

ADDITIONAL FILE 6.

Diseases or functions annotation

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Antimicrobial Response, Inflammatory Response	Antiviral response	5,37E-13	APOBEC3B, DDX58, DDX60, EIF2AK2, IFI16, IFI44, IFIH1, IFIT2, IFIT3, OAS1, OAS2, PLSCR1, RNASEL, TRIM22	14
Inflammatory Response	Innate immune response	3,88E-08	DDX58, EIF2AK2, IFIH1, IFIT2, PLSCR1, PML, TRIM25, TRIM38, TRIM56, ZBP1	10
Infectious Diseases	Replication of vesicular stomatitis virus	6,68E-08	DDX58, IFIH1, OAS1, PARP12, PML, TRIM25, TRIM38	7
Infectious Diseases	Replication of herpesviridae	7,74E-07	DDX58, IFIH1, OAS1, PARP12, PML, ZBP1	6
Cell-To-Cell Signaling and Interaction, Embryonic Development	Response of embryonic cell lines	1,53E-06	DDX58, IFIH1, TAS1R3, TRIM25, TRIM38, TRIM56	6
Cell-To-Cell Signaling and Interaction, Hair and Skin Development and Function	Response of epithelial cell lines	1,53E-06	DDX58, IFIH1, TAS1R3, TRIM25, TRIM38, TRIM56	6
Inflammatory Response	Interferon response	1,53E-06	DDX58, EIF2AK2, IFIH1, RNASEL	4
Infectious Diseases	Replication of murine herpesvirus 4	2,08E-06	DDX58, IFIH1, OAS1, PARP12	4
Cell-To-Cell Signaling and Interaction, Renal and Urological System Development and Function	Response of kidney cell lines	2,09E-06	DDX58, IFIH1, TAS1R3, TRIM25, TRIM38, TRIM56	6
Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Psoriasis	8,52E-06	APOL6, DDX58, EPSTI1, G0S2, GBP1, IFI16, IFI44, IFI44L, IFIT3, OAS1, OAS2, PARP9, PLSCR1, RTP4, TRIM22, UPP1	16
Cell Signaling	Replication of viral replicon	1,11E-05	EIF2AK2, IFI16, OAS1, PLSCR1, RNASEL	5
Cardiovascular Disease, Connective Tissue Disorders, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Singleton-Merten syndrome	4,08E-05	DDX58, IFIH1	2
Infectious Diseases	Replication of virus	8,79E-05	APOBEC3B, DDX58, EIF2AK2, GBP1, IFIH1, MOV10, OAS1, PARP12, PML, RNASEL, TNFSF10, TRIM25, TRIM38, ZBP1	14
Gastrointestinal Disease, Immunological Disease, Ophthalmic Disease, Organismal Injury and Abnormalities	Sjögren syndrome	1,06E-04	GBP1, IFIH1, IFIT3, IL6R, PML	5
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	T-cell non-Hodgkin disease	1,15E-04	AIM2, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, STK17B, TRIM25, TRIM38	11
Infectious Diseases	Replication of RNA virus	1,23E-04	APOBEC3B, DDX58, EIF2AK2, GBP1, IFIH1, MOV10, OAS1, PARP12, PML, RNASEL, TNFSF10, TRIM25, TRIM38	13
Hematological Disease, Immunological Disease	T-cell lymphoproliferative disorder	1,32E-04	AIM2, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, POT1, STK17B, TCF7, TRIM25, TRIM38	13

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cancer, Hematological Disease, Organismal Injury and Abnormalities	Hematologic cancer of cells	1,32E-04	AIM2, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, POT1, STK17B, TCF7, TRIM25, TRIM38	13
Infectious Diseases	Viral infection	1,33E-04	APOBEC3B, CSF2RA, DDX58, DDX60L, EIF2AK2, GBP1, HCP5, HSPA6, IFIH1, IFIT2, IFIT3, IL6R, MAPK14, MOV10, MS4A4A, OAS1, PARP12, PARP9, PML, RNASEL, SPATS2L, TNFSF10, TNFSF14, TRIM22, TRIM25, TRIM38, TRIM56, ZBP1	28
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Peripheral T-cell lymphoma	1,62E-04	IFI44, IFI44L, IFIT2, IFIT3, STK17B, TRIM25, TRIM38	7
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Neoplasia of leukocytes	1,71E-04	AIM2, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, POT1, STK17B, TCF7, TRIM25, TRIM38	13
Immunological Disease	Systemic autoimmune syndrome	2,86E-04	CACNA1C, CCRL2, CEACAM1, G0S2, GRB10, HCP5, HELZ2, IFIH1, IL6R, KLRB1, LAP3, OAS1, PADI2, SAMD9L, SPATS2L, STK17B, TCF7, TNFSF10, TRIM25, ZBP1	20
Inflammatory Response	Type I interferon response	4,03E-04	DDX58, IFIH1	2
Infectious Diseases	Production of virus	4,21E-04	EIF2AK2, IFIH1, MOV10, PML, TRIM22	5
Cellular Assembly and Organization	Fusion of chromosomes	6,02E-04	PML, POT1	2
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Short QT syndrome	6,02E-04	CACNA1C, KCNJ2	2
Inflammatory Response	Immune response of cells	7,49E-04	DDX58, EIF2AK2, IFIH1, IL6R, KLRF1, PML, TNFSF10, TRIM25, TRIM38, TRIM56	10
Antimicrobial Response, Inflammatory Response	Antiviral response of cells	7,50E-04	DDX58, EIF2AK2, IFIH1	3
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Kidney carcinoma	7,74E-04	DDX58, DDX60L, DOCK8, FAAP20, HIF3A, IFI16, IFIT3, IL6R, KCNJ15, LHFPL2, MAPK14, PADI2, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, TNFSF10, TRIM22	19
Cellular Growth and Proliferation	Cytostasis	8,26E-04	CEACAM1, DDX58, EIF2AK2, IFI16, IFIH1, MAPK14, PML	7
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Colony formation of cancer cells	8,33E-04	CEACAM1, MAPK14, TNFSF10	3

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Assembly and Organization	Quantity of micronuclei	8,39E-04	LMNB1, PML	2
Infectious Diseases	Replication of vesicular stomatitis indiana virus	8,39E-04	DDX58, IFIH1	2
Developmental Disorder, Hereditary Disorder, Metabolic Disease, Neurological Disease, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Familial periodic paralysis	1,11E-03	KCNE3, KCNJ2	2
Cancer, Cell-To-Cell Signaling and Interaction, Organismal Injury and Abnormalities	Response of cancer cells	1,11E-03	PML, TNFSF10	2
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of tumor cell lines	1,59E-03	DDX58, IFI16, IFIH1, MAPK14	4
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Kidney adenocarcinoma formation	1,61E-03	DDX58, DDX60L, DOCK8, FAAP20, IFI16, IFIT3, IL6R, KCNJ15, LHFPL2, MAPK14, PADI2, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, TNFSF10, TRIM22	18
Infectious Diseases	Flu	1,67E-03	HSPA6, IFIT2, MS4A4A, PML	4
Cell Death and Survival, DNA Replication, Recombination, and Repair	Fragmentation of DNA fragment	1,71E-03	APOBEC3B, EIF2AK2, TNFSF10	3
Cell Death and Survival	Cell death of fibroblasts	1,73E-03	MAPK14, PML, RNASEL, TNFSF10, TNFSF14	5
Cell Death and Survival	Apoptosis of hematopoietic cells	1,75E-03	CSF2RA, EIF2AK2, PML, TNFSF10	4
Cell Death and Survival	Cell death of lymphoma cell lines	1,75E-03	EIF2AK2, IL6R, LMNB1, NAIP, PML, TNFSF10	6
Cell Death and Survival	Cell death of adipocytes	1,78E-03	MAPK14, TNFSF10	2
Cardiovascular System Development and Function, Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function, Hematological System Development and Function, Hematopoiesis, Organismal Development, Tissue Development	Hematopoiesis of erythroid precursor cells	1,78E-03	EIF2AK2, IL6R	2
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response	Activation of lymphocytes	1,79E-03	CEACAM1, CR1L, KLRB1, KLRF1, MAGEA3/MAGEA6, SEMA4D, TNFSF10, TNFSF14	8
Infectious Diseases	Replication of HIV-1	1,84E-03	APOBEC3B, EIF2AK2, MOV10, PML, TNFSF10	5
Nucleic Acid Metabolism, Small Molecule Biochemistry	Biosynthesis of nucleoside triphosphate	1,92E-03	CMPK2, G0S2, PML, UCP3	4
Cellular Growth and Proliferation	Cytostasis of prostate cancer cell lines	2,16E-03	CEACAM1, IFIH1	2
Connective Tissue Disorders, Immunological Disease, Inflammatory Disease, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Systemic lupus erythematosus	2,35E-03	CEACAM1, KLRB1, OAS1, TCF7, TRIM25, ZBP1	6

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival, Cellular Compromise	Cytotoxicity of leukemia cell lines	2,58E-03	DOCK8, TNFSF10	2
Cell Death and Survival	Cell death of connective tissue cells	2,63E-03	EIF2AK2, GRB10, MAPK14, PML, RNASEL, TNFSF10, TNFSF14	7
Cell Death and Survival	Cell death of immune cells	2,70E-03	CSF2RA, EIF2AK2, IFIH1, IL6R, MAPK14, PML, SEMA4D, TNFSF10, TNFSF14	9
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Urinary tract cancer	2,89E-03	APOBEC3B, CSF2RA, DDX58, DDX60L, DOCK8, FAAP20, HIF3A, IFI16, IFIT3, IL6R, KCNJ15, LHFPL2, MAPK14, PADI2, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, TAS1R3, TNFSF10, TRIM22	22
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Proliferation of cancer cells	2,89E-03	CEACAM1, CSF2RA, IL6R, MAPK14, SEMA4D, TNFSF10, TRIM22, TRIM25	8
Cellular Assembly and Organization, DNA Replication, Recombination, and Repair	Formation of nuclear bodies	3,04E-03	PML, TNFSF10	2
Cellular Growth and Proliferation	Cytostasis of tumor cell lines	3,07E-03	CEACAM1, DDX58, IFI16, IFIH1, MAPK14	5
Cancer, Cell-To-Cell Signaling and Interaction, Organismal Injury and Abnormalities	Activation of leukemia cells	3,53E-03	SEMA4D, TNFSF10	2
Cellular Compromise, DNA Replication, Recombination, and Repair	Breakage of chromosomes	3,53E-03	FAAP20, POT1	2
Cardiovascular Disease, Cardiovascular System Development and Function, Embryonic Development, Organ Development, Organismal Development, Tissue Development	Blood vessel collateralization of coronary artery	3,61E-03	CARD6, IFI16, TNFSF10	3
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Renal cell carcinoma	3,89E-03	DDX58, DDX60L, DOCK8, FAAP20, IFI16, IFIT3, IL6R, KCNJ15, LHFPL2, PADI2, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, TNFSF10, TRIM22	17
Cancer, Organismal Injury and Abnormalities	Neoplasia of cells	3,97E-03	AIM2, APOBEC3B, ATF7IP2, CACNA1C, CARD6, CEACAM1, CMPK2, CR1L, DDX58, DDX60L, DOCK8, EIF2AK2, EPSTI1, FAM46A, GALM, GRB10, HIF3A, IFI44, IFI44L, IFIT2, IFIT3, IL6R, KCNJ2, LAP3, MACROD2, NLGN2, OAS1, OAS2, PADI2, PASK, PML, POT1, RNF213, SAMD9L, SEMA4D, SPATA13, SPATS2L, STK17B, TCF7, TNFSF10, TNFSF14, TRIM25, TRIM38, UPP1, ZCCHC2	45

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Apoptosis of fibrosarcoma cell lines	4,05E-03	DDX58, EIF2AK2, TNFSF10	3
Cardiovascular Disease, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities	Congenital long QT syndrome	4,06E-03	CACNA1C, KCNJ2	2
Cell Death and Survival	Apoptosis	4,12E-03	AIM2, APOBEC3B, APOL6, CEACAM1, CSF2RA, DDX58, EIF2AK2, G0S2, GRB10, IFI16, IFIH1, IFIT2, IFIT3, IL6R, LMNB1, MAGEA3/MAGEA6, MAPK14, NAIP, OAS1, PARP14, PLSCR1, PML, POT1, RNASEL, SAT1, SEMA4D, TNFSF10, TNFSF14	28
Cell Death and Survival	Apoptosis of lymphoma cell lines	4,35E-03	EIF2AK2, IL6R, LMNB1, PML, TNFSF10	5
Cell Death and Survival, Cellular Compromise	Cytotoxicity of lymphocytes	4,37E-03	CEACAM1, DOCK8, KLRF1, TNFSF10	4
Connective Tissue Disorders, Inflammatory Disease, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Rheumatic disease	4,46E-03	CACNA1C, CCRL2, CEACAM1, G0S2, GRB10, HELZ2, IL6R, KLRB1, LAP3, OAS1, PADI2, SAMD9L, SPATS2L, STK17B, TCF7, TNFSF10, TRIM25, ZBP1	18
Cell Death and Survival	Apoptosis of blood cells	4,68E-03	CSF2RA, EIF2AK2, IL6R, MAPK14, PML, TNFSF10, TNFSF14	7
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Hematological System Development and Function	Stimulation of lymphocytes	4,68E-03	MAGEA3/MAGEA6, TMIGD2, TNFSF10, TNFSF14	4
Cell Death and Survival	Apoptosis of tumor cell lines	4,78E-03	AIM2, CEACAM1, CSF2RA, DDX58, EIF2AK2, G0S2, IFI16, IL6R, LMNB1, MAGEA3/MAGEA6, MAPK14, NAIP, PARP14, PML, POT1, RNASEL, SAT1, TNFSF10, TNFSF14	19
Cell Death and Survival	Apoptosis of macrophages	4,78E-03	EIF2AK2, MAPK14, TNFSF10	3
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Familial arrhythmia	4,78E-03	CACNA1C, KCNE3, KCNJ2	3
Cellular Development, Hematopoiesis, Tissue Development	Differentiation of bone marrow cells	4,84E-03	EIF2AK2, IL6R, MAPK14, PML	4
Cellular Growth and Proliferation	Arrest in proliferation of cells	5,05E-03	EIF2AK2, MAPK14, PML, SAT1, TNFSF10	5
Cellular Growth and Proliferation	Colony formation of cells	5,25E-03	CEACAM1, EIF2AK2, IFI16, IFIH1, IL6R, MAPK14, SEMA4D, TNFSF10, TRIM22	9
Cardiovascular System Development and Function, Organismal Development	Vasculogenesis	5,70E-03	CARD6, CEACAM1, GBP1, IFI16, IL6R, KCNJ2, MAPK14, PML, TMIGD2, TNFSF10	10
Cellular Development	Maturation of blood cells	5,83E-03	IFIH1, PML, TCF7, TNFSF10, TNFSF14	5

ADDITIONAL FILE 6.

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Infectious Diseases	Production of retroviridae	5,86E-03	EIF2AK2, MOV10, TRIM22	3
Cell Death and Survival	Apoptosis of hematopoietic cell lines	6,06E-03	EIF2AK2, IFIH1, PML, TNFSF10	4
Cell Cycle, Cellular Development, Respiratory System Development and Function	Senescence of lung cell lines	6,15E-03	LMNB1, PML, POT1	3
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Tissue Development	Development of hematopoietic progenitor cells	6,25E-03	EIF2AK2, IL6R, MAPK14, TCF7	4
Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities, Psychological Disorders	Aicardi-Goutieres syndrome 7	6,42E-03	IFIH1	1
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Brugada syndrome type 3	6,42E-03	CACNA1C	1
Cancer, Cell Cycle, Organismal Injury and Abnormalities	G0/G1 phase transition of chronic lymphocytic leukemia B cells	6,42E-03	IL6R	1
Cardiovascular Disease, Connective Tissue Disorders, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Singleton-Merten syndrome type 1	6,42E-03	IFIH1	1
Cardiovascular Disease, Connective Tissue Disorders, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Singleton-Merten syndrome type 2	6,42E-03	DDX58	1
Cardiovascular Disease, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Timothy syndrome	6,42E-03	CACNA1C	1
Cancer, Cell-To-Cell Signaling and Interaction, Organismal Injury and Abnormalities	Activation of acute myeloid leukemia blast cells	6,42E-03	TNFSF10	1
Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities, Psychological Disorders	Adult onset autosomal dominant leukodystrophy	6,42E-03	LMNB1	1
Cell-To-Cell Signaling and Interaction	Aggregation of endothelial cell lines	6,42E-03	TMIGD2	1
Organismal Development	Aging of brain	6,42E-03	EIF2AK2	1
Antimicrobial Response, Cell-To-Cell Signaling and Interaction, Inflammatory Response	Antiviral response of macrophages	6,42E-03	DDX58	1
Cell Death and Survival	Apoptosis of articular chondrocytes	6,42E-03	TNFSF10	1
Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of follicular cells	6,42E-03	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of head and neck tumor	6,42E-03	TNFSF10	1

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Apoptosis of progenitor-derived astrocytes	6,42E-03	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of squamous-cell carcinoma	6,42E-03	TNFSF10	1
Hematological Disease, Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Ataxia-pancytopenia syndrome	6,42E-03	SAMD9L	1
Cell Morphology, Cellular Function and Maintenance	Autophagy of fibrosarcoma cell lines	6,42E-03	RNASEL	1
Developmental Disorder, Hereditary Disorder, Ophthalmic Disease, Organismal Injury and Abnormalities	Autosomal recessive congenital cataract type 4	6,42E-03	TDRD7	1
Infectious Diseases	Binding of Human foamy virus	6,42E-03	PML	1
Cell-To-Cell Signaling and Interaction	Binding of Neisseria gonorrhoeae	6,42E-03	CEACAM1	1
Cell Cycle, Gene Expression	Binding of Nur77/N10 binding site	6,42E-03	PML	1
Gene Expression, RNA Post-Transcriptional Modification	Binding of dsRNA	6,42E-03	EIF2AK2	1
Drug Metabolism, Small Molecule Biochemistry	Binding of isradipine	6,42E-03	CACNA1C	1
Cell Morphology, Organismal Injury and Abnormalities	Blebbing of nucleus	6,42E-03	LMNB1	1
Cellular Compromise	Breakdown of mitochondria	6,42E-03	TNFSF10	1
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Brugada syndrome type 6	6,42E-03	KCNE3	1
Cellular Compromise, Connective Tissue Development and Function, Skeletal and Muscular System Development and Function, Tissue Development	Calcification of osteoblasts	6,42E-03	EIF2AK2	1
Cell Cycle, DNA Replication, Recombination, and Repair	Checkpoint control of adipocytes	6,42E-03	MAPK14	1
Cell Cycle, DNA Replication, Recombination, and Repair	Checkpoint control of neurons	6,42E-03	MAPK14	1
Cellular Assembly and Organization, Cellular Function and Maintenance	Co-localization of autoimmune regulator nuclear body	6,42E-03	PML	1
Cell Death and Survival, Cellular Function and Maintenance	Colony survival of neuroblastoma cell lines	6,42E-03	TNFSF10	1
Cellular Assembly and Organization	Coupling of mitochondria	6,42E-03	UCP3	1
Cell Death and Survival	Cytolysis of B-lymphocyte derived cell lines	6,42E-03	CEACAM1	1
Cell Death and Survival, Cellular Compromise, Reproductive System Development and Function	Cytotoxicity of decidual natural killer cells	6,42E-03	CEACAM1	1
Molecular Transport, Small Molecule Biochemistry	Depletion of spermidine	6,42E-03	SAT1	1

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Molecular Transport, Small Molecule Biochemistry	Depletion of spermine	6,42E-03	SAT1	1
Cellular Development, Nervous System Development and Function, Tissue Development	Differentiation of axons	6,42E-03	NLGN2	1
Cell Morphology, Cellular Assembly and Organization, DNA Replication, Recombination, and Repair	Enlargement of PML nuclear bodies	6,42E-03	PML	1
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Familial atrial fibrillation type 9	6,42E-03	KCNJ2	1
Small Molecule Biochemistry	Flux of spermidine	6,42E-03	SAT1	1
Small Molecule Biochemistry	Flux of spermine	6,42E-03	SAT1	1
Cancer, Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Glioma susceptibility 9	6,42E-03	POT1	1
Cellular Growth and Proliferation	Growth of insect cells	6,42E-03	EIF2AK2	1
Cancer, Hereditary Disorder, Organismal Injury and Abnormalities, Reproductive System Disease	Hereditary prostate cancer 1	6,42E-03	RNASEL	1
Cell Morphology, Cellular Function and Maintenance	Homologous recombination repair of fibrosarcoma cell lines	6,42E-03	PML	1
Antimicrobial Response	Inhibition of reoviridae	6,42E-03	EIF2AK2	1
Cellular Growth and Proliferation, Hematological System Development and Function	Inhibition of erythroblasts	6,42E-03	TNFSF10	1
Cellular Growth and Proliferation	Inhibition of hepatocytes	6,42E-03	TNFSF10	1
Cell Death and Survival	Killing of melanocytes	6,42E-03	TNFSF10	1
Cellular Movement, Nervous System Development and Function	Migration of CA1 neuron	6,42E-03	DISC1	1
Cancer, Cell Death and Survival, Neurological Disease, Organismal Injury and Abnormalities, Tumor Morphology	Mitotic catastrophe of glioma cells	6,42E-03	MAPK14	1
Endocrine System Disorders, Nutritional Disease, Organismal Injury and Abnormalities, Reproductive System Disease	Morbid obesity and spermatogenic failure	6,42E-03	CEP19	1
Cellular Assembly and Organization	Movement of lipid bilayer	6,42E-03	PLSCR1	1
Cardiovascular Disease, Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Moyamoya disease type 2	6,42E-03	RNF213	1
Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of dUMP	6,42E-03	CMPK2	1

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Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Drug Metabolism, Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of floxuridine	6,42E-03	CMPK2	1
Cancer, Organismal Injury and Abnormalities	Poorly differentiated head and neck squamous cell carcinoma	6,42E-03	DDX58	1
Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function, Tissue Development	Proliferation of stromal vascular cells	6,42E-03	TNFSF10	1
Carbohydrate Metabolism, Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Quantity of L-alpha-palmitoyl-oleoyl-phosphatidylcholine	6,42E-03	TNFSF10	1
Cell Death and Survival	Quantity of apoptotic endothelial cell lines	6,42E-03	TNFSF10	1
Tissue Morphology	Remodeling of smooth muscle tissue	6,42E-03	TNFSF10	1
Infectious Diseases	Replication of Human foamy virus	6,42E-03	PML	1
Infectious Diseases	Replication of human herpesvirus 2	6,42E-03	PML	1
Infectious Diseases	Replication of lymphocytic choriomeningitis virus	6,42E-03	PML	1
Infectious Diseases	Resistance to Vesicular Stomatitis Virus	6,42E-03	PML	1
Cancer, Cell-To-Cell Signaling and Interaction, Organismal Injury and Abnormalities	Response of neuroblastoma cells	6,42E-03	PML	1
Cellular Response to Therapeutics	Sensitivity of astrocytes	6,42E-03	TNFSF10	1
Cell-To-Cell Signaling and Interaction	Sensitization of myeloma cell lines	6,42E-03	PARP14	1
Endocrine System Disorders, Gastrointestinal Disease, Metabolic Disease, Nutritional Disease, Organismal Injury and Abnormalities	Severe obesity and type II diabetes	6,42E-03	UCP3	1
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Short-QT syndrome 3	6,42E-03	KCNJ2	1
Cardiovascular System Development and Function, Cell Morphology, Connective Tissue Development and Function, Hematological System Development and Function, Hematopoiesis, Tissue Morphology	Size of colony-forming erythroid cells	6,42E-03	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Survival of myeloma cells	6,42E-03	PARP14	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Susceptibility to cutaneous malignant melanoma type 10	6,42E-03	POT1	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell-To-Cell Signaling and Interaction, Nervous System Development and Function	Targeting of olfactory receptor neurons	6,42E-03	KCNJ2	1
Protein Synthesis	Translation of green fluorescent protein	6,42E-03	EIF2AK2	1
RNA Post-Transcriptional Modification	Unwinding of siRNA	6,42E-03	DDX58	1
Cell Death and Survival	Apoptosis of fibroblasts	6,44E-03	MAPK14, RNASEL, TNFSF10, TNFSF14	4
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hypersensitivity Response, Inflammatory Response, Lymphoid Tissue Structure and Development	Proliferation of mast cells	6,50E-03	IL6R, SEMA4D	2
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Brugada syndrome type 1	7,19E-03	CACNA1C, KCNE3	2
Cell Death and Survival	Apoptosis of synovial fibroblasts	7,92E-03	TNFSF10, TNFSF14	2
Cell Death and Survival, Hematological System Development and Function	Cell viability of neutrophils	7,92E-03	CSF2RA, TNFSF10	2
Cell Death and Survival, Cellular Compromise	Cytotoxicity of leukocyte cell lines	7,92E-03	DOCK8, KLRF1	2
Cardiovascular System Development and Function, Embryonic Development, Organ Development, Organismal Development, Tissue Development	Cardiogenesis	7,96E-03	CACNA1C, CARD6, IFI16, MAPK14, TNFSF10	5
Cellular Development, Cellular Growth and Proliferation, Respiratory System Development and Function	Proliferation of lung cell lines	8,07E-03	IFI16, LMNB1, PML	3
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Renal clear cell adenocarcinoma	8,14E-03	DDX58, DDX60L, DOCK8, FAAP20, IFI16, IL6R, KCNJ15, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, TNFSF10, TRIM22	14
Cellular Development, Cellular Growth and Proliferation, Embryonic Development, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Organ Development, Organismal Development, Tissue Development	Hematopoiesis of bone marrow cells	8,42E-03	EIF2AK2, IL6R, MAPK14	3
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Stimulation of cells	8,65E-03	CACNA1C, KCNJ2, MAGEA3/MAGEA6, TMIGD2, TNFSF10, TNFSF14	6
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Nervous System Development and Function	Excitation of neurons	8,67E-03	CACNA1C, KCNJ2	2
Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis	Colony formation of hematopoietic progenitor cells	8,78E-03	EIF2AK2, IL6R, MAPK14	3

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Apoptosis of cervical cancer cell lines	8,96E-03	EIF2AK2, G0S2, MAPK14, NAIP, PML, POT1, TNFSF10	7
Cell Death and Survival, DNA Replication, Recombination, and Repair	Fragmentation of DNA	9,09E-03	APOBEC3B, EIF2AK2, PML, TNFSF10	4
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Familial cardiovascular disease	9,25E-03	CACNA1C, CSF2RA, DDX58, IFIH1, KCNE3, KCNJ2	6
Cell Death and Survival	Apoptosis of squamous cell carcinoma cell lines	9,53E-03	DDX58, PML, TNFSF10	3
Cardiovascular System Development and Function, Organismal Development	Angiogenesis	9,68E-03	CARD6, CEACAM1, GBP1, IFI16, IL6R, KCNJ2, MAPK14, PML, RNF213, TMIGD2, TNFSF10	11
Cell Death and Survival, Cellular Compromise	Cytotoxicity of natural killer cells	9,92E-03	CEACAM1, DOCK8, KLRF1	3
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Tissue Development	Hematopoiesis of hematopoietic progenitor cells	9,92E-03	EIF2AK2, IL6R, MAPK14	3
Cellular Growth and Proliferation	Colony formation of hematopoietic cell lines	1,03E-02	IFIH1, IL6R	2
Energy Production, Nucleic Acid Metabolism, Small Molecule Biochemistry	Synthesis of ATP	1,03E-02	G0S2, PML, UCP3	3
Cell Cycle, Gene Expression	Binding of DNA	1,06E-02	BATF2, CSF2RA, DDX58, HIF3A, IFIH1, IL6R, MAPK14, OAS1, PML	9
Cell Signaling, Molecular Transport, Vitamin and Mineral Metabolism	Concentration of Ca ²⁺	1,07E-02	CACNA1C, TNFSF14, UCP3	3
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of breast cancer cell lines	1,11E-02	IFI16, MAPK14	2
Cancer, Cell Cycle, Organismal Injury and Abnormalities	Interphase of cancer cells	1,11E-02	IL6R, MAPK14	2
Lipid Metabolism, Small Molecule Biochemistry	Phospholipid flip-flop of phosphatidylserine	1,11E-02	PLSCR1, TNFSF10	2
Cellular Development	Differentiation of leukemia cell lines	1,15E-02	HK3, MAPK14, PLSCR1, PML	4
Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function, Skeletal and Muscular System Development and Function, Tissue Development	Formation of osteoclasts	1,20E-02	EIF2AK2, MAPK14, TNFSF10	3
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Myelopoiesis of leukocytes	1,21E-02	CSF2RA, IFIH1, PML, TNFSF10	4

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Apoptosis of hematopoietic progenitor cells	1,24E-02	EIF2AK2, PML, TNFSF10	3
Cell Death and Survival	Cell viability of leukemia cell lines	1,24E-02	HK3, PML, TNFSF10	3
Embryonic Development, Organismal Development	Development of body trunk	1,28E-02	CACNA1C, CARD6, IFI16, IL6R, MAPK14, TCF7, TNFSF10	7
Cardiovascular Disease, Developmental Disorder, Hereditary Disorder, Organismal Injury and Abnormalities	Andersen syndrome	1,28E-02	KCNJ2	1
Cancer, Cell Cycle, Organismal Injury and Abnormalities	G2/M phase of glioma cells	1,28E-02	MAPK14	1
Antimicrobial Response, Cell-To-Cell Signaling and Interaction, Connective Tissue Development and Function, Inflammatory Response	Antiviral response of fibroblasts	1,28E-02	DDX58	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of cholangiocarcinoma cell	1,28E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of duct cancer cell lines	1,28E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of lamina propria T lymphocytes	1,28E-02	IL6R	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of leukemic blasts	1,28E-02	TNFSF10	1
Cell Death and Survival	Arrest in apoptosis of carcinoma cell lines	1,28E-02	TNFSF10	1
Cell Death and Survival	Arrest in apoptosis of lung cancer cell lines	1,28E-02	TNFSF10	1
Cell Cycle	Arrest in cell cycle progression of thyroid tumor cell lines	1,28E-02	IFI16	1
Cellular Development, Cellular Growth and Proliferation, Embryonic Development, Hematological System Development and Function, Hematopoiesis, Humoral Immune Response, Lymphoid Tissue Structure and Development, Organ Development, Organismal Development, Tissue Development	Arrest in differentiation of pro-B lymphocytes	1,28E-02	PML	1
Cellular Development, Cellular Growth and Proliferation, Embryonic Development	Arrest in growth of embryonic cell lines	1,28E-02	SAT1	1
Cellular Development, Hematological System Development and Function, Hematopoiesis	Arrest in maturation of hematopoietic progenitor cells	1,28E-02	PML	1
Developmental Disorder, Hematological Disease, Hereditary Disorder, Immunological Disease, Organismal Injury and Abnormalities	Autosomal recessive hyper-IgE recurrent infection syndrome	1,28E-02	DOCK8	1
Cell Death and Survival, Hematological System Development and Function	Cell survival of pro-B lymphocytes	1,28E-02	PML	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Growth and Proliferation	Clonogenicity of breast cancer cell lines	1,28E-02	PML	1
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of thyroid tumor cell lines	1,28E-02	IFI16	1
Cell Death and Survival, Cellular Compromise	Cytotoxicity of lung cancer cell lines	1,28E-02	TNFSF10	1
Cell Death and Survival, Cellular Compromise	Cytotoxicity of lymphoblasts	1,28E-02	TNFSF10	1
Cell Death and Survival	Delay in cell death of cervical cancer cell lines	1,28E-02	TNFSF10	1
Cell Cycle, Cellular Development, Respiratory System Development and Function	Delay in initiation of senescence of lung cell lines	1,28E-02	LMNB1	1
Cellular Compromise	Deletion of thymocytes	1,28E-02	TCF7	1
Cancer, Cardiovascular Disease, Organismal Injury and Abnormalities	Development of hemangioma	1,28E-02	CEACAM1	1
Cellular Assembly and Organization	Disassembly of nuclear bodies	1,28E-02	PML	1
Cell-To-Cell Signaling and Interaction	Dissociation of epithelial cells	1,28E-02	SEMA4D	1
Cardiovascular Disease, Developmental Disorder, Hematological Disease, Hereditary Disorder, Metabolic Disease, Organismal Injury and Abnormalities	Enterocyte cobalamin malabsorption	1,28E-02	AMN	1
Small Molecule Biochemistry	Formation of spermidine	1,28E-02	SAT1	1
RNA Damage and Repair, RNA Post-Transcriptional Modification	Hydrolysis of RNA fragment	1,28E-02	RNASEL	1
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Hematological System Development and Function, Humoral Immune Response	Induction of plasma cells	1,28E-02	TNFSF10	1
Antimicrobial Response	Inhibition of vesicular stomatitis virus	1,28E-02	EIF2AK2	1
Cell Death and Survival	Initiation of cell death of synovial cells	1,28E-02	TNFSF10	1
Cellular Movement	Invasion of hybrid cells	1,28E-02	CEACAM1	1
Cellular Development	Lifespan of chronic lymphocytic leukemia B cells	1,28E-02	SEMA4D	1
Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Male breast cancer	1,28E-02	G0S2	1
Cellular Movement	Migration of B cell lymphoma cells	1,28E-02	PARP9	1
Cellular Movement, Hematological System Development and Function, Hypersensitivity Response, Immune Cell Trafficking, Inflammatory Response	Migration of CD34 ⁺ progenitor-derived connective tissue-type mast cells	1,28E-02	MS4A4A	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Mitochondrial cell death of squamous cell carcinoma cell lines	1,28E-02	DDX58	1
Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of UMP	1,28E-02	CMPK2	1
Drug Metabolism, Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of cytarabine	1,28E-02	CMPK2	1
Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of dCMP	1,28E-02	CMPK2	1
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Proliferation of cholangiocarcinoma cell	1,28E-02	TNFSF10	1
Molecular Transport, Nucleic Acid Metabolism, Small Molecule Biochemistry	Quantity of ADP	1,28E-02	UCP3	1
Infectious Diseases	Quantity of Theiler's encephalomyelitis virus	1,28E-02	IFIT3	1
Infectious Diseases	Quantity of vesicular stomatitis Indiana virus	1,28E-02	IFIT3	1
Cell Death and Survival, Gastrointestinal Disease, Hepatic System Disease, Organ Morphology, Organismal Injury and Abnormalities, Tissue Morphology	Quantity of apoptotic hepatocytes	1,28E-02	TNFSF10	1
Hematological System Development and Function, Lymphoid Tissue Structure and Development, Tissue Morphology	Quantity of follicular T helper cells	1,28E-02	IL6R	1
Molecular Transport, Small Molecule Biochemistry	Quantity of spermidine	1,28E-02	SAT1	1
Molecular Transport, Small Molecule Biochemistry	Quantity of spermine	1,28E-02	SAT1	1
Infectious Diseases	Reactivation of human herpesvirus 8	1,28E-02	MAPK14	1
Small Molecule Biochemistry	Regulation of spermidine	1,28E-02	SAT1	1
Infectious Diseases	Replication of myxoma virus	1,28E-02	EIF2AK2	1
Cell Cycle, Cellular Development, Connective Tissue Development and Function	Senescence of dermal fibroblasts	1,28E-02	LMNB1	1
Cellular Response to Therapeutics	Sensitivity of tumor cells	1,28E-02	TNFSF10	1
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Short-QT syndrome 4	1,28E-02	CACNA1C	1
Cell-To-Cell Signaling and Interaction, Nervous System Development and Function	Silencing of neurons	1,28E-02	KCNJ2	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Survival of non-small-cell lung cancer cells	1,28E-02	TNFSF10	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Drug Metabolism, Lipid Metabolism, Small Molecule Biochemistry, Vitamin and Mineral Metabolism	Synthesis of alitretinoin	1,28E-02	DHRS9	1
Infectious Diseases	Viral entry by human herpesvirus 1	1,28E-02	TNFSF14	1
Cell-To-Cell Signaling and Interaction, Cellular Assembly and Organization, Cellular Development, Cellular Function and Maintenance, Cellular Growth and Proliferation, Nervous System Development and Function, Tissue Development	Developmental process of synapse	1,29E-02	IGSF9, NLGN2, SEMA4D	3
Cellular Development	Lifespan of cells	1,29E-02	PML, SEMA4D	2
Cancer, Dermatological Diseases and Conditions, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Cutaneous T-cell lymphoma	1,38E-02	IFI44, OAS1, OAS2	3
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of carcinoma cells	1,38E-02	EIF2AK2, TNFSF10	2
Cell Morphology, Cellular Function and Maintenance, Hair and Skin Development and Function	Autophagy of epithelial cell lines	1,38E-02	MAPK14, TNFSF10	2
Cellular Development, Hematological System Development and Function, Lymphoid Tissue Structure and Development	Maturation of leukocytes	1,39E-02	IFIH1, TCF7, TNFSF10, TNFSF14	4
Cancer, Organismal Injury and Abnormalities	Tumorigenesis of adenocarcinoma	1,41E-02	APOBEC3B, ATF7IP2, CACNA1C, CARD6, DDX58, DDX60L, DOCK8, FAAP20, FFAR2, IFI16, IFI44L, IFIH1, IFIT3, IL6R, KCNJ15, LHFPL2, MAGEA3/MAGEA6, MAPK14, NLGN2, PADI2, PASK, PLSCR1, RNF213, RSRP1, SAMD9L, SEMA4D, SH2D5, SIRPB2, SRGAP2, TMEM140, TNFSF10, TRIM22, TRIM25	33
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Non-hodgkin disease	1,42E-02	AIM2, CSF2RA, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, POT1, RNF213, STK17B, TRIM25, TRIM38	14
Protein Synthesis	Oligomerization of protein	1,42E-02	AIM2, GBP1, RNF213, TOR1B	4
Cellular Movement, Hematological System Development and Function, Hypersensitivity Response, Immune Cell Trafficking, Inflammatory Response	Cell movement of mast cells	1,48E-02	MS4A4A, SEMA4D	2
Cell Death and Survival	Cell death of tumor cell lines	1,52E-02	AIM2, CEACAM1, CSF2RA, DDX58, EIF2AK2, GOS2, IFI16, IL6R, LMNB1, MAGEA3/MAGEA6, MAPK14, MLKL, NAIP, PARP14, PLSCR1, PML, POT1, RNASEL, SAT1, TNFSF10, TNFSF14	21

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Development, Connective Tissue Development and Function, Tissue Development	Differentiation of connective tissue cells	1,52E-02	EIF2AK2, IFI16, IL6R, MAPK14, SEMA4D, TNFSF10, TNFSF14	7
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Hematological System Development and Function	Stimulation of T lymphocytes	1,53E-02	MAGEA3/MAGEA6, TMIGD2, TNFSF14	3
Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Neoplasia of breast cancer cell lines	1,58E-02	CR1L, PML	2
Cancer, Cellular Development, Cellular Growth and Proliferation, Neurological Disease, Organismal Injury and Abnormalities, Tumor Morphology	Proliferation of glioma cells	1,58E-02	CSF2RA, TNFSF10	2
Cancer, Cell Death and Survival, Neurological Disease, Organismal Injury and Abnormalities, Tumor Morphology	Cell death of glioma cells	1,68E-02	MAPK14, TNFSF10	2
Protein Synthesis	Homo-oligomerization of protein	1,74E-02	GBP1, RNF213, TOR1B	3
Cellular Movement	Cell movement of cancer cells	1,78E-02	CEACAM1, CSF2RA, PARP9, SEMA4D	4
Cell Death and Survival	Cell death of stem cells	1,79E-02	TNFSF10, TNFSF14	2
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Lymphoid Tissue Structure and Development	Proliferation of activated T lymphocytes	1,79E-02	CEACAM1, TMIGD2	2
Gene Expression	Transcription of RNA	1,81E-02	CSF2RA, DDX58, DISC1, EIF2AK2, EVX1, HELZ2, HIF3A, IFI16, IL6R, MAPK14, PLSCR1, PML, RNASEL, SEMA4D, TCF7, TNFSF10, TNFSF14, TRIM22, TRIM38, ZBP1	20
Cell Death and Survival	Apoptosis of bladder cancer cell lines	1,89E-02	IFI16, TNFSF10	2
Cellular Function and Maintenance, Hematological System Development and Function	Function of lymphocytes	1,90E-02	CEACAM1, KLRB1, TCF7	3
Cancer, Organismal Injury and Abnormalities	Castleman disease	1,91E-02	IL6R	1
Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	UV-sensitive syndrome	1,91E-02	UVSSA	1
Cell Death and Survival	Apoptosis of adipoblasts	1,91E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of adipose cell lines	1,91E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of colon cell lines	1,91E-02	TNFSF10	1
Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of colonocytes	1,91E-02	CEACAM1	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Development, Cellular Growth and Proliferation, Renal and Urological System Development and Function	Arrest in growth of kidney cell lines	1,91E-02	SAT1	1
Cellular Development, Cellular Growth and Proliferation, Organ Development, Skeletal and Muscular System Development and Function, Tissue Development	Arrest in proliferation of muscle cells	1,91E-02	MAPK14	1
Cell Morphology, Cellular Function and Maintenance	Autophagy of epithelial cells	1,91E-02	TNFSF10	1
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function	Binding of Th2 cells	1,91E-02	TNFSF14	1
Vitamin and Mineral Metabolism	Biosynthesis of molybdenum cofactor complex	1,91E-02	MOCS3	1
Cardiovascular System Development and Function, Cell Death and Survival	Cell viability of microvascular endothelial cells	1,91E-02	CEACAM1	1
Cellular Movement, Hematological System Development and Function, Hypersensitivity Response, Immune Cell Trafficking, Inflammatory Response	Chemotaxis of CD34 ⁺ progenitor-derived connective tissue-type mast cells	1,91E-02	SEMA4D	1
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Colony formation of acute myeloblastic leukemia cells	1,91E-02	TNFSF10	1
Cell Death and Survival	Cytolysis of breast cancer cell lines	1,91E-02	TNFSF10	1
Cell Death and Survival, Cellular Compromise	Cytotoxicity of carcinoma cell lines	1,91E-02	TNFSF10	1
Cellular Development, Tissue Development, Visual System Development and Function	Differentiation of lens fiber cells	1,91E-02	TDRD7	1
Cell-To-Cell Signaling and Interaction, Cellular Assembly and Organization, Cellular Development, Cellular Function and Maintenance, Cellular Growth and Proliferation, Nervous System Development and Function, Tissue Development	Differentiation of synapse	1,91E-02	NLGN2	1
Cellular Development, Cellular Growth and Proliferation, Embryonic Development, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Organ Development, Organismal Development, Tissue Development	Hematopoiesis of myeloid progenitor cells	1,91E-02	EIF2AK2	1
Cell Cycle	Initiation of G2 phase	1,91E-02	MAPK14	1
Cellular Movement	Invasion of Neisseria gonorrhoeae	1,91E-02	CEACAM1	1
Cell Death and Survival	Killing of dendritic cells	1,91E-02	TNFSF10	1
Cell Death and Survival	Killing of hepatoma cell lines	1,91E-02	TNFSF10	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival	Necroptosis of pancreatic cancer cell lines	1,91E-02	TNFSF10	1
Cancer, Organismal Injury and Abnormalities	Neoplasia of skin cancer cell lines	1,91E-02	PADI2	1
Infectious Diseases	Nosocomial infection	1,91E-02	CSF2RA	1
Connective Tissue Disorders, Inflammatory Disease, Inflammatory Response, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Osteoarthritis susceptibility 2	1,91E-02	IL6R	1
Energy Production, Lipid Metabolism, Small Molecule Biochemistry	Oxidation of fat	1,91E-02	UCP3	1
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response	Priming of natural killer cells	1,91E-02	KLRF1	1
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hypersensitivity Response, Inflammatory Response, Lymphoid Tissue Structure and Development	Proliferation of CD34+ progenitor-derived connective tissue-type mast cells	1,91E-02	SEMA4D	1
Organ Development, Organ Morphology, Skeletal and Muscular System Development and Function	Relaxation of skeletal muscle	1,91E-02	KCNJ2	1
Cell-To-Cell Signaling and Interaction, Connective Tissue Development and Function	Response of fibroblast cell lines	1,91E-02	PML	1
Cellular Assembly and Organization, Cellular Compromise, Nervous System Development and Function	Retraction of dendrites	1,91E-02	IL6R	1
Lipid Metabolism, Small Molecule Biochemistry	Scrambling of phospholipid	1,91E-02	PLSCR1	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Stage IB cutaneous melanoma	1,91E-02	CSF2RA	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Stage IIA cutaneous melanoma	1,91E-02	CSF2RA	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Stage IIB cutaneous melanoma	1,91E-02	CSF2RA	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Stage IIC cutaneous melanoma	1,91E-02	CSF2RA	1
Cell Cycle	Senescence of cells	1,96E-02	IFI16, LMNB1, MAPK14, PML, POT1	5
Cellular Growth and Proliferation, Hematopoiesis	Colony formation of bone marrow cells	2,00E-02	MAPK14, TNFSF10	2
Cell Death and Survival	Delay in cell death	2,00E-02	MAPK14, TNFSF10	2

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cancer, Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Growth of liver tumor	2,00E-02	MAPK14, TNFSF10	2
Cell Death and Survival	Apoptosis of leukocyte cell lines	2,02E-02	EIF2AK2, IFIH1, TNFSF10	3
Cell Death and Survival, Organismal Injury and Abnormalities	Cell death of epithelial cells	2,02E-02	APOBEC3B, CEACAM1, EIF2AK2, MAPK14, MLKL, TNFSF10, TNFSF14	7
Cell-To-Cell Signaling and Interaction	Activation of cells	2,07E-02	CEACAM1, CR1L, EIF2AK2, IFI16, IL6R, KLRB1, KLRF1, MAGEA3/MAGEA6, SEMA4D, TNFSF10, TNFSF14	11
Infectious Diseases	Replication of Influenza virus	2,10E-02	DDX58, EIF2AK2, GBP1, PML, RNASEL, TNFSF10	6
Cellular Development, Connective Tissue Development and Function, Tissue Development	Differentiation of bone cells	2,26E-02	EIF2AK2, IL6R, SEMA4D, TNFSF10, TNFSF14	5
Cell Death and Survival	Apoptosis of fibroblast cell lines	2,26E-02	EIF2AK2, GRB10, TNFSF10	3
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Differentiation of myeloid leukocytes	2,26E-02	CSF2RA, IFI16, PML, TNFSF10	4
Cell Death and Survival	Cell death	2,28E-02	AIM2, APOBEC3B, APOL6, CEACAM1, CSF2RA, DDX58, DOCK8, EIF2AK2, G0S2, GRB10, IFI16, IFIH1, IFIT2, IFIT3, IL6R, KLRF1, LMNB1, MAGEA3/MAGEA6, MAPK14, MLKL, NAIP, OAS1, PARP14, PLSCR1, PML, POT1, RNASEL, SAT1, SEMA4D, TNFSF10, TNFSF14	31
Carbohydrate Metabolism, Small Molecule Biochemistry	Metabolism of D-glucose	2,35E-02	GALM, OAS1	2
Cardiovascular System Development and Function, Cell Death and Survival	Survival of vascular endothelial cells	2,35E-02	CEACAM1, TNFSF10	2
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response	Activation of T lymphocytes	2,43E-02	CEACAM1, CR1L, MAGEA3/MAGEA6, TNFSF10, TNFSF14	5
Cell Death and Survival	Cell viability of leukocytes	2,44E-02	CSF2RA, PML, SEMA4D, TNFSF10	4
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Type M3 acute myeloid leukemia	2,47E-02	HK3, PML	2
Cancer, Organismal Injury and Abnormalities	Cancer of cells	2,53E-02	AIM2, APOBEC3B, ATF7IP2, CACNA1C, CARD6, CMPK2, DDX58, DDX60L, DOCK8, EPSTI1, FAM46A, GALM, GRB10, HIF3A, IFI44, IFI44L, IFIT2, IFIT3, IL6R, KCNJ2, LAP3, MACROD2, NLGN2, OAS1, OAS2, PASK, PML, POT1, RNF213, SAMD9L, SEMA4D, SPATA13, SPATS2L, STK17B, TCF7, TNFSF10, TNFSF14, TRIM25, TRIM38, UPP1, ZCCHC2	41

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cancer, Neurological Disease, Organismal Injury and Abnormalities	EGFRvIII positive malignant glioma	2,54E-02	CSF2RA	1
Cancer, Neurological Disease, Organismal Injury and Abnormalities	EGFRvIII mutation positive giant cell glioblastoma	2,54E-02	CSF2RA	1
Cancer, Neurological Disease, Organismal Injury and Abnormalities	EGFRvIII mutation positive gliosarcoma	2,54E-02	CSF2RA	1
Cancer, Neurological Disease, Organismal Injury and Abnormalities	EGFRvIII mutation positive small cell glioblastoma	2,54E-02	CSF2RA	1
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response	Activation of peripheral T lymphocyte	2,54E-02	TNFSF10	1
Antimicrobial Response, Cell-To-Cell Signaling and Interaction, Inflammatory Response	Antiviral response of dendritic cells	2,54E-02	DDX58	1
Cell Death and Survival, Embryonic Development	Apoptosis of cytotrophoblastic cells	2,54E-02	TNFSF14	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of follicular B-cell lymphoma cells	2,54E-02	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of mesothelioma cells	2,54E-02	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of non-small-cell lung cancer cells	2,54E-02	TNFSF10	1
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function	Binding of Th1 cells	2,54E-02	TNFSF14	1
Cell Cycle, Gene Expression	Binding of hypoxia response element	2,54E-02	HIF3A	1
Cell Death and Survival, Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Cell death of sinusoidal endothelial cells	2,54E-02	TNFSF10	1
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Colony formation of cancer stem cells	2,54E-02	CEACAM1	1
Cellular Growth and Proliferation, Hematological System Development and Function	Colony formation of leukocyte cell lines	2,54E-02	IFIH1	1
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of prostate cancer cell lines	2,54E-02	IFIH1	1
Cancer, Cell-To-Cell Signaling and Interaction, Inflammatory Response, Organismal Injury and Abnormalities, Tumor Morphology	Cytotoxic reaction of cancer cells	2,54E-02	TNFSF10	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival, Cellular Compromise	Cytotoxicity of monocytes	2,54E-02	TNFSF10	1
Cellular Assembly and Organization, Cellular Compromise	Depolymerization of actin	2,54E-02	MAPK14	1
Cancer, Cellular Development, Organismal Injury and Abnormalities, Tumor Morphology	Differentiation of acute promyelocytic leukemia cells	2,54E-02	PML	1
Cellular Function and Maintenance, Molecular Transport	Flux of H+	2,54E-02	UCP3	1
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function	Hematopoiesis of leukemia cell lines	2,54E-02	MAPK14	1
Cellular Compromise	Injury of mitochondria	2,54E-02	TNFSF10	1
Cellular Function and Maintenance	Internalization of Neisseria gonorrhoeae	2,54E-02	CEACAM1	1
Infectious Diseases	Measles	2,54E-02	TNFSF10	1
Infectious Diseases	Production of encephalomyocarditis virus	2,54E-02	PML	1
Tissue Morphology	Quantity of brain cancer cell lines	2,54E-02	EIF2AK2	1
Hematological System Development and Function, Lymphoid Tissue Structure and Development, Tissue Morphology	Quantity of naive T lymphocytes	2,54E-02	DOCK8	1
Cellular Function and Maintenance, Molecular Transport, Protein Trafficking	Receptor-mediated endocytosis of protein	2,54E-02	AMN	1
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Refractory PML-RARalpha positive acute promyelocytic leukemia	2,54E-02	PML	1
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Relapsed PML-RARalpha positive acute promyelocytic leukemia	2,54E-02	PML	1
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function	Response of V-delta-1 gamma-delta T cells	2,54E-02	MAPK14	1
Cellular Response to Therapeutics	Sensitivity of colorectal cancer cell lines	2,54E-02	TNFSF10	1
Gene Expression, RNA Damage and Repair, RNA Post-Transcriptional Modification	Stabilization of reporter mRNA	2,54E-02	MAPK14	1
Cancer, Organismal Injury and Abnormalities	Tumorigenesis of cancer stem cells	2,54E-02	CEACAM1	1
Cell Death and Survival	Cell death of colorectal cancer cell lines	2,57E-02	CEACAM1, G0S2, MAPK14, MLKL, TNFSF10, TNFSF14	6
Cell Cycle, Cellular Development, Connective Tissue Development and Function	Senescence of fibroblast cell lines	2,59E-02	MAPK14, PML, POT1	3
Cellular Development	Differentiation of lymphoma cell lines	2,59E-02	PLSCR1, PML	2

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cardiovascular Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Familial vascular disease	2,66E-02	CSF2RA, DDX58, IFIH1	3
Protein Synthesis	Synthesis of protein	2,66E-02	EIF2AK2, PARP12, PASK, RNASEL, SAT1, TNFSF10	6
Gastrointestinal Disease, Immunological Disease, Ophthalmic Disease, Organismal Injury and Abnormalities	Primary Sjögren syndrome	2,72E-02	IL6R, PML	2
Cellular Development, Hematological System Development and Function, Lymphoid Tissue Structure and Development	Maturation of dendritic cells	2,72E-02	IFIH1, TNFSF10, TNFSF14	3
Cell-To-Cell Signaling and Interaction, Hematological System Development and Function	Binding of mononuclear leukocytes	2,78E-02	DOCK8, IL6R, MAPK14, TNFSF14	4
Cancer, Hematological Disease, Organismal Injury and Abnormalities	Hematological neoplasia	2,79E-02	AIM2, ALPK1, ANKFY1, CACNA1C, CSF2RA, DDX58, DDX60, DDX60L, EIF2AK2, EPSTI1, HK3, HSPA6, IFI44, IFI44L, IFIT2, IFIT3, IL6R, KCNJ15, MAPK14, OAS1, OAS2, PML, POT1, RNF213, STK17B, TCF7, TNFSF10, TRIM22, TRIM25, TRIM38, UVSSA	31
Cell-To-Cell Signaling and Interaction	Signaling of cells	2,86E-02	DDX58, TAS1R3, TRIM25	3
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Tissue Development	Differentiation of hematopoietic progenitor cells	2,88E-02	EIF2AK2, IL6R, MAPK14, PML	4
Cancer, Hematological Disease, Organismal Injury and Abnormalities	Lymphocytic neoplasm	2,96E-02	AIM2, CACNA1C, CSF2RA, DDX58, IFI44, IFI44L, IFIT2, IFIT3, IL6R, OAS1, OAS2, PML, POT1, RNF213, STK17B, TCF7, TRIM25, TRIM38, UVSSA	19
Antimicrobial Response	Inhibition of virus	2,97E-02	APOBEC3B, EIF2AK2	2
Connective Tissue Disorders, Immunological Disease, Inflammatory Disease, Inflammatory Response, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Rheumatoid arthritis	3,07E-02	CACNA1C, CCRL2, G0S2, GRB10, HELZ2, IL6R, LAP3, PADI2, SAMD9L, SPATS2L, STK17B, TNFSF10	12
Lymphoid Tissue Structure and Development, Tissue Morphology	Quantity of lymphatic system cells	3,08E-02	DOCK8, IL6R, TNFSF10	3
Cell Death and Survival, Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Apoptosis of hepatocytes	3,11E-02	TNFSF10, TNFSF14	2
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Hematological System Development and Function	Induction of lymphocytes	3,11E-02	MAGEA3/MAGEA6, TNFSF10	2

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cancer, Organismal Injury and Abnormalities	Neoplasia of tumor cell lines	3,16E-02	CR1L, PADI2, PML	3
Cardiovascular Disease, Inflammatory Disease, Inflammatory Response, Organismal Injury and Abnormalities	Takayasu arteritis	3,17E-02	IL6R	1
Cell Morphology, Cellular Assembly and Organization, Cellular Compromise, Cellular Function and Maintenance	Accumulation of autophagic vacuoles	3,17E-02	RNASEL	1
DNA Replication, Recombination, and Repair, RNA Post-Transcriptional Modification	Annealing of RNA	3,17E-02	EIF2AK2	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of Hodgkin and Reed-Sternberg cells	3,17E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of adenocarcinoma cell lines	3,17E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of erythroblasts	3,17E-02	TNFSF10	1
Cancer, Cell Death and Survival, Neurological Disease, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of glioblastoma cells	3,17E-02	TNFSF10	1
Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of mammary epithelial cells	3,17E-02	TNFSF10	1
Cell Cycle	Cell cycle progression of B-lymphocyte derived cell lines	3,17E-02	MAPK14	1
Cellular Movement	Cell movement of osteoblasts	3,17E-02	SEMA4D	1
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Colony formation of glioma cells	3,17E-02	MAPK14	1
Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis	Colony formation of granulocyte-macrophage progenitor cells	3,17E-02	MAPK14	1
Developmental Disorder, Hereditary Disorder, Metabolic Disease, Organismal Injury and Abnormalities, Respiratory Disease	Congenital pulmonary alveolar proteinosis	3,17E-02	CSF2RA	1
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of lymphoma cell lines	3,17E-02	DDX58	1
Cell Death and Survival	Cytolysis of melanoma cell lines	3,17E-02	TNFSF10	1
Cell-To-Cell Signaling and Interaction, Inflammatory Response	Cytotoxic reaction of leukocyte cell lines	3,17E-02	KLRF1	1
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Development of eosinophils	3,17E-02	CSF2RA	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Assembly and Organization, Cellular Compromise	Disruption of nuclear bodies	3,17E-02	PML	1
Cellular Compromise, DNA Replication, Recombination, and Repair	Fragmentation of chromatin	3,17E-02	TNFSF10	1
Cell Death and Survival	Killing of lung cancer cell lines	3,17E-02	TNFSF10	1
Cell Death and Survival, Cellular Development, Hematological System Development and Function	Lifespan of B lymphocytes	3,17E-02	SEMA4D	1
Carbohydrate Metabolism, Small Molecule Biochemistry	Metabolism of D-galactose	3,17E-02	GALM	1
Cellular Movement	Migration of bone marrow cell lines	3,17E-02	SEMA4D	1
Embryonic Development, Organismal Development, Skeletal and Muscular System Development and Function	Morphogenesis of embryonic forelimb	3,17E-02	CACNA1C	1
Infectious Diseases	Production of vesicular stomatitis virus	3,17E-02	IFIH1	1
Cancer, Organismal Injury and Abnormalities, Tumor Morphology	Progressive unresectable BRAF mutation negative melanoma	3,17E-02	CSF2RA	1
Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function	Proliferation of adipose cell lines	3,17E-02	TNFSF10	1
Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Quantity of cardiolipin	3,17E-02	TNFSF10	1
Tissue Morphology	Quantity of lung cell lines	3,17E-02	PML	1
Nervous System Development and Function, Tissue Morphology	Quantity of oligodendrocytes	3,17E-02	SEMA4D	1
Organ Morphology, Organismal Development, Reproductive System Development and Function, Tissue Morphology	Quantity of sperm	3,17E-02	IL6R	1
Infectious Diseases	Replication of Sindbis virus	3,17E-02	RNASEL	1
Infectious Diseases	Replication of virus chimera	3,17E-02	EIF2AK2	1
Cancer, Organismal Injury and Abnormalities, Tumor Morphology	Stage IV progressive BRAF mutation negative melanoma	3,17E-02	CSF2RA	1
Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Susceptibility to prostate cancer	3,17E-02	RNASEL	1
Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Tumorigenesis of kidney cancer cell lines	3,17E-02	PML	1
Cellular Response to Therapeutics	Sensitivity of cells	3,24E-02	EIF2AK2, TNFSF10	2

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Leukopoiesis	3,34E-02	CR1L, CSF2RA, IFI16, MAPK14, PML, TCF7, TNFSF10	7
Cell Death and Survival	Apoptosis of neutrophils	3,38E-02	MAPK14, TNFSF10	2
Gene Expression	Transactivation	3,38E-02	DDX58, DDX60L, EIF2AK2, HIF3A, IFI16, MAPK14, PML, TCF7, TNFSF10	9
Protein Synthesis	Polymerization of protein	3,44E-02	AIM2, GBP1, KCNJ2, RNF213, TOR1B	5
Cardiovascular Disease, Organismal Injury and Abnormalities	Unstable angina	3,52E-02	CACNA1C, KCNJ2	2
Cellular Development, Cellular Growth and Proliferation	Cell proliferation of breast cancer cell lines	3,59E-02	AIM2, BATF2, CEACAM1, G0S2, MAPK14, PML, SAT1, TNFSF10	8
Cell Death and Survival, Organismal Injury and Abnormalities, Renal and Urological Disease	Cell death of kidney cells	3,66E-02	APOBEC3B, EIF2AK2, GRB10, MAPK14, MLKL, TNFSF10	6
Tissue Morphology	Quantity of cells	3,68E-02	DOCK8, EIF2AK2, IL6R, MAPK14, PML, SEMA4D, TNFSF10	7
Cell Death and Survival	Necrosis	3,74E-02	AIM2, APOBEC3B, CEACAM1, CSF2RA, DDX58, EIF2AK2, G0S2, GRB10, IFI16, IFIH1, IL6R, LMNB1, MAGEA3/MAGEA6, MAPK14, MLKL, NAIP, PARP14, PLSCR1, PML, POT1, RNASEL, SAT1, SEMA4D, TNFSF10, TNFSF14	25
Cancer, Cell-To-Cell Signaling and Interaction, Organismal Injury and Abnormalities	Activation of chronic lymphocytic leukemia B cells	3,79E-02	SEMA4D	1
Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of PrEC cells	3,79E-02	TNFSF10	1
Cell Death and Survival, Organismal Injury and Abnormalities	Apoptosis of bronchial epithelial cells	3,79E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of myeloid dendritic cells	3,79E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of schwannoma cell lines	3,79E-02	TNFSF10	1
Cellular Function and Maintenance	Assembly of stress granule	3,79E-02	DISC1	1
Cellular Assembly and Organization	Association of telomeres	3,79E-02	POT1	1
Organismal Functions	Basal metabolic rate	3,79E-02	UCP3	1
Cell Cycle, Gene Expression	Binding of serum response element	3,79E-02	MAPK14	1
Cardiovascular System Development and Function, Cell-To-Cell Signaling and Interaction, Cellular Assembly and Organization	Cell-cell contact of endothelial cell lines	3,79E-02	TMIGD2	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cellular Assembly and Organization	Clustering of mitochondria	3,79E-02	TNFSF10	1
Post-Translational Modification, Protein Folding, Protein Trafficking	Conjugation of protein	3,79E-02	PML	1
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Differentiation of promyelocytes	3,79E-02	PML	1
Cardiovascular System Development and Function, Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function, Hematological System Development and Function, Hematopoiesis, Organismal Development, Tissue Development	Erythropoiesis of erythroid cells	3,79E-02	IL6R	1
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Nervous System Development and Function	Excitation of sensory neurons	3,79E-02	KCNJ2	1
Cellular Assembly and Organization	Formation of membrane rafts	3,79E-02	TNFSF10	1
Developmental Disorder, Hematological Disease, Hereditary Disorder, Metabolic Disease, Neurological Disease, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Hyperkalemic periodic paralysis	3,79E-02	KCNE3	1
Cell-To-Cell Signaling and Interaction, Digestive System Development and Function, Hepatic System Development and Function, Inflammatory Response, Organ Development	Inflammatory response of Kupffer cells	3,79E-02	IL6R	1
Cancer, Cellular Movement, Organismal Injury and Abnormalities, Tumor Morphology	Invasion of ovarian cancer cells	3,79E-02	SEMA4D	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Killing of cancer cells	3,79E-02	TNFSF10	1
Cell Death and Survival	Killing of colorectal cancer cell lines	3,79E-02	TNFSF10	1
Cell Death and Survival	Killing of ovarian cancer cell lines	3,79E-02	TNFSF10	1
Cell Death and Survival	Killing of prostate cancer cell lines	3,79E-02	TNFSF10	1
Cell-To-Cell Signaling and Interaction, Nervous System Development and Function	Long term depression of cells	3,79E-02	PPP1R14A	1
Cell Death and Survival	Necroptosis of colorectal cancer cell lines	3,79E-02	TNFSF10	1
Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Primary cutaneous melanoma	3,79E-02	CSF2RA	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Respiratory System Development and Function	Respiratory quotient	3,79E-02	UCP3	1
Cell Morphology	Size of brain cancer cell lines	3,79E-02	MAPK14	1
Organismal Functions	Thermogenesis	3,79E-02	UCP3	1
Cardiovascular System Development and Function, Cell Morphology, Cellular Development, Organismal Development, Tissue Development	Tubulation of endothelial colony-forming cells	3,79E-02	MAPK14	1
Cell Death and Survival, Hematological System Development and Function	Cell viability of B lymphocytes	3,80E-02	PML, SEMA4D	2
Protein Synthesis	Translation of protein	3,88E-02	EIF2AK2, PARP12, RNASEL, TNFSF10	4
Connective Tissue Disorders, Inflammatory Disease, Inflammatory Response, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Ankylosing spondylitis	3,95E-02	CACNA1C, IL6R	2
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis, Lymphoid Tissue Structure and Development, Tissue Development	Hematopoiesis of mononuclear leukocytes	3,98E-02	CR1L, IFI16, MAPK14, PML, TCF7, TNFSF10	6
Cancer, Neurological Disease, Organismal Injury and Abnormalities	Neuroblastoma formation	4,12E-02	CSF2RA, PML, TNFSF10	3
Cell Death and Survival	Apoptosis of leukocytes	4,16E-02	EIF2AK2, IL6R, MAPK14, TNFSF10, TNFSF14	5
Cellular Movement, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response	Chemotaxis of leukocytes	4,16E-02	CSF2RA, IL6R, MAPK14, SEMA4D, TNFSF14	5
Cancer, Hematological Disease, Immunological Disease, Organismal Injury and Abnormalities	Multiple myeloma	4,21E-02	CSF2RA, EPSTI1, IFIT2, IFIT3, IL6R	5
Endocrine System Disorders, Gastrointestinal Disease, Metabolic Disease, Organismal Injury and Abnormalities, Renal and Urological Disease	Diabetic nephropathy	4,31E-02	CACNA1C, OAS1, PLSCR1, TNFSF10	4
Cardiovascular Disease, Organismal Injury and Abnormalities	Chronic stable angina	4,40E-02	CACNA1C, KCNJ2	2
Infectious Diseases	Production of HIV-1	4,40E-02	EIF2AK2, TRIM22	2
Cell Death and Survival	Anoikis of colorectal cancer cell lines	4,41E-02	TNFSF10	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Apoptosis of pancreatic cancer cells	4,41E-02	TNFSF10	1
Cell Death and Survival	Apoptosis of plasmacytoid dendritic cells	4,41E-02	TNFSF10	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cell Death and Survival, Skeletal and Muscular Disorders	Apoptosis of smooth muscle cell lines	4,41E-02	TNFSF10	1
Cardiovascular Disease, Connective Tissue Disorders, Hematological Disease, Hereditary Disorder, Organismal Injury and Abnormalities	Beta-thalassemia major	4,41E-02	CACNA1C	1
Carbohydrate Metabolism, Lipid Metabolism, Small Molecule Biochemistry	Binding of phosphatidylserine	4,41E-02	TNFSF10	1
Cell Death and Survival	Cell death of plasma cells	4,41E-02	TNFSF10	1
Cell Cycle, Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation	Contact growth inhibition of carcinoma cell lines	4,41E-02	IFI16	1
Infectious Diseases, Inflammatory Disease, Ophthalmic Disease, Organismal Injury and Abnormalities	Cytomegalovirus retinitis	4,41E-02	CSF2RA	1
Cancer, Cellular Development, Neurological Disease, Organismal Injury and Abnormalities, Tumor Morphology	Differentiation of neuroblastoma cells	4,41E-02	PML	1
Cancer, Cell Cycle, Organismal Injury and Abnormalities	Entry into S phase of Kaposi's sarcoma cells	4,41E-02	IL6R	1
Cellular Development	Epithelial-mesenchymal transition of squamous cell carcinoma cell lines	4,41E-02	IFIT2	1
Cellular Assembly and Organization, DNA Replication, Recombination, and Repair	Formation of PML nuclear bodies	4,41E-02	PML	1
Cell Cycle	Formation of senescence-associated heterochromatic foci	4,41E-02	LMNB1	1
Cell Death and Survival	Killing of melanoma cell lines	4,41E-02	TNFSF10	1
Cellular Movement, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response, Nervous System Development and Function	Migration of microglia	4,41E-02	SEMA4D	1
Ophthalmic Disease, Organismal Injury and Abnormalities	Normal tension glaucoma	4,41E-02	PADI2	1
Endocrine System Development and Function, Energy Production, Lipid Metabolism, Small Molecule Biochemistry	Oxidation of dihydrotestosterone	4,41E-02	DHRS9	1
Nucleic Acid Metabolism, Small Molecule Biochemistry	Phosphorylation of nucleoside diphosphates	4,41E-02	CMPK2	1
Connective Tissue Disorders, Inflammatory Disease, Organismal Injury and Abnormalities, Skeletal and Muscular Disorders	Polymyalgia rheumatica	4,41E-02	IL6R	1
Cellular Movement, Nervous System Development and Function	Positioning of neurons	4,41E-02	DISC1	1

ADDITIONAL FILE 6.

Continued

Categories	Diseases or functions annotation	p-Value	Molecules	# Molecules
Cancer, Cellular Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tumor Morphology	Proliferation of Kaposi's sarcoma cells	4,41E-02	IL6R	1
Cellular Compromise	Severing of actin filaments	4,41E-02	SRGAP2	1
Cancer, Cell Death and Survival, Organismal Injury and Abnormalities, Tumor Morphology	Survival of glioma cells	4,41E-02	TNFSF10	1
Cell Death and Survival	Survival of hepatic stellate cells	4,41E-02	IL6R	1
Drug Metabolism, Molecular Transport, Small Molecule Biochemistry	Transport of cyanocobalamin	4,41E-02	AMN	1
Cardiovascular System Development and Function, Embryonic Development, Organismal Development, Tissue Development	Vascularization of chorioallantoic membrane	4,41E-02	CEACAM1	1
Cardiovascular Disease, Organismal Injury and Abnormalities	Vasospastic angina pectoris	4,41E-02	CACNA1C	1
Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Carcinoma in lung	4,42E-02	APOBEC3B, CACNA1C, CARD6, CEACAM1, DDX60L, DOCK8, FAM46A, GRB10, IFI44L, IL6R, MAGEA3/MAGEA6, NLGN2, PASK, RNF213, SEMA4D, SIRPB2, TRIM22, TRIM25	18
Cell Death and Survival	Apoptosis of mononuclear leukocytes	4,51E-02	EIF2AK2, IL6R, TNFSF10, TNFSF14	4
Cell-To-Cell Signaling and Interaction, Inflammatory Response	Immune response of macrophages	4,55E-02	DDX58, IL6R	2
Cardiovascular System Development and Function, Cell Morphology, Cellular Development, Organismal Development, Tissue Development	Tubulation of endothelial cells	4,57E-02	GBP1, MAPK14, TMIGD2	3