

RT² Profiler PCR Array (384-Well Format)

Human Ubiquitin Ligases

Cat. no. 330231 PAHS-3079ZE

For pathway expression analysis

Format	For use with the following real-time cyclers
RT ² Profiler PCR Array, Format E	Applied Biosystems® models 7900HT (384-well block), ViiA™ 7 (384-well block); Bio-Rad CFX384™
RT ² Profiler PCR Array, Format G	Roche® LightCycler® 480 (384-well block)

Description

The Human Ubiquitin Ligases RT² Profiler PCR Array profiles the expression of 370 ubiquitin ligase genes representing potential drug targets. Ubiquitination, also known as ubiquitylation, regulates degradation of cellular proteins by the ubiquitin-proteasome system. This process involves the sequential action of ubiquitin-activating enzymes (E1), ubiquitin-conjugating enzymes (E2), and ubiquitin ligases (E3). Mammalian genomes encode approximately 12 E1 enzymes, 30–40 E2 enzymes, and 600 E3 enzymes. These enzymes target many protein substrates, and are therefore involved in a wide variety of biological pathways. In addition, ubiquitination does not always target a protein for degradation. For example, monoubiquitination of cell surface transmembrane receptors marks them for endocytosis, whereas polyubiquitination acts as a scaffold for ubiquitin-binding proteins. Disruption of the ubiquitin-proteasomal degradation pathway has been implicated in a wide range of human diseases, such as cancer, diabetes, and cardiovascular and neurodegenerative diseases. The diversity and protein substrate specificity of E3 enzymes allows them to play a major role in normal and disease-related pathways, identifying these enzymes as potential drug targets. Developing drug screening assays requires surveying the expression of not only the drug target, but also related genes with redundant or compensating functions that could possibly cause lower drug efficacy or off-target effects. This array includes ubiquitin ligases from all major E3 families, focusing on the most characterized and broadly expressed enzymes. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused panel of ubiquitin ligases with this array.

For further details, consult the *RT² Profiler PCR Array Handbook*.



Sample & Assay Technologies

Shipping and storage

RT² Profiler PCR Arrays in formats E and G are shipped at ambient temperature, on dry ice, or blue ice packs depending on destination and accompanying products.

For long term storage, keep plates at –20°C.

Note: Ensure that you have the correct RT² Profiler PCR Array format for your real-time cycler (see table above).

Note: Open the package and store the products appropriately immediately on receipt.

Gene table: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Hs.295137	NM_001144	AMFR	Autocrine motility factor receptor
A02	Hs.480876	NM_014885	ANAPC10	Anaphase promoting complex subunit 10
A03	Hs.534456	NM_001002244	ANAPC11	Anaphase promoting complex subunit 11
A04	Hs.106909	NM_015391	ANAPC13	Anaphase promoting complex subunit 13
A05	Hs.533262	NM_013366	ANAPC2	Anaphase promoting complex subunit 2
A06	Hs.152173	NM_013367	ANAPC4	Anaphase promoting complex subunit 4
A07	Hs.7101	NM_016237	ANAPC5	Anaphase promoting complex subunit 5
A08	Hs.529280	NM_016238	ANAPC7	Anaphase promoting complex subunit 7
A09	Hs.83293	NM_019004	ANKIB1	Ankyrin repeat and IBR domain containing 1
A10	Hs.446376	NM_005883	APC2	Adenomatosis polyposis coli 2
A11	Hs.268787	NM_005744	ARIH1	Ariadne homolog, ubiquitin-conjugating enzyme E2 binding protein, 1 (Drosophila)
A12	Hs.633601	NM_006321	ARIH2	Ariadne homolog 2 (Drosophila)
A13	Hs.516788	NM_001040445	ASB1	Ankyrin repeat and SOCS box containing 1
A14	Hs.639909	NM_212556	ASB18	Ankyrin repeat and SOCS box containing 18
A15	Hs.510327	NM_016150	ASB2	Ankyrin repeat and SOCS box containing 2
A16	Hs.40763	NM_016115	ASB3	Ankyrin repeat and SOCS box containing 3
A17	Hs.19404	NM_024087	ASB9	Ankyrin repeat and SOCS box containing 9
A18	Hs.533526	NM_000489	ATRX	Alpha thalassemia/mental retardation syndrome X-linked
A19	Hs.591642	NM_000465	BARD1	BRCA1 associated RING domain 1
A20	Hs.659681	NM_017745	BCOR	BCL6 corepressor
A21	Hs.435556	NM_016561	BFAR	Bifunctional apoptosis regulator
A22	Hs.696238	NM_001166	BIRC2	Baculoviral IAP repeat containing 2
A23	Hs.127799	NM_001165	BIRC3	Baculoviral IAP repeat containing 3
A24	Hs.256126	NM_022161	BIRC7	Baculoviral IAP repeat containing 7
B01	Hs.380403	NM_005180	BMI1	BMI1 polycomb ring finger oncogene
B02	Hs.530940	NM_006768	BRAP	BRCA1 associated protein
B03	Hs.194143	NM_007294	BRCA1	Breast cancer 1, early onset
B04	Hs.34012	NM_000059	BRCA2	Breast cancer 2, early onset
B05	Hs.558537	NM_024332	BRCC3	BRCA1/BRCA2-containing complex, subunit 3
B06	Hs.459149	NM_025238	BTBD1	BTB (POZ) domain containing 1
B07	Hs.465543	NM_017797	BTBD2	BTB (POZ) domain containing 2
B08	Hs.643802	NM_033637	BTRC	Beta-transducin repeat containing
B09	Hs.504096	NM_005188	CBL	Cas-Br-M (murine) ecotropic retroviral transforming sequence
B10	Hs.430589	NM_170662	CBLB	Cas-Br-M (murine) ecotropic retroviral transforming sequence b
B11	Hs.466907	NM_012116	CBLC	Cas-Br-M (murine) ecotropic retroviral transforming sequence c
B12	Hs.592271	NM_024814	CBLL1	Cas-Br-M (murine) ecotropic retroviral transforming sequence-like 1
B13	Hs.107003	NM_182852	CCNB1IP1	Cyclin B1 interacting protein 1, E3 ubiquitin protein ligase
B14	Hs.1973	NM_001761	CCNF	Cyclin F
B15	Hs.374127	NM_003903	CDC16	Cell division cycle 16 homolog (S. cerevisiae)
B16	Hs.524947	NM_001255	CDC20	Cell division cycle 20 homolog (S. cerevisiae)
B17	Hs.153546	NM_004661	CDC23	Cell division cycle 23 homolog (S. cerevisiae)
B18	Hs.463295	NM_001256	CDC27	Cell division cycle 27 homolog (S. cerevisiae)
B19	Hs.514997	NM_004359	CDC34	Cell division cycle 34 homolog (S. cerevisiae)
B20	Hs.461086	NM_004360	CDH1	Cadherin 1, type 1, E-cadherin (epithelial)
B21	Hs.59106	NM_006568	CGRF1	Cell growth regulator with ring finger domain 1
B22	Hs.656770	NM_018223	CHFR	Checkpoint with forkhead and ring finger domains
B23	Hs.655334	NM_145071	CISH	Cytokine inducible SH2-containing protein
B24	Hs.490224	NM_013316	CNOT4	CCR4-NOT transcription complex, subunit 4
C01	Hs.18925	NM_016302	CRBN	Cereblon

Position	UniGene	GenBank	Symbol	Description
C02	Hs.146806	NM_003592	CUL1	Cullin 1
C03	Hs.82919	NM_003591	CUL2	Cullin 2
C04	Hs.372286	NM_003590	CUL3	Cullin 3
C05	Hs.339735	NM_003589	CUL4A	Cullin 4A
C06	Hs.102914	NM_003588	CUL4B	Cullin 4B
C07	Hs.440320	NM_003478	CUL5	Cullin 5
C08	Hs.520136	NM_014780	CUL7	Cullin 7
C09	Hs.567717	NM_152494	DCST1	DC-STAMP domain containing 1
C10	Hs.706814	NM_024050	DDA1	DET1 and DDB1 associated 1
C11	Hs.290758	NM_001923	DDB1	Damage-specific DNA binding protein 1, 127kDa
C12	Hs.700338	NM_000107	DDB2	Damage-specific DNA binding protein 2, 48kDa
C13	Hs.567523	NM_017996	DET1	De-etiolated homolog 1 (Arabidopsis)
C14	Hs.169611	NM_019887	DIABLO	Diablo, IAP-binding mitochondrial protein
C15	Hs.656473	NM_016448	DTL	Denticleless homolog (Drosophila)
C16	Hs.32374	NM_178502	DTX3	Deltex homolog 3 (Drosophila)
C17	Hs.523696	NM_015177	DTX4	Deltex homolog 4 (Drosophila)
C18	Hs.409210	NM_014648	DZIP3	DAZ interacting protein 3, zinc finger
C19	Hs.104925	NM_003633	ENC1	Ectodermal-neural cortex 1 (with BTB-like domain)
C20	Hs.708194	NM_018062	FANCL	Fanconi anemia, complementation group L
C21	Hs.12439	NM_017703	FBXL12	F-box and leucine-rich repeat protein 12
C22	Hs.367956	NM_152441	FBXL14	F-box and leucine-rich repeat protein 14
C23	Hs.380081	NM_024326	FBXL15	F-box and leucine-rich repeat protein 15
C24	Hs.623974	NM_024963	FBXL18	F-box and leucine-rich repeat protein 18
D01	Hs.475872	NM_012157	FBXL2	F-box and leucine-rich repeat protein 2
D02	Hs.462946	NM_032875	FBXL20	F-box and leucine-rich repeat protein 20
D03	Hs.508284	NM_012158	FBXL3	F-box and leucine-rich repeat protein 3
D04	Hs.536850	NM_012160	FBXL4	F-box and leucine-rich repeat protein 4
D05	Hs.643433	NM_012161	FBXL5	F-box and leucine-rich repeat protein 5
D06	Hs.352677	NM_001190274	FBXO11	F-box protein 11
D07	Hs.498543	NM_178150	FBXO18	F-box protein, helicase, 18
D08	Hs.132753	NM_012168	FBXO2	F-box protein 2
D09	Hs.159699	NM_015002	FBXO21	F-box protein 21
D10	Hs.438454	NM_183421	FBXO25	F-box protein 25
D11	Hs.406787	NM_012175	FBXO3	F-box protein 3
D12	Hs.421095	NM_032145	FBXO30	F-box protein 30
D13	Hs.567582	NM_024735	FBXO31	F-box protein 31
D14	Hs.403933	NM_058229	FBXO32	F-box protein 32
D15	Hs.324342	NM_203301	FBXO33	F-box protein 33
D16	Hs.165575	NM_012176	FBXO4	F-box protein 4
D17	Hs.339577	NM_001029860	FBXO43	F-box protein 43
D18	Hs.556006	NM_183413	FBXO44	F-box protein 44
D19	Hs.520506	NM_012177	FBXO5	F-box protein 5
D20	Hs.464419	NM_018438	FBXO6	F-box protein 6
D21	Hs.5912	NM_012179	FBXO7	F-box protein 7
D22	Hs.216653	NM_012347	FBXO9	F-box protein 9
D23	Hs.592128	NM_031456	FBXW10	F-box and WD repeat domain containing 10
D24	Hs.484138	NM_012300	FBXW11	F-box and WD repeat domain containing 11
E01	Hs.288793	NM_207102	FBXW12	F-box and WD repeat domain containing 12
E02	Hs.494985	NM_012164	FBXW2	F-box and WD repeat domain containing 2
E03	Hs.500822	NM_022039	FBXW4	F-box and WD repeat domain containing 4
E04	Hs.522507	NM_018998	FBXW5	F-box and WD repeat domain containing 5
E05	Hs.679796	NM_033632	FBXW7	F-box and WD repeat domain containing 7
E06	Hs.362733	NM_015322	FEM1B	Fem-1 homolog b (C. elegans)
E07	Hs.112569	NM_022041	GAN	Gigaxonin
E08	Hs.434340	NM_020771	HACE1	HECT domain and ankyrin repeat containing, E3 ubiquitin protein ligase 1
E09	Hs.708017	NM_015382	HECTD1	HECT domain containing 1
E10	Hs.525084	NM_024602	HECTD3	HECT domain containing 3
E11	Hs.164453	NM_015052	HECW1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1
E12	Hs.210385	NM_003922	HERC1	Hect (homologous to the E6-AP (UBE3A) carboxyl terminus) domain and RCC1 (CHC1)-like domain (RLD) 1
E13	Hs.434890	NM_004667	HERC2	Hect domain and RLD 2
E14	Hs.35804	NM_014606	HERC3	Hect domain and RLD 3
E15	Hs.51891	NM_015601	HERC4	Hect domain and RLD 4
E16	Hs.26663	NM_016323	HERC5	Hect domain and RLD 5
E17	Hs.529317	NM_017912	HERC6	Hect domain and RLD 6
E18	Hs.3068	NM_003071	HLTF	Helicase-like transcription factor
E19	Hs.136905	NM_031407	HUWE1	HECT, UBA and WWE domain containing 1
E20	Hs.522819	NM_001569	IRAK1	Interleukin-1 receptor-associated kinase 1
E21	Hs.179260	NM_024496	IRF2BPL	Interferon regulatory factor 2 binding protein-like
E22	Hs.632272	NM_031483	ITCH	Itchy E3 ubiquitin protein ligase homolog (mouse)
E23	Hs.50550	NM_006063	KBTBD10	Kelch repeat and BTB (POZ) domain containing 10

Position	UniGene	GenBank	Symbol	Description
E24	Hs.63841	NM_032138	KBTBD7	Kelch repeat and BTB (POZ) domain containing 7
F01	Hs.524731	NM_031954	KCTD10	Potassium channel tetramerisation domain containing 10
F02	Hs.465870	NM_012289	KEAP1	Kelch-like ECH-associated protein 1
F03	Hs.348262	NM_033495	KLHL13	Kelch-like 13 (Drosophila)
F04	Hs.388668	NM_007246	KLHL2	Kelch-like 2, Mayven (Drosophila)
F05	Hs.495035	NM_014458	KLHL20	Kelch-like 20 (Drosophila)
F06	Hs.7764	NM_014851	KLHL21	Kelch-like 21 (Drosophila)
F07	Hs.517419	NM_032775	KLHL22	Kelch-like 22 (Drosophila)
F08	Hs.407709	NM_017644	KLHL24	Kelch-like 24 (Drosophila)
F09	Hs.654817	NM_018846	KLHL7	Kelch-like 7 (Drosophila)
F10	Hs.522029	NM_018847	KLHL9	Kelch-like 9 (Drosophila)
F11	Hs.207631	NM_005358	LMO7	LIM domain 7
F12	Hs.655269	NM_032622	LNK1	Ligand of numb-protein X 1
F13	Hs.180178	NM_152271	LONRF1	LON peptidase N-terminal domain and ring finger 1
F14	Hs.144941	NM_006369	LRRC41	Leucine rich repeat containing 41
F15	Hs.495188	NM_138361	LRSAM1	Leucine rich repeat and sterile alpha motif containing 1
F16	Hs.288773	NM_015565	LTN1	Listerin E3 ubiquitin protein ligase 1
F17	Hs.601217	NM_173844	MALT1	Mucosa associated lymphoid tissue lymphoma translocation gene 1
F18	Hs.657756	NM_005921	MAP3K1	Mitogen-activated protein kinase kinase kinase 1
F19	Hs.608487	NM_017923	MARCH1	Membrane-associated ring finger (C3HC4) 1
F20	Hs.662216	NM_001102562	MARCH11	Membrane-associated ring finger (C3HC4) 11
F21	Hs.631861	NM_016496	MARCH2	Membrane-associated ring finger (C3HC4) 2
F22	Hs.132441	NM_178450	MARCH3	Membrane-associated ring finger (C3HC4) 3
F23	Hs.573490	NM_017824	MARCH5	Membrane-associated ring finger (C3HC4) 5
F24	Hs.432862	NM_005885	MARCH6	Membrane-associated ring finger (C3HC4) 6
G01	Hs.529272	NM_022826	MARCH7	Membrane-associated ring finger (C3HC4) 7
G02	Hs.499489	NM_145021	MARCH8	Membrane-associated ring finger (C3HC4) 8
G03	Hs.484551	NM_002392	MDM2	Mdm2 p53 binding protein homolog (mouse)
G04	Hs.497492	NM_002393	MDM4	Mdm4 p53 binding protein homolog (mouse)
G05	Hs.591496	NM_001093725	MEX3A	Mex-3 homolog A (C. elegans)
G06	Hs.465144	NM_016626	MEX3C	Mex-3 homolog C (C. elegans)
G07	Hs.436495	NM_203304	MEX3D	Mex-3 homolog D (C. elegans)
G08	Hs.526494	NM_015246	MGRN1	Mahogunin, ring finger 1
G09	Hs.140903	NM_020774	MIB1	Mindbomb homolog 1 (Drosophila)
G10	Hs.135805	NM_080875	MIB2	Mindbomb homolog 2 (Drosophila)
G11	Hs.27695	NM_000381	MID1	Midline 1 (Opitz/BBB syndrome)
G12	Hs.12256	NM_012216	MID2	Midline 2
G13	Hs.728819	NM_013446	MKRN1	Makorin ring finger protein 1
G14	Hs.591666	NM_014160	MKRN2	Makorin ring finger protein 2
G15	Hs.509523	NM_002431	MNAT1	Menage a trois homolog 1, cyclin H assembly factor (Xenopus laevis)
G16	Hs.18631	NM_018133	MSL2	Male-specific lethal 2 homolog (Drosophila)
G17	Hs.591221	NM_015057	MYCBP2	MYC binding protein 2
G18	Hs.484738	NM_013262	MYLIP	Myosin regulatory light chain interacting protein
G19	Hs.1565	NM_006154	NEDD4	Neural precursor cell expressed, developmentally down-regulated 4
G20	Hs.185677	NM_015277	NEDD4L	Neural precursor cell expressed, developmentally down-regulated 4-like
G21	Hs.716382	NM_004210	NEURL	Neuralized homolog (Drosophila)
G22	Hs.413074	NM_002504	NFX1	Nuclear transcription factor, X-box binding 1
G23	Hs.646325	NM_152995	NFXL1	Nuclear transcription factor, X-box binding-like 1
G24	Hs.348351	NM_198586	NHLRC1	NHL repeat containing 1
H01	Hs.7236	NM_015953	NOSIP	Nitric oxide synthase interacting protein
H02	Hs.226780	NM_014028	OSTM1	Osteopetrosis associated transmembrane protein 1
H03	Hs.132954	NM_004562	PARK2	Parkinson protein 2, E3 ubiquitin protein ligase (parkin)
H04	Hs.270303	NM_000280	PAX6	Paired box 6
H05	Hs.371617	NM_007144	PCGF2	Polycomb group ring finger 2
H06	Hs.144309	NM_006315	PCGF3	Polycomb group ring finger 3
H07	Hs.500512	NM_032373	PCGF5	Polycomb group ring finger 5
H08	Hs.434900	NM_015009	PDZRN3	PDZ domain containing RING finger 3
H09	Hs.380044	NM_013377	PDZRN4	PDZ domain containing RING finger 4
H10	Hs.7886	NM_020651	PELL1	Pellino homolog 1 (Drosophila)
H11	Hs.657926	NM_021255	PELL2	Pellino homolog 2 (Drosophila)
H12	Hs.591190	NM_000286	PEX12	Peroxisomal biogenesis factor 12
H13	Hs.437966	NM_000318	PEX2	Peroxisomal biogenesis factor 2
H14	Hs.511817	NM_017934	PHIP	Pleckstrin homology domain interacting protein
H15	Hs.325838	NM_020901	PHRF1	PHD and ring finger domains 1
H16	Hs.162458	NM_016166	PIAS1	Protein inhibitor of activated STAT, 1
H17	Hs.658013	NM_004671	PIAS2	Protein inhibitor of activated STAT, 2
H18	Hs.105779	NM_015897	PIAS4	Protein inhibitor of activated STAT, 4
H19	Hs.522679	NM_145119	PJA1	Praja ring finger 1
H20	Hs.483036	NM_014819	PJA2	Praja ring finger 2
H21	Hs.526464	NM_033238	PML	Promyelocytic leukemia
H22	Hs.375684	NM_020165	RAD18	RAD18 homolog (S. cerevisiae)

Position	UniGene	GenBank	Symbol	Description
H23	Hs.631709	NM_002875	RAD51	RAD51 homolog (S. cerevisiae)
H24	Hs.199561	NM_006267	RANBP2	RAN binding protein 2
I01	Hs.188553	NM_018703	RBBP6	Retinoblastoma binding protein 6
I02	Hs.247280	NM_006462	RBCK1	RanBP-type and C3HC4-type zinc finger containing 1
I03	Hs.474949	NM_014248	RBX1	Ring-box 1, E3 ubiquitin protein ligase
I04	Hs.30258	NM_172071	RC3H1	Ring finger and CCCH-type domains 1
I05	Hs.533499	NM_018835	RC3H2	Ring finger and CCCH-type domains 2
I06	Hs.48297	NM_015436	RCHY1	Ring finger and CHY zinc finger domain containing 1
I07	Hs.558455	NM_006604	RFPL3	Ret finger protein-like 3
I08	Hs.523744	NM_022457	RFWD2	Ring finger and WD repeat domain 2
I09	Hs.148670	NM_014836	RHOBTB1	Rho-related BTB domain containing 1
I10	Hs.445030	NM_014899	RHOBTB3	Rho-related BTB domain containing 3
I11	Hs.631989	NM_002931	RING1	Ring finger protein 1
I12	Hs.442798	NM_014868	RNF10	Ring finger protein 10
I13	Hs.469199	NM_005667	RNF103	Ring finger protein 103
I14	Hs.309641	NM_014372	RNF11	Ring finger protein 11
I15	Hs.404423	NM_017610	RNF111	Ring finger protein 111
I16	Hs.458365	NM_006978	RNF113A	Ring finger protein 113A
I17	Hs.144949	NM_018683	RNF114	Ring finger protein 114
I18	Hs.523550	NM_014455	RNF115	Ring finger protein 115
I19	Hs.368554	NM_018320	RNF121	Ring finger protein 121
I20	Hs.553723	NM_022064	RNF123	Ring finger protein 123
I21	Hs.633703	NM_017831	RNF125	Ring finger protein 125
I22	Hs.69554	NM_194460	RNF126	Ring finger protein 126
I23	Hs.496542	NM_194463	RNF128	Ring finger protein 128
I24	Hs.12333	NM_007282	RNF13	Ring finger protein 13
J01	Hs.484363	NM_018434	RNF130	Ring finger protein 130
J02	Hs.29874	NM_197939	RNF135	Ring finger protein 135
J03	Hs.302408	NM_198128	RNF138	Ring finger protein 138
J04	Hs.632057	NM_007218	RNF139	Ring finger protein 139
J05	Hs.483616	NM_004290	RNF14	Ring finger protein 14
J06	Hs.22146	NM_014746	RNF144A	Ring finger protein 144A
J07	Hs.148741	NM_182757	RNF144B	Ring finger protein 144B
J08	Hs.729363	NM_144726	RNF145	Ring finger protein 145
J09	Hs.267120	NM_030963	RNF146	Ring finger protein 146
J10	Hs.659104	NM_020724	RNF150	Ring finger protein 150
J11	Hs.667457	NM_173557	RNF152	Ring finger protein 152
J12	Hs.513804	NM_178841	RNF166	Ring finger protein 166
J13	Hs.7158	NM_015528	RNF167	Ring finger protein 167
J14	Hs.660132	NM_152617	RNF168	Ring finger protein 168
J15	Hs.696153	NM_030954	RNF170	Ring finger protein 170
J16	Hs.388364	NM_173662	RNF175	Ring finger protein 175
J17	Hs.356187	NM_016494	RNF181	Ring finger protein 181
J18	Hs.356377	NM_001010858	RNF187	Ring finger protein 187
J19	Hs.292882	NM_183419	RNF19A	Ring finger protein 19A
J20	Hs.591504	NM_153341	RNF19B	Ring finger protein 19B
J21	Hs.591490	NM_007212	RNF2	Ring finger protein 2
J22	Hs.729085	NM_019592	RNF20	Ring finger protein 20
J23	Hs.716549	NM_207396	RNF207	Ring finger protein 207
J24	Hs.648197	NM_031297	RNF208	Ring finger protein 208
K01	Hs.248290	NM_194439	RNF212	Ring finger protein 212
K02	Hs.592194	NM_001017981	RNF215	Ring finger protein 215
K03	Hs.487458	NM_207111	RNF216	Ring finger protein 216
K04	Hs.567576	NM_024546	RNF219	Ring finger protein 219
K05	Hs.456557	NM_018150	RNF220	Ring finger protein 220
K06	Hs.589884	NM_007219	RNF24	Ring finger protein 24
K07	Hs.524084	NM_032015	RNF26	Ring finger protein 26
K08	Hs.375217	NM_017999	RNF31	Ring finger protein 31
K09	Hs.292804	NM_194271	RNF34	Ring finger protein 34
K10	Hs.333503	NM_194332	RNF38	Ring finger protein 38
K11	Hs.66394	NM_002938	RNF4	Ring finger protein 4
K12	Hs.65238	NM_014771	RNF40	Ring finger protein 40
K13	Hs.524502	NM_194359	RNF41	Ring finger protein 41
K14	Hs.584916	NM_017763	RNF43	Ring finger protein 43
K15	Hs.434888	NM_014901	RNF44	Ring finger protein 44
K16	Hs.718462	NM_006913	RNF5	Ring finger protein 5
K17	Hs.136885	NM_005977	RNF6	Ring finger protein (C3H2C3 type) 6
K18	Hs.134623	NM_014245	RNF7	Ring finger protein 7
K19	Hs.485278	NM_183078	RNF8	Ring finger protein 8
K20	Hs.460885	NM_133368	RSPRY1	Ring finger and SPRY domain containing 1
K21	Hs.124537	NM_173082	SHPRH	SNF2 histone linker PHD RING helicase

Position	UniGene	GenBank	Symbol	Description
K22	Hs.728779	NM_003031	SIAH1	Seven in absentia homolog 1 (Drosophila)
K23	Hs.477959	NM_005067	SIAH2	Seven in absentia homolog 2 (Drosophila)
K24	Hs.171626	NM_006930	SKP1	S-phase kinase-associated protein 1
L01	Hs.23348	NM_005983	SKP2	S-phase kinase-associated protein 2 (p45)
L02	Hs.189329	NM_020429	SMURF1	SMAD specific E3 ubiquitin protein ligase 1
L03	Hs.705442	NM_022739	SMURF2	SMAD specific E3 ubiquitin protein ligase 2
L04	Hs.50640	NM_003745	SOCS1	Suppressor of cytokine signaling 1
L05	Hs.485572	NM_003877	SOCS2	Suppressor of cytokine signaling 2
L06	Hs.527973	NM_003955	SOCS3	Suppressor of cytokine signaling 3
L07	Hs.708344	NM_080867	SOCS4	Suppressor of cytokine signaling 4
L08	Hs.468426	NM_144949	SOCS5	Suppressor of cytokine signaling 5
L09	Hs.44439	NM_004232	SOCS6	Suppressor of cytokine signaling 6
L10	Hs.463382	NM_003563	SPOP	Speckle-type POZ protein
L11	Hs.705454	NM_025106	SPSB1	SplA/ryanodine receptor domain and SOCS box containing 1
L12	Hs.479856	NM_032641	SPSB2	SplA/ryanodine receptor domain and SOCS box containing 2
L13	Hs.655112	NM_080862	SPSB4	SplA/ryanodine receptor domain and SOCS box containing 4
L14	Hs.592081	NM_005861	STUB1	STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
L15	Hs.715498	NM_172230	SYVN1	Synovial apoptosis inhibitor 1, synoviolin
L16	Hs.554594	NM_005648	TCEB1	Transcription elongation factor B (SIII), polypeptide 1 (15kDa, elongin C)
L17	Hs.172772	NM_007108	TCEB2	Transcription elongation factor B (SIII), polypeptide 2 (18kDa, elongin B)
L18	Hs.76090	NM_021137	TNFAIP1	Tumor necrosis factor, alpha-induced protein 1 (endothelial)
L19	Hs.211600	NM_006290	TNFAIP3	Tumor necrosis factor, alpha-induced protein 3
L20	Hs.589962	NM_005802	TOPORS	Topoisomerase I binding, arginine/serine-rich, E3 ubiquitin protein ligase
L21	Hs.522506	NM_021138	TRAF2	TNF receptor-associated factor 2
L22	Hs.510528	NM_003300	TRAF3	TNF receptor-associated factor 3
L23	Hs.8375	NM_004295	TRAF4	TNF receptor-associated factor 4
L24	Hs.523930	NM_004619	TRAF5	TNF receptor-associated factor 5
M01	Hs.591983	NM_004620	TRAF6	TNF receptor-associated factor 6
M02	Hs.643537	NM_032271	TRAF7	TNF receptor-associated factor 7
M03	Hs.517972	NM_005879	TRAF	TRAF interacting protein
M04	Hs.709483	NM_006778	TRIM10	Tripartite motif containing 10
M05	Hs.13543	NM_145214	TRIM11	Tripartite motif containing 11
M06	Hs.436922	NM_005798	TRIM13	Tripartite motif containing 13
M07	Hs.121748	NM_016102	TRIM17	Tripartite motif containing 17
M08	Hs.435711	NM_015271	TRIM2	Tripartite motif containing 2
M09	Hs.501778	NM_006074	TRIM22	Tripartite motif containing 22
M10	Hs.792	NM_001656	TRIM23	Tripartite motif containing 23
M11	Hs.490287	NM_003852	TRIM24	Tripartite motif containing 24
M12	Hs.528952	NM_005082	TRIM25	Tripartite motif containing 25
M13	Hs.485041	NM_003449	TRIM26	Tripartite motif containing 26
M14	Hs.440382	NM_006510	TRIM27	Tripartite motif containing 27
M15	Hs.467408	NM_005762	TRIM28	Tripartite motif containing 28
M16	Hs.591992	NM_006458	TRIM3	Tripartite motif containing 3
M17	Hs.493275	NM_007028	TRIM31	Tripartite motif containing 31
M18	Hs.591910	NM_012210	TRIM32	Tripartite motif containing 32
M19	Hs.26837	NM_015906	TRIM33	Tripartite motif containing 33
M20	Hs.519514	NM_018700	TRIM36	Tripartite motif containing 36
M21	Hs.579079	NM_015294	TRIM37	Tripartite motif containing 37
M22	Hs.584851	NM_006355	TRIM38	Tripartite motif containing 38
M23	Hs.413493	NM_021253	TRIM39	Tripartite motif containing 39
M24	Hs.50749	NM_033017	TRIM4	Tripartite motif containing 4
N01	Hs.509439	NM_138700	TRIM40	Tripartite motif containing 40
N02	Hs.441488	NM_201627	TRIM41	Tripartite motif containing 41
N03	Hs.192103	NM_017583	TRIM44	Tripartite motif containing 44
N04	Hs.301526	NM_025188	TRIM45	Tripartite motif containing 45
N05	Hs.195715	NM_024114	TRIM48	Tripartite motif containing 48
N06	Hs.370515	NM_033093	TRIM5	Tripartite motif containing 5
N07	Hs.708154	NM_032765	TRIM52	Tripartite motif containing 52
N08	Hs.516036	NM_187841	TRIM54	Tripartite motif containing 54
N09	Hs.521092	NM_030961	TRIM56	Tripartite motif containing 56
N10	Hs.654633	NM_001012414	TRIM61	Tripartite motif containing 61
N11	Hs.656006	NM_018207	TRIM62	Tripartite motif containing 62
N12	Hs.279709	NM_032588	TRIM63	Tripartite motif containing 63
N13	Hs.454490	NM_001136486	TRIM64	Tripartite motif containing 64
N14	Hs.655089	NM_001004342	TRIM67	Tripartite motif containing 67
N15	Hs.523438	NM_018073	TRIM68	Tripartite motif containing 68
N16	Hs.567678	NM_001039111	TRIM71	Tripartite motif containing 71
N17	Hs.661859	NM_001008274	TRIM72	Tripartite motif containing 72
N18	Hs.632307	NM_198924	TRIM73	Tripartite motif containing 73
N19	Hs.645328	NM_198853	TRIM74	Tripartite motif containing 74
N20	Hs.705357	NM_001105575	TRIM75	Tripartite motif containing 75

Position	UniGene	GenBank	Symbol	Description
N21	Hs.336810	NM_030912	TRIM8	Tripartite motif containing 8
N22	Hs.654750	NM_015163	TRIM9	Tripartite motif containing 9
N23	Hs.348618	NM_178556	TRIML1	Tripartite motif family-like 1
N24	Hs.591633	NM_004238	TRIP12	Thyroid hormone receptor interactor 12
O01	Hs.532129	NM_130465	TSPAN17	Tetraspanin 17
O02	Hs.368214	NM_003316	TTC3	Tetratricopeptide repeat domain 3
O03	Hs.356190	NM_018955	UBB	Ubiquitin B
O04	Hs.520348	NM_021009	UBC	Ubiquitin C
O05	Hs.598862	NM_000462	UBE3A	Ubiquitin protein ligase E3A
O06	Hs.374067	NM_183415	UBE3B	Ubiquitin protein ligase E3B
O07	Hs.118351	NM_014671	UBE3C	Ubiquitin protein ligase E3C
O08	Hs.75275	NM_004788	UBE4A	Ubiquitination factor E4A
O09	Hs.632370	NM_006048	UBE4B	Ubiquitination factor E4B
O10	Hs.591121	NM_174916	UBR1	Ubiquitin protein ligase E3 component n-recognin 1
O11	Hs.529925	NM_015255	UBR2	Ubiquitin protein ligase E3 component n-recognin 2
O12	Hs.379548	NM_172070	UBR3	Ubiquitin protein ligase E3 component n-recognin 3 (putative)
O13	Hs.148078	NM_020765	UBR4	Ubiquitin protein ligase E3 component n-recognin 4
O14	Hs.591856	NM_015902	UBR5	Ubiquitin protein ligase E3 component n-recognin 5
O15	Hs.728932	NM_175748	UBR7	Ubiquitin protein ligase E3 component n-recognin 7 (putative)
O16	Hs.493401	NM_152896	UHRF2	Ubiquitin-like with PHD and ring finger domains 2
O17	Hs.584768	NM_001080419	UNK	Unkempt homolog (Drosophila)
O18	Hs.517792	NM_000551	VHL	Von Hippel-Lindau tumor suppressor
O19	Hs.716623	NM_014703	VprBP	Vpr (HIV-1) binding protein
O20	Hs.234282	NM_021729	VPS11	Vacuolar protein sorting 11 homolog (S. cerevisiae)
O21	Hs.23876	NM_020857	VPS18	Vacuolar protein sorting 18 homolog (S. cerevisiae)
O22	Hs.592184	NM_014396	VPS41	Vacuolar protein sorting 41 homolog (S. cerevisiae)
O23	Hs.269263	NM_015303	VPS8	Vacuolar protein sorting 8 homolog (S. cerevisiae)
O24	Hs.20848	NM_152528	WDSUB1	WD repeat, sterile alpha motif and U-box domain containing 1
P01	Hs.113876	NM_007331	WHSC1	Wolf-Hirschhorn syndrome candidate 1
P02	Hs.446017	NM_015626	WSB1	WD repeat and SOCS box containing 1
P03	Hs.655189	NM_007013	WWP1	WW domain containing E3 ubiquitin protein ligase 1
P04	Hs.356076	NM_001167	XIAP	X-linked inhibitor of apoptosis
P05	Hs.591945	NM_006006	ZBTB16	Zinc finger and BTB domain containing 16
P06	Hs.147950	NM_006336	ZER1	Zer-1 homolog (C. elegans)
P07	Hs.132485	NM_152577	ZNF645	Zinc finger protein 645
P08	Hs.427284	NM_032268	ZNRF1	Zinc and ring finger 1
P09	Hs.487869	NM_147128	ZNRF2	Zinc and ring finger 2
P10	Hs.476280	NM_024646	ZYG11B	Zyg-11 homolog B (C. elegans)
P11	Hs.520640	NM_001101	ACTB	Actin, beta
P12	Hs.534255	NM_004048	B2M	Beta-2-microglobulin
P13	Hs.592355	NM_002046	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
P14	Hs.412707	NM_000194	HPRT1	Hypoxanthine phosphoribosyltransferase 1
P15	Hs.546285	NM_001002	RPLP0	Ribosomal protein, large, P0
P16	N/A	SA_00105	HGDC	Human Genomic DNA Contamination
P17	N/A	SA_00105	HGDC	Human Genomic DNA Contamination
P18	N/A	SA_00105	HGDC	Human Genomic DNA Contamination
P19	N/A	SA_00104	RTC	Reverse Transcription Control
P20	N/A	SA_00104	RTC	Reverse Transcription Control
P21	N/A	SA_00104	RTC	Reverse Transcription Control
P22	N/A	SA_00103	PPC	Positive PCR Control
P23	N/A	SA_00103	PPC	Positive PCR Control
P24	N/A	SA_00103	PPC	Positive PCR Control

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RT ² SYBR Green qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with real-time cyclers that do not require a reference dye, including: Bio-Rad model CFX384; Roche LightCycler 480 (384-well); all other cyclers	330501
RT ² SYBR Green ROX [™] qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with the following real-time cyclers: Applied Biosystems models 7900HT, ViiA 7 (384-well blocks)	330521
RT ² SYBR Green Fluor qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with the following real-time cyclers: Bio-Rad models iCycler [®] , iQ [™] 5, MyiQ [™] , MyiQ2	330511

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