; ALPP; IMPDH2; PGAM1; CYP19A1; TBXAS1; HMGCR; TKT; CYP2C19; ALAD; AKR1A1; PLA2G2A; ATP5C1; CYP51A1; NME1; ACSL4; PTGS1; PKM; DHFR; CYP1A2; ASPA; PYGL; ATP5A1; ALOX15; HSD17B2; NT5E; IMPA1; CYP3A4; PPAT; AKR1B1; LDHA; SHMT2; PIK3C2G; ACADSB; IMPDH1; CMPK1	105	Niacin; Isoniazid; Alvocidib; Rutin; Bafilomycin A1; Simvastatin; 2-Methoxyestradiol; Meloxicam; Naproxen; Estradiol; Hydroxyurea; Itraconazole; Metyrapone; Lithium; nocodazole; Melatonin; Mercaptopurine; Dasatinib; Fluvastatin; Chlorpromazine; Clofarabine; Troglitazone; Ezetimibe; Fostamatinib; Ebselen; Pemetrexed; Artenimol; Dexamethasone; Rosuvastatin; Thalidomide; Quercetin; Sulfasalazine; Spironolactone; Calcium; Nicotine; Acetylsalicylic acid; Rhein; Salicylic acid; Aminolevulinic acid; Indomethacin; Minoxidil; Copper; Resveratrol; Sulindac; Mevastatin; Masoprocil; Tamoxifen; Gemcitabine; Pentoxifylline; Valproic Acid; Quinacrine; Zinc; Atorvastatin; Trimetazidine; Curcumin; Rosiglitazone; PICEATANNOL; Procainamide; Zoledronic acid	59	1
212	Phototransduction	Organismal Systems	Sensory system	PDE6G	1	Sildenafil	1	1
213	Butanoate metabolism	Metabolism	Carbohydrate metabolism	ABAT; ACAT1; ALDH5A1	3	Valproic Acid; Sulfasalazine	2	1
214	Rheumatoid arthritis	Human Diseases	Immune diseases	ITGAL; ATP6V1A; IFNG; TNF; JUN; CTSL; FLT1; TEK; ITGB2	9	Sorafenib; Chloroquine; Thalidomide; Bafilomycin A1; Vinblastine; Ponatinib; Sunitinib; Fostamatinib; Pazopanib; Glucosamine; Simvastatin; Regorafenib	12	1
215	Protein digestion and absorption	Organismal Systems	Digestive system	ATP1A1; ATP1A3; ATP1A2; DPP4; KCNN4	5	Clotrimazole; Sitagliptin; Ouabain; Diazoxide; Atorvastatin; Cyclopirox	6	1
216	Pyrimidine metabolism	Metabolism	Nucleotide metabolism	POLA1; NME1; NT5E; TYMS; CMPK1; RRM1	6	Copper; Gemcitabine; Clofarabine; Zinc; Hydroxyurea; Pentoxifylline; Pemetrexed	7	1
217	Alanine, aspartate and glutamate metabolism	Metabolism	Amino acid metabolism	ABAT; GOT1; ASPA; PPAT; ALDH5A1	5	Valproic Acid; Copper; Dasatinib; Zinc; Mercaptopurine	5	1
218	ECM-receptor interaction	Environmental Information Processing	Signaling molecules and interaction	ITGB3; COMP; ITGA5; FN1; VTN	5	Calcium; Resveratrol; Zinc; Copper	4	1
219	Cysteine and methionine metabolism	Metabolism	Amino acid metabolism	GOT1; DNMT1; LDHB; AHCY; GSS; MDH1; LDHA	7	Copper; Artenimol; Procainamide	3	1
220	Histidine metabolism	Metabolism	Amino acid metabolism	ALDH7A1; ASPA; AOC1	3	Calcium; Artenimol; Zinc	3	1
221	Tyrosine metabolism	Metabolism	Amino acid metabolism	COMT; GOT1	2	Copper; 2-Methoxyestradiol	2	1

222	Lysine degradation	Metabolism	Amino acid metabolism	ALDH7A1; OGDH; ACAT1	3	Valproic Acid; Sulfasalazine; Arteminol	3	1
223	Fatty acid degradation	Metabolism	Lipid metabolism	ALDH7A1; ACADSB; ACSL4; ACAT1; ACAA1; CPT1A	6	Sulfasalazine; Troglitazone; Valproic Acid; Trimetazidine; Glyburide; Rosiglitazone; Arteminol	7	1
224	Thiamine metabolism	Metabolism	Metabolism of cofactors and vitamins	ALPP	1	Calcium	1	1
225	Biosynthesis of amino acids	Metabolism	Global and overview maps	GAPDH; GOT1; TKT; ENO1; IDH3A; TPI1; PGK1; ALDOA; PGAM1; ACY1; PSPH; PKM; SHMT2	13	Copper; Arteminol; Zinc	3	1
226	Sphingolipid metabolism	Metabolism	Lipid metabolism	SMPD1	1	Chlorpromazine	1	1
227	Glycerophospholipid metabolism	Metabolism	Lipid metabolism	PLA2G6; PLA2G4A; ACHE; CHAT; PLA2G2A; PLA2G1B	6	Quinacrine; Sulfasalazine; Acetylcholine; Indomethacin; Nicotine	5	1
228	Glycerolipid metabolism	Metabolism	Lipid metabolism	AKR1B10; ALDH7A1; AKR1A1; AKR1B1	4	Copper; Sulindac; Arteminol	3	1
229	Chemical carcinogenesis	Human Diseases	Cancers: Overview	HPGDS; PTGS2; CYP1B1; GSTP1; UGT1A1; GSTA2; CYP2C19; CYP1A1; CBR1; CYP3A4; CYP2C8; CYP1A2	12	Resveratrol; Sulindac; Rutin; Thalidomide; Quercetin; Sulfasalazine; Chloroquine; Troglitazone; Genistein; Fostamatinib; 2-Methoxyestradiol; Isoniazid; Meloxicam; Naproxen; Acetylsalicylic acid; Salicylic acid; Curcumin; nocodazole; Indomethacin	19	1
230	Asthma	Human Diseases	Immune diseases	EPX; IL3; TNF	3	Melatonin; Chloroquine; Glucosamine; Zinc; Thalidomide	5	1
231	Thermogenesis	Organismal Systems	Environmental adaptation	NPR1; MT-ATP6; PRKACA; PRKAG3; PRKAA2; ACSL4; PRKAG1; RPS6KA6; RPS6KA1; FGFR1; MAPK14; ATP5A1; PRKG2; PRKAG2; PRKAB1; PRKAB2; ATP5B; MAPK11; RPS6KA3; MAP2K3; CPT1A; PRKACB; ADRB3; MTOR; ACTB; PPARG; ATP5C1; PRKAA1; ACTG1; ATP5L; ATP5O; MAPK13; RPS6	33	Nitroprusside; Sirolimus; Estradiol; Fasudil; Glyburide; Metformin; Dasatinib; Troglitazone; Fostamatinib; Amiodarone; Salbutamol; Regorafenib; Arteminol; Heparin; Everolimus; Copper; Quercetin; Sulfasalazine; Fenofibrate; Ponatinib; Sorafenib; Acetylsalicylic acid; Olanzapine; Indomethacin; Temsirolimus; Ridaforolimus; Resveratrol; XL765; Telmisartan; Nortriptyline; PICEATANNOL; Valproic Acid; Purvalanol A; Curcumin; Rosiglitazone; Propranolol	36	1
232	Drug metabolism - cytochrome P450	Metabolism	Xenobiotics biodegradation and metabolism	HPGDS; CYP1A2; GSTP1; UGT1A1; GSTA2; CYP2C19; CYP3A4; CYP2C8	8	Chloroquine; Isoniazid; Troglitazone; Fostamatinib; Curcumin; nocodazole	6	1
233	Glutamatergic synapse	Organismal Systems	Nervous system	PRKCB; MAPK3; PRKCA; GRIN2B; PRKACA; CACNA1C; PLA2G4A; GRIN2A; CACNA1A; CACNA1D; PRKACB; GRIA3; GRIN1; MAPK1; GRIN3A; PRKCG	16	Taurine; Felodipine; Fasudil; Lithium; Nimodipine; Lacidipine; Verapamil; Fostamatinib; Perifosine; Memantine; Dronedarone; Nitrendipine; Spironolactone; Calcium; Nifedipine; Isradipine; Sulindac; Tamoxifen; Quinacrine; Nicardipine; Loperamide; Nilvadipine	22	1
234	Fat digestion and absorption	Organismal Systems	Digestive system	NPC1L1; APOA1; ABCA1; PLA2G2A; PLA2G1B	5	Copper; Sulfasalazine; Ezetimibe; Zinc; Glyburide; Indomethacin	6	1
235	Alzheimer disease	Human Diseases	Neurodegenerative diseases	ERN1; MT-ATP6; GRIN1; CYCS; MAPK3; ATP5A1; GRIN2B; GAPDH; CACNA1S; CACNA1D; ATP5B; CACNA1F; MAPT; APOE; CDK5; ATP5C1; GRIN2A; TNF; SNCA; CASP8; CACNA1C; GSK3B; APP; ATP5O; MAPK1	25	Alvocidib; Taurine; Felodipine; Estradiol; Lithium; Nimodipine; Lacidipine; Chloroquine; Deferoxamine; Verapamil; Thalidomide; Quercetin; Fostamatinib; Resveratrol; Perifosine; Paclitaxel; Arteminol; Nifedipine; Memantine; Bardoxolone; Dronedarone; Nitrendipine; Spironolactone; Calcium; Glucosamine; Copper; Isradipine; Sulindac; Nicardipine; Zinc; Nilvadipine; PICEATANNOL	32	1
236	Lysosome	Cellular Processes	Transport and catabolism	CTSS; SMPD1; CTSL	3	Fostamatinib; Chlorpromazine	2	1
237	Parkinson disease	Human Diseases	Neurodegenerative diseases	ATP5A1; SNCA; ATP5C1; MT-ATP6; PRKACA; SLC18A1; DRD2; CYCS; ATP5B; PRKACB; ATP5O; LRRK2; PARK7; DRD1; SLC18A2; UBA1; ADORA2A	17	Estradiol; Sertindole; Reserpine; Triflupromazine; Fasudil; Chlorpromazine; Pimozide; Fostamatinib; Maprotiline; Memantine; Mefloquine; Lamotrigine; Fluphenazine; Quercetin; Fluspirilene; Adenosine; Olanzapine; Copper; Resveratrol; Theophylline; Arteminol; Nortriptyline;	27	1

						Cabergoline; Pentoxifylline; Thioridazine; Trifluoperazine; PICEATANNOL		
238	Arginine and proline metabolism	Metabolism	Amino acid metabolism	NOS2; GOT1; ALDH7A1; AOC1	4	Copper; Artenimol; Calcium; Dexamethasone	4	1
239	Mineral absorption	Organismal Systems	Digestive system	ATP1A3; VDR; ATP1A1; MT2A; TF; MT1A; ATP1A2	7	Copper; Ouabain; Diazoxide; Zinc; Curcumin; Ciclopirox	6	1
240	Cell adhesion molecules (CAMs)	Environmental Information Processing	Signaling molecules and interaction	ITGAL; ITGB2; SELP	3	Heparin; Simvastatin	2	1
241	Maturity onset diabetes of the young	Human Diseases	Endocrine and metabolic diseases	INS; IAPP	2	Copper; Zinc	2	1
242	RNA degradation	Genetic Information Processing	Folding, sorting and degradation	HSPD1; ENO1	2	Copper; Artenimol; Zinc	3	1
243	DNA replication	Genetic Information Processing	Replication and repair	POLA1	1	Clofarabine	1	1
244	Glutathione metabolism	Metabolism	Metabolism of other amino acids	HPGDS; GSTP1; GSS; ANPEP; G6PD; GSTA2; GSR; RRM1	8	Copper; Chloroquine; Gemcitabine; nocodazole; Clofarabine; Troglitazone; Ezetimibe; Hydroxyurea; Curcumin; Artenimol	10	1
245	Glycine, serine and threonine metabolism	Metabolism	Amino acid metabolism	PGAM1; SHMT2; ALDH7A1; PSPH	4	Copper; Artenimol; Zinc	3	1
246	beta-Alanine metabolism	Metabolism	Metabolism of other amino acids	ALDH7A1; HIBCH; ABAT	3	Valproic Acid; Quercetin; Artenimol	3	1
247	Phenylalanine, tyrosine and tryptophan biosynthesis	Metabolism	Amino acid metabolism	GOT1	1	Copper	1	1
248	Tryptophan metabolism	Metabolism	Amino acid metabolism	CYP1A2; CYP1B1; CYP1A1; ALDH7A1; ASMT; OGDH; ACAT1; AOC1	8	Isoniazid; Quercetin; Sulfasalazine; Genistein; Valproic Acid; Calcium; 2-Methoxyestradiol; Melatonin; Artenimol	9	1
249	Phenylalanine metabolism	Metabolism	Amino acid metabolism	GOT1	1	Copper	1	1
250	Fatty acid biosynthesis	Metabolism	Lipid metabolism	ACSL4	1	Rosiglitazone; Troglitazone	2	1
251	Carbon metabolism	Metabolism	Global and overview maps	GAPDH; GOT1; TKT; ENO1; IDH3A; TPI1; PGK1; OGDH; PGAM1; MDH1; HIBCH; ACAT1; PSPH; G6PD; PKM; GPI; ALDOA; SHMT2	18	Copper; Quercetin; Sulfasalazine; Valproic Acid; Zinc; Artenimol	6	1
252	Peroxisome	Cellular Processes	Transport and catabolism	NOS2; EPHX2; ACSL4; SOD1; PRDX1; ACAA1	6	Copper; Troglitazone; Trimetazidine; Zinc; Ebselen; Rosiglitazone; Artenimol; Dexamethasone	8	1
253	Hematopoietic cell lineage	Organismal Systems	Immune system	TNF; FLT3; CSF1R; ITGA5; ITGB3; ANPEP; IL3; KIT	8	Sorafenib; Chloroquine; Regorafenib; Zinc; Pazopanib; Thalidomide; Quizartinib; Dasatinib; Ponatinib; Resveratrol; Sunitinib; Fostamatinib; Imatinib; Glucosamine; Ezetimibe; Nilotinib	16	1
254	Huntington disease	Human Diseases	Neurodegenerative diseases	BDNF; PPARG; HTT; CASP8; MT-A TP6; ATP5A1; GRIN2B; TP53; SOD1; CYCS; ATP5B; GRIN1; ATP5O; ATP5C1; HDAC2; HDAC1	16	Vorinostat; Taurine; Estradiol; Troglitazone; Amiodarone; Quercetin; Artenimol; Memantine; Sulfasalazine; Bardoxolone; Fenofibrate; Acetylsalicylic acid; Indomethacin; Copper; Resveratrol; Theophylline; Telmisartan; Panobinostat; Valproic Acid; Mocetinostat; Zinc; Curcumin; Rosiglitazone; PICEATANNOL	24	1
255	2-Oxocarboxylic acid metabolism	Metabolism	Global and overview maps	IDH3A; GOT1; ACY1	3	Copper	1	1

256	Glyoxylate and dicarboxylate metabolism	Metabolism	Carbohydrate metabolism	MDH1; ACAT1; SHMT2	3	Sulfasalazine; Arteminol	2	1
257	Vitamin digestion and absorption	Organismal Systems	Digestive system	APOA1	1	Copper; Zinc	2	1
258	Pancreatic secretion	Organismal Systems	Digestive system	RYR2; PRKCB; ATP1A3; PLA2G1B; PRKCA; ATP1A1; CHRM3; ATP1A2; PRKCG; KCNMA1; CFTR; PLA2G2A; CA2	13	Paroxetine; Acetylcholine; Chlorpromazine; Lamotrigine; Tamoxifen; Sulfasalazine; Ouabain; Diazoxide; Indomethacin; Fostamatinib; Maprotiline; Nicardipine; Acetazolamide; Perifosine; Atropine; Glyburide; Olanzapine; Tetracaine; Nortriptyline; Ciclopirox	20	1
259	JAK-STAT signaling pathway	Environmental Information Processing	Signal transduction	PIK3CD; EGFR; TYK2; PIK3CA; JAK1; IFNG; PDGFRA; PDGFRB; JAK2; JAK3; RAF1; PIM1; STAT5B; PIK3CB; AKT1; IL3; MTOR; PIK3R1; BCL2	19	Wortmannin; Alvocidib; Afatinib; Genistein; Sirolimus; Obatoclast; Dasatinib; Gefitinib; Fostamatinib; Perifosine; Quercetin; LY-294002; Regorafenib; Everolimus; Lapatinib; Ponatinib; Sorafenib; Paclitaxel; Pazopanib; Glucosamine; Temsirolimus; Ridaforolimus; Resveratrol; XL765; Ruxolitinib; Sunitinib; Imatinib; Zinc; Erlotinib	29	1
260	Galactose metabolism	Metabolism	Carbohydrate metabolism	AKR1B10; AKR1B1	2	Sulindac	1	1
261	Endocytosis	Cellular Processes	Transport and catabolism	FGFR2; MDM2; EGFR; HSPA2; HSPA8; PRKCZ; FGFR3; PDGFRA; PRKCI; SRC; TGFBR1; FGFR4; TGFBR2	13	Heparin; Copper; Dasatinib; Imatinib; Alvocidib; Thalidomide; Lapatinib; Tamoxifen; Gefitinib; Ponatinib; Afatinib; Sunitinib; Fostamatinib; Purvalanol A; Pazopanib; Zinc; Quercetin; Regorafenib; Arteminol; Erlotinib	20	1
262	Synthesis and degradation of ketone bodies	Metabolism	Lipid metabolism	ACAT1	1	Sulfasalazine	1	1
263	Steroid biosynthesis	Metabolism	Lipid metabolism	EBP; SOAT1; CYP51A1	3	Itraconazole; Tamoxifen; Ezetimibe	3	1
264	Propanoate metabolism	Metabolism	Carbohydrate metabolism	ABAT; LDHA; HIBCH; ACAT1; LDHB	5	Valproic Acid; Copper; Sulfasalazine; Arteminol; Quercetin	5	1
265	Caffeine metabolism	Metabolism	Biosynthesis of other secondary metabolites	CYP1A2	1	Isoniazid	1	1
266	Purine metabolism	Metabolism	Nucleotide metabolism	PDE5A; PDE4B; PDE6G; IMPDH2; PDE6H; PDE3A; PDE1A; POLA1; PDE4A; GART; NT5E; PDE1B; NPR1; HPRT1; NME1; ATIC; IMPDH1; PKM; GUCY1A2; PPAT; RRM1	21	Mercaptopurine; Cilostazol; Nitroprusside; Theophylline; Clofarabine; Copper; Isosorbide Mononitrate; Dasatinib; Sildenafil; Gemcitabine; Fostamatinib; Nicardipine; Felodipine; Zinc; Hydroxyurea; Pentoxifylline; Pemetrexed; Arteminol; Levosimendan	19	1
267	Arginine biosynthesis	Metabolism	Amino acid metabolism	NOS2; GOT1; ACY1	3	Copper; Dexamethasone	2	1
268	Nucleotide excision repair	Genetic Information Processing	Replication and repair	CDK7	1	Alvocidib	1	1
269	Notch signaling pathway	Environmental Information Processing	Signal transduction	HDAC2; HDAC1	2	Theophylline; Vorinostat; Panobinostat; Valproic Acid; Mocetinostat; Zinc	6	1
270	Homologous recombination	Genetic Information Processing	Replication and repair	BRCC3	1	Zinc	1	1
271	Drug metabolism - other enzymes	Metabolism	Xenobiotics biodegradation and metabolism	IMPDH2; GSTP1; UGT1A1; NME1; GSTA2; CYP3A4; MPO; RRM1; IMPDH1; CMPK1; HPRT1	11	Mercaptopurine; Copper; Chloroquine; Isoniazid; Gemcitabine; Clofarabine; Troglitazone; Fostamatinib; Zinc; Hydroxyurea; Curcumin; Melatonin	12	1
272	Selenocompound metabolism	Metabolism	Metabolism of other amino acids	TXNRD1	1	Spermidine	1	1

273	Aminoacyl-tRNA biosynthesis	Genetic Information Processing	Translation	YARS	1	Resveratrol	1	1
274	Fatty acid metabolism	Metabolism	Global and overview maps	CPT1A; ACAA1; ACAT1; ACADSB; ACSL4	5	Sulfasalazine; Troglitazone; Valproic Acid; Trimetazidine; Glyburide; Rosiglitazone	6	1
275	Type I diabetes mellitus	Human Diseases	Endocrine and metabolic diseases	HSPD1; INS; IFNG; TNF	4	Copper; Chloroquine; Glucosamine; Zinc; Thalidomide	5	1
276	Metabolism of xenobiotics by cytochrome P450	Metabolism	Xenobiotics biodegradation and metabolism	AKR1C1; CYP1A2; CYP1B1; GSTP1; UGT1A1; HPGDS; GSTA2; CYP1A1; CBR1; CYP3A4	10	Chloroquine; Isoniazid; Rutin; Quercetin; Resveratrol; Troglitazone; Genistein; Fostamatinib; 2-Methoxyestradiol; Acetylsalicylic acid; Salicylic acid; Curcumin; nocodazole	13	1
277	Non-alcoholic fatty liver disease (NAFLD)	Human Diseases	Endocrine and metabolic diseases	ERN1; IKBKB; PRKAG3; PRKAA2; NR1H3; PRKAG1; CYCS; PRKAG2; PIK3CA; PRKAB1; PRKAB2; PIK3CB; INS; PIK3R1; RXRA; MAPK9; NFKB1; PIK3CD; PPARA; INSR; CASP8; GSK3A; TNF; MAP3K11; PRKAA1; MAPK10; JUN; GSK3B; AKT1	29	Wortmannin; Acetylsalicylic acid; Genistein; Lithium; Metformin; Chloroquine; Bexarotene; Troglitazone; Fostamatinib; Perifosine; Artenimol; Thalidomide; Fenofibrate; Sulfasalazine; Bardoxolone; GW-501516; Glucosamine; Rhein; Indomethacin; Resveratrol; XL765; Vinblastine; Valproic Acid; Zinc; Rosiglitazone	25	1
278	Pyruvate metabolism	Metabolism	Carbohydrate metabolism	LDHB; GLO1; ALDH7A1; MDH1; ACAT1; LDHA; PKM	7	Copper; Sulfasalazine; Artenimol; Indomethacin	4	1
279	mRNA surveillance pathway	Genetic Information Processing	Translation	DDX39B	1	Artenimol	1	1
280	Amino sugar and nucleotide sugar metabolism	Metabolism	Carbohydrate metabolism	CYB5R3; UGDH; GPI	3	Copper; Artenimol	2	1
281	Biosynthesis of unsaturated fatty acids	Metabolism	Lipid metabolism	ACAA1	1	Trimetazidine	1	1
282	Starch and sucrose metabolism	Metabolism	Carbohydrate metabolism	PYGM; PYGB; PYGL; GPI	4	Copper; Artenimol; Alvocidib	3	1
283	Glycolysis / Gluconeogenesis	Metabolism	Carbohydrate metabolism	GAPDH; ENO1; LDHB; ALDH7A1; PGK1; ALDOA; PGAM1; LDHA; TPI1; PKM; GAPDHS; AKR1A1; GPI	13	Copper; Artenimol; Zinc	3	1
284	Allograft rejection	Human Diseases	Immune diseases	IFNG; TNF	2	Chloroquine; Glucosamine; Thalidomide	3	1
285	Inflammatory bowel disease (IBD)	Human Diseases	Immune diseases	JUN; NFKB1; IFNG; TNF	4	Chloroquine; Vinblastine; Glucosamine; Acetylsalicylic acid; Thalidomide	5	1
286	Graft-versus-host disease	Human Diseases	Immune diseases	IFNG; TNF	2	Chloroquine; Glucosamine; Thalidomide	3	1
287	Phagosome	Cellular Processes	Transport and catabolism	ACTB; CTSS; TUBA1A; C3; ATP6V1A; C1R; ACTG1; ITGA5; ITGB3; TUBB4A; TUBB6; COMP; CTSB; CALR; TUBB1; ITGB2; MPO; TUBB; TUBA4A	19	Copper; Resveratrol; Colchicine; Bafilomycin A1; Quercetin; Cabazitaxel; Vinblastine; Vincristine; Vinorelbine; Fostamatinib; Zinc; Paclitaxel; Melatonin; Artenimol; Simvastatin; Calcium	16	1
288	Retinol metabolism	Metabolism	Metabolism of cofactors and vitamins	CYP3A4; UGT1A1; CYP1A2; CYP2C8; CYP1A1	5	Fostamatinib; 2-Methoxyestradiol; Isoniazid	3	1
289	Folate biosynthesis	Metabolism	Metabolism of cofactors and vitamins	DHFR; ALPP; AKR1C3; CBR1; AKR1B10; AKR1B1	6	Resveratrol; Sulindac; Rutin; Quercetin; Calcium; Curcumin; Pemetrexed; Indomethacin	8	1
290	Nicotinate and nicotinamide metabolism	Metabolism	Metabolism of cofactors and vitamins	NNMT; QPRT; NT5E	3	Niacin; Pentoxifylline	2	1

291	Prophyrin and chlorophyll metabolism	Metabolism	Metabolism of cofactors and vitamins	CP; UGT1A1; ALAD	3	Calcium; Aminolevulinic acid; Zinc; Fostamatinib	4	1
292	Citrate cycle (TCA cycle)	Metabolism	Carbohydrate metabolism	IDH3A; MDH1; OGDH	3	Valproic Acid; Copper; Artenimol	3	1
293	Valine, leucine and isoleucine degradation	Metabolism	Amino acid metabolism	ALDH7A1; ACADSB; HIBCH; ABAT; ACAA1; ACAT1	6	Valproic Acid; Quercetin; Trimetazidine; Sulfasalazine; Artenimol	5	1
294	Cytokine-cytokine receptor interaction	Environmental Information Processing	Signaling molecules and interaction	ACVR1; BMP4; BMPR1B; ACVR1B; CSF1R; IFNG; PPBP; BMPR2; PF4; TGFBR1; IL3; TNF; TGFBR2	13	Heparin; Copper; Chloroquine; Zinc; Calcium; Thalidomide; Sunitinib; Fostamatinib; Imatinib; Glucosamine	10	1

Pathways Enriched by Targets of Activators (p-value < 0.05)

Signal transduction

No.	Pathway	Class	Subclass	Targets	No. Targets	p-value
1	Calcium signaling pathway	Environmental Information Processing	Signal transduction	NOS2; ADCY1; AGTR1; EDNRA; TNNC2; ATP2A1; EGFR; CAMK2D; PDGFRA; CACNA1S; PTGER3; CACNA1F; EDNRB; OXTR; ATP2A2; CAMK4; CACNA1A; ADRB2; PDE1B; CAMK2G; BDKRB2; NOS3; PRKCA; TBXA2R; CACNA1H; CHRM1; HTR7; CD38; CYSLTR1; DRD1; RYR2; HTR6; HTR5A; ITPR2; HTR2C; PDE1A; HRH2; ADORA2A; BDKRB1; ERBB4; PRKACB; GRIN1; ADRB1; ITPR1; GRIN2C; ITPR3; GNAS; SLC25A4; ADRA1D; CXCR4; HTR2B; ITPKA; LHCGR; ADRA1A; PDGFRB; PRKCG; HTR2A; TNNC1; CHRM2; AVPR1B; NOS1; AVPR1A; CHRM3; CHRM5; ADRB3; GRIN2A; GRM5; CACNA1I; PRKCB; PTGFR; VDACC2; TACR1; ERBB2; CACNA1G; DRD5; PRKACA; CACNA1E; ADCY2; RYR1; PTGER1; F2R; CACNA1D; MYLK2; TACR2; ADORA2B; PPIF; CACNA1B; CCKAR; PPP3R1; GRIN2D; ADRA1B; PTK2B; HRH1; HTR4; CACNA1C; CAMK2A; SLC8A1; PDE1C	98	3.30E-08
2	cAMP signaling pathway	Environmental Information Processing	Signal transduction	PDE4B; GRIA2; SSTR2; ADCY1; EDNRA; ROCK2; CAMK2D; GRIN2B; DRD2; CACNA1S; GABBR1; CACNA1F; OXTR; GRIA1; CAMK4; HCAR2; ADRB2; CAMK2G; PPARA; PPP1CC; GRIA3; HCAR3; BDNF; BAD; JUN; RAF1; ACOX1; ATP1A2; SLC9A1; ADCY5; PDE3B; MAPK3; DRD1; SSTR1; RYR2; HTR6; ATP1A3; HTR1B; SSTR5; MAP2K2; RAC1; ATP2A2; MAPK9; ADORA2A; CHRM1; GLP1R; PDE4D; AKT2; PRKACB; GNAI1; BRAF; GRIN3A; ADRB1; GRIN2C; PDE3A; GNAS; CREB1; MAPK1; MAP2K1; GRIN1; CFTR; PTGER2; HTR1D; PIK3CB; CHRM2; NFKB1A; HTR1E; PIK3CD; GRIN2A; PTGER3; MAPK10; ROCK1; AKT1; NPR1; DRD5; MAPK8; PRKACA; TSHR; PDE4A; ADCY2; PIK3CA; ATP1A1; F2R; CACNA1D; GRIA4; PIK3R1; HTR1A; FSHR; NFKB1; HTR1F; GRIN2D; ADORA1; GRIN3B; PDE4C; GABBR2; HTR4; CACNA1C; CAMK2A	98	1.50E-06
3	Apelin signaling pathway	Environmental Information Processing	Signal transduction	SLC9A1; BECN1; ADCY5; GNG2; NOS2; PRKACA; AGTR1; PDE3B; PRKAG3; PRKAA2; ITPR2; MAP2K1; PRKAG1; MAPK3; TGFBR1; RYR2; ADCY2; PRKAG2; RYR1; PRKAB1; MAP2K2; PRKAB2; ADCY1; MYLK2; PRKCE; SERPINE1; CAMK4; AKT2; NOS1; HDAC5; PRKACB; NOS3; GNAI1; PIK3C3; MTOR; PIK3CG; HDAC4; ITPR1; PRKAA1; ITPR3; PLAT; RAF1; SLC8A1; AKT1; RPS6; MAPK1	46	0.000114
4	Rap1 signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; AKT2; CNR1; ADCY5; ITGAL; ADCY1; CSF1R; PDGFD; FLT4; MAP2K1; IGF1R; GNAS; GNAI1; FLT1; PFN1; MAPK3; ADORA2A; FGFR1; VEGFA; MAPK14; ADCY2; EGFR; PIK3CA; EGF; GRIN2B; PDGFRA; DRD2; PDGFRB; MAP2K2; ITGB3; RAC1; F2R; PRKCG; PIK3CB; PFN2; EPHA2; FGF2; HGF; ITGB2; PIK3R1; ADORA2B; MAPK11; KDR; PRKCB; FGFR3; INS; NGF; PRKCI; PIK3CD; INSR; GRIN1; BRAF; FGFR4; GRIN2A; KIT; FGFR2; ACTB; FGF4; ACTG1; PRKCZ; RAF1; SRC; ITGA2B; FGF1; MAPK12; MET; MAPK1; TEK; MAPK13; AKT1	70	0.000595
5	cGMP-PKG signaling pathway	Environmental Information Processing	Signal transduction	PDE5A; ADRA2B; ADORA3; AKT1; ADRA1B; ADCY5; ADCY1; AGTR1; NOS3; PDE3B; EDNRA; KCNMB3; KCNJ8; BAD; GNAI1; MAPK3; ROCK2; ATP2A2; KCNMA1; NPR2; ATP1A3; VDACC2; PIK3CG; ATP1A1; ADRA1A; MAP2K2; CACNA1S; CACNA1D; CACNA1F; MYLK2; EDNRB; ADORA2A; PDE2A; PRKCE; IRS1; OPRD1; ATP2A1; INS; AKT2; ADRB2; ADCY2; KCNMB4; NPR1; KCNMB2; ADRA2C; INSR; ADRB3; ADORA1; ITPR2; ADRB1; ITPR1; PPP3R1; PDE3A; GUCY1A2; CACNA1C; ITPR3; PPIF; BDKRB2; CREB1; RAF1; SLC8A1; MAP2K1; ROCK1; ADRA1D; PPP1CC; ATP1A2; SLC25A4; MAPK1	68	0.000979

6	PI3K-Akt signaling pathway	Environmental Information Processing	Signal transduction	ITGA4; PPP2R5C; IKBKB; CDK2; ITGAV; FGFR1; CHUK; EGFR; PDGFRA; TLR2; KIT; YWHAB; HSP90AB1; EGF; JAK1; NOS3; ITGA5; EIF4E; BDNF; FGF4; JAK2; IFNAR2; RAF1; ITGA2B; FN1; VWF; PRKCA; TP53; GNG2; FGFR3; PRKAA2; FLT4; IGF1R; BAD; FLT1; MAPK3; PPP2R2A; NGF; MAP2K2; ITGB3; RAC1; GSK3B; PDGFD; CHRM1; KDR; ERBB4; AKT2; MTOR; MDM2; IL3; CREB1; BCL2; FGF1; MET; TEK; MAPK1; VEGFA; EPOR; CSF1R; MAP2K1; CDK6; PDPK1; PIK3CA; IFNAR1; PDGFRB; PIK3CB; CHRM2; NTRK2; IRS1; RXRA; INS; YWHAH; PIK3CD; PPP2CB; HSP90AA1; TLR4; IL2RA; FGFR4; PCK1; SYK; CDK4; ERBB2; RPS6; AKT1; IL2RB; IL6; JAK3; HGF; PIK3CG; CD19; PTK2; IL2; F2R; EPHA2; PIK3R1; IL2RG; NTRK1; PPP2CA; NFKB1; INSR; HSP90B1; CSF3R; FGFR2; GHR; FLT3; PRKAA1; VTN; FGF2	108	0.004234
7	AMPK signaling pathway	Environmental Information Processing	Signal transduction	PPP2R5C; PPP2CA; PFKFB1; PRKAB1; PRKAA2; IGF1R; PRKAG1; CFTR; EEF2; PRKAG2; PIK3CA; FBP1; PDPK1; PPP2R2A; ADRA1A; PRKAG3; PRKAB2; PIK3CB; PIK3R1; HMGCR; IRS1; INS; AKT2; PIK3CD; PPP2CB; INSR; CCNA2; SIRT1; MTOR; ULK1; PPARG; SREBF1; PRKAA1; CREB1; PCK1; CPT1A; ACACB; HNF4A; AKT1	39	0.009535
8	MAPK signaling pathway	Environmental Information Processing	Signal transduction	TGFB1; IKBKB; FGFR1; CHUK; EGFR; MAP2K5; PDGFRA; RAC1; CACNA1S; CACNA1F; MAPK11; BDNF; CACNA1A; KIT; CACNB4; EGF; FGF4; CACNA2D3; JUN; CACNA2D2; RAF1; MAPK12; PRKCA; TP53; CACNA1H; PLA2G4A; FGFR3; MAPKAPK2; FLT4; IGF1R; FLT1; MAPK3; NGF; MAP2K2; TGFB1; CACNG1; CACNG2; MAPK9; PDGFD; MAP3K12; NFKB1; KDR; ERBB4; AKT2; PRKACB; BRAF; MAP3K1; CACNA2D1; MAP3K2; FGF1; MET; TEK; MAPK1; HSPB1; VEGFA; HSPA8; CSF1R; MAP2K1; IRAK4; RPS6KA1; ZAK; PDGFRB; PRKCG; IL1R1; NTRK2; NFKB2; INS; CACNB3; CACNB1; FGFR4; TNF; CACNA1I; PRKCB; HSPA2; MAPK10; CASP3; ERBB2; MAPK13; CACNA1G; AKT1; MAPK8; PRKACA; CACNA1E; MAPK8IP1; HGF; TGFB2; MAPK14; CACNB2; FLNA; CACNA1D; EPHA2; MAPT; NTRK1; RPS6KA3; CACNA1B; PPP3R1; INSR; FGFR2; IL1B; FLT3; CACNA1C; TAOK2; FGF2; PPP5C	104	0.0139
9	Ras signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; AKT2; VEGFA; GNG2; IKBKB; HTR7; MAPK9; PLA2G4A; CSF1R; FLT4; MAP2K1; IGF1R; FLT1; PLA2G2A; MAPK3; FGFR1; NTRK1; CHUK; EGFR; PIK3CA; EGF; RAB5A; GRIN2B; PDGFRA; PLA2G1B; PDGFRB; MAP2K2; RAC1; ABL1; PRKCG; PIK3CB; PRKACA; EPHA2; PDGFD; HGF; INS; PIK3R1; NTRK2; ABL2; KDR; BDNF; FGFR3; NFKB1; NGF; PAK5; PIK3CD; PRKACB; INSR; MAPK8; GRIN1; FGFR4; GRIN2A; KIT; PTPN11; FGFR2; PRKCB; FLT3; PLA2G2E; FGF4; MAPK10; BAD; ZAP70; RAF1; FGF2; FGF1; MET; MAPK1; TEK; AKT1	69	0.018261
10	VEGF signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; HSPB1; VEGFA; PLA2G4A; MAPKAPK2; MAP2K1; MAPK3; MAPK14; PIK3CA; PTK2; MAP2K2; RAC1; PRKCG; PIK3CB; PIK3R1; MAPK11; KDR; AKT2; PIK3CD; PPP3R1; NOS3; PRKCB; PTGS2; BAD; RAF1; SRC; MAPK12; AKT1; MAPK13; MAPK1	30	0.029696
11	Sphingolipid signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; TP53; MAPK8; PPP2R5C; PPP2CA; ADORA3; CTSD; MAP2K1; ABCC1; MAPK3; ROCK2; MAPK14; PIK3CA; PRKCZ; PPP2R2A; FYN; MAP2K2; RAC1; PRKCG; PIK3CB; PIK3R1; BCL2; MAPK11; OPRD1; MAPK9; NFKB1; AKT2; PIK3CD; PPP2CB; BDKRB2; NOS3; GNAI1; TNF; ADORA1; PRKCB; FCER1A; S1PR5; MAPK10; PDPK1; PRKCE; RAF1; SMPD1; MAPK12; ROCK1; AKT1; MAPK13; MAPK1	47	0.030014
Human diseases						
Cancers: overview						
1	Proteoglycans in cancer	Human Diseases	Cancers: Overview	IL12B; PRKCA; TP53; SLC9A1; TLR4; VEGFA; PRKACA; PLAU; ITPR2; MAP2K1; IGF1R; CTSL; MAPK3; ROCK2; FGFR1; KDR; MAPK14; EGFR; FLNA; CAMK2D; PDPK1; PTK2; RAC1; ITGA5; MAP2K2; ITGB3; TGFB1; PRKCG; PIK3CB; TLR2; FGF2; HGF; PIK3R1; CAMK2A; ITGAV; MAPK11; MMP9; SMO; PTPN11; PRKCB; ERBB4; IQGAP1; AKT2; ESR1; CAMK2G; PRKACB; PPP1CC; MAPK13; DDX5; BRAF; PIK3CD; TNF; MTOR; PIK3CA; MDM2; ACTB; ITPR1; HIF1A; LUM; MMP2; ITPR3; CASP3; ACTG1; VTN; PLAUR; RAF1; SRC; ROCK1; MAPK12; MET; AKT1; ERBB2; FN1; RPS6; MAPK1	75	0.00118
2	Pathways in cancer	Human Diseases	Cancers: Overview	TGFB1; NOS2; ADCY1; AGTR1; CDK2; EDNRA; HMOX1; ITGAV; ROCK2; FGFR1; CHUK; EGFR; CAMK2D; PDGFRA; RAC1; MTOR; IKBKB; IL13; ABL1; BIRC5; EDNRB; HSP90AB1; SKP1; SMO; JAK1; CXCR4; AR; PRKACB; CAMK2G; BDKRB2; KIT; IFNGR2; LEF1; EGF; CASP8; FGF4; JAK2; IFNAR2; JUN; GSTA1; RAF1; GSTA3; ITGA2B; NCOA1; FN1; PRKCA; TP53; POLK; ADCY5; BCR; FGFR3; CDK6; IGF1R; BAD; MAPK3; RXRG; RET; MAP2K2; TGFB1; GSK3B; RAD51; BDKRB1; MAPK9; AKT2; ESR1; STAT5B; RARB; GNAI1; BRAF; MDM2; PPARG; IL3; RXRB; GNAS; RARA; GSTM4; BCL2; FGF1; MET; MAPK1; IL12B; VEGFA; EPOR; CSF1R; KLK3; CKS1B; MAP2K1; FLT4; PTGER2; GNG2; IFNAR1; PDGFRB; PRKCG; PIK3CB; HDAC2; GSTA2; MMP9; NQO1; ALK; RXRA; NFKB2; PIK3CD; SLC2A1; HSP90AA1; IL2RA; FGFR4; PTGER3; ESR2; PRKCB; PTGS2; GSTP1; MAPK10; CASP3; PIM1; CDK4; ROCK1; ERBB2; DAPK1; AKT1; TERT; IL2RB; IL6; MAPK8; PRKACA; JAK3; CYCS; HGF; IL5; HDAC1; ADCY2; PIK3CA; PTGER1; PTK2; IL2; F2R; TGFB2; PIK3R1; IL2RG; NTRK1; NFKB1;	159	0.00158

				CXCL8; CASP7; GSTT2; HSP90B1; CSF3R; FGFR2; HIF1A; DAPK3; FLT3; MMP2; CAMK2A; IFNG; NFKBIA; MMP1; FGF2; PPARD; JUP; TXNRD1; CSF2RA		
3	Transcriptional misregulation in cancer	Human Diseases	Cancers: Overview	TP53; IL6; POLK; CSF1R; IL2RB; PLAT; GRIA3; PLAUI; IGF1R; FCGR1A; FLT1; RXRG; HDAC1; CD40; CDK9; PTK2; CEBPB; MMP3; HDAC2; MMP9; NTRK1; RXRA; ATM; NFKB1; CXCL8; DDX5; MPO; MDM2; PPARG; IGFBP3; FLT3; RXRB; NR4A3; TGFBR2; ELANE; JUP; MET; IL3; RARA	39	0.023843
Cancers: specific types						
1	Prostate cancer	Human Diseases	Cancers: Specific types	TP53; IKBKB; NFKBIA; CDK2; MAP2K1; IGF1R; PLAUI; MAPK3; FGFR1; MMP3; CHUK; EGFR; PIK3CA; PDPK1; PDGFRA; PDGFRB; MAP2K2; GSK3B; PIK3CB; PDGFD; INS; PIK3R1; MDM2; MMP9; HSP90AB1; NFKB1; AR; AKT2; PIK3CD; HSP90AA1; BRAF; KLF3; HSP90B1; MTOR; FGFR2; EGF; LEF1; SRD5A2; GSTP1; PLAT; BAD; CREB1; RAF1; BCL2; AKT1; ERBB2; MAPK1	47	0.030014
2	Non-small cell lung cancer	Human Diseases	Cancers: Specific types	PRKCA; TP53; POLK; MAP2K1; CDK6; MAPK3; RXRG; EGFR; PIK3CA; EGF; PDPK1; FHIT; MAP2K2; PRKCG; PIK3CB; JAK3; PIK3R1; ALK; RXRA; AKT2; PIK3CD; STAT5B; RARB; BRAF; PRKCB; RXRB; BAD; RAF1; CDK4; AKT1; ERBB2; MAPK1	32	0.030439
Cardiovascular diseases						
1	Hypertrophic cardiomyopathy (HCM)	Human Diseases	Cardiovascular diseases	ITGA4; IL6; PRKAB1; PRKAA2; PRKAG1; CACNB2; RYR2; ITGAV; PRKAG2; ACE; TGFB1; PRKAG3; ITGA5; ITGB3; CACNA1S; CACNG1; CACNA1D; CACNA1F; CACNG2; TNNC1; ATP2A2; CACNB3; CACNB1; TPM1; PRKAB2; TNF; CACNB4; ACTB; CACNA1C; ACTG1; CACNA2D3; CACNA2D2; CACNA2D1; SLC8A1; ITGA2B; PRKAA1	36	0.007119
2	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	Human Diseases	Cardiovascular diseases	ITGA4; DSP; ITGAV; RYR2; CACNB2; ITGB3; CACNA1S; CACNG1; CACNG2; CACNA1F; CACNA1D; ATP2A2; CACNB3; CACNB1; ITGA5; CACNB4; ACTB; LEF1; CACNA1C; ACTG1; CACNA2D3; CACNA2D2; CACNA2D1; SLC8A1; ITGA2B; JUP	26	0.009535
3	Dilated cardiomyopathy (DCM)	Human Diseases	Cardiovascular diseases	ITGA4; ADCY5; PRKACA; GNAS; ITGAV; RYR2; ADCY2; CACNB2; TGFB1; ITGA5; ITGB3; CACNA1S; CACNG1; CACNA1D; CACNA1F; ADCY1; CACNG2; TNNC1; ATP2A2; CACNB3; CACNB1; TPM1; PRKACB; TNF; CACNB4; ADRB1; ACTB; CACNA1C; ACTG1; CACNA2D3; CACNA2D2; CACNA2D1; SLC8A1; ITGA2B	34	0.011776
Endocrine and metabolic diseases						
1	Insulin resistance	Human Diseases	Endocrine and metabolic diseases	AKT2; IL6; MAPK8; IKBKB; PRKAG1; NFKBIA; NRIH2; PRKAG3; PRKAA2; PRKCQ; NRIH3; PYGB; RPS6KA1; PRKAG2; PIK3CA; PRKCZ; PYGM; PRKAB1; PRKCD; TNF; PRKAB2; PTPN1; PIK3CB; INS; PIK3R1; PRKCE; IRS1; PYGL; RPS6KA3; MAPK9; NFKB1; SLC2A2; PIK3CD; SLC2A1; PPARA; PPP1CC; INSR; PTPN11; MTOR; PRKCB; SREBF1; PRKAA1; MAPK10; PDPK1; CREB1; GSK3B; PCK1; CPT1A; NOS3; ACACB; AKT1	51	4.80E-05
2	Type II diabetes mellitus	Human Diseases	Endocrine and metabolic diseases	MAPK8; IKBKB; GSK3; CACNA1E; MAPK3; ABCC8; PIK3CA; KCNJ11; PRKCZ; TNF; CACNA1D; PIK3CB; INS; PIK3R1; PRKCE; IRS1; MAPK9; CACNA1B; CACNA1A; SLC2A2; PIK3CD; PRKCD; INSR; MTOR; CACNA1C; MAPK10; PKM; CACNA1G; MAPK1	29	0.001462
3	Cushing syndrome	Human Diseases	Endocrine and metabolic diseases	NR5A1; POMC; CAMK2A; CACNA1H; ADCY5; PRKACA; AGTR1; CDK2; AHR; MAP2K1; CDK6; MAPK3; ADCY2; EGFR; ITPR2; CAMK2D; HSD3B1; CYP21A2; MAP2K2; CACNA1S; PDE8A; CACNA1D; CACNA1F; ADCY1; KCNK2; PRKACB; CAMK2G; CYP11B1; PDE8B; GNAI1; BRAF; CACNA2; ITPR1; LEF1; PDE11A; CACNA1C; ITPR3; GNAS; CREB1; GSK3B; CDK4; CYP17A1; CACNA1G; MAPK1	44	0.027378
Infectious diseases						
1	Pertussis	Human Diseases	Infectious diseases: Bacterial	IL12B; LY96; IL6; MAPK8; NOS2; IRAK4; MAPK3; MAPK14; C1S; C4BPA; C1R; ITGA5; C4BPB; C5; ITGB2; CASP1; MAPK11; CFL1; C1QC; C1QB; MAPK9; NFKB1; CXCL8; CASP7; TLR4; GNAI1; TNF; IL1B; C3; MAPK10; SERPING1; CASP3; JUN; MAPK12; MAPK13; C1QA; MAPK1	37	0.005206
2	Chagas disease (American trypanosomiasis)	Human Diseases	Infectious diseases: Parasitic	IL12B; IL6; BDKRB2; NOS2; ADCY1; NFKBIA; IRAK4; SERPINE1; MAPK3; TGFBR2; MAPK14; CCL2; CHUK; PIK3CA; ACE; PPP2R2A; TGFBR1; TLR2; CD3E; IKBKB; TGFB1; PIK3CB; CALR; TLR9; PIK3R1; MAPK11; C1QC; C1QB; IL2; MAPK9; NFKB1; AKT2; PIK3CD; PPP2CB; TLR4; PPP2CA; MAPK8; GNAI1; CXCL8; TNF; IFNGR2; CASP8; IL1B; C3; MAPK10; IFNG; GNAS; JUN; MAPK12; MAPK1; MAPK13; C1QA; AKT1	53	0.009309
3	Epithelial cell signaling in Helicobacter pylori infection	Human Diseases	Infectious diseases: Bacterial	MAPK8; IKBKB; ATP6V1A; NFKBIA; CXCR1; MAPK14; CHUK; EGFR; ADAM17; ADAM10; LYN; RAC1; ATP6V1B2; MAPK11; MAPK9; NFKB1; CXCL8; PTPN11; MAPK10; CASP3; CSK; JUN; SRC; MAPK12; MET; MAPK13	26	0.018252

4	Legionellosis	Human Diseases	Infectious diseases: Bacterial	IL12B; IL6; HSPA8; NFKBIA; CYCS; TLR2; HSPD1; ITGB2; CASP1; NFKB2; NFKB1; ARF1; CXCL8; CASP7; TLR4; TNF; EEF1A1; CASP8; IL1B; HSPA2; C3; CASP3; CLK1	23	0.02257 2
5	Vibrio cholerae infection	Human Diseases	Infectious diseases: Bacterial	KCNQ1; ACTB; ARF1; SLC12A2; PRKCA; PRKACA; ATP6V1A; ATP6V1B2; ACTG1; GNAS; PRKACB; CFTR	12	0.03011 4
6	Measles	Human Diseases	Infectious diseases: Viral	IL12B; TP53; IL6; HSPA8; IL13; JAK2; NFKBIA; IL2RB; CDK2; PRKCQ; JAK3; CDK6; CSNK2A1; PIK3CA; AKT2; IFNAR1; FYN; TP73; CD3E; IL2; TLR2; IFNGR2; PIK3CB; TLR9; PIK3R1; IL2RG; FCGR2B; JAK1; NFKB1; CHUK; PIK3CD; STAT5B; TLR4; CSNK2B; IL2RA; IRAK4; IL1B; RACK1; TYK2; TLR7; HSPA2; CSNK2A2; IFNG; IFNAR2; TACR1; GSK3B; CDK4; TNFRSF10B; AKT1	49	0.04002 4
Neural diseases						
1	Morphine addiction	Human Diseases	Substance dependence	PDE4B; PRKCA; GABRD; KCNJ5; OPRM1; PDE7B; GNG2; PRKACA; PDE3B; PDE4A; GABRQ; PDE11A; GABRE; GABRA3; GABRR1; PDE2A; GABRR3; DRD1; GABRB2; ADCY2; GABRG1; KCNJ9; ADCY5; GABRP; GABBR1; PRKCG; GABRA2; PDE1A; GABRG3; PDE7A; PDE10A; GABRA1; PDE4D; CACNA1B; CACNA1A; ADRBK2; PDE1B; GABRA5; ADCY1; PRKACB; PDE8B; GNAI1; GABRB1; ADORA1; PRKCB; PDE4C; KCNJ3; GABRA4; GABBR2; GABRA6; PDE3A; GABRB3; GNAS; GABRR2; PDE8A; GABRG2; KCNJ6; PDE1C	58	3.08E-09
2	Nicotine addiction	Human Diseases	Substance dependence	GABRQ; GABRD; CHRNA6; GRIA2; GABRE; GABRA3; CHRN2B; GABRR1; GABRR3; GABRB2; GABRG1; GRIN2B; GRIN3A; GABRP; GABRA2; GRIA4; CHRNA4; GABRG3; GABRA1; GRIA1; CACNA1B; CACNA1A; GABRA5; GRIA3; GRIN1; GABRB1; GRIN2A; GRIN3B; GABRA4; GABRA6; GABRR2; GABRB3; GRIN2C; GRIN2D; GABRG2	35	1.50E-06
3	Amphetamine addiction	Human Diseases	Substance dependence	PRKCA; MAOA; GRIA2; PRKACA; DRD1; SLC18A2; HDAC1; SLC18A1; ADCY5; CAMK2D; GRIN2B; GRIN2A; CAMK4; TH; CACNA1D; PRKCG; GRIA4; SLC6A3; GRIA1; GRIN3B; SIRT1; PPP3R1; GRIN2D; CAMK2G; PRKACB; PPP1CC; GRIA3; GRIN1; GRIN3A; PRKCB; MAOB; GRIN2C; CACNA1C; CAMK2A; GNAS; JUN; CREB1	37	0.00278 3
4	Alcoholism	Human Diseases	Substance dependence	PPP1CC; ADCY5; GNG2; PRKACA; HDAC9; HDAC8; MAP2K1; TH; GNAI1; MAPK3; DRD1; SLC18A2; HDAC1; SLC18A1; CREB1; GRIN2B; GRIN2A; CAMK4; DRD2; HDAC11; HDAC2; ADORA2A; NTRK2; SLC6A3; HDAC6; GRIN3B; HDAC5; GRIN2D; HDAC3; GRIN1; BRAF; MAOA; GRIN3A; SLC29A1; BDNF; HDAC4; MAOB; GRIN2C; HDAC10; GNAS; HDAC7; PKIA; RAF1; ADORA2B; MAPK1	45	0.00342
5	Endocrine resistance	Human Diseases	Drug resistance: Antineoplastic	TP53; MAPK8; ADCY5; PRKACA; MAP2K1; IGF1R; GNAS; MAPK3; ADCY2; MAPK14; GPER1; EGFR; PIK3CA; PTK2; MAP2K2; PIK3CB; ADCY1; PIK3R1; BCL2; MAPK11; MMP9; MAPK9; AKT2; PIK3CD; CYP2D6; PRKACB; BRAF; ESR1; MTOR; ESR2; MDM2; ABCB11; MMP2; MAPK10; BAD; JUN; RAF1; SRC; CDK4; MAPK12; AKT1; ERBB2; MAPK13; MAPK1	44	0.00452 2
6	Prion diseases	Human Diseases	Neurodegenerative diseases	HSPA5; MAP2K2; MAPK3; C1QC; PRNP; IL1B; PRKACA; FYN; SOD1; C1QB; C8B; PRKACB; C9; MAP2K1; IL6; STIP1; C5; C8A; C8G; C1QA; MAPK1	21	0.02042 5
7	EGFR tyrosine kinase inhibitor resistance	Human Diseases	Drug resistance: Antineoplastic	PRKCA; IL6; VEGFA; FGFR3; MAP2K1; IGF1R; MAPK3; EGFR; PIK3CA; PDGFRA; PDGFRB; MAP2K2; GSK3B; PRKCG; PIK3CB; FGF2; HGF; PIK3R1; KDR; EGF; JAK1; AKT2; PIK3CD; PDGFD; BRAF; MTOR; EIF4E; FGFR2; PRKCB; JAK2; BAD; RAF1; SRC; BCL2; MET; AKT1; ERBB2; RPS6; MAPK1	39	0.02384 3
8	Cocaine addiction	Human Diseases	Substance dependence	GRIA2; PRKACA; TH; GNAI1; DRD1; SLC18A2; SLC18A1; ADCY5; GRIN2B; GRIN2A; DRD2; CDK5; SLC6A3; CDK5R1; GRIN3B; NFKB1; GRIN2D; PRKACB; MAOA; GRIN1; GRIN3A; BDNF; MAOB; GRIN2C; GNAS; JUN; CREB1	27	0.02426
Organismal systems						
Circulatory system						
1	Adrenergic signaling in cardiomyocytes	Organismal Systems	Circulatory system	PRKCA; SCN5A; PPP1CC; ADCY5; MAPK11; PRKACA; AGTR1; SLC9A1; CAMK2D; MAPK3; ADCY2; ATP2A2; RYR2; ATP1A3; CACNB2; PIK3CG; MAPK13; ATP1A1; PPP2R2A; ADRA1A; KCNQ1; CACNA1S; CACNG1; CACNA1D; CACNA1F; ADCY1; CACNG2; TNNC1; SLC8A1; MAPK14; SCN1B; CACNB3; CACNB1; ADRB2; AKT2; PPP2CB; TPM1; CAMK2G; SCN7A; ADRA1B; PPP2CA; AKT1; GNAI1; CACNB4; ADRB1; PPP2R5C; CACNA1C; CAMK2A; GNAS; CACNA2D3; SCN4B; CREB1; CACNA2D2; CACNA2D1; BCL2; MAPK12; PRKACB; ADRA1D; ATP1A2; AGTR2; MAPK1	61	7.24E-06

2	Vascular smooth muscle contraction	Organismal Systems	Circulatory system	NPR1; PRKCA; PPP1CC; ADCY5; PRKACA; AGTR1; PLA2G4A; PRKCQ; KCNMB3; MAP2K1; PLA2G2A; MAPK3; ROCK2; KCNMA1; NPR2; ADCY2; PLA2G1B; ADRA1A; PRKCD; MAP2K2; CACNA1S; CACNA1D; PRKCG; CACNA1F; ADCY1; MYLK2; ADORA2A; AVPR1B; AVPR1A; CALCRL; KCNMB4; PRKACB; PTGIR; ADORA2B; ADRA1B; BRAF; MYH11; ITPR2; PRKCB; ITPR1; EDNRA; PLA2G2E; CACNA1C; ITPR3; GNAS; PRKCE; RAF1; KCNMB2; ROCK1; ADRA1D; GUCY1A2; MAPK1	52	0.00452 2
Endocrine system						
1	Estrogen signaling pathway	Organismal Systems	Endocrine system	KRT10; KRT14; KCNJ5; TFF1; HSPA8; PRKACA; PGR; CTSD; ITPR2; MAP2K1; MAPK3; ADCY2; OPRM1; GPER1; EGFR; PIK3CA; KCNJ9; ADCY5; MAP2K2; GABBR1; PIK3CB; ADCY1; PIK3R1; MMP9; HSP90AB1; GABBR2; AKT2; ESR1; KRT9; PRKACB; ITPR1; HSP90AA1; PRKCD; NOS3; GNAI1; PIK3CD; HSP90B1; ESR2; NCOA1; KCNJ3; NCOA2; HSPA2; KRT16; MMP2; ITPR3; GNAS; JUN; CREB1; RAF1; SRC; BCL2; KCNJ6; AKT1; RARA; MAPK1	55	2.95E-05
2	Renin secretion	Organismal Systems	Endocrine system	NPR1; ADCY5; AGT; AGTR1; PDE3B; EDNRA; GNAI1; KCNMA1; PTGER2; REN; ITPR2; ACE; AQP1; CACNA1S; CACNA1D; CACNA1F; PRKACA; CTSSB; PDE1A; ADRB2; PDE1B; PRKACB; ADRB3; ADORA1; ADRB1; ITPR1; PPP3R1; PDE3A; CACNA1C; ITPR3; GNAS; CREB1; GUCY1A2; PDE1C	34	0.00066
3	Oxytocin signaling pathway	Organismal Systems	Endocrine system	NPR1; PRKCA; CACNG2; CAMK2A; KCNJ5; ADCY5; PRKACA; CD38; PRKAB1; PRKAA2; ITPR2; MAP2K1; GNAS; PRKAG1; MAPK3; ROCK2; EEF2; RYR2; NPR2; ADCY2; EGFR; PRKAG2; RYR1; CAMK2D; KCNJ9; CAMK4; PRKAG3; MAP2K2; CACNA1S; CACNG1; CACNA1D; PRKCG; CACNA1F; ADCY1; MYLK2; SRC; GNAI1; OXTR; PLA2G4A; KCNJ12; PRKCB; KCNJ14; CACNB3; CACNB1; PPP3R1; CAMK2G; PRKACB; PPP1CC; NOS3; PRKAB2; CACNB2; MAP2K5; CACNB4; PIK3CG; ACTB; ITPR1; KCNJ3; PTGS2; CACNA1C; ITPR3; ACTG1; CACNA2D3; JUN; CACNA2D2; RAF1; CACNA2D1; KCNJ6; ROCK1; GUCY1A2; PRKAA1; MAPK1	71	0.00118 9
4	Progesterone-mediated oocyte maturation	Organismal Systems	Endocrine system	MAPK8; ADCY5; PRKACA; PGR; PDE3B; CDK2; MAP2K1; IGF1R; MAPK3; RPS6KA1; MAPK14; ADCY2; CCNA2; PIK3CA; PIK3CB; ADCY1; CDK1; PIK3R1; MAPK11; HSP90AB1; RPS6KA3; MAPK9; INS; AKT2; PIK3CD; HSP90AA1; PRKACB; GNAI1; BRAF; PLK1; MAPK10; AURKA; RAF1; MAPK12; MAPK1; MAPK13; AKT1	37	0.00520 6
5	Insulin secretion	Organismal Systems	Endocrine system	PRKCA; CAMK2A; ADCY5; PRKACA; FFAR1; KCNMB3; GCK; ABCC8; ADCY2; RYR2; ATP1A3; KCNN3; CAMK2D; KCNJ11; ATP1A1; CACNA1S; CACNA1D; PRKCG; CACNA1F; ADCY1; KCNMA1; GLP1R; INS; CCKAR; CHRM3; KCNN4; SLC2A1; KCNMB4; CAMK2G; PRKACB; PRKCB; CACNA1C; ITPR3; GNAS; ATP1A2; CREB1; SLC2A2; KCNMB2; KCNN2	39	0.00534 8
6	Regulation of lipolysis in adipocytes	Organismal Systems	Endocrine system	NPR1; ADCY5; ADCY1; TSHR; GNAI1; ADCY2; PIK3CA; PTGER3; IRS1; PRKACA; PIK3R1; PIK3CB; PDE3B; INS; AKT2; ADRB2; PIK3CD; PRKACB; INSR; ADRB3; ADORA1; ADRB1; PTGS2; GNAS; PTGS1; AKT1	26	0.00956 1
7	Adipocytokine signaling pathway	Organismal Systems	Endocrine system	POMC; MAPK10; MAPK8; IKBKB; NFKBIA; PRKAG3; PRKAA2; PRKCQ; ACSL3; PRKAG1; RXRG; CHUK; PRKAG2; PRKAB1; TNF; PRKAB2; IRS1; RXRA; MAPK9; NFKB1; ACSL1; AKT2; PTPN11; SLC2A1; PPARA; MTOR; PCK1; PRKAA1; RXRB; JAK2; ACSL4; CPT1A; ACACB; AKT1	34	0.01177 6
8	Thyroid hormone signaling pathway	Organismal Systems	Endocrine system	PRKCA; THRB; SLC9A1; PRKACA; TP53; PRKCB; MAP2K1; BAD; MAPK3; RXRG; HDAC1; ATP1A3; ITGAV; PIK3CA; ATP1A1; MAP2K2; ITGB3; GSK3B; PRKCG; PIK3CB; DIO3; HDAC2; ATP2A2; RXRA; AKT2; ESR1; SLC2A1; PRKACB; HDAC3; PIK3CD; MTOR; HIF1A; MDM2; ACTB; NCOA1; NCOA2; KAT2B; THRA; RXRB; ACTG1; PDPK1; RAF1; SRC; PIK3R1; AKT1; ATP1A2; MAPK1	47	0.01420 7
9	Insulin signaling pathway	Organismal Systems	Endocrine system	AKT2; GSK3B; MAPK8; IKBKB; PRKACA; PRKAG1; PDE3B; PRKAG3; PRKAA2; MAP2K1; PYGB; MAPK3; PRKAG2; PIK3CA; FBP1; PRKCZ; PYGM; PRKAB1; MAP2K2; PRKAB2; PTPN1; PIK3CB; PIK3R1; IRS1; PYGL; MAPK9; INS; PRKCI; PIK3CD; PRKACB; PPP1CC; INSR; BRAF; MTOR; EIF4E; PRKAR1A; SREBF1; PRKAA1; MAPK10; BAD; PDPK1; RAF1; PCK1; GSK; ACACB; RPS6; MAPK1	48	0.01791 3
10	Relaxin signaling pathway	Organismal Systems	Endocrine system	PRKCA; VEGFA; ADCY5; GNG2; NOS2; PRKACA; NFKBIA; MAP2K1; MAPK3; TGFB2; MAPK14; ADCY2; EGFR; PIK3CA; CREB1; PRKCZ; TGFB1; MAP2K2; TGFB1; PIK3CB; ADCY1; EDNRB; PIK3R1; MAPK11; MMP9; MAPK9; NFKB1; AKT2; PIK3CD; NOS1; PRKACB; NOS3; MAPK8; GNAI1; MMP2; MAPK10; GNAS; JUN; MMP1; RAF1; SRC; MMP13; MAPK12; AKT1; MAPK13; MAPK1	46	0.01825 2
11	GnRH signaling pathway	Organismal Systems	Endocrine system	PRKCA; MAPK10; MAPK8; ADCY5; PRKACA; PLA2G4A; MAP2K1; MAPK3; MAPK14; ADCY2; EGFR; ITPR2; CAMK2D; MAP2K2; CACNA1S; CACNA1D; CACNA1F; ADCY1; CAMK2A; MAPK11; MAPK9; CAMK2G; PRKACB; PTK2B; MAP3K1; PRKCB; GNRHR; ITPR1; MMP2; CACNA1C; ITPR3; GNAS; JUN; RAF1; SRC; MAP3K2; MAPK12; MAPK1; MAPK13; PRKCD	40	0.02920 6
12	Melanogenesis	Organismal Systems	Endocrine system	PRKCA; POMC; ADCY5; PRKACA; MAP2K1; MAPK3; ADCY2; CAMK2D; MAP2K2; GSK3B; PRKCG; ADCY1; EDNRB; TYR; CAMK2G; PRKACB; GNAI1; KIT; PRKCB; LEF1; CAMK2A; GNAS; CREB1; RAF1; MAPK1	25	0.03951 3
13	Glucagon signaling pathway	Organismal Systems	Endocrine system	PGAM2; CAMK2A; PRKACA; PRKAG1; PDE3B; PFKFB1; PRKAG3; PRKAA2; GSK; PYGB; ADCY2; PRKAG2; ITPR2; LDHB; FBP1; PYGM; PRKAB1; PGAM1; PRKAB2; PYGL; SLC2A2; AKT2; SLC2A1; PPP3R1; LDHA; PRKACB; SIRT1; SIK2; ITPR1; CAMK2D; PCK1; PRKAA1; ITPR3; GNAS; CREB1; CPT1A; CAMK2G; PKM; AKT1; ACACB; PPARA	41	0.04905 8

Immune system						
1	Complement and coagulation cascades	Organismal Systems	Immune system	SERPIND1; KNG1; A2M; C4BPB; F5; KLKB1; C1R; CPB2; PLAU; SERPINE1; F12; CLU; VTN; MASP2; F10; FGB; PROCR; C1S; THBD; C4BPA; CFB; FGA; F2; F2R; SERPINC1; F11; C5; ITGB2; BDKRB1; MBL2; C1QC; C1QB; F9; PROC; PROS1; C8B; F7; BDKRB2; PLG; C8G; F8; C8A; SERPINA1; F13B; PLAUR; C3; SERPING1; PLAT; CFI; SERPINF2; C1QA; C9; CFH; FGG; VWF	55	4.12E-06
2	Platelet activation	Organismal Systems	Immune system	AKT2; TBXA2R; ADCY5; P2RY12; PRKACA; PLA2G4A; ITPR2; GNAS; MAPK3; ROCK2; MAPK14; ADCY2; PIK3CG; PRKCZ; FYN; FGA; ITGB3; LYN; F2R; PIK3CB; ADCY1; MYLK2; GP1BA; PIK3R1; TBXAS1; MYL12A; MAPK11; FCGR2A; BTK; FGB; PRKCI; PIK3CD; PTGIR; PRKACB; PPP1CC; NOS3; GNAI1; PIK3CA; ACTB; ITPR1; FGG; ITPR3; ACTG1; PTGS1; SYK; SRC; ITGA2B; MAPK12; ROCK1; AKT1; GUCY1A2; MAPK13; VWF; MAPK1	54	0.0015
3	IL-17 signaling pathway	Organismal Systems	Immune system	IL6; IL17A; MAPK8; IL13; IKKB; NFKBIA; S100A7; MAPK3; IL5; MMP3; MAPK14; CCL2; CHUK; SRSF1; CEBPB; CXCL10; MMP13; MAPK11; MMP9; HSP90AB1; S100A8; MAPK9; NFKB1; CXCL8; HSP90AA1; HSP90B1; TNF; IL1B; CASP8; PTGS2; MAPK10; IFNG; CASP3; JUN; MMP1; GSK3B; MAPK12; MAPK1; MAPK13; S100A9	40	0.011974
4	Th17 cell differentiation	Organismal Systems	Immune system	IL2RB; IL6; IL17A; TGFB1; IL2RG; IKKB; IFNG; NFKBIA; PRKCQ; JAK3; MAPK3; RXRG; TGFB2; MAPK14; CHUK; MAPK10; CD3E; IL2; TGFB1; AHR; IL1R1; MAPK11; HSP90AB1; RXRA; JAK1; MAPK9; NFKB1; PPP3R1; HSP90AA1; STAT5B; MAPK8; IL2RA; CD4; MTOR; IFNGR2; HIF1A; TYK2; IL1B; LCK; RXRB; JAK2; MAPK13; JUN; ZAP70; MAPK12; RARA; MAPK1	47	0.04154
Nervous system						
1	Serotonergic synapse	Organismal Systems	Nervous system	PRKCA; ITPR3; KCNJ5; MAOA; ADCY5; GNG2; HTR7; PLA2G4A; HTR3B; MAOB; MAP2K1; HTR3D; HTR2B; MAPK3; SLC18A2; CYP2C8; GABRB2; HTR6; SLC18A1; HTR5A; ALOX15; KCNJ9; HTR1B; HTR1D; ALOX5; HTR3E; CACNA1S; SLC6A4; CACNA1D; PRKCG; CACNA1F; PRKACA; HTR2A; CYP2C9; KCND2; HTR3C; HTR1A; HTR2C; CACNA1B; CACNA1A; HTR1E; HTR1F; CYP2D6; ITPR1; PRKACB; CYP2C19; GNAI1; BRAF; GABRB1; ITPR2; PRKCB; HTR3A; KCNJ3; PTGS2; HTR4; CACNA1C; GABRB3; CASP3; GNAS; PTGS1; RAF1; APP; KCNJ6; KCNN2; MAPK1	65	2.89E-08
2	Dopaminergic synapse	Organismal Systems	Nervous system	PRKCA; DRD5; MAPK10; KCNJ5; MAOA; GRIA2; GNG2; PRKACA; CALY; MAOB; ADCY5; TH; SCN1A; DRD1; SLC18A2; MAPK8; MAPK14; DRD3; ITPR2; CAMK2D; KCNJ9; GRIN2B; PPP2R2A; DRD2; CACNA1D; PRKCG; GRIA4; CAMK2A; MAPK11; SLC6A3; GRIA1; MAPK9; CACNA1B; CACNA1A; SLC18A1; AKT2; PPP2CB; CAMK2G; PRKACB; PPP1CC; PPP2CA; GRIA3; GNAI1; DRD4; GRIN2A; PRKCB; ITPR1; KCNJ3; CACNA1C; ITPR3; GNAS; COMT; CREB1; GSK3B; KCNJ6; MAPK12; PPP2R5C; MAPK13; AKT1	59	2.56E-06
3	Cholinergic synapse	Organismal Systems	Nervous system	KCNQ2; PRKCA; AKT2; CAMK2A; CHRNA6; CHRM4; GNG2; PRKACA; ITPR2; ADCY5; MAP2K1; CHRN2B; MAPK3; ADCY2; PIK3CG; CAMK2D; FYN; CACNA1S; CACNA1D; PRKCG; CACNA1F; ADCY1; KCNQ5; CHRNA4; PIK3R1; CHRM2; CHRM1; PIK3CB; CAMK4; KCNJ14; CACNA1B; CACNA1A; KCNJ12; CHRM3; PIK3CD; CHAT; CAMK2G; CHRN2B4; CHRM5; GNAI1; PIK3CA; KCNQ1; PRKCB; ITPR1; KCNJ3; CHRNA3; CACNA1C; ITPR3; JAK2; ACHE; CREB1; KCNQ3; BCL2; KCNJ6; PRKACB; AKT1; MAPK1	57	4.98E-06
4	GABAergic synapse	Organismal Systems	Nervous system	PRKCA; GABRD; ADCY5; GNG2; PRKACA; GABRQ; GABRE; GABRA3; GABRR1; GABRR3; GABRB2; ADCY2; GABRG1; GABRP; CACNA1S; GABBR1; CACNA1D; PRKCG; CACNA1F; GABRA2; ABAT; GABRG3; GABRA1; CACNA1B; CACNA1A; GABRA5; ADCY1; PRKACB; GNAI1; GABRB1; PRKCB; GPHN; SLC6A1; GABRA4; GABBR2; GABRA6; GABRR2; CACNA1C; GABRB3; SRC; GABRG2; KCNJ6	42	0.018585
5	Neurotrophin signaling pathway	Organismal Systems	Nervous system	TP53; GSK3B; MAPK8; IKKB; NFKBIA; MAPKAPK2; MAP2K1; SH2B3; IRAK4; MAPK3; RPS6KA1; MAPK14; PIK3CA; CAMK2D; PDPK1; NGF; TP73; MAP2K2; RAC1; ABL1; PIK3CB; PIK3R1; CAMK2A; NTRK2; MAPK11; IRS1; NTRK1; RPS6KA3; CAMK4; MAPK9; NFKB1; AKT2; PIK3CD; CAMK2G; PRKCD; BRAF; PTPN11; MAP3K1; MAP2K5; BDNF; MAPK10; BAD; JUN; RAF1; BCL2; MAPK12; AKT1; MAPK13; MAPK1	49	0.029174
6	Long-term potentiation	Organismal Systems	Nervous system	PRKCA; CAMK2A; GRIA2; PRKACA; MAP2K1; MAPK3; RPS6KA1; ITPR2; CAMK2D; GRIN2B; MAP2K2; PRKCG; ADCY1; GRIA1; RPS6KA3; CAMK4; PPP3R1; GRIN2D; CAMK2G; PRKACB; PPP1CC; GRIN1; BRAF; GRIN2A; GRM5; PRKCB; ITPR1; GRIN2C; CACNA1C; ITPR3; RAF1; MAPK1	32	0.048865
Digestive system						
1	Pancreatic secretion	Organismal Systems	Digestive system	PRKCA; SLC9A1; ADCY5; ADCY1; CD38; PRSS1; CPB2; AMY2A; CPB1; CPA1; SCTR; CFTR; RYR2; BST1; ATP1A3; ITPR2; SLC12A2; ATP1A1; RAC1; PRKCG; PRSS2; ATP2A1; AMY2B; CA2; KCNMA1; ATP2A2; PNLIIPR2; CCKAR; CHRM3; ADCY2; PNLIIP; CTRB1; PLA2G2A; KCNQ1; PRKCB; ITPR1; PLA2G2E; ITPR3; GNAS; PRSS3; ATP1A2; PLA2G1B	42	7.66E-05
2	Salivary secretion	Organismal Systems	Digestive system	PRKCA; SLC9A1; ADCY5; PRKACA; CD38; KCNMA1; BST1; ATP1A3; LYZ; ITPR2; SLC12A2; ATP1A1; ADRA1A; PRKCG; ADCY1; ADRB2; ADCY2; CHRM3; KCNN4; NOS1; PRKACB; ADRA1B; ADRB3; ADRB1; PRKCB; ITPR1; ITPR3; GNAS; GUCY1A2; ATP1A2; ADRA1D	31	0.000714

3	Gastric acid secretion	Organismal Systems	Digestive system	PRKCA; SLC9A1; ADCY5; ATP4B; SSTR2; PRKACA; KCNJ1; CFTR; ATP1A3; ITPR2; CAMK2D; ATP1A1; PRKCG; ADCY1; MYLK2; HRH2; CA2; KCNJ10; CAMK2A; PRKCB; ADCY2; CHRM3; CAMK2G; PRKACB; GNAI1; KCNQ1; ACTB; ITPR1; ITPR3; GNAS; KCNK2; ATP4A; ATP1A2; KCNJ15	34	0.00342
Others						
1	Circadian entrainment	Organismal Systems	Environmental adaptation	MTNR1B; PRKCA; CAMK2A; KCNJ5; CACNA1H; GRIA2; GNG2; PRKACA; GNAI1; MAPK3; RYR2; ADCY2; RYR1; CAMK2D; KCNJ9; GRIN2B; ADCY5; CACNA1D; PRKCG; ADCY1; GRIA4; GRIA1; MTNR1A; NOS1; GRIN2D; CAMK2G; PRKACB; GRIA3; GRIN1; GRIN2A; CACNA1I; PRKCB; ITPR1; KCNJ3; GRIN2C; CACNA1C; ITPR3; GNAS; CREB1; KCNJ6; GUCY1A2; CACNA1G; MAPK1	43	1.69E-06
2	Inflammatory mediator regulation of TRP channels	Organismal Systems	Sensory system	PRKCA; MAPK10; TRPV3; ADCY5; MAPK11; PRKACA; PLA2G4A; PRKCQ; TRPV2; HTR2B; MAPK8; MAPK14; PTGER2; ADCY2; PIK3CB; PIK3CA; CAMK2D; NGF; PRKCG; HTR2C; ADCY1; HTR2A; PIK3R1; PRKCE; BDKRB1; NTRK1; P2RY2; MAPK9; TRPA1; IL1R1; PIK3CD; ITPR2; CAMK2G; PRKCD; PPP1CC; MAPK12; CAMK2A; TRPV4; HRH1; PRKCB; ITPR1; IL1B; TRPV1; ITPR3; GNAS; SRC; TRPM8; BDKRB2; MAPK13; PRKACB	50	0.001462
3	Longevity regulating pathway - multiple species	Organismal Systems	Aging	HSPA8; PRKACA; PRKAB1; PRKAA2; IGF1R; PRKAG1; HDAC1; ADCY2; PRKAG2; PIK3CA; PRKAG3; ADCY5; PRKAB2; PIK3CB; ADCY1; HDAC2; IRS1; INS; AKT2; PIK3CD; PRKACB; INSR; SIRT1; MTOR; HSPA2; PRKAA1; SOD1; PIK3R1; AKT1	29	0.014207
4	Endocrine and other factor-regulated calcium reabsorption	Organismal Systems	Excretory system	PRKCB; ATP1A3; PTH1R; VDR; PRKCA; ATP1A1; PRKACA; GNAS; ESR1; PRKCG; BDKRB2; SLC8A1; KLK1; ATP1A2; PRKACB	15	0.029174
5	Taste transduction	Organismal Systems	Sensory system	SCN9A; PRKACA; HTR3B; GABRA3; HTR3D; HTR3C; HTR1B; HTR3E; HTR1D; SCN3A; PDE1A; GABRA2; HTR1A; GABRA1; CACNA1A; HTR1E; CHRM3; HTR1F; PDE1B; GABRA5; PRKACB; SCN2A; GABBR1; HTR3A; GABRA4; GABBR2; GABRA6; CACNA1C; ITPR3; PDE1C	30	0.029696
Cellular processes						
1	Gap junction	Cellular Processes	Cellular community - eukaryotes	PRKCA; TUBA1C; ADCY5; PRKACA; TUBB4A; MAP2K1; TUBB1; HTR2B; MAPK3; DRD1; TUBB3; ADCY2; EGFR; ITPR2; TUBB6; PDGFRA; DRD2; PDGFRB; MAP2K2; TUBB4B; PRKCG; HTR2C; ADCY1; HTR2A; PDGFD; CDK1; TUBB; TUBB2B; EGF; TUBA1B; TUBA3E; PRKACB; GNAI1; GRM5; MAP2K5; ADRB1; PRKCB; ITPR1; TUBA1A; ITPR3; GNAS; RAF1; SRC; MAP3K2; TUBA8; TUBB2A; MAPK1; GUCY1A2; TUBA4A	49	4.10E-05
2	Tight junction	Cellular Processes	Cellular community - eukaryotes	TUBA1C; MAPK8; PRKACA; MYH14; CD1D; PRKAB1; PRKAA2; MYL12A; PRKAG1; CFTR; PRKAG2; MAP3K1; PRKCZ; PPP2R2A; ACTN1; TUBA8; PRKAG3; ROCK2; RAC1; PRKAB2; CACNA1D; RAB8B; PRKCE; MYH9; MAPK9; TUBA1B; PRKCI; CD1A; PPP2CB; TUBA3E; PRKACB; PPP2CA; MYH11; ACTB; TUBA1A; PRKAA1; MAPK10; ACTG1; JUN; SRC; CDK4; ROCK1; ERBB2; TUBA4A	44	0.007643
3	Apoptosis	Cellular Processes	Cell growth and death	TP53; AKT1; TUBA1C; MAPK8; IKKB; CTSS; NFKB1A; CTSD; MAP2K1; BAD; PARP3; CYCS; CTSS; MAPK3; CHUK; PIK3CA; CTSK; PDPK1; TNFRSF10B; MAPK10; NGF; MAP2K2; BIRC5; PIK3CB; PARP2; PIK3R1; CTSV; NTRK1; ATM; MAPK9; NFKB1; TUBA1B; CTSF; AKT2; PIK3CD; CASP7; TUBA3E; CTSH; CTSL; PARP1; TNF; ITPR2; ACTB; ITPR1; CASP8; TUBA1A; ITPR3; CASP3; ACTG1; JUN; RAF1; BCL2; TUBA8; MAPK1; IL3; TUBA4A	56	0.010417
4	Autophagy - animal	Cellular Processes	Transport and catabolism	BECN1; PRKACA; CTSD; MAPK1; PRKAA2; PRKCQ; MAP2K1; IGF1R; CTSL; MAPK3; MAPK8; PIK3CA; PDPK1; MAP2K2; PIK3CB; CTSS; HMGB1; PIK3R1; IRS1; MAPK9; INS; AKT2; PIK3CD; PPP2CB; PRKCD; PPP2CA; PIK3C3; MTOR; ULK1; ITPR1; HIF1A; DAPK3; PRKAA1; MAPK10; BAD; RAF1; BCL2; AKT1; DAPK1; PRKACB	40	0.018772
5	Oocyte meiosis	Cellular Processes	Cell growth and death	CAMK2A; ADCY5; PRKACA; PGR; CDK2; SLK; MAP2K1; IGF1R; MAPK3; RPS6KA1; ADCY2; ITPR2; CAMK2D; ADCY1; YWHAB; CDK1; SKP1; RPS6KA3; INS; AR; YWHAH; PPP2CB; PPP3R1; CAMK2G; PRKACB; PPP1CC; PPP2CA; PLK1; ITPR1; ITPR3; AURKA; MAPK12; PPP2R5C; MAPK1	34	0.030356
Metabolism						
1	Purine metabolism	Metabolism	Nucleotide metabolism	PDE5A; PDE4B; RRM2B; ADCY5; ENPP1; ADCY1; PDE3B; PDE4A; ADK; ATIC; ADSSL1; PDE6B; HPRT1; PNP; NT5C2; GMPR; ADA; ADCY2; PDE6A; PAPSS1; IMPDH2; PDE6G; FHIT; NT5E; NPR2; POLE3; PDE1A; PPAT; RRM1; PDE7A; POLE2; POLE; PDE4D; PDE2A; PDE10A; POLA1; GART; RRM2; PDE1B; NPR1; PDE11A; DCK; PDE8B; XDH; PDE6H; PDE4C; PGM1; ADSS; PDE7B; PDE3A; PDE9A; NME1; APRT; POLE4; PDE6C; PDE8A; NT5M; PKM; GUCY1A2; IMPDH1; PDE1C	61	8.64E-05

2	Steroid hormone biosynthesis	Metabolism	Lipid metabolism	SRD5A1; CYP1A2; SULT2B1; AKR1C3; STS; HSD3B1; CYP19A1; HSD17B2; CYP2E1; CYP21A2; CYP3A4; AKR1C1; SULT1E1; CYP1A1; CYP11B2; CYP17A1; CYP11B1; HSD11B1; CYP3A5; HSD17B8; UGT1A9; SRD5A2; CYP11B1; HSD11B2; AKR1C2; COMT; HSD17B1	27	0.039513
Genetic information processing						
1	Proteasome	Genetic Information Processing	Folding, sorting and degradation	PSMB6; PSMB9; PSMA4; PSMB4; PSMB7; PSMA2; IFNG; PSMB8; PSMB5; PSMA1; PSMA6; PSMA3; PSMB10; PSME1; PSMA7; PSMB1; PSMB2; PSMB3	18	0.010417
Pathways Enriched by Targets of Inhibitors (p-value < 0.05)						
Signal transduction						
No.	Pathway	Class	Subclass	Targets	No. Targets	p-value
1	MAPK signaling pathway	Environmental Information Processing	Signal transduction	MAP3K13; TGFB1; IKBKB; MAP4K1; MAP2K6; PAK1; MAP4K3; FGF1; CHUK; EGFR; MAP3K1; PDGFRA; CACNA1S; CACNA1F; IRAK1; MAPK11; MAP2K3; CACNA1A; TAOK1; KIT; CACNB4; FGF4; CACNA2D2; RAF1; CACNA1H; PLA2G4A; MKNK1; MAPKAPK2; PAK2; FGF19; IGF1; FLT1; MAPK3; IGF1; MAP2K2; CACNG1; ERBB4; MAP3K12; KDR; MAPK9; AKT2; PRKACB; MAP3K6; BRAF; MAP2K5; CACNA2D1; MAP3K2; FGF1; MET; TEK; MAPK1; VEGFA; HSPA8; TAOK3; CSF1R; IRAK4; RPS6KA1; ZAK; PDGFRB; MAP3K3; PRKCG; NTRK2; FGFR3; MAP4K4; CACNB3; CACNB1; FGF4; TNF; FLT4; PRKCB; MAPK10; CASP3; STK3; ERBB2; MAPK13; CACNA1G; AKT1; PRKACA; MAPKAPK5; MAP3K4; CACNA1E; HGF; TGFB2; MAPK14; CACNB2; MKNK2; NFKB2; EPHA2; MAPT; NTRK1; RPS6KA3; CACNA1B; INSR; MAPK7; FGFR2; MAP3K11; IL1B; FLT3; CACNA1C; RPS6KA6; TAOK2; FGF2; MAP4K2	103	1.30E-17
2	Ras signaling pathway	Environmental Information Processing	Signal transduction	VEGFA; IKBKB; PRKACA; PLA2G4A; CSF1R; PIK3R2; PIK3R3; PAK2; FGF19; IGF1; PAK1; FLT1; PLA2G2A; HGF; HTR7; FGFR1; NTRK1; IGF1; PAK5; TBK1; PAK3; GRIN2B; PDGFRA; PLA2G1B; PDGFRB; MAP2K2; MAPK3; ABL1; PRKCG; PIK3CB; MAPK9; EPHA2; PIK3R1; NTRK2; PAK4; ABL2; KDR; FGFR3; AKT2; PIK3CD; PLA2G6; EGFR; PRKACB; INSR; GRIN1; FGFR4; KIT; FLT4; PIK3CA; FGFR2; PRKCB; CHUK; FLT3; PLA2G2E; FGF4; MAPK10; ZAP70; RAF1; FGF2; FGF1; MET; MAPK1; TEK; AKT1	64	1.32E-09
3	ErbB signaling pathway	Environmental Information Processing	Signal transduction	CAMK2A; PIK3R2; PIK3R3; PAK2; PAK1; MAPK3; CAMK2B; PAK5; EGFR; PAK3; CAMK2D; PTK2; MAP2K2; ABL1; GSK3B; PRKCG; PIK3CB; MAPK9; PIK3R1; PAK4; ABL2; ERBB4; AKT2; PIK3CD; CAMK2G; STAT5B; BRAF; MTOR; PIK3CA; PRKCB; MAPK10; RAF1; SRC; MAPK1; ERBB2; AKT1	36	7.16E-08
4	Calcium signaling pathway	Environmental Information Processing	Signal transduction	DRD5; PDE1A; ADRA1B; BDKRB1; NOS2; PRKACA; AGTR1; EDNRA; CACNA1E; GRIN1; HTR2B; MYLK4; CAMK2B; CACNA1H; HTR6; PTAFR; HTR5A; CAMK2D; DRD1; PDGFRA; CACNA1S; PDGFRB; ADRA1A; F2R; PRKCG; HTR2C; HTR7; MYLK2; PHKG1; TNNC1; MYLK3; ADRB2; CACNA1B; CHRM2; CHRM1; PPIF; HRH2; HTR2A; CACNA1F; ERBB4; AVPR1A; ADORA2B; CHRM3; MYLK; EGFR; CAMK2G; PRKACB; CHRM5; NOS3; ADRB3; PTK2B; PDE1B; HRH1; ADRB1; PRKCB; EDNRB; NOS1; HTR4; CACNA1C; CAMK2A; PLCD1; OXTR; TACR1; CACNA1A; ADORA2A; ERBB2; CACNA1G; ADRA1D	68	2.27E-07
5	mTOR signaling pathway	Environmental Information Processing	Signal transduction	ULK2; IKBKB; ATP6V1A; PIK3R2; PIK3R3; PRKAA2; IGF1R; MAPK3; RPS6KA1; IGF1; CHUK; PIK3CA; PDPK1; MTOR; MAP2K2; RAF1; PRKCG; PIK3CB; PIK3R1; RPS6KA3; PRKCB; AKT2; PIK3CD; INSR; BRAF; TNF; EIF4E; ULK1; PRKAA1; RPS6KA6; GSK3B; SGK1; MAPK1; AKT1	34	8.11E-07
6	Rap1 signaling pathway	Environmental Information Processing	Signal transduction	AKT2; VEGFA; PRKD1; MAPK3; CSF1R; MAPK1; FGF19; MAP2K6; FLT1; HGF; FGFR1; MAPK14; EGFR; PIK3CA; GRIN2B; PDGFRA; DRD2; PDGFRB; MAP2K2; F2R; PRKCG; PIK3CB; EPHA2; FGF2; IGF1; PIK3R1; ADORA2A; MAPK11; KDR; PRKCB; FGFR3; PRKCI; PIK3CD; INSR; GRIN1; BRAF; FGFR4; KIT; FLT4; PIK3R2; FGFR2; MAP2K3; FGF4; RAF1; SRC; FGF1; PIK3R3; IGF1R; MET; ADORA2B; TEK; MAPK13; AKT1	53	3.20E-06
7	PI3K-Akt signaling pathway	Environmental Information Processing	Signal transduction	ITGA4; IL6; TLR4; VEGFA; BCL2; IKBKB; MAPK3; NOS3; CSF1R; IL2RB; CDK6; PIK3R3; PRKAA2; FGF19; JAK3; IGF1R; FLT1; HGF; FGFR1; NTRK1; IGF1; CHUK; EGFR; PIK3CG; PDPK1; AKT2; PTK2; PDGFRA; IFNAR1; PDGFRB; MAP2K2; IL2; GSK3B; SYK; EPHA2; EIF4E; PIK3R1; CHRM2; NTRK2; CHRM1; RXRA; HSP90AB1; PRLR; KDR; PIK3CB; COL1A1; JAK1; ERBB4; PIK3R2; PKN2; PIK3CD; FGFR3; HSP90AA1; MTOR; INSR; FGFR4; HSP90B1; KIT; FLT4; PIK3CA; FGFR2; CDK2; FLT3; TEK; FGF4; JAK2; F2R; FN1; RAF1; FGF2; CDK4; FGF1; PKN1; SGK1; MET; MAPK1; ERBB2; PRKAA1; AKT1	79	7.66E-06
8	FoxO signaling pathway	Environmental Information Processing	Signal transduction	IL6; TGFB1; IKBKB; PLK4; PRKAG3; PRKAA2; IGF1R; PRKAG1; MAPK3; BRAF; TGFB2; MAPK14; CHUK; EGFR; PRKAG2; PIK3CA; PDPK1; PRKAB1; MAP2K2; PRKAB2; PIK3CB; IGF1; PIK3R1; MAPK11; STAT3;	42	1.00E-05

				MAPK9; AKT2; PIK3CD; INSR; PLK3; PIK3R3; PIK3R2; PLK1; CDK2; PRKAA1; MAPK10; RAF1; PLK2; SGK1; MAPK1; MAPK13; AKT1		
9	cGMP-PKG signaling pathway	Environmental Information Processing	Signal transduction	PDE5A; ADRA2B; ADORA3; ADRA1B; PDE2A; AGTR1; NOS3; PDE3B; MAPK1; EDNRA; KCNMB3; MAPK3; MYLK4; ROCK2; CNGA1; PRKG2; PIK3CG; ATP1A1; ADRA1A; MAP2K2; CACNA1S; CACNA1F; MYLK2; EDNRB; ADRA2A; PRKCE; KCNMA1; PPIF; OPRD1; PDE2A; NPPB; AKT2; ADRB2; KCNMB4; ADRA2C; INSR; ADRB3; ADORA1; ADRB1; MYLK3; MYLK; PDE3A; CACNA1C; KCNMB1; RAF1; ROCK1; ADRA1D; GUCY1A2; AKT1	49	6.66E-05
10	Apelin signaling pathway	Environmental Information Processing	Signal transduction	SLC9A1; BECN1; NOS2; PRKACA; AGTR1; PDE3B; PRKAG3; PRKAA2; PRKAG1; MAPK3; MYLK4; TGFBF1; PRKAG2; PIK3CG; PRKAB1; MAP2K2; PRKAB2; MYLK2; MYLK3; PRKCE; AKT2; MYLK; PRKACB; NOS3; PIK3C3; MTOR; HDAC4; NOS1; PRKAA1; PLAT; RAF1; MAPK1; AKT1	33	0.00011
11	cAMP signaling pathway	Environmental Information Processing	Signal transduction	PDE4B; DRD5; MAPK10; GRIA2; PRKACA; PDE3B; PDE4A; MAPK1; EDNRA; SLC9A1; PAK1; MAPK3; DRD1; CAMK2B; CNGA1; HTR6; ATP1A1; PIK3CA; CAMK2D; HTR1B; AKT2; HCN2; F2R; DRD2; ROCK2; MAP2K2; CACNA1S; HTR1D; CACNA1F; PDE4D; PIK3R1; ADORA2A; CHRM1; HTR1A; CFTR; PIK3CB; MAPK9; HTR1E; ADRB2; PIK3CD; CAMK2G; PRKACB; AKT1; GRIN1; BRAF; HTR1F; GRIN3A; ADORA1; PIK3R2; ADRB1; GRIN3B; PDE3A; HTR4; CACNA1C; CAMK2A; OXTR; GRIN2B; RAF1; PIK3R3; ROCK1; CHRM2; PPARA	62	0.000136
12	VEGF signaling pathway	Environmental Information Processing	Signal transduction	VEGFA; PLA2G4A; MAPKAPK2; PIK3R3; MAPK3; MAPK14; PIK3R2; PTK2; MAP2K2; PRKCG; PIK3CB; PIK3R1; MAPK11; KDR; AKT2; PIK3CD; NOS3; PIK3CA; PRKCB; PTGS2; RAF1; SRC; AKT1; MAPK13; MAPK1	25	0.000258
13	AMPK signaling pathway	Environmental Information Processing	Signal transduction	PFKFB1; PRKAB1; PRKAA2; IGF1R; PRKAG1; CAMKK2; CFTR; IGF1; PRKAG2; PIK3CA; FBP1; PDPK1; ADRA1A; PRKAG3; PRKAB2; PIK3CB; PIK3R1; HMGCR; AKT2; PIK3CD; INSR; CCNA2; PIK3R3; MTOR; PIK3R2; ULK1; PPARG; SREBF1; PRKAA1; AKT1	30	0.000275
14	NF-kappa B signaling pathway	Environmental Information Processing	Signal transduction	IKBKB; CSNK2A2; PLAUI; XIAP; IRAK4; RIPK1; CSNK2A1; LYN; SYK; VCAM1; IRAK1; BTK; NFKB2; CHUK; ICAM1; TLR4; CSNK2B; PARP1; TNF; TNFRSF11A; IL1B; PRKCB; PTGS2; LCK; PRKCQ; ZAP70; BCL2	27	0.00037
15	HIF-1 signaling pathway	Environmental Information Processing	Signal transduction	IL6; VEGFA; NOS2; NOS3; MKNK1; PIK3R2; PIK3R3; IGF1R; FLT1; MAPK3; CAMK2B; IGF1; EGFR; PIK3CA; CAMK2D; MKNK2; MAP2K2; TF; PRKCG; PIK3CB; PIK3R1; STAT3; AKT2; PIK3CD; SLC2A1; CAMK2G; TLR4; INSR; MTOR; EIF4E; PRKCB; HIF1A; ERBB2; CAMK2A; BCL2; MAPK1; TEK; AKT1	38	0.000815
16	TNF signaling pathway	Environmental Information Processing	Signal transduction	IL6; IKBKB; PIK3R2; PIK3R3; MAP2K6; MAPK3; CSF2; MMP3; MAPK14; CHUK; PIK3CA; PIK3CB; VCAM1; RIPK1; PIK3R1; MAPK11; SELE; MAPK9; AKT2; PIK3CD; CASP7; ICAM1; TNF; PTGS2; MAP2K3; IL1B; MAPK10; CASP3; AKT1; MAPK13; MAPK1	31	0.004275
17	Sphingolipid signaling pathway	Environmental Information Processing	Signal transduction	ADORA3; CTSD; PIK3R3; MAPK3; ROCK2; MAPK14; PIK3CB; PIK3CA; PDPK1; FYN; MAP2K2; PRKCG; ABCC1; PIK3R1; PRKCE; MAPK11; OPRD1; MAPK9; AKT2; PIK3CD; NOS3; TNF; ADORA1; PIK3R2; PRKCB; MAPK10; RAF1; BCL2; ROCK1; MAPK1; MAPK13; AKT1	32	0.01183

Human diseases

Cancers: Overview

1	Pathways in cancer	Human Diseases	Cancers: Overview	TGFBF1; IKBKB; AGTR1; PIK3R3; CDK2; EDNRA; XIAP; ROCK2; FGFR1; CHUK; EGFR; PIK3R2; CAMK2D; PDGFRA; MTOR; NOS2; ABL1; EDNRB; STAT3; HSP90AB1; JAK1; AR; CAMK2G; KIT; NQO1; FGF4; JAK2; GSTA1; GSK3B; NCOA1; RARA; BCR; FGFR3; CDK6; FGF19; IGF1R; MAPK3; RXRG; IGF1; RET; MAP2K2; RAF1; BDKRB1; MAPK9; AKT2; ESR1; PRKACB; BRAF; DAPK2; PPARG; RXRB; FN1; GSTM4; BCL2; FGF1; MET; MAPK1; IL12B; VEGFA; CSF1R; FLT4; GSTM1; IFNAR1; PDGFRB; PRKCG; PIK3CB; HDAC2; GSTA2; ALK; RXRA; NFKB2; PIK3CD; SLC2A1; HSP90AA1; FGFR4; ESR2; PRKCB; PTGS2; GSTP1; MAPK10; CASP3; PIM1; CDK4; ROCK1; ERBB2; DAPK1; AKT1; IL2RB; IL6; PRKACA; JAK3; HGF; TGFBF2; PIK3CA; PTK2; CAMK2B; IL2; F2R; PIK3R1; NTRK1; CASP7; HSP90B1; FGFR2; HIF1A; DAPK3; FLT3; CAMK2A; MMP1; STAT5B; FGF2; PPARD; TXNRD1; CSF2RA	113	1.25E-06
2	Proteoglycans in cancer	Human Diseases	Cancers: Overview	IL12B; SLC9A1; VEGFA; PRKACA; MAPK1; PLAUI; IGF1R; PAK1; HGF; CAMK2B; FGFR1; MAPK14; EGFR; PIK3CA; CAMK2D; PDPK1; PTK2; TNF; MAP2K2; PRKCG; PIK3CB; SRC; IGF1; PIK3R1; MAPK11; STAT3; KDR; ERBB4; AKT2; ESR1; MAPK3; CAMK2G; PRKACB; TLR4; BRAF; PIK3CD; ROCK2; MTOR; PIK3R2; PRKCB; HIF1A; CAMK2A; CASP3; FN1; RAF1; FGF2; ROCK1; PIK3R3; MET; AKT1; ERBB2; MAPK13; CTSL	53	0.000113
3	Central carbon metabolism in cancer	Human Diseases	Cancers: Overview	PGAM2; FGFR3; NTRK3; PIK3R3; GCK; MAPK3; FGFR1; EGFR; PIK3CA; RET; PDGFRA; PDGFRB; MAP2K2; PIK3CB; KIT; NTRK1; AKT2; PIK3CD; SLC2A1; MTOR; PIK3R2; FGFR2; HIF1A; FLT3; RAF1; PIK3R1; MET; MAPK1; ERBB2; AKT1	30	0.000701

4	MicroRNAs in cancer	Human Diseases	Cancers: Overview	VEGFA; IKBKB; FGFR3; STAT3; PLAU; CDK6; ABCB1; EGFR; PIK3CA; PDGFRA; PDGFRB; MAP2K2; ABL1; PRKCG; ABCC1; MMP16; PRKCE; PAK4; BMPR2; MAPK7; MTOR; PIK3R2; PRKCB; HDAC4; PTGS2; CYP1B1; CASP3; RAF1; PIM1; BCL2; ROCK1; MET; ERBB2; MAPK1	34	0.024695
5	Choline metabolism in cancer	Human Diseases	Cancers: Overview	PLA2G4A; PIK3R3; MAPK3; EGFR; PIK3R2; PDPK1; PDGFRA; PDGFRB; MAP2K2; PRKCG; PIK3CB; PIK3R1; MAPK9; AKT2; PIK3CD; MTOR; PIK3CA; PRKCB; HIF1A; MAPK10; RAF1; AKT1; MAPK1	23	0.039373
Cancers: Specific types						
1	Breast cancer	Human Diseases	Cancers: Specific types	PGR; PIK3R2; CDK6; PIK3R3; FGF19; IGF1R; FLT4; MAPK3; FGFR1; IGF1; EGFR; PIK3CA; KIT; MAP2K2; RAF1; PIK3CB; ESR2; PIK3R1; NFKB2; AKT2; PIK3CD; BRAF; ESR1; MTOR; CSNK1A1; NCOA1; FGF4; GSK3B; FGF2; CDK4; FGF1; MAPK1; ERBB2; AKT1	34	1.95E-05
2	Gastric cancer	Human Diseases	Cancers: Specific types	TGFBR1; PIK3R2; PIK3R3; CDK2; FGF19; MAPK3; HGF; ABCB1; RXRG; TGFB2; EGFR; PIK3CA; MAP2K2; RAF1; PIK3CB; PIK3R1; RXRA; AKT2; PIK3CD; BRAF; MTOR; CSNK1A1; FGFR2; FGF4; RXRB; GSK3B; FGF2; BCL2; FGF1; MET; MAPK1; ERBB2; AKT1	33	0.000106
3	Glioma	Human Diseases	Cancers: Specific types	PIK3R3; IGF1R; CDK6; MAPK3; CAMK2B; IGF1; EGFR; PIK3CA; CAMK2D; PDGFRA; PDGFRB; MAP2K2; PRKCG; PIK3CB; PIK3R1; AKT2; PIK3CD; CAMK2G; BRAF; MTOR; PIK3R2; PRKCB; CAMK2A; RAF1; CDK4; AKT1; MAPK1	27	0.000146
4	Melanoma	Human Diseases	Cancers: Specific types	PIK3R3; FGF19; IGF1R; CDK6; MAPK3; FGFR1; IGF1; EGFR; PIK3CA; PDGFRA; PDGFRB; MAP2K2; PIK3CB; HGF; PIK3R1; AKT2; PIK3CD; BRAF; PIK3R2; FGF4; RAF1; FGF2; CDK4; FGF1; MET; AKT1; MAPK1	27	0.000146
5	Non-small cell lung cancer	Human Diseases	Cancers: Specific types	PIK3R3; JAK3; CDK6; MAPK3; RXRG; EGFR; PIK3CA; PDPK1; MAP2K2; PRKCG; PIK3CB; PIK3R1; STAT3; ALK; RXRA; AKT2; PIK3CD; STAT5B; BRAF; PIK3R2; PRKCB; RXRB; RAF1; CDK4; AKT1; ERBB2; MAPK1	27	0.00015
6	Prostate cancer	Human Diseases	Cancers: Specific types	IKBKB; INSRR; PIK3R3; CDK2; PLAU; IGF1R; MAPK3; FGFR1; MMP3; IGF1; CHUK; EGFR; PIK3CA; PDPK1; PDGFRA; PDGFRB; MAP2K2; RAF1; PIK3CB; PIK3R1; HSP90AB1; AR; AKT2; PIK3CD; HSP90AA1; BRAF; HSP90B1; MTOR; PIK3R2; FGFR2; GSTP1; PLAT; GSK3B; BCL2; MAPK1; ERBB2; AKT1	37	0.000214
7	Acute myeloid leukemia	Human Diseases	Cancers: Specific types	IKBKB; CSF1R; PIK3R3; MAPK3; BRAF; CHUK; PIK3CA; KIT; MAP2K2; PIK3CB; PIK3R1; STAT3; AKT2; PIK3CD; STAT5B; MPO; MTOR; PIK3R2; FLT3; CSF2; RAF1; PIM1; PPARD; AKT1; RARA; MAPK1	26	0.000402
8	Renal cell carcinoma	Human Diseases	Cancers: Specific types	VEGFA; PIK3R2; PIK3R3; PAK2; PAK1; MAPK3; PAK5; HGF; PAK3; MAP2K2; PIK3CB; PIK3R1; PAK4; AKT2; PIK3CD; SLC2A1; BRAF; PIK3CA; HIF1A; RAF1; MET; MAPK1; AKT1	23	0.005725
9	Pancreatic cancer	Human Diseases	Cancers: Specific types	VEGFA; IKBKB; PIK3R3; CDK6; MAPK3; TGFB2; CHUK; EGFR; PIK3CA; PIK3CB; TGFB2; PIK3R1; STAT3; JAK1; MAPK9; AKT2; PIK3CD; BRAF; MTOR; PIK3R2; MAPK10; RAF1; CDK4; AKT1; ERBB2; MAPK1	26	0.01107
10	Chronic myeloid leukemia	Human Diseases	Cancers: Specific types	TGFBR1; IKBKB; PIK3R3; CDK6; MAPK3; TGFB2; CHUK; PIK3CA; MAP2K2; ABL1; PIK3CB; HDAC2; BCR; AKT2; PIK3CD; STAT5B; BRAF; PIK3R2; PIK3R1; RAF1; CDK4; MAPK1; AKT1	23	0.03091
Neural diseases						
1	EGFR tyrosine kinase inhibitor resistance	Human Diseases	Drug resistance: Antineoplastic	IL6; VEGFA; MAPK3; FGFR3; PIK3R2; PIK3R3; IGF1R; HGF; IGF1; EGFR; PIK3CA; PDGFRA; PDGFRB; MAP2K2; RAF1; PRKCG; PIK3CB; FGF2; PIK3R1; STAT3; KDR; JAK1; AKT2; PIK3CD; AXL; BRAF; MTOR; EIF4E; FGFR2; PRKCB; JAK2; GSK3B; SRC; BCL2; MET; MAPK1; ERBB2; AKT1	38	7.18E-08
2	Morphine addiction	Human Diseases	Substance dependence	PDE4B; GABRQ; GABRD; PDE1A; OPRM1; PDE2A; PRKACA; PDE3B; PDE4A; PDE11A; GABRE; GABRA3; GABRR3; DRD1; GABRB2; GABRG1; GABRP; PRKCG; GABRA2; CACNA1B; GABRG3; PDE7A; CACNA1A; GABRA1; PDE4D; PDE2A; PDE10A; PDE7B; GABRA5; PRKACB; PDE1B; GABRR1; GABRB1; ADORA1; PRKCB; GABRA4; GABRA6; PDE3A; GABRB3; PDE8A; GABRG2	41	4.76E-07
3	Nicotine addiction	Human Diseases	Substance dependence	GABRQ; GABRD; CHRNA6; GRIA2; GABRE; GABRA3; CHRN2; GABRR1; GABRR3; GABRB2; GABRG1; GRIN2B; GABRP; GABRA2; CHRNA4; GABRG3; GABRA1; CACNA1B; CACNA1A; GABRA5; GRIN1; GABRB1; GRIN3A; GRIN3B; GABRA4; GABRA6; GABRB3; GABRG2	28	5.81E-07
4	Endocrine resistance	Human Diseases	Drug resistance: Antineoplastic	PRKACA; PIK3R2; PIK3R3; IGF1R; MAPK3; MAPK14; GPER1; EGFR; PIK3CA; PTK2; MAP2K2; PIK3CB; IGF1; PIK3R1; BCL2; MAPK11; MAPK9; AKT2; ESR1; PRKACB; BRAF; PIK3CD; MTOR; ESR2; MAPK10; RAF1; SRC; CDK4; MAPK1; ERBB2; MAPK13; AKT1	32	0.000548
5	Alcoholism	Human Diseases	Substance dependence	PRKACA; HDAC8; DDC; CAMKK2; MAPK3; DRD1; SLC18A2; GRIN2B; DRD2; HDAC2; ADORA2B; NTRK2; SLC6A3; CAMKK1; MAOA; GRIN1; BRAF; GRIN3A; SLC29A1; GRIN3B; HDAC4; MAOB; HDAC7; PKIA; RAF1; ADORA2A; MAPK1	27	0.038304

Endocrine and metabolic diseases						
1	Insulin resistance	Human Diseases	Endocrine and metabolic diseases	IL6; IKBKB; NOS3; NR1H2; PRKAG3; PRKAA2; PRKCQ; NR1H3; PRKAG1; RPS6KA1; PRKAG2; PIK3CA; PDPK1; PRKAB1; MTOR; PRKAB2; PTPN1; PIK3CB; PIK3R1; PRKCE; STAT3; PYGL; RPS6KA3; MAPK9; AKT2; PIK3CD; SLC2A1; PRKCD; INSR; PIK3R3; TNF; PIK3R2; PRKCB; SREBF1; PRKAA1; MAPK10; RPS6KA6; GSK3B; AKT1; PPARA	40	8.05E-07
2	Type II diabetes mellitus	Human Diseases	Endocrine and metabolic diseases	IKBKB; PIK3R3; GCK; CACNA1E; MAPK3; PIK3CA; KCNJ11; MTOR; PIK3CB; PIK3R1; PRKCE; MAPK9; CACNA1B; CACNA1A; PIK3CD; PRKCD; INSR; TNF; PIK3R2; CACNA1C; MAPK10; CACNA1G; MAPK1	23	0.000106
3	AGE-RAGE signaling pathway in diabetic complications	Human Diseases	Endocrine and metabolic diseases	IL6; VEGFA; PLCD1; AGTR1; PIK3R3; MAPK3; TGFBR1; MAPK14; PIK3CA; BCL2; PIK3CB; VCAM1; TGFBR2; PIK3R1; PRKCE; MAPK11; STAT3; SELE; COL1A1; MAPK9; AKT2; PIK3CD; PRKCD; NOS3; ICAM1; TNF; PIK3R2; PRKCB; IL1B; MAPK10; JAK2; CASP3; FN1; STAT5B; PIM1; CDK4; MAPK1; MAPK13; AKT1	39	0.000132
Infectious diseases						
1	Measles	Human Diseases	Infectious diseases: Viral	IL12B; IL2RB; IL6; HSPA8; PIK3R2; CDK6; PIK3R3; CDK2; CSNK2A2; JAK3; IRAK4; CSNK2A1; TBK1; PIK3CA; IFNAR1; FYN; JAK1; PIK3CB; TLR9; PIK3R1; CDK4; STAT3; IKBKE; AKT2; PIK3CD; EIF2AK2; EIF2AK4; TLR4; CSNK2B; IL1B; CHUK; TYK2; TLR7; PRKCQ; IL2; JAK2; TACR1; STAT5B; GSK3B; IRAK1; EIF2AK1; AKT1	42	1.00E-05
2	Epstein-Barr virus infection	Human Diseases	Infectious diseases: Viral	HSPA8; IKBKB; PRKACA; PIK3R3; CDK2; CSNK2A2; JAK3; MAP2K6; RIPK1; MAPK14; CSNK2A1; TBK1; CCNA2; PIK3CA; LYN; SYK; NFKB2; CDK1; PIK3R1; BCL2; MAPK11; STAT3; PIK3CB; JAK1; MAPK9; AKT2; PIK3CD; HDAC2; EIF2AK2; PRKACB; CSNK2B; FCER2; ICAM1; PIK3R2; MAP2K3; HDAC4; CHUK; TYK2; MAPK10; FGR; GSK3B; IRAK1; EIF2AK1; AKT1; MAPK13; EIF2AK4	46	9.90E-05
3	Hepatitis C	Human Diseases	Infectious diseases: Viral	IKBKB; MAPK1; NR1H3; MAPK3; RIPK1; MAPK14; CHUK; TBK1; PIK3CA; PDPK1; IFNAR1; JAK1; RAF1; PIK3CB; PIK3R1; MAPK11; STAT3; RXRA; IKBKE; MAPK9; AKT2; PIK3CD; EIF2AK2; EGFR; EIF2AK4; BRAF; PIK3R3; TNF; PIK3R2; TYK2; MAPK10; GSK3B; EIF2AK1; AKT1; MAPK13; PPARA	36	0.000166
4	Influenza A	Human Diseases	Infectious diseases: Viral	IL12B; IL6; HSPA8; IKBKB; PIK3R2; PIK3R3; PRSS1; MAP2K6; IRAK4; MAPK3; MAPK14; TBK1; PIK3CA; IFNAR1; MAP2K2; JAK1; RAF1; PRSS2; IL1B; PIK3R1; MAPK11; PIK3CB; PRKCB; IKBKE; MAPK9; AKT2; PIK3CD; EIF2AK2; EIF2AK4; TLR4; ICAM1; TNF; FDPS; MAP2K3; TYK2; TLR7; MAPK10; JAK2; GSK3B; EIF2AK1; MAPK1; PRSS3; MAPK13; AKT1	44	0.000199
5	Kaposi sarcoma-associated herpesvirus infection	Human Diseases	Infectious diseases: Viral	IL6; BECN1; IKBKB; PIK3R2; MAPKAPK2; PIK3R3; MAP2K6; PTGS2; CDK6; MAPK3; CSF2; VEGFA; MAPK14; CHUK; TBK1; PIK3CA; IFNAR1; MAP2K2; JAK1; LYN; RAF1; SYK; SRC; PIK3R1; MAPK11; STAT3; PIK3CB; IKBKE; MAPK9; AKT2; PIK3CD; EIF2AK2; ICAM1; PIK3C3; MTOR; PIK3CG; TYK2; HIF1A; MAPK10; JAK2; CASP3; HCK; GSK3B; FGF2; CDK4; MAPK1; MAPK13; AKT1	48	0.00022
6	Hepatitis B	Human Diseases	Infectious diseases: Viral	IL6; TGFBR1; IKBKB; PIK3R2; PIK3R3; CDK2; CDK6; MAPK3; CHUK; TBK1; CCNA2; PIK3CA; IFNAR1; MAP2K2; JAK1; PRKCG; PIK3CB; PIK3R1; BCL2; STAT3; IKBKE; MAPK9; AKT2; PIK3CD; STAT5B; TLR4; PTK2B; TNF; MAP3K1; PRKCB; MAPK10; CASP3; RAF1; SRC; CDK4; MAPK1; AKT1	37	0.01304
7	Toxoplasmosis	Human Diseases	Infectious diseases: Parasitic	IL12B; HSPA8; NOS2; MAP2K6; XIAP; IRAK4; MAPK3; MAPK14; CHUK; PIK3CG; PDPK1; ALOX5; IKBKB; IRAK1; MAPK11; STAT3; PPIF; JAK1; MAPK9; AKT2; TLR4; TNF; MAP2K3; TYK2; MAPK10; JAK2; CASP3; BCL2; AKT1; MAPK13; MAPK1	31	0.023177
8	African trypanosomiasis	Human Diseases	Infectious diseases: Parasitic	IL12B; PRKCB; HBB; IL6; IL1B; TLR9; PRKCG; VCAM1; ICAM1; TNF; SELE	11	0.035695
Cardiovascular diseases						
1	Fluid shear stress and atherosclerosis	Human Diseases	Cardiovascular diseases	ACVR1; VEGFA; IKBKB; CDH5; PIK3R2; PIK3R3; PRKAA2; MAP2K6; GSTM1; SELE; MAPK14; CHUK; PIK3CA; VCAM1; PTK2; GSTA2; PIK3CB; GSTM4; BMPR1A; PIK3R1; MAPK11; HSP90AB1; KDR; NQO1; MAPK9; AKT2; PIK3CD; BMPR2; CTSL; NOS3; MAPK7; ICAM1; HSP90B1; TNF; ASS1; MAP2K5; IL1B; BMPR1B; GSTP1; PRKAA1; MAPK10; PLAT; GSTA1; SRC; BCL2; HSP90AA1; MAPK13; AKT1	48	0.004032
2	Hypertrophic cardiomyopathy (HCM)	Human Diseases	Cardiovascular diseases	ITGA4; IL6; PRKAB1; PRKAA2; PRKAG1; CACNB2; IGF1; PRKAG2; ACE; PRKAG3; CACNA1S; CACNG1; CACNA1F; TNNC1; CACNB3; CACNB1; PRKAB2; TNF; CACNB4; PRKAA1; CACNA2D2; CACNA2D1; CACNA1C	23	0.023177

Organismal Systems						
Endocrine system						
1	Progesterone-mediated oocyte maturation	Organismal Systems	Endocrine system	PRKACA; STK10; PDE3B; PIK3R3; CDK2; HSP90AB1; IGF1R; MAPK3; RPS6KA1; MAPK14; CCNA2; PIK3CA; PKMYT1; PIK3CB; CDK1; IGF1; PIK3R1; MAPK11; PGR; RPS6KA3; MAPK9; AKT2; PIK3CD; HSP90AA1; PRKACB; BRAF; PIK3R2; PLK1; MAPK10; AURKA; RPS6KA6; RAF1; MAPK1; MAPK13; AKT1	35	7.16E-08
2	Insulin signaling pathway	Organismal Systems	Endocrine system	AKT2; PRKAG3; IKKBK; PRKACA; MKNK1; PIK3R2; PRKAB1; PRKAA2; GCK; PRKAG1; MAPK3; PRKAG2; PIK3CA; FBP1; PDPK1; MKNK2; MAP2K2; PDE3B; RAF1; PTPN1; PIK3CB; PIK3R1; PYGL; MAPK9; PRKCI; PHKG1; PIK3CD; PRKACB; INSR; PRKAB2; BRAF; PIK3R3; MTOR; EIF4E; PRKAR1A; SREBF1; PRKAA1; MAPK10; GSK3B; MAPK1; AKT1	41	3.90E-06
3	Oxytocin signaling pathway	Organismal Systems	Endocrine system	PRKACA; PLA2G4A; CACNG1; PRKAG3; PRKAA2; CAMK1; CAMK1G; CAMK1D; PRKAG1; CAMKK2; MAPK3; MYLK4; CAMK2B; EGFR; PRKAG2; MAP2K5; CAMK2D; PRKAB1; ROCK2; MAP2K2; CACNA1S; PRKAB2; PRKCG; CACNA1F; MYLK2; CACNA2D1; MYLK3; OXTR; CACNB3; CACNB1; MYLK; CAMK2G; PRKACB; NOS3; MAPK7; CACNB2; CACNB4; PIK3CG; PRKCB; PTGS2; PRKAA1; CAMK2A; KCNJ4; CACNA2D2; RAF1; SRC; ROCK1; GUCY1A2; CACNA1C; MAPK1	50	0.00014 1
4	Prolactin signaling pathway	Organismal Systems	Endocrine system	PIK3R3; GCK; MAPK3; MAPK14; PIK3CA; MAP2K2; RAF1; PIK3CB; ESR2; PIK3R1; MAPK11; STAT3; PRLR; MAPK9; AKT2; ESR1; STAT5B; PIK3CD; TNFRSF11A; PIK3R2; MAPK10; JAK2; GSK3B; SRC; AKT1; MAPK13; MAPK1	27	0.00022 7
5	GnRH signaling pathway	Organismal Systems	Endocrine system	CAMK2A; PRKACA; PLA2G4A; MAP3K4; MAP2K6; MAPK3; CAMK2B; MAPK14; EGFR; MAP3K1; CAMK2D; MAP2K2; MAP3K3; CACNA1S; CACNA1F; MAPK11; PRKCB; MAPK9; CAMK2G; PRKCD; MAPK7; PTK2B; MAP2K3; GNRHR; CACNA1C; MAPK10; RAF1; SRC; MAP3K2; MAPK1; MAPK13; PRKACB	32	0.00022 8
6	Thyroid hormone signaling pathway	Organismal Systems	Endocrine system	THRB; SLC9A1; PRKACA; PIK3R2; PIK3R3; MAPK3; RXRG; PIK3CA; PDPK1; MAP2K2; RAF1; PRKCG; PIK3CB; PIK3R1; RXRA; AKT2; ESR1; SLC2A1; PRKACB; PIK3CD; MTOR; NCOA2; PRKCB; NCOA1; HIF1A; THRA; RXRB; PLCD1; ATP1A1; GSK3B; SRC; HDAC2; MAPK1; AKT1	34	0.00137 7
7	Adipocytokine signaling pathway	Organismal Systems	Endocrine system	MAPK10; IKKBK; PRKAB1; PRKAA2; PRKCG; PRKAG1; CAMKK2; RXRG; CHUK; PRKAG2; PRKAG3; MTOR; PRKAB2; STAT3; RXRA; MAPK9; AKT2; SLC2A1; PPARA; TNF; PRKAA1; RXRB; JAK2; AKT1	24	0.00518 9
8	Estrogen signaling pathway	Organismal Systems	Endocrine system	TFF1; HSPA8; PRKACA; PGR; PIK3R2; CTSD; PIK3R3; MAPK3; OPRM1; GPER1; EGFR; PIK3CA; MAP2K2; PIK3CB; PIK3R1; HSP90AB1; AKT2; ESR1; PRKACB; HSP90AA1; PRKCD; NOS3; PIK3CD; HSP90B1; ESR2; NCOA1; NCOA2; RAF1; SRC; BCL2; AKT1; RARA; MAPK1	33	0.00588 8
9	Regulation of lipolysis in adipocytes	Organismal Systems	Endocrine system	ADRB1; PIK3R3; PRKG2; PIK3CA; PRKACA; PIK3R2; PDE3B; AKT2; ADRB2; PIK3CD; PRKACB; PIK3CB; INSR; ADORA1; ADRB3; AKT1; PIK3R1; PTGS2	18	0.01036 1
10	Relaxin signaling pathway	Organismal Systems	Endocrine system	VEGFA; NOS2; PRKACA; TGFB2; PIK3R3; MAPK3; TGFB1; MAPK14; EGFR; PIK3CA; MAP2K2; PIK3CB; EDNRB; PIK3R1; MAPK11; COL1A1; MAPK9; AKT2; PIK3CD; NOS1; PRKACB; NOS3; PIK3R2; MAPK10; MMP1; RAF1; SRC; MMP13; MAPK1; MAPK13; AKT1	31	0.01036 1
11	Renin secretion	Organismal Systems	Endocrine system	ADRB1; KCNMA1; PRKG2; REN; ACE; PDE1B; PDE3A; PRKACA; AGTR1; PDE1A; PDE3B; ADRB2; EDNRA; CACNA1S; PRKACB; CACNA1F; CTSB; ADRB3; GUCY1A2; CACNA1C; ADORA1	21	0.01558
12	Insulin secretion	Organismal Systems	Endocrine system	PRKACA; KCNMB3; GCK; CAMK2B; KCNMA1; KCNN3; CAMK2D; KCNJ11; ATP1A1; CACNA1S; PRKCG; CACNA1F; CHRM3; KCNN4; SLC2A1; KCNMB4; CAMK2G; PRKACB; KCNN1; PRKCB; KCNN2; CAMK2A; KCNMB1; CACNA1C	24	0.03512 8
13	Ovarian steroidogenesis	Organismal Systems	Endocrine system	IGF1; PTGS2; HSD3B1; CYP1B1; PRKACA; PLA2G4A; CYP19A1; HSD17B2; ALOX5; AKR1C3; IGF1R; PRKACB; CYP1A1; INSR; HSD17B1	15	0.04883 1
Immune system						
1	Fc epsilon RI signaling pathway	Organismal Systems	Immune system	PLA2G4A; PIK3R3; MAP2K6; MAPK3; CSF2; MAPK14; ALOX5; PIK3CB; PIK3CA; PDPK1; FYN; MAP2K2; LYN; SYK; PIK3R1; MAPK11; BTK; MAPK9; AKT2; PIK3CD; TNF; PIK3R2; MAP2K3; MAPK10; RAF1; AKT1; MAPK13; MAPK1	28	0.00021 6
2	Toll-like receptor signaling pathway	Organismal Systems	Immune system	IL12B; IL6; IKKBK; PIK3R2; PIK3R3; MAP2K6; IRAK4; MAPK3; RIPK1; MAPK14; CHUK; TBK1; PIK3CA; CTSK; IFNAR1; MAP2K2; PIK3CB; TLR9; PIK3R1; MAPK11; IKBKE; MAPK9; AKT2; PIK3CD; TLR4; TNF; IL1B; MAP2K3; TLR7; MAPK10; IRAK1; MAPK1; MAPK13; AKT1	34	0.00027 5

1	Salivary secretion	Organismal Systems	Digestive system	ADRB1; KCNMA1; PRKG2; SLC9A1; PRKCB; ATP1A1; GUCY1A2; ADRA1A; LYZ; CHRM3; KCNN4; NOS1; PRKACB; ADRA1B; PRKACA; ADRB3; ADRA1D; ADRB2; PRKCG	19	0.02055 1
2	Gastric acid secretion	Organismal Systems	Digestive system	KCNQ1; PRKCB; HRH2; CAMK2D; MYLK; ATP4B; PRKACA; CAMK2A; CHRM3; CFTR; MYLK2; SLC9A1; CAMK2G; PRKACB; ATP1A1; ATP4A; CA2; MYLK3; MYLK4; CAMK2B; PRKCG	21	0.03047 1
Aging						
1	Longevity regulating pathway - multiple species	Organismal Systems	Aging	HSPA8; PRKACA; PRKAG3; PRKAA2; IGF1R; PRKAG1; IGF1; PRKAG2; PIK3CA; PRKAB1; PRKAB2; PIK3CB; HDAC2; AKT2; PIK3CD; PRKACB; INSR; PIK3R3; MTOR; PIK3R2; PRKAA1; SOD1; PIK3R1; AKT1	24	0.00016 7
2	Longevity regulating pathway	Organismal Systems	Aging	PRKACA; PIK3R2; PRKAG3; PRKAA2; IGF1R; PRKAG1; CAMKK2; IGF1; PRKAG2; PIK3CA; PRKAB1; PRKAB2; PIK3CB; PIK3R1; AKT2; PIK3CD; PRKACB; INSR; PIK3R3; MTOR; EIF4E; ULK1; PPARG; PRKAA1; AKT1	25	0.00197 6
Others						
1	Axon guidance	Organismal Systems	Development	LIMK2; GSK3B; EPHB2; EPHA4; LIMK1; PIK3R3; PAK2; PAK1; MAPK3; CAMK2B; PAK5; PAK3; CAMK2D; PTK2; FYN; ROCK2; ABL1; PIK3CB; EPHA2; SRC; EPHB4; PIK3R1; PAK4; PIK3R2; EPHA5; PIK3CD; EPHA1; CAMK2G; ROCK1; EPHB1; PIK3CA; BMPR1B; EPHA7; CAMK2A; FES; EPHA3; RAF1; EPHA6; BMPR2; MET; MAPK1; NRPI; EPHA8; EPHB6	44	2.50E-07
2	Inflammatory mediator regulation of TRP channels	Organismal Systems	Sensory system	CAMK2A; MAPK11; ASIC1; PRKACA; PLA2G4A; PIK3R2; PIK3R3; PRKCQ; MAP2K6; HTR2B; CAMK2B; MAPK14; PIK3CB; PIK3CA; CAMK2D; PRKCG; HTR2C; HTR2A; IGF1; PIK3R1; PRKCE; BDKRB1; NTRK1; PRKCB; MAPK9; TRPA1; PIK3CD; PLA2G6; CAMK2G; PRKCD; HRH1; MAP2K3; IL1B; MAPK10; SRC; MAPK13; PRKACB	37	0.00011 1
3	Taste transduction	Organismal Systems	Sensory system	PRKACA; HTR3B; GABRA3; HTR3D; HTR3C; HTR1B; HTR3E; HTR1D; GABRA2; HTR1A; CACNA1A; GABRA1; PDE1A; HTR1E; CHRM3; HTR1F; PDE1B; GABRA5; PRKACB; SCN2A; HTR3A; GABRA4; GABRA6; CACNA1C	24	0.00080 9
4	Olfactory transduction	Organismal Systems	Sensory system	PRKG2; CAMK2D; PDE2A; PRKACA; PDE2A; CAMK2A; PDE1B; CAMK2G; PRKACB; PDE1A; CAMK2B	11	0.00572 5
5	Aldosterone-regulated sodium reabsorption	Organismal Systems	Excretory system	IGF1; PRKCB; ATP1A1; PIK3CA; PDPK1; PIK3R2; PIK3CD; NR3C2; SGK1; PRKCG; PIK3CB; INSR; PIK3R3; MAPK3; PIK3R1; MAPK1	16	0.02055 1
6	Circadian rhythm	Organismal Systems	Environmental adaptation	PRKAG2; NR1D1; PRKAA1; PRKAG3; PRKAB1; PRKAA2; PRKAB2; PRKAG1	8	0.02459 5
7	Osteoclast differentiation	Organismal Systems	Development	TGFBR1; IKBKB; CSF1R; PIK3R3; MAP2K6; MAPK3; TGFB2; MAPK14; CHUK; PIK3CB; PIK3CA; CTSK; IFNAR1; FYN; SYK; NFKB2; PIK3R1; MAPK11; BTK; JAK1; MAPK9; AKT2; PIK3CD; TEC; TNF; TNFRSF11A; PIK3R2; PPARG; TYK2; IL1B; LCK; MAPK10; MAPK1; MAPK13; AKT1	35	0.03358 5
Cellular processes						
1	Autophagy - animal	Cellular Processes	Transport and catabolism	BECN1; PRKACA; CTSD; MAPK1; PRKAA2; PRKCQ; IGF1R; CTSL; CAMKK2; MAPK3; ULK2; PIK3CA; PDPK1; ERN1; MAP2K2; PIK3CB; CTSB; PIK3R1; MAPK9; AKT2; PIK3CD; PRKACB; EIF2AK4; PIK3R3; PIK3C3; MTOR; PIK3R2; DAPK2; ULK1; HIF1A; DAPK3; PRKAA1; MAPK10; RAF1; BCL2; AKT1; DAPK1; PRKCD	38	1.51E-07
2	Signaling pathways regulating pluripotency of stem cells	Cellular Processes	Cellular community - eukaryotes	ACVR1; FGFR3; PIK3R3; JAK3; IGF1R; MAPK3; ACVR1B; FGFR1; ESRRB; MAPK14; PIK3CA; MAP2K2; RAF1; PIK3CB; BMPR1A; PIK3R1; MAPK11; STAT3; IGF1; JAK1; AKT2; PIK3CD; BMPR2; FGFR4; PIK3R2; FGFR2; BMPR1B; JAK2; GSK3B; FGF2; MAPK1; MAPK13; AKT1	33	4.76E-07
3	Regulation of actin cytoskeleton	Cellular Processes	Cell motility	LIMK2; SLC9A1; CHRM4; BDKRB1; INSR; FGFR3; LIMK1; PIK3R3; PAK2; FGF19; PAK1; MAPK3; MYLK4; ROCK2; FGFR1; PAK5; FGFR4; PAK3; PTK2; PDGFRA; PDGFRB; MAP2K2; ITGA4; F2R; PIK3CB; MYLK2; FGF2; MYLK3; F2; PIK3R1; CHRM2; CHRM1; PAK4; PIK3R2; CHRM3; PIK3CD; MYLK; EGFR; CHRM5; BRAF; PIP4K2B; PIK3CA; FGFR2; ARPC3; FGF4; PIP4K2C; RAF1; SRC; FGF1; ROCK1; MYH14; FN1; MAPK1	53	1.68E-05

4	Focal adhesion	Cellular Processes	Cellular community - eukaryotes	ITGA4; VEGFA; MAPK3; PIK3R2; PIK3R3; PAK2; FLT4; IGF1R; XIAP; PAK1; FLT1; HGF; MYLK4; ROCK2; IGF1; PAK5; EGFR; PAK3; PDPK1; PTK2; PDGFRA; FYN; PDGFRB; GSK3B; PRKCG; PIK3CB; MYLK2; MYLK3; PIK3R1; PAK4; KDR; COL1A1; MAPK9; AKT2; PIK3CD; MYLK; BRAF; ROCK1; PIK3CA; PRKCB; MAPK10; RAF1; SRC; BCL2; MET; MAPK1; ERBB2; FN1; AKT1	49	0.000202
5	Adherens junction	Cellular Processes	Cellular community - eukaryotes	CSNK2A1; EGFR; TGFBF1; FER; MAPK3; CSNK2B; FYN; CSNK2A2; IGF1R; SRC; FGFR1; INSR; PTPN1; MET; MAPK1; ERBB2; YES1; TGFBF2	18	0.032955
6	Gap junction	Cellular Processes	Cellular community - eukaryotes	PRKACA; HTR2B; MAPK3; DRD1; PRKG2; EGFR; MAP2K5; PDGFRA; DRD2; PDGFRB; MAP2K2; PRKCG; HTR2C; HTR2A; CDK1; TUBB; PRKACB; MAPK7; ADRB1; PRKCB; TUBA1A; GJA1; RAF1; SRC; MAP3K2; GUCY1A2; MAPK1	27	0.038304

Pathways Enriched by Targets of Dual-modulator (p-value < 0.05)

Signal transduction

No.	Pathway	Class	Subclass	Targets	No. Targets	p-value
1	Calcium signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; DRD5; CYSLTR2; NOS2; HTR7; AGTR1; CXCR4; CHRM5; TNNC2; HTR2B; DRD1; CACNA1H; HTR6; EGFR; HTR5A; RYR1; PTGER1; ADRA1A; PDGFRB; CACNA1S; F2R; CACNA1D; PTGER3; CACNA1F; PDE1A; HTR2A; TNNC1; HRH2; ADORA2B; CHRM1; HTR2C; CAMK4; CACNA1B; CACNA1A; CHRM3; PDE1B; ADRB2; ADRA1B; NOS3; ADRB3; PTK2B; CACNA1I; HRH1; ADRB1; PRKCB; GRIN2C; HTR4; CACNA1C; ITPR3; PLCD1; CHRM2; SLC8A1; PRKACA; ADORA2A; LHCGR; CACNA1G; ADRA1D	57	3.73E-11
2	cAMP signaling pathway	Environmental Information Processing	Signal transduction	PDE4B; DRD5; MAPK8; GRIA2; PRKACA; PDE4A; MAP2K1; MAPK3; DRD1; HTR6; PIK3CA; HTR1B; AKT2; DRD2; CACNA1S; HTR1D; CACNA1D; PTGER3; CACNA1F; GRIA4; ADORA2A; CHRM1; HTR1A; GRIA1; CAMK4; PDE4D; HTR1E; ADRB2; HTR1F; PPARA; GRIA3; PIK3CD; ADORA1; ADRB1; PDE4C; GRIN2C; PDE3A; HTR4; CACNA1C; MAPK10; F2R; RAF1; CHRM2; AKT1	44	0.000179
3	cGMP-PKG signaling pathway	Environmental Information Processing	Signal transduction	PDE5A; ADRA2B; ADORA3; ADRA2C; AGTR1; INSR; MAP2K1; MAPK3; KCNMA1; ADRA1A; CACNA1S; CACNA1D; CACNA1F; ADRA2A; OPRD1; INS; NPPB; AKT2; ADRB2; KCNMB2; ADRA1B; NOS3; ADRB3; ADORA1; ADRB1; PDE3A; CACNA1C; ITPR3; RAF1; SLC8A1; ADRA1D; GUCY1A2; AKT1	33	0.000775
4	VEGF signaling pathway	Environmental Information Processing	Signal transduction	MAPK14; PRKCB; VEGFA; PTGS2; PRKCA; PIK3CA; PTK2; AKT2; PIK3CD; RAF1; SRC; NOS3; MAP2K1; HSPB1; MAPK3; AKT1	16	0.012364
5	HIF-1 signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; IL6; VEGFA; NOS2; INSR; MAP2K1; IGF1R; FLT1; MAPK3; EGFR; PIK3CA; INS; SERPINE1; EGF; HK1; AKT2; PIK3CD; TLR4; NOS3; PRKCB; HIF1A; PGK1; BCL2; AKT1	24	0.01916
6	MAPK signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; HSPB1; VEGFA; IKBKB; PRKACA; MAP2K1; IGF1R; FLT1; MAPK8IP1; MAPK3; CACNA1H; MAPK14; EGFR; CACNB2; NGF; PDGFRB; CACNA1S; CACNG1; CACNA1D; CACNB4; CACNA1F; INS; MAPT; EGF; CACNA1B; CACNA1A; CACNB3; CACNB1; AKT2; INSR; MAPK8; TNF; CACNA1I; PRKCB; IL1B; CACNA1C; MAPK10; CACNA2D3; CACNA2D2; RAF1; CACNA2D1; CACNA1G; AKT1	43	0.023873
7	Ras signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; VEGFA; IKBKB; HTR7; MAP2K1; IGF1R; FLT1; MAPK3; MAPK8; EGFR; PIK3CA; PLA2G2D; NGF; PDGFRB; PRKACA; EGF; INS; AKT2; PIK3CD; INSR; PLA2G2A; PRKCB; MAPK10; ZAP70; RAF1; BCL2L1; PLA2G1B; PLA2G2E; AKT1	29	0.040438
8	Rap1 signaling pathway	Environmental Information Processing	Signal transduction	PRKCA; VEGFA; PRKCB; MAP2K1; IGF1R; FLT1; F2RL3; MAPK14; EGFR; PIK3CA; NGF; DRD2; PDGFRB; ITGB3; F2R; MAPK3; ADORA2B; EGF; INS; AKT2; PIK3CD; INSR; ACTB; RAF1; SRC; ADORA2A; AKT1	27	0.048829

Human diseases

Cancers: overview						
1	Pathways in cancer	Human Diseases	Cancers: Overview	IL12B; PRKCA; MAPK8; IL6; VEGFA; NOS2; MAPK3; AGTR1; CXCR4; CDK2; CDK6; MAP2K1; IGF1R; CYCS; F2RL3; RXRG; HDAC1; EGFR; PIK3CA; EGF; PTGER1; MAPK10; CSF2RB; SMO; PDGFRB; IKBKB; RAF1; BIRC5; PRKACA; ESR2; PTK2; HDAC2; BCL2; HSP90AB1; SKP1; BMP4; ALK; RXRA; AR; AKT2; ESR1; HSP90AA1; RARB; PIK3CD; PTGER3; PTGS2; PRKCB; PPARG; NCOA1; HIF1A; MMP2; RXRB; F2R; GSK3B; PIM1; PPARD; BCL2L1; GSTP1; IL23A; CSF2RA; RARA; AKT1	62	0.018902
2	Transcriptional misregulation in cancer	Human Diseases	Cancers: Overview	PPARG; IL6; RXRA; ATM; RXRB; PTK2; RARA; CEBPB; FLT1; PLAU; IGF1R; BCL2L1; GRIA3; MPO; MMP3; RXRG; HDAC2; HDAC1	18	0.036238
Cancers: specific types						
1	Non-small cell lung cancer	Human Diseases	Cancers: Specific types	PRKCB; EGFR; PIK3CA; ALK; RXRA; PRKCA; RXRB; AKT2; MAP2K1; PIK3CD; CDK6; RAF1; FHIT; EGF; RARB; MAPK3; RXRG; AKT1	18	0.004115
2	Small cell lung cancer	Human Diseases	Cancers: Specific types	PTK2; PTGS2; IKBKB; RXRA; NOS2; PIK3CA; RXRB; AKT2; FHIT; PIK3CD; CDK2; CYCS; CDK6; BCL2; BCL2L1; RARB; RXRG; AKT1	18	0.01916
3	Prostate cancer	Human Diseases	Cancers: Specific types	IKBKB; CDK2; PLAU; IGF1R; MAPK3; MMP3; EGFR; PIK3CA; PDGFRB; GSK3B; HSP90AB1; INS; AR; AKT2; PIK3CD; HSP90AA1; EGF; GSTP1; RAF1; BCL2; MAP2K1; AKT1	22	0.02446
Cardiovascular diseases						
1	Dilated cardiomyopathy (DCM)	Human Diseases	Cardiovascular diseases	ADRB1; ACTB; CACNB2; CACNA2D2; PRKACA; CACNA1C; CACNB3; CACNB1; CACNA2D3; ITGB3; CACNA1S; CACNG1; CACNA1D; SLC8A1; CACNA1F; CACNA2D1; TNNC1; TNF; CACNB4	19	0.001977
2	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	Human Diseases	Cardiovascular diseases	ACTB; CACNB2; CACNA2D2; CACNA1C; CACNB3; CACNB1; CACNA2D3; ITGB3; CACNA1S; CACNG1; CACNA1D; SLC8A1; CACNA1F; CACNA2D1; CACNB4	15	0.002841
3	Hypertrophic cardiomyopathy (HCM)	Human Diseases	Cardiovascular diseases	ACTB; IL6; CACNB2; CACNA2D2; ACE; CACNA1C; CACNB3; CACNB1; CACNA2D3; ITGB3; CACNA1S; CACNG1; CACNA1D; SLC8A1; CACNA1F; CACNA2D1; TNNC1; TNF; CACNB4	19	0.003716
Endocrine and metabolic diseases						
1	Type II diabetes mellitus	Human Diseases	Endocrine and metabolic diseases	MAPK10; HK1; PIK3CA; KCNJ11; IKBKB; CACNA1C; CACNA1A; PIK3CD; CACNA1B; CACNA1D; INSR; MAPK3; INS; TNF; CACNA1G; MAPK8	16	0.001867
2	Insulin resistance	Human Diseases	Endocrine and metabolic diseases	PRKCB; MAPK8; IL6; MAPK10; PYGL; IKBKB; SREBF1; INS; INSR; AKT2; PIK3CD; GSK3B; PTPN1; PPARG; NR1H3; NOS3; CPT1A; PIK3CA; TNF; AKT1	20	0.035492
3	AGE-RAGE signaling pathway in diabetic complications	Human Diseases	Endocrine and metabolic diseases	PRKCA; IL6; VEGFA; AGTR1; MAPK3; MAPK8; MAPK14; PIK3CA; THBD; SERPINE1; AKT2; PIK3CD; NOS3; TNF; PRKCB; IL1B; MMP2; MAPK10; PLCD1; PIM1; BCL2; AKT1	22	0.035492
Infectious diseases						
1	Pathogenic Escherichia coli infection	Human Diseases	Infectious diseases: Bacterial	ACTB; TUBA1C; TUBB2B; PRKCA; TUBA1A; TUBB2A; TUBA1B; TUBA8; TUBA3E; TUBB4B; TUBB4A; TUBB6; TLR4; TUBB1; TUBB3; TUBB; TUBA4A	17	0.001242
2	Human papillomavirus infection	Human Diseases	Infectious diseases: Viral	VEGFA; IKBKB; PRKACA; HDAC9; HDAC8; CDK2; MAP2K1; PPP2R1A; CDK6; MAPK3; HDAC1; EGFR; PIK3CA; HDAC7; PTK2; PDGFRB; ITGB3; GSK3B; COMP; HDAC11; HDAC2; ATP6V1B2; HDAC6; ATM; AKT2; PIK3CD; HDAC5; HDAC3; TNF; EGF; HDAC4; PTGS2; HDAC10; RAF1; AKT1	35	0.010036

3	Influenza A	Human Diseases	Infectious diseases: Viral	IL12B; PRKCA; IL6; MAPK8; IKBKB; PRSS1; MAP2K1; CYCS; MAPK3; MAPK14; FDPS; GSK3B; CXCL10; PRKCB; AKT2; PIK3CD; TLR4; PLG; TNF; PIK3CA; ACTB; IL1B; MAPK10; RAF1; AKT1	25	0.03986
Neural diseases						
1	Alcoholism	Human Diseases	Substance dependence	PRKACA; HDAC9; HDAC8; MAP2K1; MAPK3; DRD1; SLC18A2; HDAC1; SLC18A1; HDAC7; DRD2; HDAC11; HDAC2; ADORA2B; SLC6A3; HDAC6; CAMK4; HDAC5; HDAC3; HDAC4; MAOB; GRIN2C; HDAC10; PKIA; RAF1; ADORA2A	26	0.000127
2	Morphine addiction	Human Diseases	Substance dependence	PDE4B; PRKCA; OPRM1; PRKACA; PDE4A; GABRA3; DRD1; KCNJ9; PDE1A; GABRA1; PDE4D; CACNA1B; CACNA1A; PDE7B; PDE8B; GABRB1; ADORA1; PRKCB; PDE4C; PDE1B; PDE3A; KCNJ6	22	0.012364
3	EGFR tyrosine kinase inhibitor resistance	Human Diseases	Drug resistance: Antineoplastic	PRKCB; PIK3CD; EGFR; VEGFA; EGF; RAF1; PRKCA; PIK3CA; AKT2; PDGFRB; GSK3B; SRC; BCL2; BCL2L1; MAP2K1; IGF1R; MAPK3; IL6; AKT1	19	0.018902
4	Endocrine resistance	Human Diseases	Drug resistance: Antineoplastic	MAPK14; PIK3CD; EGFR; PIK3CA; MMP2; MAPK10; GPER1; AKT2; ESR1; MAPK8; RAF1; SRC; BCL2; PRKACA; MAP2K1; IGF1R; ESR2; PTK2; MAPK3; AKT1	20	0.019439
5	Amphetamine addiction	Human Diseases	Substance dependence	PRKCB; SLC18A1; MAOB; GRIA2; GRIA1; GRIN2C; PRKCA; PRKACA; CACNA1C; CAMK4; SLC6A3; CACNA1D; GRIA3; GRIA4; DRD1; SLC18A2; HDAC1	17	0.020024
Organismal systems						
Circulatory system						
1	Adrenergic signaling in cardiomyocytes	Organismal Systems	Circulatory system	PRKCA; SCN5A; PRKACA; AGTR1; MAPK3; MAPK14; CACNB2; ADRA1A; CACNA1S; CACNG1; CACNA1D; CACNA1F; TNNC1; BCL2; SCN1B; CACNB3; CACNB1; ADRB2; AKT2; ADRA1B; CACNB4; ADRB1; CACNA1C; CACNA2D3; CACNA2D2; PPP2R1A; CACNA2D1; SLC8A1; AKT1; ADRA1D	30	0.000179
2	Vascular smooth muscle contraction	Organismal Systems	Circulatory system	PRKCA; PTGIR; AGTR1; MAP2K1; MAPK3; KCNMA1; PLA2G1B; PLA2G2D; ADRA1A; CACNA1S; CACNA1D; CACNA1F; PRKACA; ADORA2B; KCNMB2; ADRA1B; PLA2G2A; PRKCB; PLA2G2E; CACNA1C; ITPR3; RAF1; ADORA2A; GUCY1A2; ADRA1D	25	0.005001
Endocrine system						
1	Thyroid hormone signaling pathway	Organismal Systems	Endocrine system	PRKCA; THRB; PRKACA; PRKCB; MAP2K1; MAPK3; RXRG; HDAC1; PIK3CA; ITGB3; GSK3B; HDAC2; BMP4; RXRA; AKT2; ESR1; HDAC3; PIK3CD; NCOA2; ACTB; HIF1A; RXRB; PLCD1; RAF1; SRC; NCOA1; AKT1	27	0.000257
2	Estrogen signaling pathway	Organismal Systems	Endocrine system	OPRM1; PRKACA; PGR; MAP2K1; MAPK3; GPER1; EGFR; PIK3CA; KRT12; KCNJ9; HSP90AB1; AKT2; ESR1; HSP90AA1; NOS3; PIK3CD; ESR2; NCOA2; MMP2; ITPR3; RAF1; SRC; BCL2; KCNJ6; NCOA1; RARA; AKT1	27	0.000475
3	Renin secretion	Organismal Systems	Endocrine system	ADRB1; KCNMA1; REN; ACE; PDE3A; PRKACA; AGTR1; ITPR3; ADRB2; PDE1B; CACNA1S; CACNA1D; CACNA1F; PDE1A; ADRB3; GUCY1A2; CACNA1C; ADORA1	18	0.001665
4	Regulation of lipolysis in adipocytes	Organismal Systems	Endocrine system	ADRB1; PTGS2; PIK3CA; INS; AKT2; ADRB2; PTGS1; PRKACA; PTGER3; INSR; ADRB3; PIK3CD; ADORA1; AKT1	14	0.009018
5	Ovarian steroidogenesis	Organismal Systems	Endocrine system	PRKACA; PTGS2; CYP1B1; CYP1A1; LHCGR; CYP19A1; HSD17B2; ALOX5; AKR1C3; IGF1R; INSR; INS; HSD17B1	13	0.009692
6	Progesterone-mediated oocyte maturation	Organismal Systems	Endocrine system	MAPK14; MAPK8; MAPK10; PIK3CA; PRKACA; INS; PGR; AKT2; PIK3CD; CDK2; HSP90AB1; RAF1; IGF1R; MAP2K1; HSP90AA1; MAPK3; AKT1	17	0.023653

7	Oxytocin signaling pathway	Organismal Systems	Endocrine system	PRKCA; PRKACA; MAP2K1; MAPK3; EGFR; CACNB2; RYR1; KCNJ9; CAMK4; CACNA1S; CACNG1; CACNA1D; CACNA1F; CACNA2D1; PRKCB; CACNB3; CACNB1; NOS3; CACNB4; ACTB; PTGS2; CACNA1C; ITPR3; CACNA2D3; CACNA2D2; RAF1; SRC; KCNJ6; GUCY1A2	29	0.025354
8	Prolactin signaling pathway	Organismal Systems	Endocrine system	MAPK14; PIK3CD; GSK3B; PIK3CA; LHCGR; MAPK10; AKT2; ESR1; RAF1; SRC; MAP2K1; MAPK8; ESR2; INS; MAPK3; AKT1	16	0.026674
9	Parathyroid hormone synthesis, secretion and action	Organismal Systems	Endocrine system	PDE4B; PRKCB; CASR; RXRB; RXRA; PRKCA; PDE4D; ITPR3; PDE4A; EGFR; RAF1; BCL2; PRKACA; MAP2K1; MAPK3; RXRG; MMP13; PDE4C	18	0.03545
10	Insulin secretion	Organismal Systems	Endocrine system	KCNMA1; PRKCB; KCNN3; KCNJ11; PRKCA; PRKACA; KCNN2; ITPR3; FFAR1; CHRM3; KCNN4; CACNA1S; CACNA1D; CACNA1F; KCNMB2; INS; CACNA1C	17	0.03986
11	GnRH signaling pathway	Organismal Systems	Endocrine system	MAPK14; PRKCB; EGFR; MAPK10; MAPK8; PRKCA; MMP2; CACNA1C; ITPR3; CACNA1S; RAF1; CACNA1D; CACNA1F; PRKACA; MAP2K1; SRC; PTK2B; MAPK3	18	0.048786
Immune system						
1	IL-17 signaling pathway	Organismal Systems	Immune system	MAPK14; MMP3; IL6; PTGS2; S100A8; IKBKB; MAPK10; CEBPB; HSP90AB1; GSK3B; MAPK3; CXCL10; MAPK8; HSP90AA1; IL1B; TNF; MMP13; S100A9	18	0.03545
Nervous system						
1	Serotonergic synapse	Organismal Systems	Nervous system	PRKCA; HTR7; HTR3B; MAP2K1; HTR2B; MAPK3; SLC18A2; HTR6; SLC18A1; HTR5A; KCNJ9; HTR1B; ALOX5; CACNA1S; HTR1D; CACNA1D; CACNA1F; PRKACA; HTR2A; SLC6A4; HTR1A; HTR2C; CACNA1B; CACNA1A; HTR1E; HTR1F; GABRB1; PRKCB; HTR3A; MAOB; PTGS2; HTR4; CACNA1C; ITPR3; PTGS1; RAF1; APP; KCNJ6; KCNN2	39	2.12E-09
2	Dopaminergic synapse	Organismal Systems	Nervous system	PRKCA; DRD5; MAPK10; MAPK8; GRIA2; PRKACA; CALY; SCN1A; DRD1; SLC18A2; MAPK14; SLC18A1; KCNJ9; DRD2; PPP2R1A; CACNA1D; GRIA4; SLC6A3; GRIA1; CACNA1B; CACNA1A; DRD3; AKT2; GRIA3; DRD4; PRKCB; MAOB; CACNA1C; ITPR3; COMT; GSK3B; KCNJ6; AKT1	33	1.15E-06
3	Cholinergic synapse	Organismal Systems	Nervous system	KCNQ2; PRKCA; CHRNA6; CHRM4; PRKACA; MAP2K1; MAPK3; PIK3CA; CACNA1S; CACNA1D; CACNA1F; CHRNA4; CHRM2; CHRM1; CAMK4; CACNA1B; CACNA1A; AKT2; CHRM3; PIK3CD; CHRM5; PRKCB; CHRNA3; CACNA1C; ITPR3; ACHE; KCNQ3; BCL2; KCNJ6; AKT1	30	2.73E-05
4	Long-term depression	Organismal Systems	Nervous system	PRKCB; ITPR3; RYR1; GRIA1; PRKCA; CACNA1A; MAP2K1; RAF1; IGF1R; PPP2R1A; GRIA3; GRIA2; MAPK3; GUCY1A2	14	0.023653
Digestive system						
1	Salivary secretion	Organismal Systems	Digestive system	ADRB1; KCNMA1; PRKCB; PRKCA; PRKACA; ITPR3; ADRA1A; CHRM3; KCNN4; ADRB2; ADRA1B; ADRB3; GUCY1A2; ADRA1D	14	0.023833
Others						
1	Circadian entrainment	Organismal Systems	Environmental adaptation	MTNR1B; PRKCB; MAPK3; RYR1; GRIA1; KCNJ9; PRKCA; PRKACA; CACNA1C; ITPR3; MTNR1A; GRIN2C; CACNA1D; CACNA1G; KCNJ6; GRIA3; GRIA2; GRIA4; GUCY1A2; CACNA1I; CACNA1H	21	0.000645
2	Taste transduction	Organismal Systems	Sensory system	PRKACA; HTR1A; HTR3A; GABRA1; ITPR3; HTR1B; HTR1D; CACNA1C; CACNA1A; HTR3B; HTR1E; CHRM3; HTR1F; PDE1B; GABRA3; PDE1A; SCN2A	17	0.004532
Cellular processes						
1	Gap junction	Cellular Processes	Cellular community - eukaryotes	PRKCA; TUBA1C; PRKACA; TUBB4A; MAP2K1; TUBB1; HTR2B; MAPK3; DRD1; TUBB3; EGFR; TUBB6; TUBA8; DRD2; PDGFRB; TUBB4B; HTR2C; HTR2A; TUBB; TUBB2B; EGF; TUBA1B; TUBA3E; ADRB1; PRKCB; TUBA1A; ITPR3; RAF1; SRC; TUBB2A; GUCY1A2; TUBA4A	32	3.12E-08

2	Apoptosis	Cellular Processes	Cell growth and death	ITPR3; TUBA1C; MAPK8; IKBKB; NGF; MAP2K1; PARP3; CYCS; MAPK3; PIK3CA; CTSK; TUBA8; CSF2RB; BIRC5; PARP2; ATM; TUBA1B; AKT2; PARP1; TUBA3E; PIK3CD; TNF; ACTB; TUBA1A; MAPK10; RAF1; BCL2; BCL2L1; TUBA4A; AKT1	30	0.000501
3	Phagosome	Cellular Processes	Transport and catabolism	TUBB4A; CANX; TUBB1; TUBB3; ITGB3; TUBB6; TUBA8; TUBB4B; COMP; TUBB2B; CALR; TUBB; ATP6V1B2; TUBA1B; TUBA3E; TLR4; MPO; ACTB; TUBA1A; TUBA1C; TUBB2A; TUBA4A	22	0.019248
Metabolism						
1	Steroid hormone biosynthesis	Metabolism	Lipid metabolism	SRD5A1; AKR1C1; UGT1A9; SULT2B1; CYP1B1; CYP1A1; CYP11B2; CYP19A1; HSD17B2; COMT; AKR1C3; HSD11B1; HSD17B1	13	0.048845
Genetic information processing						
1	Proteasome	Genetic Information Processing	Folding, sorting and degradation	PSMB6; PSMA2; PSMA4; PSMB7; PSMB4; PSMB8; PSMB5; PSMA1; PSMA6; PSMA3; PSMB10; PSMB9; PSMA7; PSMB1; PSMB2; PSMB3	16	3.35E-07