AGING_MODULE_1

Functional_annotation

GO:0002455~HUMORAL IMMUNE RESPONSE MEDIATED BY CIRCULATING IMMUNOGLOBULIN
GO:0050778~POSITIVE REGULATION OF IMMUNE RESPONSE
GO:0048584~POSITIVE REGULATION OF RESPONSE TO STIMULUS
GO:0002443~LEUKOCYTE MEDIATED IMMUNITY
GO:0002460~ADAPTIVE IMMUNE RESPONSE BASED ON SOMATIC RECOMBINATION OF IMMUNE RECEPTORS BUILT FROM IMMUNOGLOBULIN SUPERFAMILY DOMAINS
GO:0019724~B CELL MEDIATED IMMUNITY
GO:0016064~IMMUNOGLOBULIN MEDIATED IMMUNE RESPONSE
GO:0016485~PROTEIN PROCESSING
GO:0006956~COMPLEMENT ACTIVATION
GO:0002449~LYMPHOCYTE MEDIATED IMMUNITY
GO:0002252~IMMUNE EFFECTOR PROCESS
GO:0002250~ADAPTIVE IMMUNE RESPONSE
GO:0002253~ACTIVATION OF IMMUNE RESPONSE
GO:0006958~COMPLEMENT ACTIVATION, CLASSICAL PATHWAY
HSA04610:COMPLEMENT AND COAGULATION CASCADES
GO:0006959~HUMORAL IMMUNE RESPONSE
GO:0002541~ACTIVATION OF PLASMA PROTEINS INVOLVED IN ACUTE INFLAMMATORY RESPONSE
GO:0006955~IMMUNE RESPONSE
GO:0002684~POSITIVE REGULATION OF IMMUNE SYSTEM PROCESS
GO:0045087~INNATE IMMUNE RESPONSE
GO:0051605~PROTEIN MATURATION BY PEPTIDE BOND CLEAVAGE

Genes_entrezGene_symbol_name (AGING_MODULE_1)

1191;CLU;clusterin
713;C1QB;complement component 1, q subcomponent, B chain
727;C5;complement component 5
720;C4A;complement component 4A (Rodgers blood group)
716;C1S;complement component 1, s subcomponent
721;C4B;complement component 4B (Chido blood group)
712;C1QA;complement component 1, q subcomponent, A chain
715;C1R;complement C1r subcomponent
1401;CRP;C-reactive protein, pentraxin-related
718;C3;complement component 3
714;C1QC;complement component 1, q subcomponent, C chain
10747;MASP2;mannan binding lectin serine peptidase 2
3902;LAG3;lymphocyte activating 3
3108;HLA-DMA;major histocompatibility complex, class II, DM alpha
10892;MALT1;MALT1 paracaspase
2207;FCER1G;Fc fragment of IgE receptor Ig
3075;CFH;complement factor H
3656;IRAK2;interleukin 1 receptor associated kinase 2
3078;CFHR1;complement factor H related 1
5648;MASP1;mannan binding lectin serine peptidase 1
100;ADA;adenosine deaminase
4277;MICB;MHC class I polypeptide-related sequence B
4615;MYD88;myeloid differentiation primary response 88
51311;TLR8;toll like receptor 8

5663;PSEN1;presenilin 1
51284;TLR7;toll like receptor 7
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
5594;MAPK1;mitogen-activated protein kinase 1
5819;NECTIN2;nectin cell adhesion molecule 2
3122;HLA-DRA;major histocompatibility complex, class II, DR alpha
11326;VSIG4;V-set and immunoglobulin domain containing 4
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
64127;NOD2;nucleotide binding oligomerization domain containing 2
5336;PLCG2;phospholipase C gamma 2
3329;HSPD1;heat shock protein family D (Hsp60) member 1
3553;IL1B;interleukin 1 beta
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
4792;NFKBIA;NFKB inhibitor alpha
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
719;C3AR1;complement component 3a receptor 1
7099;TLR4;toll like receptor 4
3673;ITGA2;integrin subunit alpha 2
3481;IGF2;insulin like growth factor 2
4088;SMAD3;SMAD family member 3
672;BRCA1;breast cancer 1
3717;JAK2;Janus kinase 2
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
9521;EEF1E1;eukaryotic translation elongation factor 1 epsilon 1
3569;IL6;interleukin 6
3667;IRS1;insulin receptor substrate 1
1901;S1PR1;sphingosine-1-phosphate receptor 1
28996;HIPK2;homeodomain interacting protein kinase 2
6376;CX3CL1;C-X3-C motif chemokine ligand 1
7422;VEGFA;vascular endothelial growth factor A
5582;PRKCG;protein kinase C gamma
7040;TGFB1;transforming growth factor beta 1
51720;UIMC1;ubiquitin interaction motif containing 1
4916;NTRK3;neurotrophic tyrosine kinase, receptor, type 3
185;AGTR1;angiotensin II receptor type 1
3014;H2AFX;H2A histone family member X
5578;PRKCA;protein kinase C alpha
1161;ERCC8;excision repair cross-complementation group 8
5155;PDGFB;platelet derived growth factor subunit B
7124;TNF;tumor necrosis factor
3630;INS;insulin
6387;CXCL12;C-X-C motif chemokine ligand 12
5580;PRKCD;protein kinase C delta
5052;PRDX1;peroxiredoxin 1
4292;MLH1;mutL homolog 1
7534;YWHAZ;tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein zeta
4683;NBN;nibrin
355;FAS;Fas cell surface death receptor

2067;ERCC1;excision repair cross-complementation group 1
4791;NFKB2;nuclear factor of kappa light polypeptide gene enhancer in B-cells 2
10148;EBI3;Epstein-Barr virus induced 3
3606;IL18;interleukin 18
834;CASP1;caspase 1
83464;APH1B;aph-1 homolog B, gamma secretase subunit
4803;NGF;nerve growth factor
5744;PTHLH;parathyroid hormone-like hormone
1718;DHCR24;24-dehydrocholesterol reductase
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
142;PARP1;poly(ADP-ribose) polymerase 1
5653;KLK6;kallikrein related peptidase 6
3575;IL7R;interleukin 7 receptor
3764;KCNJ8;potassium voltage-gated channel subfamily J member 8
2219;FCN1;ficolin 1
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
7450;VWF;von Willebrand factor
2;A2M;alpha-2-macroglobulin
728;C5AR1;complement component 5a receptor 1
5328;PLAU;plasminogen activator, urokinase
5265;SERPINA1;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1
5104;SERPINA5;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5
3574;IL7;interleukin 7
6347;CCL2;C-C motif chemokine ligand 2
4057;LTF;lactotransferrin
2821;GPI;glucose-6-phosphate isomerase
54472;TOLLIP;toll interacting protein
11314;CD300A;CD300a molecule
3480;IGF1R;insulin like growth factor 1 receptor
5468;PPARG;peroxisome proliferator activated receptor gamma
8878;SQSTM1;sequestosome 1
58191;CXCL16;C-X-C motif chemokine ligand 16
6366;CCL21;C-C motif chemokine ligand 21
3394;IRF8;interferon regulatory factor 8
1437;CSF2;colony stimulating factor 2
4155;MBP;myelin basic protein
1672;DEFB1;defensin beta 1
1230;CCR1;chemokine (C-C motif) receptor 1
3135;HLA-G;major histocompatibility complex, class I, G
1511;CTSG;cathepsin G
5763;PTMS;parathymosin
2209;FCGR1A;Fc fragment of IgG receptor Ia
654;BMP6;bone morphogenetic protein 6
3106;HLA-B;major histocompatibility complex, class I, B
6890;TAP1;transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)
3107;HLA-C;major histocompatibility complex, class I, C
7096;TLR1;toll like receptor 1
3119;HLA-DQB1;major histocompatibility complex, class II, DQ beta 1
3117;HLA-DQA1;major histocompatibility complex, class II, DQ alpha 1
3430;IFI35;interferon induced protein 35

3113;HLA-DPA1;major histocompatibility complex, class II, DP alpha 1
974;CD79B;CD79b molecule
3109;HLA-DMB;major histocompatibility complex, class II, DM beta
3123;HLA-DRB1;major histocompatibility complex, class II, DR beta 1
54878;DPP8;dipeptidyl peptidase 8
1051;CEBPB;CCAAT/enhancer binding protein beta
54795;TRPM4;transient receptor potential cation channel subfamily M member 4
4938;OAS1;2'-5'-oligoadenylate synthetase 1
4689;NCF4;neutrophil cytosolic factor 4
3133;HLA-E;major histocompatibility complex, class I, E
3561;IL2RG;interleukin 2 receptor subunit gamma
3134;HLA-F;major histocompatibility complex, class I, F
3127;HLA-DRB5;major histocompatibility complex, class II, DR beta 5
2214;FCGR3A;Fc fragment of IgG receptor IIIa
6368;CCL23;C-C motif chemokine ligand 23
7157;TP53;tumor protein p53
7100;TLR5;toll like receptor 5
30835;CD209;CD209 molecule
4050;LTB;lymphotoxin beta
53833;IL20RB;interleukin 20 receptor subunit beta
7433;VIPR1;vasoactive intestinal peptide receptor 1
28988;DBNL;drebrin like
51295;ECSIT;ECSIT signalling integrator
920;CD4;CD4 molecule
929;CD14;CD14 molecule
6938;TCF12;transcription factor 12
7412;VCAM1;vascular cell adhesion molecule 1
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
604;BCL6;B-cell CLL/lymphoma 6
3707;ITPKB;inositol-trisphosphate 3-kinase B
6929;TCF3;transcription factor 3
641;BLM;Bloom syndrome RecQ like helicase

AGING_MODULE_2

Functional_annotation

GO:0046328~REGULATION OF JNK CASCADE
GO:0019220~REGULATION OF PHOSPHATE METABOLIC PROCESS
GO:0012502~INDUCTION OF PROGRAMMED CELL DEATH
GO:0044093~POSITIVE REGULATION OF MOLECULAR FUNCTION
GO:0002460~ADAPTIVE IMMUNE RESPONSE BASED ON SOMATIC RECOMBINATION OF IMMUNE RECEPTORS BUILT FROM IMMUNOGLOBULIN SUPERFAMILY DOMAINS
GO:0043406~POSITIVE REGULATION OF MAP KINASE ACTIVITY
GO:0010942~POSITIVE REGULATION OF CELL DEATH
GO:0043507~POSITIVE REGULATION OF JUN KINASE ACTIVITY
GO:0043068~POSITIVE REGULATION OF PROGRAMMED CELL DEATH
GO:0008219~CELL DEATH
GO:0045859~REGULATION OF PROTEIN KINASE ACTIVITY
GO:0007242~INTRACELLULAR SIGNALING CASCADE
GO:0051347~POSITIVE REGULATION OF TRANSFERASE ACTIVITY
GO:0043281~REGULATION OF CASPASE ACTIVITY
GO:0001836~RELEASE OF CYTOCHROME C FROM MITOCHONDRIA
GO:0042325~REGULATION OF PHOSPHORYLATION
GO:0043506~REGULATION OF JUN KINASE ACTIVITY
GO:0012501~PROGRAMMED CELL DEATH
GO:0043085~POSITIVE REGULATION OF CATALYTIC ACTIVITY
GO:0070302~REGULATION OF STRESS-ACTIVATED PROTEIN KINASE SIGNALING PATHWAY
GO:0007243~PROTEIN KINASE CASCADE
GO:0043405~REGULATION OF MAP KINASE ACTIVITY
GO:0042981~REGULATION OF APOPTOSIS
GO:0016265~DEATH
GO:0043549~REGULATION OF KINASE ACTIVITY
GO:0000165~MAPKKK CASCADE
GO:0043408~REGULATION OF MAPKKK CASCADE
GO:0043280~POSITIVE REGULATION OF CASPASE ACTIVITY
GO:0052548~REGULATION OF ENDOPEPTIDASE ACTIVITY
GO:0043067~REGULATION OF PROGRAMMED CELL DEATH
GO:0000187~ACTIVATION OF MAPK ACTIVITY
GO:0010941~REGULATION OF CELL DEATH
GO:0006915~APOPTOSIS
GO:0051174~REGULATION OF PHOSPHORUS METABOLIC PROCESS
GO:0051338~REGULATION OF TRANSFERASE ACTIVITY
GO:0045860~POSITIVE REGULATION OF PROTEIN KINASE ACTIVITY
GO:0033674~POSITIVE REGULATION OF KINASE ACTIVITY
GO:0010952~POSITIVE REGULATION OF PEPTIDASE ACTIVITY
GO:0006919~ACTIVATION OF CASPASE ACTIVITY
GO:0043065~POSITIVE REGULATION OF APOPTOSIS
GO:0006917~INDUCTION OF APOPTOSIS

Genes_entrezGene_symbol_name (AGING_MODULE_2)

28996;HIPK2;homeodomain interacting protein kinase 2
9611;NCOR1;nuclear receptor corepressor 1
23162;MAPK8IP3;mitogen-activated protein kinase 8 interacting protein 3
2185;PTK2B;protein tyrosine kinase 2 beta

9064;MAP3K6;mitogen-activated protein kinase kinase kinase 6
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
64127;NOD2;nucleotide binding oligomerization domain containing 2
28988;DBNL;drebrin like
5585;PKN1;protein kinase N1
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2
5058;PAK1;p21 protein (Cdc42/Rac)-activated kinase 1
3553;IL1B;interleukin 1 beta
875;CBS;cystathionine-beta-synthase
8841;HDAC3;histone deacetylase 3
7124;TNF;tumor necrosis factor
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
7161;TP73;tumor protein p73
4217;MAP3K5;mitogen-activated protein kinase kinase kinase 5
27250;PDCD4;programmed cell death 4 (neoplastic transformation inhibitor)
2074;ERCC6;excision repair cross-complementation group 6
7099;TLR4;toll like receptor 4
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
3725;JUN;jun proto-oncogene
55437;STRADB;STE20-related kinase adaptor beta
10892;MALT1;MALT1 paracaspase
727;C5;complement component 5
3084;NRG1;neuregulin 1
3479;IGF1;insulin like growth factor 1
728;C5AR1;complement component 5a receptor 1
3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
3673;ITGA2;integrin subunit alpha 2
3481;IGF2;insulin like growth factor 2
3486;IGFBP3;insulin like growth factor binding protein 3
7248;TSC1;tuberous sclerosis 1
885;CCK;cholecystokinin
3643;INSR;insulin receptor
3717;JAK2;Janus kinase 2
348;APOE;apolipoprotein E
7424;VEGFC;vascular endothelial growth factor C
92;ACVR2A;activin A receptor type 2A
4092;SMAD7;SMAD family member 7
2688;GH1;growth hormone 1
3667;IRS1;insulin receptor substrate 1
1437;CSF2;colony stimulating factor 2
146433;IL34;interleukin 34
253260;RICTOR;RPTOR independent companion of MTOR, complex 2
9043;SPAG9;sperm associated antigen 9
5649;RELN;reelin
7040;TGFB1;transforming growth factor beta 1
5925;RB1;retinoblastoma 1
6310;ATXN1;ataxin 1
8851;CDK5R1;cyclin-dependent kinase 5, regulatory subunit 1 (p35)
10188;TNK2;tyrosine kinase, non-receptor, 2

2081;ERN1;endoplasmic reticulum to nucleus signaling 1
80824;DUSP16;dual specificity phosphatase 16
9077;DIRAS3;DIRAS family GTP binding RAS like 3
5341;PLEK;pleckstrin
641;BLM;Bloom syndrome RecQ like helicase
5578;PRKCA;protein kinase C alpha
5300;PIN1;peptidylprolyl cis/trans isomerase, NIMA-interacting 1
10395;DLC1;DLC1 Rho GTPase activating protein
1022;CDK7;cyclin-dependent kinase 7
5291;PIK3CB;phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit beta
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4
10645;CAMKK2;calcium/calmodulin-dependent protein kinase kinase 2
578;BAK1;BCL2 antagonist/killer 1
3630;INS;insulin
2247;FGF2;fibroblast growth factor 2
6647;SOD1;superoxide dismutase 1, soluble
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
2771;GNAI2;G protein subunit alpha i2
64061;TSPYL2;TSPY-like 2
80279;CDK5RAP3;CDK5 regulatory subunit associated protein 3
2596;GAP43;growth associated protein 43
5590;PRKCZ;protein kinase C zeta
581;BAX;BCL2-associated X protein
2321;FLT1;fms related tyrosine kinase 1
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
5663;PSEN1;presenilin 1
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
4088;SMAD3;SMAD family member 3
995;CDC25C;cell division cycle 25C
5159;PDGFRB;platelet derived growth factor receptor beta
1956;EGFR;epidermal growth factor receptor
2690;GHR;growth hormone receptor
998;CDC42;cell division cycle 42
655;BMP7;bone morphogenetic protein 7
1950;EGF;epidermal growth factor
3356;HTR2A;5-hydroxytryptamine receptor 2A
1607;DGKB;diacylglycerol kinase beta
3569;IL6;interleukin 6
10451;VAV3;vav guanine nucleotide exchange factor 3
5999;RGS4;regulator of G-protein signaling 4
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
1020;CDK5;cyclin-dependent kinase 5
351;APP;amyloid beta precursor protein
1154;CISH;cytokine inducible SH2-containing protein
5170;PDPK1;3-phosphoinositide dependent protein kinase 1
5580;PRKCD;protein kinase C delta
920;CD4;CD4 molecule
1942;EFNA1;ephrin-A1
10253;SPRY2;sprouty RTK signaling antagonist 2
2280;FKBP1A;FK506 binding protein 1A

1647;GADD45A;growth arrest and DNA damage inducible alpha
5155;PDGFB;platelet derived growth factor subunit B
84619;ZGPAT;zinc finger CCCH-type and G-patch domain containing
7436;VLDLR;very low density lipoprotein receptor
5562;PRKAA1;protein kinase AMP-activated catalytic subunit alpha 1
2475;MTOR;mechanistic target of rapamycin
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
111;ADCY5;adenylate cyclase 5
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
834;CASP1;caspase 1
7314;UBB;ubiquitin B
7507;XPA;xeroderma pigmentosum, complementation group A
5371;PML;promyelocytic leukemia
8626;TP63;tumor protein p63
5923;RASGRF1;Ras protein specific guanine nucleotide releasing factor 1
25791;NGEF;neuronal guanine nucleotide exchange factor
27429;HTRA2;HtrA serine peptidase 2
8878;SQSTM1;sequestosome 1
5594;MAPK1;mitogen-activated protein kinase 1
11200;CHEK2;checkpoint kinase 2
675;BRCA2;breast cancer 2
5599;MAPK8;mitogen-activated protein kinase 8
672;BRCA1;breast cancer 1
4292;MLH1;mutL homolog 1
25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
11269;DDX19B;DEAD-box helicase 19B
7157;TP53;tumor protein p53
472;ATM;ATM serine/threonine kinase
4832;NME3;NME/NM23 nucleoside diphosphate kinase 3
2876;GPX1;glutathione peroxidase 1
4050;LTB;lymphotoxin beta
7013;TERF1;telomeric repeat binding factor 1
9538;EI24;EI24, autophagy associated transmembrane protein
8718;TNFRSF25;tumor necrosis factor receptor superfamily member 25
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
1611;DAP;death-associated protein
9131;AIFM1;apoptosis inducing factor, mitochondria associated 1
51100;SH3GLB1;SH3-domain GRB2 like endophilin B1
6750;SST;somatostatin
3064;HTT;huntingtin
6753;SSTR3;somatostatin receptor 3
355;FAS;Fas cell surface death receptor
2071;ERCC3;excision repair cross-complementation group 3
83464;APH1B;aph-1 homolog B, gamma secretase subunit
4803;NGF;nerve growth factor
2068;ERCC2;excision repair cross-complementation group 2
10016;PDCD6;programmed cell death 6
4804;NGFR;nerve growth factor receptor
22861;NLRP1;NLR family, pyrin domain containing 1
5052;PRDX1;peroxiredoxin 1

6272;SORT1;sortilin 1
2309;FOXO3;forkhead box O3
91;ACVR1B;activin A receptor type 1B
6262;RYR2;ryanodine receptor 2
50649;ARHGEF4;Rho guanine nucleotide exchange factor 4
5601;MAPK9;mitogen-activated protein kinase 9
158471;PRUNE2;prune homolog 2 (Drosophila)
1051;CEBPB;CCAAT/enhancer binding protein beta
637;BID;BH3 interacting domain death agonist
9500;MAGED1;MAGE family member D1
3656;IRAK2;interleukin 1 receptor associated kinase 2
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
4615;MYD88;myeloid differentiation primary response 88
7486;WRN;Werner syndrome RecQ like helicase
2033;EP300;E1A binding protein p300
3551;IKBKB;inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
51433;ANAPC5;anaphase promoting complex subunit 5
8881;CDC16;cell division cycle 16
317;APAF1;apoptotic peptidase activating factor 1
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
7415;VCP;valosin containing protein
1901;S1PR1;sphingosine-1-phosphate receptor 1
9104;RGN;regucalcin
51529;ANAPC11;anaphase promoting complex subunit 11
5693;PSMB5;proteasome subunit beta 5
8896;BUD31;BUD31 homolog
5690;PSMB2;proteasome subunit beta 2
185;AGTR1;angiotensin II receptor type 1
6597;SMARCA4;SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 4
5720;PSME1;proteasome activator subunit 1
5336;PLCG2;phospholipase C gamma 2
3329;HSPD1;heat shock protein family D (Hsp60) member 1
983;CDK1;cyclin-dependent kinase 1
847;CAT;catalase
5733;PTGER3;prostaglandin E receptor 3
29945;ANAPC4;anaphase promoting complex subunit 4
10197;PSME3;proteasome activator subunit 3
5694;PSMB6;proteasome subunit beta 6
7376;NR1H2;nuclear receptor subfamily 1 group H member 2
5714;PSMD8;proteasome 26S subunit, non-ATPase 8
2035;EPB41;erythrocyte membrane protein band 4.1
7139;TNNT2;troponin T2, cardiac type
808;CALM3;calmodulin 3 (phosphorylase kinase, delta)
801;CALM1;calmodulin 1 (phosphorylase kinase, delta)
800;CALD1;caldesmon 1
5705;PSMC5;proteasome 26S subunit, ATPase 5
887;CCKBR;cholecystokinin B receptor
5744;PTHLH;parathyroid hormone-like hormone
2730;GCLM;glutamate-cysteine ligase modifier subunit

949;SCARB1;scavenger receptor class B member 1
8074;FGF23;fibroblast growth factor 23
2782;GNB1;G protein subunit beta 1
9759;HDAC4;histone deacetylase 4
229;ALDOB;aldolase, fructose-bisphosphate B
1471;CST3;cystatin C
1718;DHCR24;24-dehydrocholesterol reductase
2908;NR3C1;nuclear receptor subfamily 3 group C member 1
604;BCL6;B-cell CLL/lymphoma 6
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
5743;PTGS2;prostaglandin-endoperoxide synthase 2
7153;TOP2A;topoisomerase (DNA) II alpha
6609;SMPD1;sphingomyelin phosphodiesterase 1
10628;TXNIP;thioredoxin interacting protein
9521;EEF1E1;eukaryotic translation elongation factor 1 epsilon 1
1785;DNM2;dynamin 2
1649;DDIT3;DNA damage inducible transcript 3
7704;ZBTB16;zinc finger and BTB domain containing 16
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
1191;CLU;clusterin
1499;CTNNB1;catenin beta 1
367;AR;androgen receptor
10201;NME6;NME/NM23 nucleoside diphosphate kinase 6
728642;CDK11A;cyclin-dependent kinase 11A
70;ACTC1;actin, alpha, cardiac muscle 1
8870;IER3;immediate early response 3
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
54840;APTX;aprataxin
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
4792;NFKBIA;NFKB inhibitor alpha
5582;PRKCG;protein kinase C gamma
23017;FAIM2;Fas apoptotic inhibitory molecule 2
1200;TPP1;tripeptidyl peptidase I
5423;POLB;polymerase (DNA) beta
57142;RTN4;reticulon 4
1869;E2F1;E2F transcription factor 1
7150;TOP1;topoisomerase (DNA) I
22985;ACIN1;apoptotic chromatin condensation inducer 1
6908;TBP;TATA-box binding protein
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
3956;LGALS1;lectin, galactoside-binding, soluble, 1
1870;E2F2;E2F transcription factor 2
6648;SOD2;superoxide dismutase 2, mitochondrial
1603;DAD1;defender against cell death 1
23411;SIRT1;sirtuin 1
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
8996;NOL3;nucleolar protein 3
7009;TMBIM6;transmembrane BAX inhibitor motif containing 6
9844;ELMO1;engulfment and cell motility 1
11188;NISCH;nischarin

57448;BIRC6;baculoviral IAP repeat containing 6
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
5521;PPP2R2B;protein phosphatase 2 regulatory subunit B, beta
30011;SH3KBP1;SH3-domain kinase binding protein 1
255488;RNF144B;ring finger protein 144B
4744;NEFH;neurofilament, heavy polypeptide
4069;LYZ;lysozyme
51747;LUC7L3;LUC7-like 3 pre-mRNA splicing factor
27242;TNFRSF21;tumor necrosis factor receptor superfamily member 21
4277;MICB;MHC class I polypeptide-related sequence B
929;CD14;CD14 molecule
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
7291;TWIST1;twist family bHLH transcription factor 1
80208;SPG11;spastic paraplegia 11 (autosomal recessive)
4205;MEF2A;myocyte enhancer factor 2A
23503;ZFYVE26;zinc finger FYVE-type containing 26
84287;ZDHHC16;zinc finger DHHC-type containing 16
90525;SHF;Src homology 2 domain containing F
56997;ADCK3;aarF domain containing kinase 3
26999;CYFIP2;cytoplasmic FMR1 interacting protein 2
5153;PDE1B;phosphodiesterase 1B
10884;MRPS30;mitochondrial ribosomal protein S30
55177;RMDN3;regulator of microtubule dynamics 3
1639;DCTN1;dynactin subunit 1
2999;GZMH;granzyme H
10059;DNM1L;dynamin 1-like
63970;TP53AIP1;tumor protein p53 regulated apoptosis inducing protein 1
11083;DIDO1;death inducer-obliterator 1
51024;FIS1;fission, mitochondrial 1
9984;THOC1;THO complex 1
57556;SEMA6A;semaphorin 6A
7416;VDAC1;voltage dependent anion channel 1
54739;XAF1;XIAP associated factor 1
6687;SPG7;SPG7, paraplegin matrix AAA peptidase subunit
10277;UBE4B;ubiquitination factor E4B
10110;SGK2;serum/glucocorticoid regulated kinase 2
6347;CCL2;C-C motif chemokine ligand 2
54472;TOLLIP;toll interacting protein
9201;DCLK1;doublecortin like kinase 1
2099;ESR1;estrogen receptor 1
5579;PRKCB;protein kinase C beta
10617;STAMBP;STAM binding protein
3480;IGF1R;insulin like growth factor 1 receptor
5595;MAPK3;mitogen-activated protein kinase 3
6196;RPS6KA2;ribosomal protein S6 kinase A2
6733;SRPK2;SRSF protein kinase 2
660;BMX;BMX non-receptor tyrosine kinase
7508;XPC;xeroderma pigmentosum, complementation group C
5984;RFC4;replication factor C subunit 4
2237;FEN1;flap structure-specific endonuclease 1

6776;STAT5A;signal transducer and activator of transcription 5A
5111;PCNA;proliferating cell nuclear antigen
6777;STAT5B;signal transducer and activator of transcription 5B
9448;MAP4K4;mitogen-activated protein kinase kinase kinase kinase 4
2057;EPOR;erythropoietin receptor
1230;CCR1;chemokine (C-C motif) receptor 1
3925;STMN1;stathmin 1
10890;RAB10;RAB10, member RAS oncogene family
811;CALR;calreticulin
27289;RND1;Rho family GTPase 1
9231;DLG5;discs large homolog 5
8766;RAB11A;RAB11A, member RAS oncogene family
5364;PLXNB1;plexin B1
2100;ESR2;estrogen receptor 2 (ER beta)
55884;WSB2;WD repeat and SOCS box containing 2
5899;RALB;v-ral simian leukemia viral oncogene homolog B
53632;PRKAG3;protein kinase AMP-activated non-catalytic subunit gamma 3
79754;ASB13;ankyrin repeat and SOCS box containing 13
23228;PLCL2;phospholipase C like 2
8365;HIST1H4H;histone cluster 1, H4h
4882;NPR2;natriuretic peptide receptor 2
4139;MARK1;microtubule affinity regulating kinase 1
8835;SOCS2;suppressor of cytokine signaling 2
5921;RASA1;RAS p21 protein activator 1
2932;GSK3B;glycogen synthase kinase 3 beta
1268;CNR1;cannabinoid receptor 1 (brain)
23589;CARHSP1;calcium regulated heat stable protein 1
392;ARHGAP1;Rho GTPase activating protein 1
1124;CHN2;chimerin 2
7100;TLR5;toll like receptor 5
1123;CHN1;chimerin 1
2768;GNA12;G protein subunit alpha 12
30835;CD209;CD209 molecule
5900;RALGDS;ral guanine nucleotide dissociation stimulator
9651;PLCH2;phospholipase C eta 2
84932;RAB2B;RAB2B, member RAS oncogene family
23682;RAB38;RAB38, member RAS oncogene family
2258;FGF13;fibroblast growth factor 13
3707;ITPKB;inositol-trisphosphate 3-kinase B
56937;PMEPA1;prostate transmembrane protein, androgen induced 1
4303;FOXO4;forkhead box O4
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
11075;STMN2;stathmin 2
5864;RAB3A;RAB3A, member RAS oncogene family
5862;RAB2A;RAB2A, member RAS oncogene family
10124;ARL4A;ADP ribosylation factor like GTPase 4A
10307;APBB3;amyloid beta precursor protein binding family B member 3
128178;EDARADD;EDAR-associated death domain
79602;ADIPOR2;adiponectin receptor 2
54331;GNG2;G protein subunit gamma 2

2787;GNG5;G protein subunit gamma 5
1432;MAPK14;mitogen-activated protein kinase 14
890;CCNA2;cyclin A2
8854;ALDH1A2;aldehyde dehydrogenase 1 family member A2
55970;GNG12;G protein subunit gamma 12
3952;LEP;leptin
2885;GRB2;growth factor receptor bound protein 2
4087;SMAD2;SMAD family member 2
23054;NCOA6;nuclear receptor coactivator 6
5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
10891;PPARGC1A;PPARG coactivator 1 alpha
1857;DVL3;dishevelled segment polarity protein 3
51720;UIMC1;ubiquitin interaction motif containing 1
51311;TLR8;toll like receptor 8
51284;TLR7;toll like receptor 7
3014;H2AFX;H2A histone family member X
5469;MED1;mediator complex subunit 1
7096;TLR1;toll like receptor 1
4646;MYO6;myosin VI
9063;PIAS2;protein inhibitor of activated STAT 2
8289;ARID1A;AT-rich interaction domain 1A
391;RHOG;ras homolog family member G
3488;IGFBP5;insulin like growth factor binding protein 5
5880;RAC2;ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
2260;FGFR1;fibroblast growth factor receptor 1
2261;FGFR3;fibroblast growth factor receptor 3
4683;NBN;nibrin
7433;VIPR1;vasoactive intestinal peptide receptor 1
2246;FGF1;fibroblast growth factor 1
1278;COL1A2;collagen type I alpha 2
1490;CTGF;connective tissue growth factor
5979;RET;ret proto-oncogene
2889;RAPGEF1;Rap guanine nucleotide exchange factor 1
80254;CEP63;centrosomal protein 63kDa
545;ATR;ATR serine/threonine kinase
79791;FBXO31;F-box protein 31
8491;MAP4K3;mitogen-activated protein kinase kinase kinase kinase 3
51366;UBR5;ubiquitin protein ligase E3 component n-recognin 5
9656;MDC1;mediator of DNA damage checkpoint 1
55544;RBM38;RNA binding motif protein 38
19;ABCA1;ATP binding cassette subfamily A member 1
3146;HMGB1;high mobility group box 1
282991;BLOC1S2;biogenesis of lysosomal organelles complex 1 subunit 2
2296;FOXC1;forkhead box C1
2950;GSTP1;glutathione S-transferase pi 1
3714;JAG2;jagged 2
3313;HSPA9;heat shock protein family A (Hsp70) member 9
1917;EEF1A2;eukaryotic translation elongation factor 1 alpha 2
7422;VEGFA;vascular endothelial growth factor A
2073;ERCC5;excision repair cross-complementation group 5

627;BDNF;brain-derived neurotrophic factor
7520;XRCC5;X-ray repair complementing defective repair in Chinese hamster cells 5
100;ADA;adenosine deaminase
81567;TXNDC5;thioredoxin domain containing 5 (endoplasmic reticulum)
349565;NMNAT3;nicotinamide nucleotide adenylyltransferase 3
57144;PAK7;p21 protein (Cdc42/Rac)-activated kinase 7
2796;GNRH1;gonadotropin releasing hormone 1
2308;FOXO1;forkhead box O1
5626;PROP1;PROP paired-like homeobox 1
7534;YWHAZ;tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein zeta
5621;PRNP;prion protein
5055;SERPINB2;serpin peptidase inhibitor, clade B (ovalbumin), member 2
60529;ALX4;ALX homeobox 4
3304;HSPA1B;heat shock protein family A (Hsp70) member 1B
2067;ERCC1;excision repair cross-complementation group 1
10105;PPIF;peptidylprolyl isomerase F
440;ASNS;asparagine synthetase (glutamine-hydrolyzing)
3303;HSPA1A;heat shock protein family A (Hsp70) member 1A
307;ANXA4;annexin A4
2729;GCLC;glutamate-cysteine ligase catalytic subunit
3070;HELLS;helicase, lymphoid-specific
3574;IL7;interleukin 7
4487;MSX1;msh homeobox 1
7015;TERT;telomerase reverse transcriptase
55825;PECR;peroxisomal trans-2-enoyl-CoA reductase
3065;HDAC1;histone deacetylase 1
55829;VIMP;VCP interacting membrane selenoprotein
3953;LEPR;leptin receptor
291;SLC25A4;solute carrier family 25 member 4
5468;PPARG;peroxisome proliferator activated receptor gamma
2931;GSK3A;glycogen synthase kinase 3 alpha

AGING_MODULE_3

Functional_annotation

GO:0010906~REGULATION OF GLUCOSE METABOLIC PROCESS
GO:0006109~REGULATION OF CARBOHYDRATE METABOLIC PROCESS
GO:0031329~REGULATION OF CELLULAR CATABOLIC PROCESS
GO:0010828~POSITIVE REGULATION OF GLUCOSE TRANSPORT
GO:0009894~REGULATION OF CATABOLIC PROCESS
GO:0010676~POSITIVE REGULATION OF CELLULAR CARBOHYDRATE METABOLIC PROCESS
GO:0031331~POSITIVE REGULATION OF CELLULAR CATABOLIC PROCESS
GO:0046324~REGULATION OF GLUCOSE IMPORT
GO:0009896~POSITIVE REGULATION OF CATABOLIC PROCESS
GO:0010604~POSITIVE REGULATION OF MACROMOLECULE METABOLIC PROCESS
GO:0010675~REGULATION OF CELLULAR CARBOHYDRATE METABOLIC PROCESS
GO:0045913~POSITIVE REGULATION OF CARBOHYDRATE METABOLIC PROCESS
GO:0031998~REGULATION OF FATTY ACID BETA-OXIDATION
GO:0043255~REGULATION OF CARBOHYDRATE BIOSYNTHETIC PROCESS
GO:0046326~POSITIVE REGULATION OF GLUCOSE IMPORT
GO:0010907~POSITIVE REGULATION OF GLUCOSE METABOLIC PROCESS
GO:0010827~REGULATION OF GLUCOSE TRANSPORT

Genes_entrezGene_symbol_name (AGING_MODULE_3)

3952;LEP;leptin
3481;IGF2;insulin like growth factor 2
3667;IRS1;insulin receptor substrate 1
3630;INS;insulin
10891;PPARGC1A;PPARG coactivator 1 alpha
3479;IGF1;insulin like growth factor 1
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
3643;INSR;insulin receptor
8660;IRS2;insulin receptor substrate 2
9759;HDAC4;histone deacetylase 4
2908;NR3C1;nuclear receptor subfamily 3 group C member 1
2475;MTOR;mechanistic target of rapamycin
2931;GSK3A;glycogen synthase kinase 3 alpha
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
5341;PLEK;pleckstrin
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
5465;PPARA;peroxisome proliferator activated receptor alpha
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
1471;CST3;cystatin C
5774;PTPN3;protein tyrosine phosphatase, non-receptor type 3
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
348;APOE;apolipoprotein E
10273;STUB1;STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
3553;IL1B;interleukin 1 beta
7076;TIMP1;TIMP metallopeptidase inhibitor 1
7124;TNF;tumor necrosis factor
4092;SMAD7;SMAD family member 7
2729;GCLC;glutamate-cysteine ligase catalytic subunit
6872;TAF1;TATA-box binding protein associated factor 1

5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
5590;PRKCZ;protein kinase C zeta
5582;PRKCG;protein kinase C gamma
406;ARNTL;aryl hydrocarbon receptor nuclear translocator like
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
5578;PRKCA;protein kinase C alpha
4050;LTB;lymphotoxin beta
26060;APPL1;adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1
3725;JUN;jun proto-oncogene
1499;CTNNB1;catenin beta 1
367;AR;androgen receptor
282991;BLOC1S2;biogenesis of lysosomal organelles complex 1 subunit 2
3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
2099;ESR1;estrogen receptor 1
3673;ITGA2;integrin subunit alpha 2
5371;PML;promyelocytic leukemia
2296;FOXC1;forkhead box C1
5468;PPARG;peroxisome proliferator activated receptor gamma
3480;IGF1R;insulin like growth factor 1 receptor
885;CCK;cholecystokinin
4087;SMAD2;SMAD family member 2
8878;SQSTM1;sequestosome 1
7161;TP73;tumor protein p73
23054;NCOA6;nuclear receptor coactivator 6
1958;EGR1;early growth response 1
2033;EP300;E1A binding protein p300
672;BRCA1;breast cancer 1
3299;HSF4;heat shock transcription factor 4
64127;NOD2;nucleotide binding oligomerization domain containing 2
51621;KLF13;Kruppel-like factor 13
3717;JAK2;Janus kinase 2
10725;NFAT5;nuclear factor of activated T-cells 5, tonicity-responsive
56648;EIF5A2;eukaryotic translation initiation factor 5A2
51433;ANAPC5;anaphase promoting complex subunit 5
10148;EBI3;Epstein-Barr virus induced 3
6182;MRPL12;mitochondrial ribosomal protein L12
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
9575;CLOCK;clock circadian regulator
7424;VEGFC;vascular endothelial growth factor C
6776;STAT5A;signal transducer and activator of transcription 5A
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
92;ACVR2A;activin A receptor type 2A
6777;STAT5B;signal transducer and activator of transcription 5B
2688;GH1;growth hormone 1
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
4792;NFKBIA;NFKB inhibitor alpha
8881;CDC16;cell division cycle 16

1437;CSF2;colony stimulating factor 2
146433;IL34;interleukin 34
4821;NKX2-2;NK2 homeobox 2
1387;CREBBP;CREB binding protein
253260;RICTOR;RPTOR independent companion of MTOR, complex 2
6095;RORA;RAR related orphan receptor A
5449;POU1F1;POU class 1 homeobox 1
2074;ERCC6;excision repair cross-complementation group 6
1901;S1PR1;sphingosine-1-phosphate receptor 1
2071;ERCC3;excision repair cross-complementation group 3
6646;SOAT1;sterol O-acyltransferase 1
28996;HIPK2;homeodomain interacting protein kinase 2
1857;DVL3;dishevelled segment polarity protein 3
7422;VEGFA;vascular endothelial growth factor A
6925;TCF4;transcription factor 4
83637;ZMIZ2;zinc finger MIZ-type containing 2
4654;MYOD1;myogenic differentiation 1
51529;ANAPC11;anaphase promoting complex subunit 11
2068;ERCC2;excision repair cross-complementation group 2
6665;SOX15;SRY-box 15
7040;TGFB1;transforming growth factor beta 1
51720;UIMC1;ubiquitin interaction motif containing 1
7136;TNNI2;troponin I2, fast skeletal type
5925;RB1;retinoblastoma 1
25937;WWTR1;WW domain containing transcription regulator 1
5693;PSMB5;proteasome subunit beta 5
6258;RXRG;retinoid X receptor gamma
5690;PSMB2;proteasome subunit beta 2
1649;DDIT3;DNA damage inducible transcript 3
6310;ATXN1;ataxin 1
51311;TLR8;toll like receptor 8
6595;SMARCA2;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 2
10188;TNK2;tyrosine kinase, non-receptor, 2
51284;TLR7;toll like receptor 7
811;CALR;calreticulin
185;AGTR1;angiotensin II receptor type 1
26747;NUFIP1;nuclear fragile X mental retardation protein interacting protein 1
3014;H2AFX;H2A histone family member X
6667;SP1;Sp1 transcription factor
5888;RAD51;RAD51 recombinase
2100;ESR2;estrogen receptor 2 (ER beta)
2101;ESRRA;estrogen related receptor alpha
1050;CEBPA;CCAAT/enhancer binding protein alpha
6929;TCF3;transcription factor 3
22937;SCAP;SREBF chaperone
2309;FOXO3;forkhead box O3
641;BLM;Bloom syndrome RecQ like helicase
2308;FOXO1;forkhead box O1
1869;E2F1;E2F transcription factor 1

5626;PROP1;PROP paired-like homeobox 1
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4
7158;TP53BP1;tumor protein p53 binding protein 1
5720;PSME1;proteasome activator subunit 1
5469;MED1;mediator complex subunit 1
654;BMP6;bone morphogenetic protein 6
7014;TERF2;telomeric repeat binding factor 2
5300;PIN1;peptidylprolyl cis/trans isomerase, NIMA-interacting 1
5092;PCBD1;pterin-4 alpha-carbinolamine dehydratase 1
51547;SIRT7;sirtuin 7
10395;DLC1;DLC1 Rho GTPase activating protein
7096;TLR1;toll like receptor 1
983;CDK1;cyclin-dependent kinase 1
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
1161;ERCC8;excision repair cross-complementation group 8
60529;ALX4;ALX homeobox 4
1022;CDK7;cyclin-dependent kinase 7
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4
10645;CAMKK2;calcium/calmodulin-dependent protein kinase kinase 2
6720;SREBF1;sterol regulatory element binding transcription factor 1
5601;MAPK9;mitogen-activated protein kinase 9
4646;MYO6;myosin VI
29945;ANAPC4;anaphase promoting complex subunit 4
2118;ETV4;ETS variant 4
60491;NIF3L1;NGG1 interacting factor 3 like 1
10197;PSME3;proteasome activator subunit 3
84448;ABLIM2;actin binding LIM protein family member 2
2247;FGF2;fibroblast growth factor 2
5694;PSMB6;proteasome subunit beta 6
9063;PIAS2;protein inhibitor of activated STAT 2
1051;CEBPB;CCAAT/enhancer binding protein beta
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
7376;NR1H2;nuclear receptor subfamily 1 group H member 2
55974;SLC50A1;solute carrier family 50 member 1
3670;ISL1;ISL LIM homeobox 1
4862;NPAS2;neuronal PAS domain protein 2
3609;ILF3;interleukin enhancer binding factor 3
5714;PSMD8;proteasome 26S subunit, non-ATPase 8
6908;TBP;TATA-box binding protein
8289;ARID1A;AT-rich interaction domain 1A
7314;UBB;ubiquitin B
5705;PSMC5;proteasome 26S subunit, ATPase 5
8626;TP63;tumor protein p63
5663;PSEN1;presenilin 1
4088;SMAD3;SMAD family member 3
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
5594;MAPK1;mitogen-activated protein kinase 1
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
2690;GHR;growth hormone receptor

7157;TP53;tumor protein p53
655;BMP7;bone morphogenetic protein 7
3569;IL6;interleukin 6
4303;FOXO4;forkhead box O4
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
351;APP;amyloid beta precursor protein
3065;HDAC1;histone deacetylase 1
7099;TLR4;toll like receptor 4
64210;MMS19;MMS19 homolog, cytosolic iron-sulfur assembly component
51176;LEF1;lymphoid enhancer binding factor 1
10401;PIAS3;protein inhibitor of activated STAT 3
4780;NFE2L2;nuclear factor, erythroid 2 like 2
920;CD4;CD4 molecule
1432;MAPK14;mitogen-activated protein kinase 14
2185;PTK2B;protein tyrosine kinase 2 beta
2280;FKBP1A;FK506 binding protein 1A
5156;PDGFRA;platelet derived growth factor receptor alpha
890;CCNA2;cyclin A2
5155;PDGFB;platelet derived growth factor subunit B
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1

AGING_MODULE_4

Functional_annotation

GO:0070727~CELLULAR MACROMOLECULE LOCALIZATION
GO:0034613~CELLULAR PROTEIN LOCALIZATION
GO:0045184~ESTABLISHMENT OF PROTEIN LOCALIZATION
GO:0046907~INTRACELLULAR TRANSPORT
GO:0006606~PROTEIN IMPORT INTO NUCLEUS
GO:0006886~INTRACELLULAR PROTEIN TRANSPORT
GO:0008104~PROTEIN LOCALIZATION
GO:0034504~PROTEIN LOCALIZATION IN NUCLEUS
GO:0017038~PROTEIN IMPORT
GO:0000060~PROTEIN IMPORT INTO NUCLEUS, TRANSLOCATION
GO:0006913~NUCLEOCYTOPLASMIC TRANSPORT
GO:0051169~NUCLEAR TRANSPORT
GO:0051170~NUCLEAR IMPORT
GO:0033365~PROTEIN LOCALIZATION IN ORGANELLE
GO:0006605~PROTEIN TARGETING

Genes_entrezGene_symbol_name (AGING_MODULE_4)

8905;AP1S2;adaptor related protein complex 1 sigma 2 subunit
3725;JUN;jun proto-oncogene
8906;AP1G2;adaptor related protein complex 1 gamma 2 subunit
55437;STRADB;STE20-related kinase adaptor beta
1175;AP2S1;adaptor related protein complex 2 sigma 1 subunit
1499;CTNNB1;catenin beta 1
1174;AP1S1;adaptor related protein complex 1 sigma 1 subunit
10267;RAMP1;receptor (G protein-coupled) activity modifying protein 1
10961;ERP29;endoplasmic reticulum protein 29
30000;TNPO2;transportin 2
23163;GGA3;golgi-associated, gamma adaptin ear containing, ARF binding protein 3
5371;PML;promyelocytic leukemia
581;BAX;BCL2-associated X protein
23165;NUP205;nucleoporin 205kDa
8774;NAPG;NSF attachment protein gamma
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
10651;MTX2;metaxin 2
23214;XPO6;exportin 6
2932;GSK3B;glycogen synthase kinase 3 beta
583;BBS2;Bardet-Biedl syndrome 2
51602;NOP58;NOP58 ribonucleoprotein
604;BCL6;B-cell CLL/lymphoma 6
5830;PEX5;peroxisomal biogenesis factor 5
23463;ICMT;isoprenylcysteine carboxyl methyltransferase
6810;STX4;syntaxin 4
5594;MAPK1;mitogen-activated protein kinase 1
10717;AP4B1;adaptor related protein complex 4 beta 1 subunit
23633;KPNA6;karyopherin subunit alpha 6
10526;IPO8;importin 8
1956;EGFR;epidermal growth factor receptor
22906;TRAK1;trafficking protein, kinesin binding 1

11097;NUPL2;nucleoporin like 2
998;CDC42;cell division cycle 42
8675;STX16;syntaxin 16
406;ARNTL;aryl hydrocarbon receptor nuclear translocator like
7157;TP53;tumor protein p53
3717;JAK2;Janus kinase 2
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
57510;XPO5;exportin 5
5111;PCNA;proliferating cell nuclear antigen
7175;TPR;translocated promoter region, nuclear basket protein
4792;NFKBIA;NFKB inhibitor alpha
51100;SH3GLB1;SH3-domain GRB2 like endophilin B1
3064;HTT;huntingtin
1020;CDK5;cyclin-dependent kinase 5
3313;HSPA9;heat shock protein family A (Hsp70) member 9
7227;TRPS1;transcriptional repressor GATA binding 1
7415;VCP;valosin containing protein
55829;VIMP;VCP interacting membrane selenoprotein
7040;TGFB1;transforming growth factor beta 1
585;BBS4;Bardet-Biedl syndrome 4
6711;SPTBN1;spectrin beta, non-erythrocytic 1
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
811;CALR;calreticulin
8766;RAB11A;RAB11A, member RAS oncogene family
80824;DUSP16;dual specificity phosphatase 16
9702;CEP57;centrosomal protein 57kDa
6272;SORT1;sortilin 1
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
7534;YWHAZ;tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein zeta
7014;TERF2;telomeric repeat binding factor 2
8888;MCM3AP;minichromosome maintenance complex component 3 associated protein
8775;NAPA;NSF attachment protein alpha
7124;TNF;tumor necrosis factor
4646;MYO6;myosin VI
2247;FGF2;fibroblast growth factor 2
637;BID;BH3 interacting domain death agonist
54843;SYTL2;synaptotagmin like 2
1211;CLTA;clathrin light chain A
11311;VPS45;vacuolar protein sorting 45 homolog (S. cerevisiae)
22820;COPG1;coatomer protein complex subunit gamma 1
3673;ITGA2;integrin subunit alpha 2
26276;VPS33B;VPS33B, late endosome and lysosome associated
2891;GRIA2;glutamate ionotropic receptor AMPA type subunit 2
5579;PRKCB;protein kinase C beta
5468;PPARG;peroxisome proliferator activated receptor gamma
8724;SNX3;sorting nexin 3
23265;EXOC7;exocyst complex component 7
56648;EIF5A2;eukaryotic translation initiation factor 5A2
4036;LRP2;LDL receptor related protein 2
29911;HOOK2;hook microtubule-tethering protein 2

10890;RAB10;RAB10, member RAS oncogene family
5341;PLEK;pleckstrin
6890;TAP1;transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)
23230;VPS13A;vacuolar protein sorting 13 homolog A (S. cerevisiae)
8773;SNAP23;synaptosome associated protein 23kDa
5663;PSEN1;presenilin 1
84220;RGPD5;RANBP2-like and GRIP domain containing 5
64145;RBSN;rabenosyn, RAB effector
8498;RANBP3;RAN binding protein 3
11269;DDX19B;DEAD-box helicase 19B
84932;RAB2B;RAB2B, member RAS oncogene family
7844;RNF103;ring finger protein 103
23682;RAB38;RAB38, member RAS oncogene family
5864;RAB3A;RAB3A, member RAS oncogene family
5862;RAB2A;RAB2A, member RAS oncogene family
821;CANX;calnexin
26056;RAB11FIP5;RAB11 family interacting protein 5 (class I)
3108;HLA-DMA;major histocompatibility complex, class II, DM alpha
51296;SLC15A3;solute carrier family 15 member 3
55916;NXT2;nuclear transport factor 2-like export factor 2
124460;SNX20;sorting nexin 20
4905;NSF;N-ethylmaleimide sensitive factor
8991;SELENBP1;selenium binding protein 1
27243;CHMP2A;charged multivesicular body protein 2A
79902;NUP85;nucleoporin 85kDa
1277;COL1A1;collagen type I alpha 1
55293;UEVLD;UEV and lactate/malate dehyrogenase domains
19;ABCA1;ATP binding cassette subfamily A member 1
10892;MALT1;MALT1 paracaspase
9201;DCLK1;doublecortin like kinase 1
70;ACTC1;actin, alpha, cardiac muscle 1
7248;TSC1;tuberous sclerosis 1
8878;SQSTM1;sequestosome 1
7352;UCP3;uncoupling protein 3 (mitochondrial, proton carrier)
348;APOE;apolipoprotein E
539;ATP5O;ATP synthase, H+ transporting, mitochondrial F1 complex, O subunit
23049;SMG1;SMG1 phosphatidylinositol 3-kinase-related kinase
513;ATP5D;ATP synthase, H+ transporting, mitochondrial F1 complex, delta subunit
1785;DNM2;dynamin 2
5449;POU1F1;POU class 1 homeobox 1
81567;TXNDC5;thioredoxin domain containing 5 (endoplasmic reticulum)
6310;ATXN1;ataxin 1
7345;UCHL1;ubiquitin C-terminal hydrolase L1
667;DST;dystonin
6262;RYR2;ryanodine receptor 2
578;BAK1;BCL2 antagonist/killer 1
488;ATP2A2;ATPase sarcoplasmic/endoplasmic reticulum Ca2+ transporting 2
8604;SLC25A12;solute carrier family 25 member 12
7139;TNNT2;troponin T2, cardiac type
10105;PPIF;peptidylprolyl isomerase F

26019;UPF2;UPF2 regulator of nonsense transcripts homolog (yeast)
6844;VAMP2;vesicle associated membrane protein 2
5590;PRKCZ;protein kinase C zeta
3178;HNRNPA1;heterogeneous nuclear ribonucleoprotein A1
22836;RHOBTB3;Rho related BTB domain containing 3
6576;SLC25A1;solute carrier family 25 member 1
25923;ATL3;atlastin GTPase 3
10212;DDX39A;DEAD-box helicase 39A
7919;DDX39B;DEAD-box helicase 39B
10938;EHD1;EH domain containing 1
23095;KIF1B;kinesin family member 1B
10482;NXF1;nuclear RNA export factor 1
30835;CD209;CD209 molecule
351;APP;amyloid beta precursor protein
3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
3312;HSPA8;heat shock protein family A (Hsp70) member 8
9984;THOC1;THO complex 1
6687;SPG7;SPG7, paraplegin matrix AAA peptidase subunit
1718;DHCR24;24-dehydrocholesterol reductase
2071;ERCC3;excision repair cross-complementation group 3
1756;DMD;dystrophin
83660;TLN2;talin 2
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
4601;MXI1;MAX interactor 1, dimerization protein
57731;SPTBN4;spectrin beta, non-erythrocytic 4
2317;FLNB;filamin B
23162;MAPK8IP3;mitogen-activated protein kinase 8 interacting protein 3
5962;RDX;radixin

AGING_MODULE_5

Functional_annotation

GO:0045429~POSITIVE REGULATION OF NITRIC OXIDE BIOSYNTHETIC PROCESS
GO:0031328~POSITIVE REGULATION OF CELLULAR BIOSYNTHETIC PROCESS
GO:0043193~POSITIVE REGULATION OF GENE-SPECIFIC TRANSCRIPTION
GO:0051173~POSITIVE REGULATION OF NITROGEN COMPOUND METABOLIC PROCESS
GO:0045893~POSITIVE REGULATION OF TRANSCRIPTION, DNA-DEPENDENT
GO:0009891~POSITIVE REGULATION OF BIOSYNTHETIC PROCESS
GO:0010551~REGULATION OF SPECIFIC TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0051254~POSITIVE REGULATION OF RNA METABOLIC PROCESS
GO:0045944~POSITIVE REGULATION OF TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0045941~POSITIVE REGULATION OF TRANSCRIPTION
GO:0032583~REGULATION OF GENE-SPECIFIC TRANSCRIPTION
GO:0045428~REGULATION OF NITRIC OXIDE BIOSYNTHETIC PROCESS
GO:0006357~REGULATION OF TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0045935~POSITIVE REGULATION OF NUCLEOBASE, NUCLEOSIDE,
NUCLEOTIDE AND NUCLEIC ACID METABOLIC PROCESS
GO:0010628~POSITIVE REGULATION OF GENE EXPRESSION
GO:0010552~POSITIVE REGULATION OF SPECIFIC TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0010557~POSITIVE REGULATION OF MACROMOLECULE BIOSYNTHETIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_5)

3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
3481;IGF2;insulin like growth factor 2
3630;INS;insulin
3717;JAK2;Janus kinase 2
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
3643;INSR;insulin receptor
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
6648;SOD2;superoxide dismutase 2, mitochondrial
3553;IL1B;interleukin 1 beta
1956;EGFR;epidermal growth factor receptor
7124;TNF;tumor necrosis factor
3725;JUN;jun proto-oncogene
5465;PPARA;peroxisome proliferator activated receptor alpha
1499;CTNNB1;catenin beta 1
3479;IGF1;insulin like growth factor 1
367;AR;androgen receptor
282991;BLOC1S2;biogenesis of lysosomal organelles complex 1 subunit 2
3673;ITGA2;integrin subunit alpha 2
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
2296;FOXC1;forkhead box C1
3480;IGF1R;insulin like growth factor 1 receptor
5468;PPARG;peroxisome proliferator activated receptor gamma
4087;SMAD2;SMAD family member 2
8878;SQSTM1;sequestosome 1
7161;TP73;tumor protein p73
23054;NCOA6;nuclear receptor coactivator 6
1958;EGR1;early growth response 1
2033;EP300;E1A binding protein p300

672;BRCA1;breast cancer 1
3299;HSF4;heat shock transcription factor 4
406;ARNTL;aryl hydrocarbon receptor nuclear translocator like
64127;NOD2;nucleotide binding oligomerization domain containing 2
51621;KLF13;Kruppel-like factor 13
10725;NFAT5;nuclear factor of activated T-cells 5, tonicity-responsive
56648;EIF5A2;eukaryotic translation initiation factor 5A2
348;APOE;apolipoprotein E
10148;EBI3;Epstein-Barr virus induced 3
6182;MRPL12;mitochondrial ribosomal protein L12
9575;CLOCK;clock circadian regulator
6776;STAT5A;signal transducer and activator of transcription 5A
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
6777;STAT5B;signal transducer and activator of transcription 5B
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
3667;IRS1;insulin receptor substrate 1
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
4792;NFKBIA;NFKB inhibitor alpha
10891;PPARGC1A;PPARG coactivator 1 alpha
6872;TAF1;TATA-box binding protein associated factor 1
1437;CSF2;colony stimulating factor 2
4821;NKX2-2;NK2 homeobox 2
1387;CREBBP;CREB binding protein
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
6095;RORA;RAR related orphan receptor A
5449;POU1F1;POU class 1 homeobox 1
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
2071;ERCC3;excision repair cross-complementation group 3
1901;S1PR1;sphingosine-1-phosphate receptor 1
28996;HIPK2;homeodomain interacting protein kinase 2
6646;SOAT1;sterol O-acyltransferase 1
7422;VEGFA;vascular endothelial growth factor A
1857;DVL3;dishevelled segment polarity protein 3
6925;TCF4;transcription factor 4
83637;ZMIZ2;zinc finger MIZ-type containing 2
4654;MYOD1;myogenic differentiation 1
2068;ERCC2;excision repair cross-complementation group 2
7040;TGFB1;transforming growth factor beta 1
6665;SOX15;SRY-box 15
7136;TNNI2;troponin I2, fast skeletal type
5925;RB1;retinoblastoma 1
25937;WWTR1;WW domain containing transcription regulator 1
6258;RXRG;retinoid X receptor gamma
1649;DDIT3;DNA damage inducible transcript 3
6310;ATXN1;ataxin 1
51311;TLR8;toll like receptor 8
6595;SMARCA2;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 2
51284;TLR7;toll like receptor 7
811;CALR;calreticulin

26747;NUFIP1;nuclear fragile X mental retardation protein interacting protein 1
6667;SP1;Sp1 transcription factor
2100;ESR2;estrogen receptor 2 (ER beta)
2101;ESRRA;estrogen related receptor alpha
1050;CEBPA;CCAAT/enhancer binding protein alpha
6929;TCF3;transcription factor 3
2309;FOXO3;forkhead box O3
22937;SCAP;SREBF chaperone
2308;FOXO1;forkhead box O1
641;BLM;Bloom syndrome RecQ like helicase
5626;PROP1;PROP paired-like homeobox 1
1869;E2F1;E2F transcription factor 1
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4
7158;TP53BP1;tumor protein p53 binding protein 1
5469;MED1;mediator complex subunit 1
654;BMP6;bone morphogenetic protein 6
5092;PCBD1;pterin-4 alpha-carbinolamine dehydratase 1
51547;SIRT7;sirtuin 7
7096;TLR1;toll like receptor 1
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
1022;CDK7;cyclin-dependent kinase 7
60529;ALX4;ALX homeobox 4
10645;CAMKK2;calcium/calmodulin-dependent protein kinase kinase 2
6720;SREBF1;sterol regulatory element binding transcription factor 1
4646;MYO6;myosin VI
2118;ETV4;ETS variant 4
60491;NIF3L1;NGG1 interacting factor 3 like 1
84448;ABLIM2;actin binding LIM protein family member 2
2247;FGF2;fibroblast growth factor 2
9063;PIAS2;protein inhibitor of activated STAT 2
1051;CEBPB;CCAAT/enhancer binding protein beta
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
7376;NR1H2;nuclear receptor subfamily 1 group H member 2
3670;ISL1;ISL LIM homeobox 1
4862;NPAS2;neuronal PAS domain protein 2
3609;ILF3;interleukin enhancer binding factor 3
6908;TBP;TATA-box binding protein
8289;ARID1A;AT-rich interaction domain 1A
7314;UBB;ubiquitin B
5705;PSMC5;proteasome 26S subunit, ATPase 5
8626;TP63;tumor protein p63
4088;SMAD3;SMAD family member 3
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
5594;MAPK1;mitogen-activated protein kinase 1
5744;PTHLH;parathyroid hormone-like hormone
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
7157;TP53;tumor protein p53
655;BMP7;bone morphogenetic protein 7
4050;LTB;lymphotoxin beta

3569;IL6;interleukin 6
4303;FOXO4;forkhead box O4
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
351;APP;amyloid beta precursor protein
3065;HDAC1;histone deacetylase 1
7099;TLR4;toll like receptor 4
64210;MMS19;MMS19 homolog, cytosolic iron-sulfur assembly component
51176;LEF1;lymphoid enhancer binding factor 1
4780;NFE2L2;nuclear factor, erythroid 2 like 2
920;CD4;CD4 molecule
1432;MAPK14;mitogen-activated protein kinase 14
2185;PTK2B;protein tyrosine kinase 2 beta
8660;IRS2;insulin receptor substrate 2
9759;HDAC4;histone deacetylase 4
5156;PDGFRA;platelet derived growth factor receptor alpha
890;CCNA2;cyclin A2
5155;PDGFB;platelet derived growth factor subunit B
19;ABCA1;ATP binding cassette subfamily A member 1
2475;MTOR;mechanistic target of rapamycin
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
2074;ERCC6;excision repair cross-complementation group 6
5582;PRKCG;protein kinase C gamma
51720;UIMC1;ubiquitin interaction motif containing 1
3014;H2AFX;H2A histone family member X
5888;RAD51;RAD51 recombinase
7014;TERF2;telomeric repeat binding factor 2
1161;ERCC8;excision repair cross-complementation group 8
1312;COMT;catechol-O-methyltransferase
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
5562;PRKAA1;protein kinase AMP-activated catalytic subunit alpha 1
9611;NCOR1;nuclear receptor corepressor 1
9612;NCOR2;nuclear receptor corepressor 2
23493;HEY2;hes related family bHLH transcription factor with YRPW motif 2
8841;HDAC3;histone deacetylase 3
4092;SMAD7;SMAD family member 7
23411;SIRT1;sirtuin 1
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
3146;HMGB1;high mobility group box 1
604;BCL6;B-cell CLL/lymphoma 6
25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
5987;TRIM27;tripartite motif containing 27
3224;HOXC8;homeobox C8
25942;SIN3A;SIN3 transcription regulator family member A
3394;IRF8;interferon regulatory factor 8
23013;SPEN;spen family transcriptional repressor
10472;ZBTB18;zinc finger and BTB domain containing 18
22882;ZHX2;zinc fingers and homeoboxes 2
1428;CRYM;crystallin mu

8896;BUD31;BUD31 homolog
7027;TFDP1;transcription factor Dp-1
9500;MAGED1;MAGE family member D1
10215;OLIG2;oligodendrocyte lineage transcription factor 2
3727;JUND;jun D proto-oncogene
22906;TRAK1;trafficking protein, kinesin binding 1
4487;MSX1;msh homeobox 1
10468;FST;follistatin
51295;ECSIT;ECSIT signalling integrator
7291;TWIST1;twist family bHLH transcription factor 1
10902;BRD8;bromodomain containing 8
8804;CREG1;cellular repressor of E1A stimulated genes 1
5932;RBBP8;retinoblastoma binding protein 8
55140;ELP3;elongator acetyltransferase complex subunit 3
6938;TCF12;transcription factor 12
7020;TFAP2A;transcription factor AP-2 alpha (activating enhancer binding protein 2 alpha)
3223;HOXC6;homeobox C6
27336;HTATSF1;HIV-1 Tat specific factor 1
2648;KAT2A;lysine acetyltransferase 2A
2099;ESR1;estrogen receptor 1
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
5601;MAPK9;mitogen-activated protein kinase 9
55974;SLC50A1;solute carrier family 50 member 1

AGING_MODULE_6

Functional_annotation

GO:0048666~NEURON DEVELOPMENT
GO:0007411~AXON GUIDANCE
GO:0032990~CELL PART MORPHOGENESIS
GO:0048858~CELL PROJECTION MORPHOGENESIS
GO:0007409~AXONOGENESIS
GO:0030030~CELL PROJECTION ORGANIZATION
GO:0048812~NEURON PROJECTION MORPHOGENESIS
GO:0000904~CELL MORPHOGENESIS INVOLVED IN DIFFERENTIATION
GO:0032989~CELLULAR COMPONENT MORPHOGENESIS
GO:0030182~NEURON DIFFERENTIATION
GO:0000902~CELL MORPHOGENESIS
GO:0031175~NEURON PROJECTION DEVELOPMENT
GO:0006928~CELL MOTION
GO:0048667~CELL MORPHOGENESIS INVOLVED IN NEURON DIFFERENTIATION

Genes_entrezGene_symbol_name (AGING_MODULE_6)

7314;UBB;ubiquitin B
1191;CLU;clusterin
3912;LAMB1;laminin subunit beta 1
2596;GAP43;growth associated protein 43
9201;DCLK1;doublecortin like kinase 1
6648;SOD2;superoxide dismutase 2, mitochondrial
60;ACTB;actin, beta
3480;IGF1R;insulin like growth factor 1 receptor
5923;RASGRF1;Ras protein specific guanine nucleotide releasing factor 1
3952;LEP;leptin
5663;PSEN1;presenilin 1
55558;PLXNA3;plexin A3
885;CCK;cholecystokinin
27429;HTRA2;HtrA serine peptidase 2
7161;TP73;tumor protein p73
57731;SPTBN4;spectrin beta, non-erythrocytic 4
1956;EGFR;epidermal growth factor receptor
2047;EPHB1;EPH receptor B1
3717;JAK2;Janus kinase 2
5747;PTK2;protein tyrosine kinase 2
655;BMP7;bone morphogenetic protein 7
1749;DLX5;distal-less homeobox 5
3569;IL6;interleukin 6
2260;FGFR1;fibroblast growth factor receptor 1
10152;ABI2;abl-interactor 2
3064;HTT;huntingtin
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
1020;CDK5;cyclin-dependent kinase 5
351;APP;amyloid beta precursor protein
5864;RAB3A;RAB3A, member RAS oncogene family
5649;RELN;reelin
23162;MAPK8IP3;mitogen-activated protein kinase 8 interacting protein 3

7422;VEGFA;vascular endothelial growth factor A
4803;NGF;nerve growth factor
1756;DMD;dystrophin
627;BDNF;brain-derived neurotrophic factor
4804;NGFR;nerve growth factor receptor
585;BBS4;Bardet-Biedl syndrome 4
5803;PTPRZ1;protein tyrosine phosphatase, receptor type Z1
8851;CDK5R1;cyclin-dependent kinase 5, regulatory subunit 1 (p35)
7345;UCHL1;ubiquitin C-terminal hydrolase L1
658;BMPR1B;bone morphogenetic protein receptor type 1B
4685;NCAM2;neural cell adhesion molecule 2
7869;SEMA3B;semaphorin 3B
27289;RND1;Rho family GTPase 1
667;DST;dystonin
9378;NRXN1;neurexin 1
80303;EFHD1;EF-hand domain family member D1
5979;RET;ret proto-oncogene
5578;PRKCA;protein kinase C alpha
2185;PTK2B;protein tyrosine kinase 2 beta
4133;MAP2;microtubule associated protein 2
7155;TOP2B;topoisomerase (DNA) II beta
1462;VCAN;versican
26039;SS18L1;synovial sarcoma translocation gene on chromosome 18-like 1
50863;NTM;neurotrimin
4009;LMX1A;LIM homeobox transcription factor 1 alpha
9637;FEZ2;fasciculation and elongation protein zeta 2
2019;EN1;engrailed homeobox 1
9638;FEZ1;fasciculation and elongation protein zeta 1
4646;MYO6;myosin VI
2118;ETV4;ETS variant 4
6647;SOD1;superoxide dismutase 1, soluble
3670;ISL1;ISL LIM homeobox 1
57556;SEMA6A;semaphorin 6A
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
491;ATP2B2;ATPase plasma membrane Ca2+ transporting 2
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
6387;CXCL12;C-X-C motif chemokine ligand 12
581;BAX;BCL2-associated X protein
3911;LAMA5;laminin subunit alpha 5
583;BBS2;Bardet-Biedl syndrome 2
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
25937;WWTR1;WW domain containing transcription regulator 1
5108;PCM1;pericentriolar material 1
578;BAK1;BCL2 antagonist/killer 1
10059;DNM1L;dynamin 1-like
51024;FIS1;fission, mitochondrial 1
84962;AJUBA;ajuba LIM protein
7248;TSC1;tuberous sclerosis 1
998;CDC42;cell division cycle 42

207;AKT1;v-akt murine thymoma viral oncogene homolog 1
5880;RAC2;ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
10451;VAV3;vav guanine nucleotide exchange factor 3
79902;NUP85;nucleoporin 85kDa
9788;MTSS1;metastasis suppressor 1
5341;PLEK;pleckstrin
5962;RDX;radixin
5155;PDGFB;platelet derived growth factor subunit B
3691;ITGB4;integrin subunit beta 4
2475;MTOR;mechanistic target of rapamycin
1499;CTNNB1;catenin beta 1
1601;DAB2;Dab, mitogen-responsive phosphoprotein, homolog 2 (Drosophila)
9241;NOG;noggin
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
7040;TGFB1;transforming growth factor beta 1
51176;LEF1;lymphoid enhancer binding factor 1
6275;S100A4;S100 calcium binding protein A4
55437;STRADB;STE20-related kinase adaptor beta
7139;TNNT2;troponin T2, cardiac type
3688;ITGB1;integrin subunit beta 1
10630;PDPN;podoplanin
70;ACTC1;actin, alpha, cardiac muscle 1
604;BCL6;B-cell CLL/lymphoma 6
1794;DOCK2;dedicator of cytokinesis 2
5376;PMP22;peripheral myelin protein 22
58;ACTA1;actin, alpha 1, skeletal muscle
4629;MYH11;myosin, heavy chain 11, smooth muscle
2068;ERCC2;excision repair cross-complementation group 2
3575;IL7R;interleukin 7 receptor
2038;EPB42;erythrocyte membrane protein band 4.2
4854;NOTCH3;notch 3
5830;PEX5;peroxisomal biogenesis factor 5
3714;JAG2;jagged 2
3224;HOXC8;homeobox C8
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
11075;STMN2;stathmin 2
4821;NKX2-2;NK2 homeobox 2
6095;RORA;RAR related orphan receptor A
1901;S1PR1;sphingosine-1-phosphate receptor 1
2016;EMX1;empty spiracles homeobox 1
4916;NTRK3;neurotrophic tyrosine kinase, receptor, type 3
6252;RTN1;reticulon 1
23287;AGTPBP1;ATP/GTP binding protein 1
1942;EFNA1;ephrin-A1
8775;NAPA;NSF attachment protein alpha
8854;ALDH1A2;aldehyde dehydrogenase 1 family member A2
1051;CEBPB;CCAAT/enhancer binding protein beta
10215;OLIG2;oligodendrocyte lineage transcription factor 2
3479;IGF1;insulin like growth factor 1
6347;CCL2;C-C motif chemokine ligand 2

800;CALD1;caldesmon 1
3673;ITGA2;integrin subunit alpha 2
7412;VCAM1;vascular cell adhesion molecule 1
2296;FOXC1;forkhead box C1
6340;SCNN1G;sodium channel epithelial 1 gamma subunit
154796;AMOT;angiomotin
2321;FLT1;fms related tyrosine kinase 1
6405;SEMA3F;semaphorin 3F
58191;CXCL16;C-X-C motif chemokine ligand 16
506;ATP5B;ATP synthase, H+ transporting, mitochondrial F1 complex, beta polypeptide
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
6280;S100A9;S100 calcium binding protein A9
5743;PTGS2;prostaglandin-endoperoxide synthase 2
5599;MAPK8;mitogen-activated protein kinase 8
5159;PDGFRB;platelet derived growth factor receptor beta
1289;COL5A1;collagen type V alpha 1
3553;IL1B;interleukin 1 beta
2876;GPX1;glutathione peroxidase 1
7424;VEGFC;vascular endothelial growth factor C
4486;MST1R;macrophage stimulating 1 receptor
5328;PLAU;plasminogen activator, urokinase
9844;ELMO1;engulfment and cell motility 1
1839;HBEGF;heparin binding EGF like growth factor
6376;CX3CL1;C-X3-C motif chemokine ligand 1
949;SCARB1;scavenger receptor class B member 1
7431;VIM;vimentin
947;CD34;CD34 molecule
5364;PLXNB1;plexin B1
2100;ESR2;estrogen receptor 2 (ER beta)
1490;CTGF;connective tissue growth factor
10109;ARPC2;actin related protein 2/3 complex subunit 2
1432;MAPK14;mitogen-activated protein kinase 14
3684;ITGAM;integrin subunit alpha M
6695;SPOCK1;sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican) 1
7291;TWIST1;twist family bHLH transcription factor 1
7295;TXN;thioredoxin
7124;TNF;tumor necrosis factor
2247;FGF2;fibroblast growth factor 2

AGING_MODULE_7

Functional_annotation

GO:0009650~UV PROTECTION
GO:0033554~CELLULAR RESPONSE TO STRESS
GO:0006281~DNA REPAIR
GO:0006974~RESPONSE TO DNA DAMAGE STIMULUS
GO:0033683~NUCLEOTIDE-EXCISION REPAIR, DNA INCISION
GO:0009314~RESPONSE TO RADIATION
GO:0006259~DNA METABOLIC PROCESS
GO:0009411~RESPONSE TO UV
GO:0006308~DNA CATABOLIC PROCESS
GO:0000718~NUCLEOTIDE-EXCISION REPAIR, DNA DAMAGE REMOVAL
HSA03420:NUCLEOTIDE EXCISION REPAIR
GO:0006289~NUCLEOTIDE-EXCISION REPAIR
GO:0006283~TRANSCRIPTION-COUPLED NUCLEOTIDE-EXCISION REPAIR

Genes_entrezGene_symbol_name (AGING_MODULE_7)

2073;ERCC5;excision repair cross-complementation group 5
2068;ERCC2;excision repair cross-complementation group 2
2237;FEN1;flap structure-specific endonuclease 1
2876;GPX1;glutathione peroxidase 1
2072;ERCC4;excision repair cross-complementation group 4
847;CAT;catalase
2067;ERCC1;excision repair cross-complementation group 1
2071;ERCC3;excision repair cross-complementation group 3
3725;JUN;jun proto-oncogene
55437;STRADB;STE20-related kinase adaptor beta
3146;HMGB1;high mobility group box 1
2879;GPX4;glutathione peroxidase 4
5371;PML;promyelocytic leukemia
604;BCL6;B-cell CLL/lymphoma 6
7161;TP73;tumor protein p73
7486;WRN;Werner syndrome RecQ like helicase
23054;NCOA6;nuclear receptor coactivator 6
4217;MAP3K5;mitogen-activated protein kinase kinase kinase 5
675;BRCA2;breast cancer 2
3992;FADS1;fatty acid desaturase 1
672;BRCA1;breast cancer 1
4292;MLH1;mutL homolog 1
25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
55339;WDR33;WD repeat domain 33
7508;XPC;xeroderma pigmentosum, complementation group C
9401;RECQL4;RecQ like helicase 4
9588;PRDX6;peroxiredoxin 6
3717;JAK2;Janus kinase 2
5893;RAD52;RAD52 homolog, DNA repair protein
3638;INSIG1;insulin induced gene 1
5984;RFC4;replication factor C subunit 4
5985;RFC5;replication factor C subunit 5
472;ATM;ATM serine/threonine kinase

26509;MYOF;myoferlin
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
3978;LIG1;ligase I, DNA, ATP-dependent
54840;APTX;aprataxin
2878;GPX3;glutathione peroxidase 3
5111;PCNA;proliferating cell nuclear antigen
10039;PARP3;poly(ADP-ribose) polymerase family member 3
10038;PARP2;poly(ADP-ribose) polymerase 2
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
142;PARP1;poly(ADP-ribose) polymerase 1
23049;SMG1;SMG1 phosphatidylinositol 3-kinase-related kinase
2074;ERCC6;excision repair cross-complementation group 6
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
7415;VCP;valosin containing protein
28996;HIPK2;homeodomain interacting protein kinase 2
51720;UIMC1;ubiquitin interaction motif containing 1
7520;XRCC5;X-ray repair complementing defective repair in Chinese hamster cells 5
1649;DDIT3;DNA damage inducible transcript 3
5423;POLB;polymerase (DNA) beta
2081;ERN1;endoplasmic reticulum to nucleus signaling 1
3014;H2AFX;H2A histone family member X
5052;PRDX1;peroxiredoxin 1
5888;RAD51;RAD51 recombinase
2309;FOXO3;forkhead box O3
22937;SCAP;SREBF chaperone
641;BLM;Bloom syndrome RecQ like helicase
7158;TP53BP1;tumor protein p53 binding protein 1
7014;TERF2;telomeric repeat binding factor 2
51547;SIRT7;sirtuin 7
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
983;CDK1;cyclin-dependent kinase 1
1161;ERCC8;excision repair cross-complementation group 8
1022;CDK7;cyclin-dependent kinase 7
6720;SREBF1;sterol regulatory element binding transcription factor 1
7124;TNF;tumor necrosis factor
5601;MAPK9;mitogen-activated protein kinase 9
4646;MYO6;myosin VI
6647;SOD1;superoxide dismutase 1, soluble
7507;XPA;xeroderma pigmentosum, complementation group A
440;ASNS;asparagine synthetase (glutamine-hydrolyzing)
6648;SOD2;superoxide dismutase 2, mitochondrial
581;BAX;BCL2-associated X protein
8626;TP63;tumor protein p63
2932;GSK3B;glycogen synthase kinase 3 beta
5663;PSEN1;presenilin 1
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
23411;SIRT1;sirtuin 1
5594;MAPK1;mitogen-activated protein kinase 1

11200;CHEK2;checkpoint kinase 2
5599;MAPK8;mitogen-activated protein kinase 8
7157;TP53;tumor protein p53
7153;TOP2A;topoisomerase (DNA) II alpha
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2
9131;AIFM1;apoptosis inducing factor, mitochondria associated 1
4303;FOXO4;forkhead box O4
4683;NBN;nibrin
6117;RPA1;replication protein A1
55829;VIMP;VCP interacting membrane selenoprotein
23162;MAPK8IP3;mitogen-activated protein kinase 8 interacting protein 3
9064;MAP3K6;mitogen-activated protein kinase kinase kinase 6
28988;DBNL;drebrin like
5585;PKN1;protein kinase N1
64210;MMS19;MMS19 homolog, cytosolic iron-sulfur assembly component
4780;NFE2L2;nuclear factor, erythroid 2 like 2
1432;MAPK14;mitogen-activated protein kinase 14
5424;POLD1;polymerase (DNA) delta 1, catalytic subunit
328;APEX1;apurinic/apyrimidinic endodeoxyribonuclease 1
80254;CEP63;centrosomal protein 63kDa
2966;GTF2H2;general transcription factor IIH subunit 2
5422;POLA1;polymerase (DNA) alpha 1, catalytic subunit
1643;DDB2;damage specific DNA binding protein 2
2177;FANCD2;Fanconi anemia complementation group D2
1462;VCAN;versican
1453;CSNK1D;casein kinase 1 delta
1454;CSNK1E;casein kinase 1 epsilon
1647;GADD45A;growth arrest and DNA damage inducible alpha
890;CCNA2;cyclin A2
5831;PYCR1;pyrroline-5-carboxylate reductase 1
545;ATR;ATR serine/threonine kinase
7341;SUMO1;small ubiquitin-like modifier 1
5932;RBBP8;retinoblastoma binding protein 8
79791;FBXO31;F-box protein 31
8491;MAP4K3;mitogen-activated protein kinase kinase kinase kinase 3
51366;UBR5;ubiquitin protein ligase E3 component n-recognin 5
25788;RAD54B;RAD54 homolog B (S. cerevisiae)
6421;SFPQ;splicing factor proline/glutamine-rich
9656;MDC1;mediator of DNA damage checkpoint 1
55544;RBM38;RNA binding motif protein 38
2539;G6PD;glucose-6-phosphate dehydrogenase
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
6347;CCL2;C-C motif chemokine ligand 2
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
8493;PPM1D;protein phosphatase, Mg2+/Mn2+ dependent 1D
1956;EGFR;epidermal growth factor receptor
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
9575;CLOCK;clock circadian regulator
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog

4036;LRP2;LDL receptor related protein 2
3064;HTT;huntingtin
5950;RBP4;retinol binding protein 4
1020;CDK5;cyclin-dependent kinase 5
351;APP;amyloid beta precursor protein
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
4803;NGF;nerve growth factor
1281;COL3A1;collagen type III alpha 1
7040;TGFB1;transforming growth factor beta 1
6310;ATXN1;ataxin 1
5153;PDE1B;phosphodiesterase 1B
578;BAK1;BCL2 antagonist/killer 1
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
10277;UBE4B;ubiquitination factor E4B
3479;IGF1;insulin like growth factor 1
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
3070;HELLS;helicase, lymphoid-specific
3487;IGFBP4;insulin like growth factor binding protein 4
995;CDC25C;cell division cycle 25C
1950;EGF;epidermal growth factor
7013;TERF1;telomeric repeat binding factor 1
7015;TERT;telomerase reverse transcriptase
317;APAF1;apoptotic peptidase activating factor 1
1490;CTGF;connective tissue growth factor
253980;KCTD13;potassium channel tetramerization domain containing 13
1775;DNASE1L2;deoxyribonuclease I-like 2
5763;PTMS;parathymosin
5469;MED1;mediator complex subunit 1
8940;TOP3B;topoisomerase (DNA) III beta
7155;TOP2B;topoisomerase (DNA) II beta
3329;HSPD1;heat shock protein family D (Hsp60) member 1
8888;MCM3AP;minichromosome maintenance complex component 3 associated protein
1854;DUT;deoxyuridine triphosphatase
7150;TOP1;topoisomerase (DNA) I
5478;PPIA;peptidylprolyl isomerase A
3669;ISG20;interferon stimulated exonuclease gene 20kDa
5000;ORC4;origin recognition complex subunit 4
5155;PDGFB;platelet derived growth factor subunit B
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
55974;SLC50A1;solute carrier family 50 member 1

AGING_MODULE_8

Functional_annotation
GO:0051248~NEGATIVE REGULATION OF PROTEIN METABOLIC PROCESS
GO:0016481~NEGATIVE REGULATION OF TRANSCRIPTION
GO:0000122~NEGATIVE REGULATION OF TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0051253~NEGATIVE REGULATION OF RNA METABOLIC PROCESS
GO:0032582~NEGATIVE REGULATION OF GENE-SPECIFIC TRANSCRIPTION
GO:0010605~NEGATIVE REGULATION OF MACROMOLECULE METABOLIC PROCESS
GO:0045892~NEGATIVE REGULATION OF TRANSCRIPTION, DNA-DEPENDENT
GO:0010553~NEGATIVE REGULATION OF SPECIFIC TRANSCRIPTION FROM RNA POLYMERASE II PROMOTER
GO:0010629~NEGATIVE REGULATION OF GENE EXPRESSION
GO:0009890~NEGATIVE REGULATION OF BIOSYNTHETIC PROCESS
GO:0045934~NEGATIVE REGULATION OF NUCLEOBASE, NUCLEOSIDE, NUCLEOTIDE AND NUCLEIC ACID METABOLIC PROCESS
GO:0031327~NEGATIVE REGULATION OF CELLULAR BIOSYNTHETIC PROCESS
GO:0010558~NEGATIVE REGULATION OF MACROMOLECULE BIOSYNTHETIC PROCESS
GO:0032269~NEGATIVE REGULATION OF CELLULAR PROTEIN METABOLIC PROCESS
GO:0051172~NEGATIVE REGULATION OF NITROGEN COMPOUND METABOLIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_8)
3725;JUN;jun proto-oncogene
7314;UBB;ubiquitin B
5590;PRKCZ;protein kinase C zeta
5371;PML;promyelocytic leukemia
581;BAX;BCL2-associated X protein
5705;PSMC5;proteasome 26S subunit, ATPase 5
7076;TIMP1;TIMP metallopeptidase inhibitor 1
3481;IGF2;insulin like growth factor 2
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
3486;IGFBP3;insulin like growth factor binding protein 3
7248;TSC1;tuberous sclerosis 1
5663;PSEN1;presenilin 1
2729;GCLC;glutamate-cysteine ligase catalytic subunit
3643;INSR;insulin receptor
3488;IGFBP5;insulin like growth factor binding protein 5
51433;ANAPC5;anaphase promoting complex subunit 5
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
4092;SMAD7;SMAD family member 7
8881;CDC16;cell division cycle 16
1020;CDK5;cyclin-dependent kinase 5
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
2;A2M;alpha-2-macroglobulin
5580;PRKCD;protein kinase C delta
51529;ANAPC11;anaphase promoting complex subunit 11
5774;PTPN3;protein tyrosine phosphatase, non-receptor type 3
5582;PRKCG;protein kinase C gamma
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
7040;TGFB1;transforming growth factor beta 1
9184;BUB3;BUB3 mitotic checkpoint protein

5648;MASP1;mannan binding lectin serine peptidase 1
5693;PSMB5;proteasome subunit beta 5
5690;PSMB2;proteasome subunit beta 2
64215;DNAJC1;DnaJ heat shock protein family (Hsp40) member C1
811;CALR;calreticulin
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
5578;PRKCA;protein kinase C alpha
5720;PSME1;proteasome activator subunit 1
2280;FKBP1A;FK506 binding protein 1A
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4
578;BAK1;BCL2 antagonist/killer 1
29945;ANAPC4;anaphase promoting complex subunit 4
3630;INS;insulin
10197;PSME3;proteasome activator subunit 3
5694;PSMB6;proteasome subunit beta 6
2539;G6PD;glucose-6-phosphate dehydrogenase
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
10642;IGF2BP1;insulin like growth factor 2 mRNA binding protein 1
5714;PSMD8;proteasome 26S subunit, non-ATPase 8
5104;SERPINA5;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5
5465;PPARA;peroxisome proliferator activated receptor alpha
1499;CTNNB1;catenin beta 1
3146;HMGB1;high mobility group box 1
23493;HEY2;hes related family bHLH transcription factor with YRPW motif 2
3084;NRG1;neuregulin 1
8626;TP63;tumor protein p63
5468;PPARG;peroxisome proliferator activated receptor gamma
4087;SMAD2;SMAD family member 2
604;BCL6;B-cell CLL/lymphoma 6
3070;HELLS;helicase, lymphoid-specific
4088;SMAD3;SMAD family member 3
1958;EGR1;early growth response 1
23411;SIRT1;sirtuin 1
672;BRCA1;breast cancer 1
3299;HSF4;heat shock transcription factor 4
9611;NCOR1;nuclear receptor corepressor 1
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
9612;NCOR2;nuclear receptor corepressor 2
5987;TRIM27;tripartite motif containing 27
23408;SIRT5;sirtuin 5
7157;TP53;tumor protein p53
4487;MSX1;msh homeobox 1
3224;HOXC8;homeobox C8
149951;COMMD7;COMM domain containing 7
57649;PHF12;PHD finger protein 12
51548;SIRT6;sirtuin 6
22955;SCMH1;sex comb on midleg homolog 1 (Drosophila)
25942;SIN3A;SIN3 transcription regulator family member A
23410;SIRT3;sirtuin 3

3394;IRF8;interferon regulatory factor 8
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
7329;UBE2I;ubiquitin conjugating enzyme E2I
23013;SPEN;spen family transcriptional repressor
7227;TRPS1;transcriptional repressor GATA binding 1
8553;BHLHE40;basic helix-loop-helix family member e40
3065;HDAC1;histone deacetylase 1
10472;ZBTB18;zinc finger and BTB domain containing 18
23316;CUX2;cut like homeobox 2
22882;ZHX2;zinc fingers and homeoboxes 2
1428;CRYM;crystallin mu
28996;HIPK2;homeodomain interacting protein kinase 2
6925;TCF4;transcription factor 4
6665;SOX15;SRY-box 15
51720;UIMC1;ubiquitin interaction motif containing 1
5925;RB1;retinoblastoma 1
25937;WWTR1;WW domain containing transcription regulator 1
51176;LEF1;lymphoid enhancer binding factor 1
6310;ATXN1;ataxin 1
6595;SMARCA2;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 2
4664;NAB1;NGFI-A binding protein 1
10468;FST;follistatin
1050;CEBPA;CCAAT/enhancer binding protein alpha
1869;E2F1;E2F transcription factor 1
5626;PROP1;PROP paired-like homeobox 1
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4
7704;ZBTB16;zinc finger and BTB domain containing 16
7291;TWIST1;twist family bHLH transcription factor 1
51547;SIRT7;sirtuin 7
9759;HDAC4;histone deacetylase 4
8841;HDAC3;histone deacetylase 3
7341;SUMO1;small ubiquitin-like modifier 1
84619;ZGPAT;zinc finger CCCH-type and G-patch domain containing
7124;TNF;tumor necrosis factor
2247;FGF2;fibroblast growth factor 2
7376;NR1H2;nuclear receptor subfamily 1 group H member 2
3609;ILF3;interleukin enhancer binding factor 3
27250;PDCD4;programmed cell death 4 (neoplastic transformation inhibitor)
10215;OLIG2;oligodendrocyte lineage transcription factor 2
2931;GSK3A;glycogen synthase kinase 3 alpha
675;BRCA2;breast cancer 2
4292;MLH1;mutL homolog 1
3625;INHBB;inhibin beta B
1471;CST3;cystatin C
57510;XPO5;exportin 5
27044;SND1;staphylococcal nuclease and tudor domain containing 1
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog

641;BLM;Bloom syndrome RecQ like helicase
7014;TERF2;telomeric repeat binding factor 2
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
2067;ERCC1;excision repair cross-complementation group 1
64061;TSPYL2;TSPY-like 2
7013;TERF1;telomeric repeat binding factor 1
3569;IL6;interleukin 6
1839;HBEGF;heparin binding EGF like growth factor
3902;LAG3;lymphocyte activating 3
51593;SRRT;serrate, RNA effector molecule
2072;ERCC4;excision repair cross-complementation group 4
545;ATR;ATR serine/threonine kinase
348;APOE;apolipoprotein E
5341;PLEK;pleckstrin
22937;SCAP;SREBF chaperone
6647;SOD1;superoxide dismutase 1, soluble
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
5155;PDGFB;platelet derived growth factor subunit B
5562;PRKAA1;protein kinase AMP-activated catalytic subunit alpha 1
93974;ATPIF1;ATPase inhibitory factor 1
978;CDA;cytidine deaminase
1312;COMT;catechol-O-methyltransferase

AGING_MODULE_9

Functional_annotation

GO:0006874~CELLULAR CALCIUM ION HOMEOSTASIS
GO:0050801~ION HOMEOSTASIS
GO:0042327~POSITIVE REGULATION OF PHOSPHORYLATION
GO:0010647~POSITIVE REGULATION OF CELL COMMUNICATION
GO:0055066~DI-, TRI-VALENT INORGANIC CATION HOMEOSTASIS
GO:0030003~CELLULAR CATION HOMEOSTASIS
GO:0045937~POSITIVE REGULATION OF PHOSPHATE METABOLIC PROCESS
GO:0055080~CATION HOMEOSTASIS
GO:0055082~CELLULAR CHEMICAL HOMEOSTASIS
GO:0048878~CHEMICAL HOMEOSTASIS
GO:0030005~CELLULAR DI-, TRI-VALENT INORGANIC CATION HOMEOSTASIS
GO:0009967~POSITIVE REGULATION OF SIGNAL TRANSDUCTION
GO:0019725~CELLULAR HOMEOSTASIS
GO:0042592~HOMEOSTATIC PROCESS
GO:0006875~CELLULAR METAL ION HOMEOSTASIS
GO:0010740~POSITIVE REGULATION OF PROTEIN KINASE CASCADE
GO:0055074~CALCIUM ION HOMEOSTASIS
GO:0010562~POSITIVE REGULATION OF PHOSPHORUS METABOLIC PROCESS
GO:0055065~METAL ION HOMEOSTASIS
GO:0014068~POSITIVE REGULATION OF PHOSPHOINOSITIDE 3-KINASE CASCADE
GO:0006873~CELLULAR ION HOMEOSTASIS

Genes_entrezGene_symbol_name (AGING_MODULE_9)

9104;RGN;regucalcin
7220;TRPC1;transient receptor potential cation channel subfamily C member 1
6263;RYR3;ryanodine receptor 3
728;C5AR1;complement component 5a receptor 1
7040;TGFB1;transforming growth factor beta 1
6347;CCL2;C-C motif chemokine ligand 2
2057;EPOR;erythropoietin receptor
56704;JPH1;junctophilin 1
581;BAX;BCL2-associated X protein
5579;PRKCB;protein kinase C beta
8896;BUD31;BUD31 homolog
1230;CCR1;chemokine (C-C motif) receptor 1
6368;CCL23;C-C motif chemokine ligand 23
5020;OXT;oxytocin/neurophysin I prepropeptide
5663;PSEN1;presenilin 1
185;AGTR1;angiotensin II receptor type 1
811;CALR;calreticulin
887;CCKBR;cholecystokinin B receptor
2185;PTK2B;protein tyrosine kinase 2 beta
5578;PRKCA;protein kinase C alpha
5336;PLCG2;phospholipase C gamma 2
2782;GNB1;G protein subunit beta 1
3717;JAK2;Janus kinase 2
2280;FKBP1A;FK506 binding protein 1A
348;APOE;apolipoprotein E

3553;IL1B;interleukin 1 beta
6262;RYR2;ryanodine receptor 2
5291;PIK3CB;phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit beta
5733;PTGER3;prostaglandin E receptor 3
578;BAK1;BCL2 antagonist/killer 1
488;ATP2A2;ATPase sarcoplasmic/endoplasmic reticulum Ca2+ transporting 2
3710;ITPR3;inositol 1,4,5-trisphosphate receptor type 3
351;APP;amyloid beta precursor protein
491;ATP2B2;ATPase plasma membrane Ca2+ transporting 2
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
6261;RYR1;ryanodine receptor 1
719;C3AR1;complement component 3a receptor 1
1901;S1PR1;sphingosine-1-phosphate receptor 1
6387;CXCL12;C-X-C motif chemokine ligand 12
3725;JUN;jun proto-oncogene
5590;PRKCZ;protein kinase C zeta
6648;SOD2;superoxide dismutase 2, mitochondrial
7248;TSC1;tuberous sclerosis 1
2729;GCLC;glutamate-cysteine ligase catalytic subunit
885;CCK;cholecystokinin
506;ATP5B;ATP synthase, H+ transporting, mitochondrial F1 complex, beta polypeptide
1373;CPS1;carbamoyl-phosphate synthase 1
5376;PMP22;peripheral myelin protein 22
2730;GCLM;glutamate-cysteine ligase modifier subunit
7157;TP53;tumor protein p53
4092;SMAD7;SMAD family member 7
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
3064;HTT;huntingtin
1020;CDK5;cyclin-dependent kinase 5
1152;CKB;creatine kinase, brain
2068;ERCC2;excision repair cross-complementation group 2
4155;MBP;myelin basic protein
9444;QKI;QKI, KH domain containing, RNA binding
4057;LTF;lactotransferrin
6310;ATXN1;ataxin 1
2038;EPB42;erythrocyte membrane protein band 4.2
4664;NAB1;NGFI-A binding protein 1
8074;FGF23;fibroblast growth factor 23
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
5621;PRNP;prion protein
5653;KLK6;kallikrein related peptidase 6
7018;TF;transferrin
6647;SOD1;superoxide dismutase 1, soluble
48;ACO1;aconitase 1
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
23428;SLC7A8;solute carrier family 7 member 8
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
10215;OLIG2;oligodendrocyte lineage transcription factor 2
3658;IREB2;iron responsive element binding protein 2
3479;IGF1;insulin like growth factor 1

3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
3481;IGF2;insulin like growth factor 2
10188;TNK2;tyrosine kinase, non-receptor, 2
3643;INSR;insulin receptor
920;CD4;CD4 molecule
1956;EGFR;epidermal growth factor receptor
2690;GHR;growth hormone receptor
64127;NOD2;nucleotide binding oligomerization domain containing 2
655;BMP7;bone morphogenetic protein 7
1950;EGF;epidermal growth factor
7424;VEGFC;vascular endothelial growth factor C
92;ACVR2A;activin A receptor type 2A
7124;TNF;tumor necrosis factor
3569;IL6;interleukin 6
2688;GH1;growth hormone 1
3630;INS;insulin
2247;FGF2;fibroblast growth factor 2
1437;CSF2;colony stimulating factor 2
146433;IL34;interleukin 34
253260;RICTOR;RPTOR independent companion of MTOR, complex 2
2475;MTOR;mechanistic target of rapamycin
7099;TLR4;toll like receptor 4
834;CASP1;caspase 1
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
7314;UBB;ubiquitin B
1499;CTNNB1;catenin beta 1
10892;MALT1;MALT1 paracaspase
3956;LGALS1;lectin, galactoside-binding, soluble, 1
3673;ITGA2;integrin subunit alpha 2
2099;ESR1;estrogen receptor 1
2891;GRIA2;glutamate ionotropic receptor AMPA type subunit 2
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
8626;TP63;tumor protein p63
4615;MYD88;myeloid differentiation primary response 88
3952;LEP;leptin
2321;FLT1;fms related tyrosine kinase 1
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
5743;PTGS2;prostaglandin-endoperoxide synthase 2
10342;TFG;TRK-fused gene
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2
2876;GPX1;glutathione peroxidase 1
4050;LTB;lymphotoxin beta
9521;EEF1E1;eukaryotic translation elongation factor 1 epsilon 1
3707;ITPKB;inositol-trisphosphate 3-kinase B
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
3667;IRS1;insulin receptor substrate 1
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
3091;HIF1A;hypoxia inducible factor 1 alpha subunit

5649;RELN;reelin
28996;HIPK2;homeodomain interacting protein kinase 2
7422;VEGFA;vascular endothelial growth factor A
1893;ECM1;extracellular matrix protein 1
5536;PPP5C;protein phosphatase 5 catalytic subunit
100;ADA;adenosine deaminase
91;ACVR1B;activin A receptor type 1B
847;CAT;catalase
3953;LEPR;leptin receptor
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
10395;DLC1;DLC1 Rho GTPase activating protein
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4
10891;PPARGC1A;PPARG coactivator 1 alpha
5468;PPARG;peroxisome proliferator activated receptor gamma
56648;EIF5A2;eukaryotic translation initiation factor 5A2
6646;SOAT1;sterol O-acyltransferase 1
2309;FOXO3;forkhead box O3
4023;LPL;lipoprotein lipase
1071;CETP;cholesteryl ester transfer protein, plasma
5744;PTHLH;parathyroid hormone-like hormone
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
5950;RBP4;retinol binding protein 4
949;SCARB1;scavenger receptor class B member 1
31;ACACA;acetyl-CoA carboxylase alpha
3931;LCAT;lecithin-cholesterol acyltransferase
8660;IRS2;insulin receptor substrate 2
2805;GOT1;glutamic-oxaloacetic transaminase 1, soluble
19;ABCA1;ATP binding cassette subfamily A member 1
9588;PRDX6;peroxiredoxin 6
9131;AIFM1;apoptosis inducing factor, mitochondria associated 1
55829;VIMP;VCP interacting membrane selenoprotein
1756;DMD;dystrophin
2936;GSR;glutathione reductase
81567;TXNDC5;thioredoxin domain containing 5 (endoplasmic reticulum)
1649;DDIT3;DNA damage inducible transcript 3
5052;PRDX1;peroxiredoxin 1
328;APEX1;apurinic/apyrimidinic endodeoxyribonuclease 1
7295;TXN;thioredoxin
54495;TMX3;thioredoxin related transmembrane protein 3
604;BCL6;B-cell CLL/lymphoma 6
7486;WRN;Werner syndrome RecQ like helicase
2033;EP300;E1A binding protein p300
3551;IKBKB;inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
142;PARP1;poly(ADP-ribose) polymerase 1
1387;CREBBP;CREB binding protein
7442;TRPV1;transient receptor potential cation channel subfamily V member 1
3575;IL7R;interleukin 7 receptor

7520;XRCC5;X-ray repair complementing defective repair in Chinese hamster cells 5
5925;RB1;retinoblastoma 1
585;BBS4;Bardet-Biedl syndrome 4
1200;TPP1;tripeptidyl peptidase I
6667;SP1;Sp1 transcription factor
641;BLM;Bloom syndrome RecQ like helicase
7014;TERF2;telomeric repeat binding factor 2
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
22985;ACIN1;apoptotic chromatin condensation inducer 1
1513;CTSK;cathepsin K
3216;HOXB6;homeobox B6
12;SERPINA3;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 3
2271;FH;fumarate hydratase
7076;TIMP1;TIMP metallopeptidase inhibitor 1
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
5159;PDGFRB;platelet derived growth factor receptor beta
3574;IL7;interleukin 7
3356;HTR2A;5-hydroxytryptamine receptor 2A
7013;TERF1;telomeric repeat binding factor 1
53833;IL20RB;interleukin 20 receptor subunit beta
7015;TERT;telomerase reverse transcriptase
5880;RAC2;ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
4683;NBN;nibrin
355;FAS;Fas cell surface death receptor
6117;RPA1;replication protein A1
2072;ERCC4;excision repair cross-complementation group 4
2539;G6PD;glucose-6-phosphate dehydrogenase

AGING_MODULE_10

Functional_annotation

GO:0010769~REGULATION OF CELL MORPHOGENESIS INVOLVED IN DIFFERENTIATION
GO:0031344~REGULATION OF CELL PROJECTION ORGANIZATION
GO:0050767~REGULATION OF NEUROGENESIS
GO:0045664~REGULATION OF NEURON DIFFERENTIATION
GO:0050770~REGULATION OF AXONOGENESIS
GO:0050770~REGULATION OF AXONOGENESIS
GO:0060284~REGULATION OF CELL DEVELOPMENT
GO:0022604~REGULATION OF CELL MORPHOGENESIS
GO:0010721~NEGATIVE REGULATION OF CELL DEVELOPMENT
GO:0051960~REGULATION OF NERVOUS SYSTEM DEVELOPMENT
GO:0050768~NEGATIVE REGULATION OF NEUROGENESIS

Genes_entrezGene_symbol_name (AGING_MODULE_10)

4803;NGF;nerve growth factor
5747;PTK2;protein tyrosine kinase 2
4155;MBP;myelin basic protein
348;APOE;apolipoprotein E
7040;TGFB1;transforming growth factor beta 1
11178;LZTS1;leucine zipper, putative tumor suppressor 1
4804;NGFR;nerve growth factor receptor
4137;MAPT;microtubule associated protein tau
4092;SMAD7;SMAD family member 7
4916;NTRK3;neurotrophic tyrosine kinase, receptor, type 3
5663;PSEN1;presenilin 1
55558;PLXNA3;plexin A3
6405;SEMA3F;semaphorin 3F
4087;SMAD2;SMAD family member 2
57142;RTN4;reticulon 4
5364;PLXNB1;plexin B1
4088;SMAD3;SMAD family member 3
1942;EFNA1;ephrin-A1
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
998;CDC42;cell division cycle 42
1627;DBN1;drebrin 1
3673;ITGA2;integrin subunit alpha 2
585;BBS4;Bardet-Biedl syndrome 4
2475;MTOR;mechanistic target of rapamycin
80279;CDK5RAP3;CDK5 regulatory subunit associated protein 3
53637;S1PR5;sphingosine-1-phosphate receptor 5
4854;NOTCH3;notch 3
627;BDNF;brain-derived neurotrophic factor
7520;XRCC5;X-ray repair complementing defective repair in Chinese hamster cells 5
5468;PPARG;peroxisome proliferator activated receptor gamma
28514;DLL1;delta-like 1 (Drosophila)
8851;CDK5R1;cyclin-dependent kinase 5, regulatory subunit 1 (p35)
811;CALR;calreticulin
9241;NOG;noggin
7157;TP53;tumor protein p53

655;BMP7;bone morphogenetic protein 7
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
7424;VEGFC;vascular endothelial growth factor C
4009;LMX1A;LIM homeobox transcription factor 1 alpha
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
4683;NBN;nibrin
4821;NKX2-2;NK2 homeobox 2
10683;DLL3;delta-like 3 (Drosophila)
3670;ISL1;ISL LIM homeobox 1
259266;ASPM;abnormal spindle microtubule assembly
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
5176;SERPINF1;serpin peptidase inhibitor, clade F
(alpha-2 antiplasmin, pigment epithelium derived factor), member 1
7314;UBB;ubiquitin B
581;BAX;BCL2-associated X protein
3481;IGF2;insulin like growth factor 2
3486;IGFBP3;insulin like growth factor binding protein 3
3065;HDAC1;histone deacetylase 1
9759;HDAC4;histone deacetylase 4
8841;HDAC3;histone deacetylase 3
3630;INS;insulin
2247;FGF2;fibroblast growth factor 2
91653;BOC;BOC cell adhesion associated, oncogene regulated
7422;VEGFA;vascular endothelial growth factor A
5921;RASA1;RAS p21 protein activator 1
10602;CDC42EP3;CDC42 effector protein 3
10630;PDPN;podoplanin
2038;EPB42;erythrocyte membrane protein band 4.2
2768;GNA12;G protein subunit alpha 12
10395;DLC1;DLC1 Rho GTPase activating protein
3479;IGF1;insulin like growth factor 1
5020;OXT;oxytocin/neurophysin I prepropeptide
5578;PRKCA;protein kinase C alpha
1950;EGF;epidermal growth factor
7018;TF;transferrin

AGING_MODULE_11

Functional_annotation

GO:0008585~FEMALE GONAD DEVELOPMENT
GO:0045137~DEVELOPMENT OF PRIMARY SEXUAL CHARACTERISTICS
GO:0008406~GONAD DEVELOPMENT
GO:0003006~REPRODUCTIVE DEVELOPMENTAL PROCESS
GO:0048608~REPRODUCTIVE STRUCTURE DEVELOPMENT
GO:0046660~FEMALE SEX DIFFERENTIATION
GO:0048511~RHYTHMIC PROCESS
GO:0032504~MULTICELLULAR ORGANISM REPRODUCTION
GO:0046545~DEVELOPMENT OF PRIMARY FEMALE SEXUAL CHARACTERISTICS
GO:0048609~REPRODUCTIVE PROCESS IN A MULTICELLULAR ORGANISM
GO:0042698~OVULATION CYCLE

Genes_entrezGene_symbol_name (AGING_MODULE_11)

7422;VEGFA;vascular endothelial growth factor A
3625;INHBB;inhibin beta B
581;BAX;BCL2-associated X protein
6776;STAT5A;signal transducer and activator of transcription 5A
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
2296;FOXC1;forkhead box C1
6777;STAT5B;signal transducer and activator of transcription 5B
3953;LEPR;leptin receptor
3952;LEP;leptin
658;BMPR1B;bone morphogenetic protein receptor type 1B
10468;FST;follistatin
6647;SOD1;superoxide dismutase 1, soluble
23411;SIRT1;sirtuin 1
2309;FOXO3;forkhead box O3
675;BRCA2;breast cancer 2
1718;DHCR24;24-dehydrocholesterol reductase
6665;SOX15;SRY-box 15
367;AR;androgen receptor
5156;PDGFRA;platelet derived growth factor receptor alpha
8626;TP63;tumor protein p63
92;ACVR2A;activin A receptor type 2A
4257;MGST1;microsomal glutathione S-transferase 1
3028;HSD17B10;hydroxysteroid (17-beta) dehydrogenase 10
5950;RBP4;retinol binding protein 4
3714;JAG2;jagged 2
2067;ERCC1;excision repair cross-complementation group 1
5521;PPP2R2B;protein phosphatase 2 regulatory subunit B, beta
2057;EPOR;erythropoietin receptor
585;BBS4;Bardet-Biedl syndrome 4
682;BSG;basigin (Ok blood group)
3480;IGF1R;insulin like growth factor 1 receptor
583;BBS2;Bardet-Biedl syndrome 2
3643;INSR;insulin receptor
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
9702;CEP57;centrosomal protein 57kDa

9241;NOG;noggin
5743;PTGS2;prostaglandin-endoperoxide synthase 2
5819;NECTIN2;nectin cell adhesion molecule 2
7704;ZBTB16;zinc finger and BTB domain containing 16
2185;PTK2B;protein tyrosine kinase 2 beta
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
578;BAK1;BCL2 antagonist/killer 1
3306;HSPA2;heat shock protein family A (Hsp70) member 2
2475;MTOR;mechanistic target of rapamycin
6387;CXCL12;C-X-C motif chemokine ligand 12
3725;JUN;jun proto-oncogene
8863;PER3;period circadian clock 3
5730;PTGDS;prostaglandin D2 synthase
100;ADA;adenosine deaminase
2796;GNRH1;gonadotropin releasing hormone 1
1956;EGFR;epidermal growth factor receptor
55068;ENOX1;ecto-NOX disulfide-thiol exchanger 1
406;ARNTL;aryl hydrocarbon receptor nuclear translocator like
9575;CLOCK;clock circadian regulator
3131;HLF;hepatic leukemia factor
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
4862;NPAS2;neuronal PAS domain protein 2
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
2879;GPX4;glutathione peroxidase 4
6347;CCL2;C-C motif chemokine ligand 2
3688;ITGB1;integrin subunit beta 1
4000;LMNA;lamin A/C
587;BCAT2;branched chain amino acid transaminase 2
5238;PGM3;phosphoglucomutase 3
7257;TSNAX;translin-associated factor X
604;BCL6;B-cell CLL/lymphoma 6
5744;PTHLH;parathyroid hormone-like hormone
4292;MLH1;mutL homolog 1
55339;WDR33;WD repeat domain 33
5987;TRIM27;tripartite motif containing 27
56648;EIF5A2;eukaryotic translation initiation factor 5A2
472;ATM;ATM serine/threonine kinase
7009;TMBIM6;transmembrane BAX inhibitor motif containing 6
3064;HTT;huntingtin
9043;SPAG9;sperm associated antigen 9
3297;HSF1;heat shock transcription factor 1
7040;TGFB1;transforming growth factor beta 1
2936;GSR;glutathione reductase
54457;TAF7L;TATA-box binding protein associated factor 7 like
3857;KRT9;keratin 9
9444;QKI;QKI, KH domain containing, RNA binding
1312;COMT;catechol-O-methyltransferase
5020;OXT;oxytocin/neurophysin I prepropeptide
51207;DUSP13;dual specificity phosphatase 13
10656;KHDRBS3;KH domain containing, RNA binding, signal transduction associated 3

3014;H2AFX;H2A histone family member X
6667;SP1;Sp1 transcription factor
2177;FANCD2;Fanconi anemia complementation group D2
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
491;ATP2B2;ATPase plasma membrane Ca2+ transporting 2
5104;SERPINA5;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5
6908;TBP;TATA-box binding protein
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11

AGING_MODULE_12

Functional_annotation

GO:0005996~MONOSACCHARIDE METABOLIC PROCESS
GO:0046364~MONOSACCHARIDE BIOSYNTHETIC PROCESS
GO:0046165~ALCOHOL BIOSYNTHETIC PROCESS
GO:0034637~CELLULAR CARBOHYDRATE BIOSYNTHETIC PROCESS
GO:0019319~HEXOSE BIOSYNTHETIC PROCESS
GO:0006094~GLUCONEOGENESIS
GO:0016051~CARBOHYDRATE BIOSYNTHETIC PROCESS
GO:0006006~GLUCOSE METABOLIC PROCESS
GO:0019318~HEXOSE METABOLIC PROCESS
GO:0006090~PYRUVATE METABOLIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_12)

5106;PCK2;phosphoenolpyruvate carboxykinase 2, mitochondrial
2203;FBP1;fructose-bisphosphatase 1
2026;ENO2;enolase 2 (gamma, neuronal)
2932;GSK3B;glycogen synthase kinase 3 beta
3952;LEP;leptin
3481;IGF2;insulin like growth factor 2
5238;PGM3;phosphoglucomutase 3
1373;CPS1;carbamoyl-phosphate synthase 1
5210;PFKFB4;6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4
2821;GPI;glucose-6-phosphate isomerase
1432;MAPK14;mitogen-activated protein kinase 14
53632;PRKAG3;protein kinase AMP-activated non-catalytic subunit gamma 3
2762;GMDS;GDP-mannose 4,6-dehydratase
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
9945;GFPT2;glutamine-fructose-6-phosphate transaminase 2
5236;PGM1;phosphoglucomutase 1
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
1737;DLAT;dihydrolipoamide S-acetyltransferase
8660;IRS2;insulin receptor substrate 2
4190;MDH1;malate dehydrogenase 1
55293;UEVLD;UEV and lactate/malate dehyrogenase domains
25796;PGLS;6-phosphogluconolactonase
229;ALDOB;aldolase, fructose-bisphosphate B
4191;MDH2;malate dehydrogenase 2
5091;PC;pyruvate carboxylase
56548;CHST7;carbohydrate (N-acetylglucosamine 6-O) sulfotransferase 7
10993;SDS;serine dehydratase
5313;PKLR;pyruvate kinase, liver and RBC
8789;FBP2;fructose-bisphosphatase 2
7124;TNF;tumor necrosis factor
10007;GNPDA1;glucosamine-6-phosphate deaminase 1
2027;ENO3;enolase 3 (beta, muscle)
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
3630;INS;insulin
5160;PDHA1;pyruvate dehydrogenase (lipoamide) alpha 1
5562;PRKAA1;protein kinase AMP-activated catalytic subunit alpha 1

5162;PDHB;pyruvate dehydrogenase (lipoamide) beta
10891;PPARGC1A;PPARG coactivator 1 alpha
5499;PPP1CA;protein phosphatase 1 catalytic subunit alpha
5950;RBP4;retinol binding protein 4
11188;NISCH;nischarin
2539;G6PD;glucose-6-phosphate dehydrogenase
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
128178;EDARADD;EDAR-associated death domain
5336;PLCG2;phospholipase C gamma 2
2805;GOT1;glutamic-oxaloacetic transaminase 1, soluble
166012;CHST13;carbohydrate (chondroitin 4) sulfotransferase 13
9526;MPDU1;mannose-P-dolichol utilization defect 1
682;BSG;basigin (Ok blood group)
8050;PDHX;pyruvate dehydrogenase complex component X
3064;HTT;huntingtin

AGING_MODULE_13

Functional_annotation

GO:0030217~T CELL DIFFERENTIATION
GO:0002521~LEUKOCYTE DIFFERENTIATION
GO:0048534~HEMOPOIETIC OR LYMPHOID ORGAN DEVELOPMENT
GO:0001775~CELL ACTIVATION
GO:0046649~LYMPHOCYTE ACTIVATION
GO:0050870~POSITIVE REGULATION OF T CELL ACTIVATION
GO:0002520~IMMUNE SYSTEM DEVELOPMENT
GO:0030098~LYMPHOCYTE DIFFERENTIATION
GO:0045321~LEUKOCYTE ACTIVATION
GO:0050871~POSITIVE REGULATION OF B CELL ACTIVATION

Genes_entrezGene_symbol_name (AGING_MODULE_13)

3108;HLA-DMA;major histocompatibility complex, class II, DM alpha
1499;CTNNB1;catenin beta 1
3574;IL7;interleukin 7
7157;TP53;tumor protein p53
3575;IL7R;interleukin 7 receptor
7040;TGFB1;transforming growth factor beta 1
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
3707;ITPKB;inositol-trisphosphate 3-kinase B
53335;BCL11A;B-cell CLL/lymphoma 11A
1794;DOCK2;dedicator of cytokinesis 2
355;FAS;Fas cell surface death receptor
920;CD4;CD4 molecule
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
1958;EGR1;early growth response 1
3714;JAG2;jagged 2
641;BLM;Bloom syndrome RecQ like helicase
10892;MALT1;MALT1 paracaspase
3688;ITGB1;integrin subunit beta 1
581;BAX;BCL2-associated X protein
100;ADA;adenosine deaminase
7412;VCAM1;vascular cell adhesion molecule 1
5468;PPARG;peroxisome proliferator activated receptor gamma
5663;PSEN1;presenilin 1
604;BCL6;B-cell CLL/lymphoma 6
1050;CEBPA;CCAAT/enhancer binding protein alpha
6929;TCF3;transcription factor 3
998;CDC42;cell division cycle 42
5336;PLCG2;phospholipase C gamma 2
9759;HDAC4;histone deacetylase 4
7124;TNF;tumor necrosis factor
578;BAK1;BCL2 antagonist/killer 1
5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
1437;CSF2;colony stimulating factor 2
3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
6648;SOD2;superoxide dismutase 2, mitochondrial

5371;PML;promyelocytic leukemia
7076;TIMP1;TIMP metallopeptidase inhibitor 1
4791;NFKB2;nuclear factor of kappa light polypeptide gene enhancer in B-cells 2
28514;DLL1;delta-like 1 (Drosophila)
3217;HOXB7;homeobox B7
5238;PGM3;phosphoglucomutase 3
51327;AHSP;alpha hemoglobin stabilizing protein
3205;HOXA9;homeobox A9
23054;NCOA6;nuclear receptor coactivator 6
675;BRCA2;breast cancer 2
54861;SNRK;SNF related kinase
3717;JAK2;Janus kinase 2
4050;LTB;lymphotoxin beta
3394;IRF8;interferon regulatory factor 8
648;BMI1;BMI1 proto-oncogene, polycomb ring finger
6117;RPA1;replication protein A1
7422;VEGFA;vascular endothelial growth factor A
2068;ERCC2;excision repair cross-complementation group 2
7520;XRCC5;X-ray repair complementing defective repair in Chinese hamster cells 5
5925;RB1;retinoblastoma 1
2038;EPB42;erythrocyte membrane protein band 4.2
6667;SP1;Sp1 transcription factor
5341;PLEK;pleckstrin
7704;ZBTB16;zinc finger and BTB domain containing 16
5469;MED1;mediator complex subunit 1
22985;ACIN1;apoptotic chromatin condensation inducer 1
2539;G6PD;glucose-6-phosphate dehydrogenase
6647;SOD1;superoxide dismutase 1, soluble
2067;ERCC1;excision repair cross-complementation group 1
7450;VWF;von Willebrand factor
54472;TOLLIP;toll interacting protein
3481;IGF2;insulin like growth factor 2
3070;HELLS;helicase, lymphoid-specific
4088;SMAD3;SMAD family member 3
1956;EGFR;epidermal growth factor receptor
4292;MLH1;mutL homolog 1
3569;IL6;interleukin 6
4683;NBN;nibrin
7099;TLR4;toll like receptor 4
6376;CX3CL1;C-X3-C motif chemokine ligand 1
5580;PRKCD;protein kinase C delta
1281;COL3A1;collagen type III alpha 1
4277;MICB;MHC class I polypeptide-related sequence B
51284;TLR7;toll like receptor 7
3684;ITGAM;integrin subunit alpha M
7534;YWHAZ;tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein zeta
3329;HSPD1;heat shock protein family D (Hsp60) member 1
2280;FKBP1A;FK506 binding protein 1A
7096;TLR1;toll like receptor 1
5156;PDGFRA;platelet derived growth factor receptor alpha

5291;PIK3CB;phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit beta
3630;INS;insulin
6387;CXCL12;C-X-C motif chemokine ligand 12
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
10148;EBI3;Epstein-Barr virus induced 3
3553;IL1B;interleukin 1 beta
3606;IL18;interleukin 18
3561;IL2RG;interleukin 2 receptor subunit gamma
3978;LIG1;ligase I, DNA, ATP-dependent
2547;XRCC6;X-ray repair complementing defective repair in Chinese hamster cells 6
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A

AGING_MODULE_14

Functional_annotation

GO:0051340~REGULATION OF LIGASE ACTIVITY
GO:0051444~NEGATIVE REGULATION OF UBIQUITIN-PROTEIN LIGASE ACTIVITY
GO:0031145~ANAPHASE-PROMOTING COMPLEX-DEPENDENT PROTEASOMAL
UBIQUITIN-DEPENDENT PROTEIN CATABOLIC PROCESS
GO:0051438~REGULATION OF UBIQUITIN-PROTEIN LIGASE ACTIVITY
GO:0031400~NEGATIVE REGULATION OF PROTEIN MODIFICATION PROCESS
GO:0031396~REGULATION OF PROTEIN UBIQUITINATION
GO:0051352~NEGATIVE REGULATION OF LIGASE ACTIVITY
GO:0031398~POSITIVE REGULATION OF PROTEIN UBIQUITINATION
GO:0031397~NEGATIVE REGULATION OF PROTEIN UBIQUITINATION

Genes_entrezGene_symbol_name (AGING_MODULE_14)

2730;GCLM;glutamate-cysteine ligase modifier subunit
5720;PSME1;proteasome activator subunit 1
7314;UBB;ubiquitin B
10444;ZER1;zyg-11 related, cell cycle regulator
51529;ANAPC11;anaphase promoting complex subunit 11
5300;PIN1;peptidylprolyl cis/trans isomerase, NIMA-interacting 1
51433;ANAPC5;anaphase promoting complex subunit 5
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
9184;BUB3;BUB3 mitotic checkpoint protein
983;CDK1;cyclin-dependent kinase 1
5705;PSMC5;proteasome 26S subunit, ATPase 5
5693;PSMB5;proteasome subunit beta 5
5690;PSMB2;proteasome subunit beta 2
4092;SMAD7;SMAD family member 7
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
29945;ANAPC4;anaphase promoting complex subunit 4
10197;PSME3;proteasome activator subunit 3
5694;PSMB6;proteasome subunit beta 6
8881;CDC16;cell division cycle 16
5714;PSMD8;proteasome 26S subunit, non-ATPase 8
3725;JUN;jun proto-oncogene
5580;PRKCD;protein kinase C delta
5582;PRKCG;protein kinase C gamma
7040;TGFB1;transforming growth factor beta 1
5590;PRKCZ;protein kinase C zeta
581;BAX;BCL2-associated X protein
7248;TSC1;tuberous sclerosis 1
3486;IGFBP3;insulin like growth factor binding protein 3
5663;PSEN1;presenilin 1
2729;GCLC;glutamate-cysteine ligase catalytic subunit
3643;INSR;insulin receptor
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
5578;PRKCA;protein kinase C alpha
2280;FKBP1A;FK506 binding protein 1A
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4

578;BAK1;BCL2 antagonist/killer 1
1020;CDK5;cyclin-dependent kinase 5
2539;G6PD;glucose-6-phosphate dehydrogenase
10273;STUB1;STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
672;BRCA1;breast cancer 1

AGING_MODULE_15

Functional_annotation

GO:0002705~POSITIVE REGULATION OF LEUKOCYTE MEDIATED IMMUNITY
GO:0002706~REGULATION OF LYMPHOCYTE MEDIATED IMMUNITY
GO:0002819~REGULATION OF ADAPTIVE IMMUNE RESPONSE
GO:0002709~REGULATION OF T CELL MEDIATED IMMUNITY
GO:0002822~REGULATION OF ADAPTIVE IMMUNE RESPONSE BASED
ON SOMATIC RECOMBINATION OF IMMUNE RECEPTORS BUILT FROM IMMUNOGLOBULIN SUPERFAMILY
GO:0002708~POSITIVE REGULATION OF LYMPHOCYTE MEDIATED IMMUNITY
GO:0002703~REGULATION OF LEUKOCYTE MEDIATED IMMUNITY
GO:0002699~POSITIVE REGULATION OF IMMUNE EFFECTOR PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_15)

3902;LAG3;lymphocyte activating 3
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
64127;NOD2;nucleotide binding oligomerization domain containing 2
10892;MALT1;MALT1 paracaspase
2207;FCER1G;Fc fragment of IgE receptor Ig
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
3329;HSPD1;heat shock protein family D (Hsp60) member 1
3553;IL1B;interleukin 1 beta
718;C3;complement component 3
5819;NECTIN2;nectin cell adhesion molecule 2
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
3575;IL7R;interleukin 7 receptor
7040;TGFB1;transforming growth factor beta 1
53833;IL20RB;interleukin 20 receptor subunit beta
604;BCL6;B-cell CLL/lymphoma 6
100;ADA;adenosine deaminase

AGING_MODULE_16

Functional_annotation

GO:0006935~CHEMOTAXIS
GO:0030595~LEUKOCYTE CHEMOTAXIS
GO:0060326~CELL CHEMOTAXIS
GO:0048870~CELL MOTILITY
GO:0051674~LOCALIZATION OF CELL
GO:0050900~LEUKOCYTE MIGRATION
GO:0042330~TAXIS
GO:0016477~CELL MIGRATION

Genes_entrezGene_symbol_name (AGING_MODULE_16)

6376;CX3CL1;C-X3-C motif chemokine ligand 1
123920;CMTM3;CKLF like MARVEL transmembrane domain containing 3
727;C5;complement component 5
728;C5AR1;complement component 5a receptor 1
6347;CCL2;C-C motif chemokine ligand 2
1672;DEFB1;defensin beta 1
154796;AMOT;angiomotin
1230;CCR1;chemokine (C-C motif) receptor 1
6368;CCL23;C-C motif chemokine ligand 23
55558;PLXNA3;plexin A3
6405;SEMA3F;semaphorin 3F
58191;CXCL16;C-X-C motif chemokine ligand 16
1794;DOCK2;dedicator of cytokinesis 2
79902;NUP85;nucleoporin 85kDa
6366;CCL21;C-C motif chemokine ligand 21
6280;S100A9;S100 calcium binding protein A9
5594;MAPK1;mitogen-activated protein kinase 1
1432;MAPK14;mitogen-activated protein kinase 14
3684;ITGAM;integrin subunit alpha M
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
5159;PDGFRB;platelet derived growth factor receptor beta
5578;PRKCA;protein kinase C alpha
3553;IL1B;interleukin 1 beta
5291;PIK3CB;phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit beta
5155;PDGFB;platelet derived growth factor subunit B
5880;RAC2;ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
3569;IL6;interleukin 6
5328;PLAU;plasminogen activator, urokinase
2247;FGF2;fibroblast growth factor 2
719;C3AR1;complement component 3a receptor 1
6387;CXCL12;C-X-C motif chemokine ligand 12
84962;AJUBA;ajuba LIM protein
9201;DCLK1;doublecortin like kinase 1
3688;ITGB1;integrin subunit beta 1
581;BAX;BCL2-associated X protein
7412;VCAM1;vascular cell adhesion molecule 1
2296;FOXC1;forkhead box C1
3911;LAMA5;laminin subunit alpha 5

6340;SCNN1G;sodium channel epithelial 1 gamma subunit
2321;FLT1;fms related tyrosine kinase 1
5663;PSEN1;presenilin 1
885;CCK;cholecystokinin
5830;PEX5;peroxisomal biogenesis factor 5
506;ATP5B;ATP synthase, H+ transporting, mitochondrial F1 complex, beta polypeptide
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
1289;COL5A1;collagen type V alpha 1
5747;PTK2;protein tyrosine kinase 2
2876;GPX1;glutathione peroxidase 1
7424;VEGFC;vascular endothelial growth factor C
10451;VAV3;vav guanine nucleotide exchange factor 3
10152;ABI2;abl-interactor 2
1839;HBEGF;heparin binding EGF like growth factor
1020;CDK5;cyclin-dependent kinase 5
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
5649;RELN;reelin
7040;TGFB1;transforming growth factor beta 1
949;SCARB1;scavenger receptor class B member 1
8851;CDK5R1;cyclin-dependent kinase 5, regulatory subunit 1 (p35)
947;CD34;CD34 molecule
5364;PLXNB1;plexin B1
2100;ESR2;estrogen receptor 2 (ER beta)
1490;CTGF;connective tissue growth factor
5979;RET;ret proto-oncogene
7291;TWIST1;twist family bHLH transcription factor 1
2185;PTK2B;protein tyrosine kinase 2 beta
7155;TOP2B;topoisomerase (DNA) II beta
1462;VCAN;versican
7124;TNF;tumor necrosis factor
3670;ISL1;ISL LIM homeobox 1

AGING_MODULE_17

Functional_annotation

HSA05215:PROSTATE CANCER
HSA05213:ENDOMETRIAL CANCER
HSA05214:GLIOMA
HSA05220:CHRONIC MYELOID LEUKEMIA
HSA05200:PATHWAYS IN CANCER
HSA05223:NON-SMALL CELL LUNG CANCER
HSA05219:BLADDER CANCER
HSA05218:MELANOMA

Genes_entrezGene_symbol_name (AGING_MODULE_17)

5170;PDPK1;3-phosphoinositide dependent protein kinase 1
1499;CTNNB1;catenin beta 1
3479;IGF1;insulin like growth factor 1
367;AR;androgen receptor
1870;E2F2;E2F transcription factor 2
5925;RB1;retinoblastoma 1
51176;LEF1;lymphoid enhancer binding factor 1
3480;IGF1R;insulin like growth factor 1 receptor
3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
2950;GSTP1;glutathione S-transferase pi 1
2932;GSK3B;glycogen synthase kinase 3 beta
5595;MAPK3;mitogen-activated protein kinase 3
3481;IGF2;insulin like growth factor 2
2885;GRB2;growth factor receptor bound protein 2
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
5594;MAPK1;mitogen-activated protein kinase 1
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
2308;FOXO1;forkhead box O1
2033;EP300;E1A binding protein p300
1869;E2F1;E2F transcription factor 1
5159;PDGFRB;platelet derived growth factor receptor beta
1956;EGFR;epidermal growth factor receptor
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
3551;IKBKB;inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
7157;TP53;tumor protein p53
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
1950;EGF;epidermal growth factor
5156;PDGFRA;platelet derived growth factor receptor alpha
5291;PIK3CB;phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit beta
5155;PDGFB;platelet derived growth factor subunit B
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
3630;INS;insulin
2260;FGFR1;fibroblast growth factor receptor 1
4792;NFKBIA;NFKB inhibitor alpha
5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
1387;CREBBP;CREB binding protein
2064;ERBB2;erb-b2 receptor tyrosine kinase 2

5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
2475;MTOR;mechanistic target of rapamycin
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
2309;FOXO3;forkhead box O3
4292;MLH1;mutL homolog 1
818;CAMK2G;calcium/calmodulin-dependent protein kinase II gamma
808;CALM3;calmodulin 3 (phosphorylase kinase, delta)
5582;PRKCG;protein kinase C gamma
801;CALM1;calmodulin 1 (phosphorylase kinase, delta)
5579;PRKCB;protein kinase C beta
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
5578;PRKCA;protein kinase C alpha
5336;PLCG2;phospholipase C gamma 2
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
7040;TGFB1;transforming growth factor beta 1
4088;SMAD3;SMAD family member 3
91;ACVR1B;activin A receptor type 1B
25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
3065;HDAC1;histone deacetylase 1
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
3725;JUN;jun proto-oncogene
3673;ITGA2;integrin subunit alpha 2
5371;PML;promyelocytic leukemia
5468;PPARG;peroxisome proliferator activated receptor gamma
4087;SMAD2;SMAD family member 2
5743;PTGS2;prostaglandin-endoperoxide synthase 2
675;BRCA2;breast cancer 2
7424;VEGFC;vascular endothelial growth factor C
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
1857;DVL3;dishevelled segment polarity protein 3
7422;VEGFA;vascular endothelial growth factor A
6258;RXRG;retinoid X receptor gamma
5888;RAD51;RAD51 recombinase
1050;CEBPA;CCAAT/enhancer binding protein alpha
5899;RALB;v-ral simian leukemia viral oncogene homolog B
7704;ZBTB16;zinc finger and BTB domain containing 16
5601;MAPK9;mitogen-activated protein kinase 9
2247;FGF2;fibroblast growth factor 2
9063;PIAS2;protein inhibitor of activated STAT 2
637;BID;BH3 interacting domain death agonist
2271;FH;fumarate hydratase
3912;LAMB1;laminin subunit beta 1
3688;ITGB1;integrin subunit beta 1
3909;LAMA3;laminin subunit alpha 3
581;BAX;BCL2-associated X protein
2257;FGF12;fibroblast growth factor 12

6513;SLC2A1;solute carrier family 2 member 1
3911;LAMA5;laminin subunit alpha 5
4149;MAX;MYC associated factor X
22798;LAMB4;laminin subunit beta 4
4791;NFKB2;nuclear factor of kappa light polypeptide gene enhancer in B-cells 2
5599;MAPK8;mitogen-activated protein kinase 8
10342;TFG;TRK-fused gene
998;CDC42;cell division cycle 42
2253;FGF8;fibroblast growth factor 8
5747;PTK2;protein tyrosine kinase 2
5900;RALGDS;ral guanine nucleotide dissociation stimulator
2258;FGF13;fibroblast growth factor 13
3569;IL6;interleukin 6
1288;COL4A6;collagen type IV alpha 6
5880;RAC2;ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
1284;COL4A2;collagen type IV alpha 2
3914;LAMB3;laminin subunit beta 3
7175;TPR;translocated promoter region, nuclear basket protein
2261;FGFR3;fibroblast growth factor receptor 3
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
3674;ITGA2B;integrin subunit alpha 2b
355;FAS;Fas cell surface death receptor
2246;FGF1;fibroblast growth factor 1
10401;PIAS3;protein inhibitor of activated STAT 3
26060;APPL1;adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1
8074;FGF23;fibroblast growth factor 23
5979;RET;ret proto-oncogene

AGING_MODULE_18

Functional_annotation

GO:0031401~POSITIVE REGULATION OF PROTEIN MODIFICATION PROCESS
GO:0045732~POSITIVE REGULATION OF PROTEIN CATABOLIC PROCESS
GO:0001932~REGULATION OF PROTEIN AMINO ACID PHOSPHORYLATION
GO:0051247~POSITIVE REGULATION OF PROTEIN METABOLIC PROCESS
GO:0032434~REGULATION OF PROTEASOMAL UBIQUITIN-DEPENDENT PROTEIN CATABOLIC PROCESS
GO:0031399~REGULATION OF PROTEIN MODIFICATION PROCESS
GO:0032270~POSITIVE REGULATION OF CELLULAR PROTEIN METABOLIC PROCESS
GO:0032268~REGULATION OF CELLULAR PROTEIN METABOLIC PROCESS
GO:0045862~POSITIVE REGULATION OF PROTEOLYSIS
GO:0032436~POSITIVE REGULATION OF PROTEASOMAL UBIQUITIN-DEPENDENT PROTEIN CATABOLIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_18)

7314;UBB;ubiquitin B
3479;IGF1;insulin like growth factor 1
3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
5371;PML;promyelocytic leukemia
5705;PSMC5;proteasome 26S subunit, ATPase 5
3481;IGF2;insulin like growth factor 2
5663;PSEN1;presenilin 1
885;CCK;cholecystokinin
3643;INSR;insulin receptor
672;BRCA1;breast cancer 1
2690;GHR;growth hormone receptor
64127;NOD2;nucleotide binding oligomerization domain containing 2
3717;JAK2;Janus kinase 2
51433;ANAPC5;anaphase promoting complex subunit 5
655;BMP7;bone morphogenetic protein 7
10273;STUB1;STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
3553;IL1B;interleukin 1 beta
7424;VEGFC;vascular endothelial growth factor C
1789;DNMT3B;DNA (cytosine-5-)-methyltransferase 3 beta
92;ACVR2A;activin A receptor type 2A
4092;SMAD7;SMAD family member 7
2688;GH1;growth hormone 1
3569;IL6;interleukin 6
8881;CDC16;cell division cycle 16
10891;PPARGC1A;PPARG coactivator 1 alpha
1437;CSF2;colony stimulating factor 2
146433;IL34;interleukin 34
253260;RICTOR;RPTOR independent companion of MTOR, complex 2
7099;TLR4;toll like receptor 4
51529;ANAPC11;anaphase promoting complex subunit 11
7040;TGFB1;transforming growth factor beta 1
10401;PIAS3;protein inhibitor of activated STAT 3
5693;PSMB5;proteasome subunit beta 5
5690;PSMB2;proteasome subunit beta 2

10188;TNK2;tyrosine kinase, non-receptor, 2
920;CD4;CD4 molecule
5578;PRKCA;protein kinase C alpha
5720;PSME1;proteasome activator subunit 1
5300;PIN1;peptidylprolyl cis/trans isomerase, NIMA-interacting 1
2280;FKBP1A;FK506 binding protein 1A
10395;DLC1;DLC1 Rho GTPase activating protein
983;CDK1;cyclin-dependent kinase 1
9759;HDAC4;histone deacetylase 4
5524;PPP2R4;protein phosphatase 2A regulatory subunit 4
7124;TNF;tumor necrosis factor
29945;ANAPC4;anaphase promoting complex subunit 4
3630;INS;insulin
10197;PSME3;proteasome activator subunit 3
5694;PSMB6;proteasome subunit beta 6
2247;FGF2;fibroblast growth factor 2
2475;MTOR;mechanistic target of rapamycin
5714;PSMD8;proteasome 26S subunit, non-ATPase 8
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
2729;GCLC;glutamate-cysteine ligase catalytic subunit
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
6872;TAF1;TATA-box binding protein associated factor 1
348;APOE;apolipoprotein E
3725;JUN;jun proto-oncogene
5590;PRKCZ;protein kinase C zeta
581;BAX;BCL2-associated X protein
3486;IGFBP3;insulin like growth factor binding protein 3
7161;TP73;tumor protein p73
4217;MAP3K5;mitogen-activated protein kinase kinase kinase 5
5159;PDGFRB;platelet derived growth factor receptor beta
1956;EGFR;epidermal growth factor receptor
1950;EGF;epidermal growth factor
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
2074;ERCC6;excision repair cross-complementation group 6
23162;MAPK8IP3;mitogen-activated protein kinase 8 interacting protein 3
9064;MAP3K6;mitogen-activated protein kinase kinase kinase 6
28988;DBNL;drebrin like
5585;PKN1;protein kinase N1
5580;PRKCD;protein kinase C delta
5058;PAK1;p21 protein (Cdc42/Rac)-activated kinase 1
875;CBS;cystathionine-beta-synthase
2185;PTK2B;protein tyrosine kinase 2 beta
5155;PDGFB;platelet derived growth factor subunit B
578;BAK1;BCL2 antagonist/killer 1
27250;PDCD4;programmed cell death 4 (neoplastic transformation inhibitor)
3673;ITGA2;integrin subunit alpha 2
5594;MAPK1;mitogen-activated protein kinase 1
2033;EP300;E1A binding protein p300
56648;EIF5A2;eukaryotic translation initiation factor 5A2
4792;NFKBIA;NFKB inhibitor alpha

185;AGTR1;angiotensin II receptor type 1
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
7376;NR1H2;nuclear receptor subfamily 1 group H member 2
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
7248;TSC1;tuberous sclerosis 1
1020;CDK5;cyclin-dependent kinase 5
10444;ZER1;zyg-11 related, cell cycle regulator
5582;PRKCG;protein kinase C gamma
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
9184;BUB3;BUB3 mitotic checkpoint protein
2539;G6PD;glucose-6-phosphate dehydrogenase
4790;NFKB1;nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
811;CALR;calreticulin
7076;TIMP1;TIMP metallopeptidase inhibitor 1
3488;IGFBP5;insulin like growth factor binding protein 5
351;APP;amyloid beta precursor protein
2;A2M;alpha-2-macroglobulin
5774;PTPN3;protein tyrosine phosphatase, non-receptor type 3
5648;MASP1;mannan binding lectin serine peptidase 1
9444;QKI;QKI, KH domain containing, RNA binding
677;ZFP36L1;ZFP36 ring finger protein-like 1
1974;EIF4A2;eukaryotic translation initiation factor 4A2
64215;DNAJC1;DnaJ heat shock protein family (Hsp40) member C1
48;ACO1;aconitase 1
10642;IGF2BP1;insulin like growth factor 2 mRNA binding protein 1
5104;SERPINA5;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5
3658;IREB2;iron responsive element binding protein 2
9470;EIF4E2;eukaryotic translation initiation factor 4E family member 2

AGING_MODULE_19

Functional_annotation

GO:0070271~PROTEIN COMPLEX BIOGENESIS
GO:0051259~PROTEIN OLIGOMERIZATION
GO:0065003~MACROMOLECULAR COMPLEX ASSEMBLY
GO:0043933~MACROMOLECULAR COMPLEX SUBUNIT ORGANIZATION
GO:0006461~PROTEIN COMPLEX ASSEMBLY
GO:0051262~PROTEIN TETRAMERIZATION
GO:0051260~PROTEIN HOMOOLIGOMERIZATION

Genes_entrezGene_symbol_name (AGING_MODULE_19)

7450;VWF;von Willebrand factor
93974;ATPIF1;ATPase inhibitory factor 1
1175;AP2S1;adaptor related protein complex 2 sigma 1 subunit
1499;CTNNB1;catenin beta 1
10892;MALT1;MALT1 paracaspase
5563;PRKAA2;protein kinase AMP-activated catalytic subunit alpha 2
3084;NRG1;neuregulin 1
5590;PRKCZ;protein kinase C zeta
1870;E2F2;E2F transcription factor 2
6648;SOD2;superoxide dismutase 2, mitochondrial
30000;TNPO2;transportin 2
5371;PML;promyelocytic leukemia
23165;NUP205;nucleoporin 205kDa
581;BAX;BCL2-associated X protein
8774;NAPG;NSF attachment protein gamma
8626;TP63;tumor protein p63
3480;IGF1R;insulin like growth factor 1 receptor
23214;XPO6;exportin 6
7388;UQCRH;ubiquinol-cytochrome c reductase hinge protein
7248;TSC1;tuberous sclerosis 1
2885;GRB2;growth factor receptor bound protein 2
25923;ATL3;atlastin GTPase 3
4087;SMAD2;SMAD family member 2
5830;PEX5;peroxisomal biogenesis factor 5
3643;INSR;insulin receptor
4088;SMAD3;SMAD family member 3
23054;NCOA6;nuclear receptor coactivator 6
6810;STX4;syntaxin 4
978;CDA;cytidine deaminase
3265;HRAS;Harvey rat sarcoma viral oncogene homolog
10526;IPO8;importin 8
4292;MLH1;mutL homolog 1
3299;HSF4;heat shock transcription factor 4
4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
5987;TRIM27;tripartite motif containing 27
64127;NOD2;nucleotide binding oligomerization domain containing 2
7157;TP53;tumor protein p53
5747;PTK2;protein tyrosine kinase 2
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2

7013;TERF1;telomeric repeat binding factor 1
2878;GPX3;glutathione peroxidase 3
3667;IRS1;insulin receptor substrate 1
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
3028;HSD17B10;hydroxysteroid (17-beta) dehydrogenase 10
4629;MYH11;myosin, heavy chain 11, smooth muscle
10891;PPARGC1A;PPARG coactivator 1 alpha
6872;TAF1;TATA-box binding protein associated factor 1
1020;CDK5;cyclin-dependent kinase 5
355;FAS;Fas cell surface death receptor
1387;CREBBP;CREB binding protein
55835;CENPJ;centromere protein J
9043;SPAG9;sperm associated antigen 9
11076;TPPP;tubulin polymerization promoting protein
7415;VCP;valosin containing protein
2071;ERCC3;excision repair cross-complementation group 3
79077;DCTPP1;dCTP pyrophosphatase 1
617;BCS1L;BCS1 homolog, ubiquinol-cytochrome c reductase complex chaperone
3108;HLA-DMA;major histocompatibility complex, class II, DM alpha
25813;SAMM50;SAMM50 sorting and assembly machinery component
2068;ERCC2;excision repair cross-complementation group 2
7040;TGFB1;transforming growth factor beta 1
241;ALOX5AP;arachidonate 5-lipoxygenase activating protein
5536;PPP5C;protein phosphatase 5 catalytic subunit
9341;VAMP3;vesicle associated membrane protein 3
54457;TAF7L;TATA-box binding protein associated factor 7 like
9404;LPXN;leupaxin
10439;OLFM1;olfactomedin 1
6877;TAF5;TATA-box binding protein associated factor 5
64756;ATPAF1;ATP synthase mitochondrial F1 complex assembly factor 1
25909;AHCTF1;AT-hook containing transcription factor 1
3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
9185;REPS2;RALBP1 associated Eps domain containing 2
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
811;CALR;calreticulin
5437;POLR2H;polymerase (RNA) II subunit H
5888;RAD51;RAD51 recombinase
641;BLM;Bloom syndrome RecQ like helicase
2185;PTK2B;protein tyrosine kinase 2 beta
5469;MED1;mediator complex subunit 1
2966;GTF2H2;general transcription factor IIH subunit 2
3329;HSPD1;heat shock protein family D (Hsp60) member 1
5621;PRNP;prion protein
2280;FKBP1A;FK506 binding protein 1A
5092;PCBD1;pterin-4 alpha-carbinolamine dehydratase 1
229;ALDOB;aldolase, fructose-bisphosphate B
4725;NDUFS5;NADH:ubiquinone oxidoreductase subunit S5
847;CAT;catalase
1022;CDK7;cyclin-dependent kinase 7
3710;ITPR3;inositol 1,4,5-trisphosphate receptor type 3

6857;SYT1;synaptotagmin 1
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
6908;TBP;TATA-box binding protein
6733;SRPK2;SRSF protein kinase 2
348;APOE;apolipoprotein E
4676;NAP1L4;nucleosome assembly protein 1 like 4
6646;SOAT1;sterol O-acyltransferase 1
6431;SRSF6;serine/arginine-rich splicing factor 6
3006;HIST1H1C;histone cluster 1, H1c
3021;H3F3B;H3 histone, family 3B (H3.3B)
8349;HIST2H2BE;histone cluster 2, H2be
26747;NUFIP1;nuclear fragile X mental retardation protein interacting protein 1
3014;H2AFX;H2A histone family member X
8365;HIST1H4H;histone cluster 1, H4h
64061;TSPYL2;TSPY-like 2
3070;HELLS;helicase, lymphoid-specific
6430;SRSF5;serine/arginine-rich splicing factor 5
201161;CENPV;centromere protein V
19;ABCA1;ATP binding cassette subfamily A member 1
10152;ABI2;abl-interactor 2
3925;STMN1;stathmin 1
185;AGTR1;angiotensin II receptor type 1
4023;LPL;lipoprotein lipase
1071;CETP;cholesteryl ester transfer protein, plasma
8289;ARID1A;AT-rich interaction domain 1A
949;SCARB1;scavenger receptor class B member 1
3931;LCAT;lecithin-cholesterol acyltransferase

AGING_MODULE_20

Functional_annotation

GO:0045792~NEGATIVE REGULATION OF CELL SIZE
GO:0032535~REGULATION OF CELLULAR COMPONENT SIZE
GO:0045926~NEGATIVE REGULATION OF GROWTH
GO:0001558~REGULATION OF CELL GROWTH
GO:0008361~REGULATION OF CELL SIZE
GO:0040008~REGULATION OF GROWTH
GO:0030308~NEGATIVE REGULATION OF CELL GROWTH

Genes_entrezGene_symbol_name (AGING_MODULE_20)

64061;TSPYL2;TSPY-like 2
79602;ADIPOR2;adiponectin receptor 2
7040;TGFB1;transforming growth factor beta 1
5925;RB1;retinoblastoma 1
5371;PML;promyelocytic leukemia
8626;TP63;tumor protein p63
5468;PPARG;peroxisome proliferator activated receptor gamma
1601;DAB2;Dab, mitogen-responsive phosphoprotein, homolog 2 (Drosophila)
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
7248;TSC1;tuberous sclerosis 1
55558;PLXNA3;plexin A3
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
6405;SEMA3F;semaphorin 3F
57142;RTN4;reticulon 4
604;BCL6;B-cell CLL/lymphoma 6
7161;TP73;tumor protein p73
4088;SMAD3;SMAD family member 3
2100;ESR2;estrogen receptor 2 (ER beta)
978;CDA;cytidine deaminase
91;ACVR1B;activin A receptor type 1B
3574;IL7;interleukin 7
7157;TP53;tumor protein p53
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
65981;CAPRIN2;caprin family member 2
9538;EI24;EI24, autophagy associated transmembrane protein
79594;MUL1;mitochondrial E3 ubiquitin protein ligase 1
2247;FGF2;fibroblast growth factor 2
2475;MTOR;mechanistic target of rapamycin
5921;RASA1;RAS p21 protein activator 1
3084;NRG1;neuregulin 1
367;AR;androgen receptor
9201;DCLK1;doublecortin like kinase 1
154796;AMOT;angiomotin
3481;IGF2;insulin like growth factor 2
51602;NOP58;NOP58 ribonucleoprotein
58191;CXCL16;C-X-C motif chemokine ligand 16
57731;SPTBN4;spectrin beta, non-erythrocytic 4
58;ACTA1;actin, alpha 1, skeletal muscle
2033;EP300;E1A binding protein p300

2260;FGFR1;fibroblast growth factor receptor 1
2261;FGFR3;fibroblast growth factor receptor 3
1839;HBEGF;heparin binding EGF like growth factor
351;APP;amyloid beta precursor protein
11078;TRIOBP;TRIO and F-actin binding protein
253260;RICTOR;RPTOR independent companion of MTOR, complex 2
4803;NGF;nerve growth factor
3575;IL7R;interleukin 7 receptor
5217;PFN2;profilin 2
4916;NTRK3;neurotrophic tyrosine kinase, receptor, type 3
6711;SPTBN1;spectrin beta, non-erythrocytic 1
2006;ELN;elastin
10109;ARPC2;actin related protein 2/3 complex subunit 2
5341;PLEK;pleckstrin
5962;RDX;radixin
2185;PTK2B;protein tyrosine kinase 2 beta
4137;MAPT;microtubule associated protein tau
5155;PDGFB;platelet derived growth factor subunit B
3630;INS;insulin
491;ATP2B2;ATPase plasma membrane Ca2+ transporting 2
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
6387;CXCL12;C-X-C motif chemokine ligand 12
583;BBS2;Bardet-Biedl syndrome 2
5747;PTK2;protein tyrosine kinase 2
2305;FOXM1;forkhead box M1
3485;IGFBP2;insulin like growth factor binding protein 2
728642;CDK11A;cyclin-dependent kinase 11A
3489;IGFBP6;insulin like growth factor binding protein 6
3486;IGFBP3;insulin like growth factor binding protein 3
185;AGTR1;angiotensin II receptor type 1
51232;CRIM1;cysteine rich transmembrane BMP regulator 1 (chordin-like)
3488;IGFBP5;insulin like growth factor binding protein 5
3487;IGFBP4;insulin like growth factor binding protein 4
1490;CTGF;connective tissue growth factor
348;APOE;apolipoprotein E
5654;HTRA1;HtrA serine peptidase 1
4009;LMX1A;LIM homeobox transcription factor 1 alpha
27346;TMEM97;transmembrane protein 97
8835;SOCS2;suppressor of cytokine signaling 2
780;DDR1;discoidin domain receptor tyrosine kinase 1
8839;WISP2;WNT1 inducible signaling pathway protein 2
1154;CISH;cytokine inducible SH2-containing protein
7314;UBB;ubiquitin B
23493;HEY2;hes related family bHLH transcription factor with YRPW motif 2
2596;GAP43;growth associated protein 43
3479;IGF1;insulin like growth factor 1
2296;FOXC1;forkhead box C1
3952;LEP;leptin
2621;GAS6;growth arrest specific 6
27429;HTRA2;HtrA serine peptidase 2

10477;UBE2E3;ubiquitin conjugating enzyme E2E 3
3643;INSR;insulin receptor
5830;PEX5;peroxisomal biogenesis factor 5
7486;WRN;Werner syndrome RecQ like helicase
86;ACTL6A;actin like 6A
9241;NOG;noggin
2690;GHR;growth hormone receptor
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
2688;GH1;growth hormone 1
142;PARP1;poly(ADP-ribose) polymerase 1
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
5950;RBP4;retinol binding protein 4
3297;HSF1;heat shock transcription factor 1
4654;MYOD1;myogenic differentiation 1
7442;TRPV1;transient receptor potential cation channel subfamily V member 1
10902;BRD8;bromodomain containing 8
8804;CREG1;cellular repressor of E1A stimulated genes 1
6647;SOD1;superoxide dismutase 1, soluble
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11

AGING_MODULE_21

Functional_annotation

GO:0008544~EPIDERMIS DEVELOPMENT
GO:0001942~HAIR FOLLICLE DEVELOPMENT
GO:0007398~ECTODERM DEVELOPMENT
GO:0022404~MOLTING CYCLE PROCESS
GO:0022405~HAIR CYCLE PROCESS
GO:0042303~MOLTING CYCLE
GO:0042633~HAIR CYCLE

Genes_entrezGene_symbol_name (AGING_MODULE_21)

5465;PPARA;peroxisome proliferator activated receptor alpha
2068;ERCC2;excision repair cross-complementation group 2
7442;TRPV1;transient receptor potential cation channel subfamily V member 1
1281;COL3A1;collagen type III alpha 1
7062;TCHH;trichohyalin
4804;NGFR;nerve growth factor receptor
3909;LAMA3;laminin subunit alpha 3
3857;KRT9;keratin 9
51176;LEF1;lymphoid enhancer binding factor 1
8626;TP63;tumor protein p63
3911;LAMA5;laminin subunit alpha 5
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
5663;PSEN1;presenilin 1
3852;KRT5;keratin 5
10468;FST;follistatin
1278;COL1A2;collagen type I alpha 2
3866;KRT15;keratin 15
1294;COL7A1;collagen type VII alpha 1
1490;CTGF;connective tissue growth factor
112802;KRT71;keratin 71
3868;KRT16;keratin 16
3882;KRT32;keratin 32
5743;PTGS2;prostaglandin-endoperoxide synthase 2
5744;PTHLH;parathyroid hormone-like hormone
1308;COL17A1;collagen type XVII alpha 1
342574;KRT27;keratin 27
1277;COL1A1;collagen type I alpha 1
1289;COL5A1;collagen type V alpha 1
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4
91;ACVR1B;activin A receptor type 1B
3891;KRT85;keratin 85
1718;DHCR24;24-dehydrocholesterol reductase
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
4050;LTB;lymphotoxin beta
10628;TXNIP;thioredoxin interacting protein
1290;COL5A2;collagen type V alpha 2
488;ATP2A2;ATPase sarcoplasmic/endoplasmic reticulum Ca2+ transporting 2
3914;LAMB3;laminin subunit beta 3

5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
128178;EDARADD;EDAR-associated death domain
2071;ERCC3;excision repair cross-complementation group 3
1499;CTNNB1;catenin beta 1
3853;KRT6A;keratin 6A
3854;KRT6B;keratin 6B
7020;TFAP2A;transcription factor AP-2 alpha (activating enhancer binding protein 2 alpha)

AGING_MODULE_22

Functional_annotation

GO:0000077~DNA DAMAGE CHECKPOINT
GO:0000075~CELL CYCLE CHECKPOINT
GO:0042770~DNA DAMAGE RESPONSE, SIGNAL TRANSDUCTION
GO:0031575~G1/S TRANSITION CHECKPOINT
GO:0031570~DNA INTEGRITY CHECKPOINT
GO:0007093~MITOTIC CELL CYCLE CHECKPOINT

Genes_entrezGene_symbol_name (AGING_MODULE_22)

7508;XPC;xeroderma pigmentosum, complementation group C
80254;CEP63;centrosomal protein 63kDa
7157;TP53;tumor protein p53
472;ATM;ATM serine/threonine kinase
51720;UIMC1;ubiquitin interaction motif containing 1
983;CDK1;cyclin-dependent kinase 1
9577;BRE;brain and reproductive organ-expressed (TNFRSF1A modulator)
5371;PML;promyelocytic leukemia
890;CCNA2;cyclin A2
545;ATR;ATR serine/threonine kinase
79791;FBXO31;F-box protein 31
4683;NBN;nibrin
4303;FOXO4;forkhead box O4
3014;H2AFX;H2A histone family member X
9656;MDC1;mediator of DNA damage checkpoint 1
55544;RBM38;RNA binding motif protein 38
1432;MAPK14;mitogen-activated protein kinase 14
11200;CHEK2;checkpoint kinase 2
641;BLM;Bloom syndrome RecQ like helicase
672;BRCA1;breast cancer 1
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
9587;MAD2L1BP;MAD2L1 binding protein
2068;ERCC2;excision repair cross-complementation group 2
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
7040;TGFB1;transforming growth factor beta 1
9184;BUB3;BUB3 mitotic checkpoint protein
5925;RB1;retinoblastoma 1
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
8379;MAD1L1;MAD1 mitotic arrest deficient-like 1 (yeast)
7013;TERF1;telomeric repeat binding factor 1
5932;RBBP8;retinoblastoma binding protein 8
7175;TPR;translocated promoter region, nuclear basket protein
2071;ERCC3;excision repair cross-complementation group 3
28996;HIPK2;homeodomain interacting protein kinase 2
7507;XPA;xeroderma pigmentosum, complementation group A
8626;TP63;tumor protein p63
7161;TP73;tumor protein p73
675;BRCA2;breast cancer 2
4292;MLH1;mutL homolog 1

25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
4646;MYO6;myosin VI
9131;AIFM1;apoptosis inducing factor, mitochondria associated 1
2074;ERCC6;excision repair cross-complementation group 6

AGING_MODULE_23

Functional_annotation

GO:0032496~RESPONSE TO LIPOPOLYSACCHARIDE
GO:0002218~ACTIVATION OF INNATE IMMUNE RESPONSE
GO:0002221~PATTERN RECOGNITION RECEPTOR SIGNALING PATHWAY
GO:0002237~RESPONSE TO MOLECULE OF BACTERIAL ORIGIN
GO:0009617~RESPONSE TO BACTERIUM
GO:0002758~INNATE IMMUNE RESPONSE-ACTIVATING SIGNAL TRANSDUCTION

Genes_entrezGene_symbol_name (AGING_MODULE_23)

3725;JUN;jun proto-oncogene
3297;HSF1;heat shock transcription factor 1
64127;NOD2;nucleotide binding oligomerization domain containing 2
5336;PLCG2;phospholipase C gamma 2
4803;NGF;nerve growth factor
6347;CCL2;C-C motif chemokine ligand 2
3553;IL1B;interleukin 1 beta
949;SCARB1;scavenger receptor class B member 1
3764;KCNJ8;potassium voltage-gated channel subfamily J member 8
1312;COMT;catechol-O-methyltransferase
6777;STAT5B;signal transducer and activator of transcription 5B
4615;MYD88;myeloid differentiation primary response 88
7436;VLDLR;very low density lipoprotein receptor
4257;MGST1;microsomal glutathione S-transferase 1
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
4792;NFKBIA;NFKB inhibitor alpha
5265;SERPINA1;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1
1373;CPS1;carbamoyl-phosphate synthase 1
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
5594;MAPK1;mitogen-activated protein kinase 1
1432;MAPK14;mitogen-activated protein kinase 14
5743;PTGS2;prostaglandin-endoperoxide synthase 2
929;CD14;CD14 molecule
7099;TLR4;toll like receptor 4
51284;TLR7;toll like receptor 7
3656;IRAK2;interleukin 1 receptor associated kinase 2
3329;HSPD1;heat shock protein family D (Hsp60) member 1
10892;MALT1;MALT1 paracaspase
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
3569;IL6;interleukin 6
1672;DEFB1;defensin beta 1
4069;LYZ;lysozyme
4057;LTF;lactotransferrin
8349;HIST2H2BE;histone cluster 2, H2be
8493;PPM1D;protein phosphatase, Mg2+/Mn2+ dependent 1D
1511;CTSG;cathepsin G
2876;GPX1;glutathione peroxidase 1
7124;TNF;tumor necrosis factor

AGING_MODULE_24

Functional_annotation

GO:0035107~APPENDAGE MORPHOGENESIS
GO:0001501~SKELETAL SYSTEM DEVELOPMENT
GO:0048598~EMBRYONIC MORPHOGENESIS
GO:0048736~APPENDAGE DEVELOPMENT
GO:0035108~LIMB MORPHOGENESIS
GO:0060173~LIMB DEVELOPMENT

Genes_entrezGene_symbol_name (AGING_MODULE_24)

7291;TWIST1;twist family bHLH transcription factor 1
7704;ZBTB16;zinc finger and BTB domain containing 16
5469;MED1;mediator complex subunit 1
1499;CTNNB1;catenin beta 1
4487;MSX1;msh homeobox 1
2768;GNA12;G protein subunit alpha 12
1749;DLX5;distal-less homeobox 5
22943;DKK1;dickkopf WNT signaling pathway inhibitor 1
51176;LEF1;lymphoid enhancer binding factor 1
581;BAX;BCL2-associated X protein
60529;ALX4;ALX homeobox 4
8626;TP63;tumor protein p63
2019;EN1;engrailed homeobox 1
8854;ALDH1A2;aldehyde dehydrogenase 1 family member A2
578;BAK1;BCL2 antagonist/killer 1
5663;PSEN1;presenilin 1
658;BMPR1B;bone morphogenetic protein receptor type 1B
3205;HOXA9;homeobox A9
9241;NOG;noggin
3238;HOXD12;homeobox D12
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4
3479;IGF1;insulin like growth factor 1
2296;FOXC1;forkhead box C1
3481;IGF2;insulin like growth factor 2
3217;HOXB7;homeobox B7
3486;IGFBP3;insulin like growth factor binding protein 3
3488;IGFBP5;insulin like growth factor binding protein 5
4088;SMAD3;SMAD family member 3
3487;IGFBP4;insulin like growth factor binding protein 4
3714;JAG2;jagged 2
5744;PTHLH;parathyroid hormone-like hormone
5743;PTGS2;prostaglandin-endoperoxide synthase 2
5599;MAPK8;mitogen-activated protein kinase 8
5159;PDGFRB;platelet derived growth factor receptor beta
1956;EGFR;epidermal growth factor receptor
2690;GHR;growth hormone receptor
3224;HOXC8;homeobox C8
655;BMP7;bone morphogenetic protein 7
92;ACVR2A;activin A receptor type 2A

5549;PRELP;proline/arginine-rich end leucine-rich repeat protein
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
1301;COL11A1;collagen type XI alpha 1
2260;FGFR1;fibroblast growth factor receptor 1
2261;FGFR3;fibroblast growth factor receptor 3
5950;RBP4;retinol binding protein 4
7227;TRPS1;transcriptional repressor GATA binding 1
2068;ERCC2;excision repair cross-complementation group 2
1281;COL3A1;collagen type III alpha 1
7040;TGFB1;transforming growth factor beta 1
25937;WWTR1;WW domain containing transcription regulator 1
3221;HOXC4;homeobox C4
26578;OSTF1;osteoclast stimulating factor 1
4664;NAB1;NGFI-A binding protein 1
6667;SP1;Sp1 transcription factor
5052;PRDX1;peroxiredoxin 1
1278;COL1A2;collagen type I alpha 2
2101;ESRRA;estrogen related receptor alpha
1490;CTGF;connective tissue growth factor
6272;SORT1;sortilin 1
1432;MAPK14;mitogen-activated protein kinase 14
7123;CLEC3B;C-type lectin domain family 3 member B
3218;HOXB8;homeobox B8
1277;COL1A1;collagen type I alpha 1
7286;TUFT1;tuftelin 1
5578;PRKCA;protein kinase C alpha
654;BMP6;bone morphogenetic protein 6
9759;HDAC4;histone deacetylase 4
5156;PDGFRA;platelet derived growth factor receptor alpha
1290;COL5A2;collagen type V alpha 2
3630;INS;insulin
1513;CTSK;cathepsin K
3216;HOXB6;homeobox B6
10683;DLL3;delta-like 3 (Drosophila)
7020;TFAP2A;transcription factor AP-2 alpha (activating enhancer binding protein 2 alpha)
3223;HOXC6;homeobox C6
3727;JUND;jun D proto-oncogene
3911;LAMA5;laminin subunit alpha 5
154796;AMOT;angiomotin
7248;TSC1;tuberous sclerosis 1
4087;SMAD2;SMAD family member 2
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
2253;FGF8;fibroblast growth factor 8
7157;TP53;tumor protein p53
7424;VEGFC;vascular endothelial growth factor C
3064;HTT;huntingtin
317;APAF1;apoptotic peptidase activating factor 1
7545;ZIC1;Zic family member 1
585;BBS4;Bardet-Biedl syndrome 4
56963;RGMA;repulsive guidance molecule family member a

51295;ECSIT;ECSIT signalling integrator
5979;RET;ret proto-oncogene
10253;SPRY2;sprouty RTK signaling antagonist 2
10395;DLC1;DLC1 Rho GTPase activating protein
8820;HESX1;HESX homeobox 1
4646;MYO6;myosin VI
6647;SOD1;superoxide dismutase 1, soluble
491;ATP2B2;ATPase plasma membrane Ca2+ transporting 2

AGING_MODULE_25

Functional_annotation

GO:0019882~ANTIGEN PROCESSING AND PRESENTATION
HSA05332:GRAFT-VERSUS-HOST DISEASE
HSA05330:ALLOGRAFT REJECTION
GO:0048002~ANTIGEN PROCESSING AND PRESENTATION OF PEPTIDE ANTIGEN
HSA04940:TYPE I DIABETES MELLITUS
HSA04612:ANTIGEN PROCESSING AND PRESENTATION

Genes_entrezGene_symbol_name (AGING_MODULE_25)

3135;HLA-G;major histocompatibility complex, class I, G
5720;PSME1;proteasome activator subunit 1
3108;HLA-DMA;major histocompatibility complex, class II, DM alpha
2207;FCER1G;Fc fragment of IgE receptor Ig
3106;HLA-B;major histocompatibility complex, class I, B
3107;HLA-C;major histocompatibility complex, class I, C
30835;CD209;CD209 molecule
4277;MICB;MHC class I polypeptide-related sequence B
3119;HLA-DQB1;major histocompatibility complex, class II, DQ beta 1
3117;HLA-DQA1;major histocompatibility complex, class II, DQ alpha 1
3113;HLA-DPA1;major histocompatibility complex, class II, DP alpha 1
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
811;CALR;calreticulin
3109;HLA-DMB;major histocompatibility complex, class II, DM beta
3123;HLA-DRB1;major histocompatibility complex, class II, DR beta 1
3133;HLA-E;major histocompatibility complex, class I, E
3134;HLA-F;major histocompatibility complex, class I, F
3122;HLA-DRA;major histocompatibility complex, class II, DR alpha
3127;HLA-DRB5;major histocompatibility complex, class II, DR beta 5
3553;IL1B;interleukin 1 beta
7124;TNF;tumor necrosis factor
3569;IL6;interleukin 6
355;FAS;Fas cell surface death receptor
3329;HSPD1;heat shock protein family D (Hsp60) member 1
3481;IGF2;insulin like growth factor 2
3630;INS;insulin
2572;GAD2;glutamate decarboxylase 2
3382;ICA1;islet cell autoantigen 1
821;CANX;calnexin
3303;HSPA1A;heat shock protein family A (Hsp70) member 1A
3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
3312;HSPA8;heat shock protein family A (Hsp70) member 8
920;CD4;CD4 molecule
6890;TAP1;transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
3306;HSPA2;heat shock protein family A (Hsp70) member 2
10197;PSME3;proteasome activator subunit 3
3304;HSPA1B;heat shock protein family A (Hsp70) member 1B

AGING_MODULE_26

Functional_annotation

GO:0042743~HYDROGEN PEROXIDE METABOLIC PROCESS
GO:0006979~RESPONSE TO OXIDATIVE STRESS
GO:0000302~RESPONSE TO REACTIVE OXYGEN SPECIES
GO:0042542~RESPONSE TO HYDROGEN PEROXIDE
GO:0034599~CELLULAR RESPONSE TO OXIDATIVE STRESS
GO:0010035~RESPONSE TO INORGANIC SUBSTANCE

Genes_entrezGene_symbol_name (AGING_MODULE_26)

1544;CYP1A2;cytochrome P450 family 1 subfamily A member 2
9588;PRDX6;peroxiredoxin 6
2879;GPX4;glutathione peroxidase 4
5052;PRDX1;peroxiredoxin 1
6647;SOD1;superoxide dismutase 1, soluble
6648;SOD2;superoxide dismutase 2, mitochondrial
2876;GPX1;glutathione peroxidase 1
847;CAT;catalase
2878;GPX3;glutathione peroxidase 3
3725;JUN;jun proto-oncogene
1191;CLU;clusterin
10110;SGK2;serum/glucocorticoid regulated kinase 2
7507;XPA;xeroderma pigmentosum, complementation group A
5371;PML;promyelocytic leukemia
5663;PSEN1;presenilin 1
6414;SEPP1;selenoprotein P, plasma, 1
2729;GCLC;glutamate-cysteine ligase catalytic subunit
7486;WRN;Werner syndrome RecQ like helicase
5743;PTGS2;prostaglandin-endoperoxide synthase 2
7352;UCP3;uncoupling protein 3 (mitochondrial, proton carrier)
2937;GSS;glutathione synthetase
55967;NDUFA12;NADH:ubiquinone oxidoreductase subunit A12
2033;EP300;E1A binding protein p300
1956;EGFR;epidermal growth factor receptor
2730;GCLM;glutamate-cysteine ligase modifier subunit
3717;JAK2;Janus kinase 2
1718;DHCR24;24-dehydrocholesterol reductase
348;APOE;apolipoprotein E
10628;TXNIP;thioredoxin interacting protein
54840;APTX;aprataxin
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
2074;ERCC6;excision repair cross-complementation group 6
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
7099;TLR4;toll like receptor 4
2071;ERCC3;excision repair cross-complementation group 3
2068;ERCC2;excision repair cross-complementation group 2
100;ADA;adenosine deaminase
5693;PSMB5;proteasome subunit beta 5
1649;DDIT3;DNA damage inducible transcript 3

4277;MICB;MHC class I polypeptide-related sequence B
1277;COL1A1;collagen type I alpha 1
5578;PRKCA;protein kinase C alpha
2185;PTK2B;protein tyrosine kinase 2 beta
5621;PRNP;prion protein
51547;SIRT7;sirtuin 7
1161;ERCC8;excision repair cross-complementation group 8
4710;NDUFB4;NADH:ubiquinone oxidoreductase subunit B4
5831;PYCR1;pyrroline-5-carboxylate reductase 1
2539;G6PD;glucose-6-phosphate dehydrogenase
2067;ERCC1;excision repair cross-complementation group 1
1499;CTNNB1;catenin beta 1
7139;TNNT2;troponin T2, cardiac type
808;CALM3;calmodulin 3 (phosphorylase kinase, delta)
801;CALM1;calmodulin 1 (phosphorylase kinase, delta)
60;ACTB;actin, beta
2891;GRIA2;glutamate ionotropic receptor AMPA type subunit 2
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
3643;INSR;insulin receptor
5599;MAPK8;mitogen-activated protein kinase 8
11269;DDX19B;DEAD-box helicase 19B
3064;HTT;huntingtin
1917;EEF1A2;eukaryotic translation elongation factor 1 alpha 2
513;ATP5D;ATP synthase, H+ transporting, mitochondrial F1 complex, delta subunit
7220;TRPC1;transient receptor potential cation channel subfamily C member 1
2;A2M;alpha-2-macroglobulin
10016;PDCD6;programmed cell death 6
3485;IGFBP2;insulin like growth factor binding protein 2
51176;LEF1;lymphoid enhancer binding factor 1
682;BSG;basigin (Ok blood group)
51593;SRRT;serrate, RNA effector molecule
3931;LCAT;lecithin-cholesterol acyltransferase
5336;PLCG2;phospholipase C gamma 2
229;ALDOB;aldolase, fructose-bisphosphate B
6262;RYR2;ryanodine receptor 2
5156;PDGFRA;platelet derived growth factor receptor alpha
5601;MAPK9;mitogen-activated protein kinase 9
8604;SLC25A12;solute carrier family 25 member 12
6857;SYT1;synaptotagmin 1
3710;ITPR3;inositol 1,4,5-trisphosphate receptor type 3
5265;SERPINA1;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1

AGING_MODULE_27

Functional_annotation

GO:0006694~STEROID BIOSYNTHETIC PROCESS
GO:0016125~STEROL METABOLIC PROCESS
GO:0016126~STEROL BIOSYNTHETIC PROCESS
GO:0008202~STEROID METABOLIC PROCESS
GO:0006695~CHOLESTEROL BIOSYNTHETIC PROCESS
GO:0008203~CHOLESTEROL METABOLIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_27)

6307;MSMO1;methylsterol monooxygenase 1
5563;PRKAA2;protein kinase AMP-activated catalytic subunit alpha 2
1718;DHCR24;24-dehydrocholesterol reductase
4597;MVD;mevalonate diphosphate decarboxylase
10654;PMVK;phosphomevalonate kinase
949;SCARB1;scavenger receptor class B member 1
1717;DHCR7;7-dehydrocholesterol reductase
3283;HSD3B1;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 1
3157;HMGCS1;3-hydroxy-3-methylglutaryl-CoA synthase 1
3294;HSD17B2;hydroxysteroid (17-beta) dehydrogenase 2
4598;MVK;mevalonate kinase
4047;LSS;lanosterol synthase (2,3-oxidosqualene-lanosterol cyclase)
2224;FDPS;farnesyl diphosphate synthase
23600;AMACR;alpha-methylacyl-CoA racemase
2247;FGF2;fibroblast growth factor 2
5562;PRKAA1;protein kinase AMP-activated catalytic subunit alpha 1
7108;TM7SF2;transmembrane 7 superfamily member 2
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
2539;G6PD;glucose-6-phosphate dehydrogenase
6646;SOAT1;sterol O-acyltransferase 1
3952;LEP;leptin
58488;PCTP;phosphatidylcholine transfer protein
1593;CYP27A1;cytochrome P450 family 27 subfamily A member 1
22937;SCAP;SREBF chaperone
3931;LCAT;lecithin-cholesterol acyltransferase
3638;INSIG1;insulin induced gene 1
348;APOE;apolipoprotein E
847;CAT;catalase
6720;SREBF1;sterol regulatory element binding transcription factor 1
3953;LEPR;leptin receptor
7436;VLDLR;very low density lipoprotein receptor
1071;CETP;cholesteryl ester transfer protein, plasma
19;ABCA1;ATP binding cassette subfamily A member 1
2908;NR3C1;nuclear receptor subfamily 3 group C member 1
1545;CYP1B1;cytochrome P450 family 1 subfamily B member 1
1312;COMT;catechol-O-methyltransferase
8074;FGF23;fibroblast growth factor 23
7367;UGT2B17;UDP glucuronosyltransferase family 2 member B17
5007;OSBP;oxysterol binding protein
6777;STAT5B;signal transducer and activator of transcription 5B

AGING_MODULE_28

Functional_annotation

GO:0045089~POSITIVE REGULATION OF INNATE IMMUNE RESPONSE
GO:0051099~POSITIVE REGULATION OF BINDING
GO:0045088~REGULATION OF INNATE IMMUNE RESPONSE
GO:0051091~POSITIVE REGULATION OF TRANSCRIPTION FACTOR ACTIVITY
GO:0010033~RESPONSE TO ORGANIC SUBSTANCE
GO:0043388~POSITIVE REGULATION OF DNA BINDING
GO:0031349~POSITIVE REGULATION OF DEFENSE RESPONSE
GO:0051092~POSITIVE REGULATION OF NF-KAPPAB TRANSCRIPTION FACTOR ACTIVITY
GO:0051090~REGULATION OF TRANSCRIPTION FACTOR ACTIVITY
GO:0001819~POSITIVE REGULATION OF CYTOKINE PRODUCTION
GO:0051098~REGULATION OF BINDING
GO:0002757~IMMUNE RESPONSE-ACTIVATING SIGNAL TRANSDUCTION
GO:0051101~REGULATION OF DNA BINDING

Genes_entrezGene_symbol_name (AGING_MODULE_28)

51311;TLR8;toll like receptor 8
3902;LAG3;lymphocyte activating 3
64127;NOD2;nucleotide binding oligomerization domain containing 2
4792;NFKBIA;NFKB inhibitor alpha
51284;TLR7;toll like receptor 7
3656;IRAK2;interleukin 1 receptor associated kinase 2
3329;HSPD1;heat shock protein family D (Hsp60) member 1
5970;RELA;v-rel avian reticuloendotheliosis viral oncogene homolog A
5819;NECTIN2;nectin cell adhesion molecule 2
6776;STAT5A;signal transducer and activator of transcription 5A
7099;TLR4;toll like receptor 4
6777;STAT5B;signal transducer and activator of transcription 5B
4615;MYD88;myeloid differentiation primary response 88
28996;HIPK2;homeodomain interacting protein kinase 2
3551;IKBKB;inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
2035;EPB41;erythrocyte membrane protein band 4.1
10892;MALT1;MALT1 paracaspase
3717;JAK2;Janus kinase 2
2280;FKBP1A;FK506 binding protein 1A
808;CALM3;calmodulin 3 (phosphorylase kinase, delta)
2068;ERCC2;excision repair cross-complementation group 2
7040;TGFB1;transforming growth factor beta 1
801;CALM1;calmodulin 1 (phosphorylase kinase, delta)
800;CALD1;caldesmon 1
9759;HDAC4;histone deacetylase 4
3553;IL1B;interleukin 1 beta
3673;ITGA2;integrin subunit alpha 2
847;CAT;catalase
7124;TNF;tumor necrosis factor
3569;IL6;interleukin 6
2033;EP300;E1A binding protein p300
6597;SMARCA4;SWI/SNF related, matrix associated,
actin dependent regulator of chromatin, subfamily a, member 4

2;A2M;alpha-2-macroglobulin
3481;IGF2;insulin like growth factor 2
3630;INS;insulin
3725;JUN;jun proto-oncogene
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
5465;PPARA;peroxisome proliferator activated receptor alpha
1499;CTNNB1;catenin beta 1
768;CA9;carbonic anhydrase IX
2879;GPX4;glutathione peroxidase 4
55970;GNG12;G protein subunit gamma 12
6347;CCL2;C-C motif chemokine ligand 2
367;AR;androgen receptor
3059;HCLS1;hematopoietic cell-specific Lyn substrate 1
2099;ESR1;estrogen receptor 1
1545;CYP1B1;cytochrome P450 family 1 subfamily B member 1
5371;PML;promyelocytic leukemia
2026;ENO2;enolase 2 (gamma, neuronal)
3973;LHCGR;luteinizing hormone/choriogonadotropin receptor
3764;KCNJ8;potassium voltage-gated channel subfamily J member 8
5468;PPARG;peroxisome proliferator activated receptor gamma
3480;IGF1R;insulin like growth factor 1 receptor
3157;HMGCS1;3-hydroxy-3-methylglutaryl-CoA synthase 1
3952;LEP;leptin
70;ACTC1;actin, alpha, cardiac muscle 1
7248;TSC1;tuberous sclerosis 1
2885;GRB2;growth factor receptor bound protein 2
2059;EPS8;epidermal growth factor receptor pathway substrate 8
4087;SMAD2;SMAD family member 2
58191;CXCL16;C-X-C motif chemokine ligand 16
3643;INSR;insulin receptor
1373;CPS1;carbamoyl-phosphate synthase 1
23054;NCOA6;nuclear receptor coactivator 6
1958;EGR1;early growth response 1
58;ACTA1;actin, alpha 1, skeletal muscle
5743;PTGS2;prostaglandin-endoperoxide synthase 2
2931;GSK3A;glycogen synthase kinase 3 alpha
675;BRCA2;breast cancer 2
3992;FADS1;fatty acid desaturase 1
672;BRCA1;breast cancer 1
65985;AACS;acetoacetyl-CoA synthetase
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
348;APOE;apolipoprotein E
6609;SMPD1;sphingomyelin phosphodiesterase 1
10628;TXNIP;thioredoxin interacting protein
2688;GH1;growth hormone 1
3667;IRS1;insulin receptor substrate 1
4609;MYC;v-myc avian myelocytomatosis viral oncogene homolog
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
142;PARP1;poly(ADP-ribose) polymerase 1

6750;SST;somatostatin
7415;VCP;valosin containing protein
4803;NGF;nerve growth factor
1649;DDIT3;DNA damage inducible transcript 3
2081;ERN1;endoplasmic reticulum to nucleus signaling 1
2100;ESR2;estrogen receptor 2 (ER beta)
2796;GNRH1;gonadotropin releasing hormone 1
6272;SORT1;sortilin 1
2308;FOXO1;forkhead box O1
5578;PRKCA;protein kinase C alpha
5336;PLCG2;phospholipase C gamma 2
6262;RYR2;ryanodine receptor 2
8835;SOCS2;suppressor of cytokine signaling 2
6647;SOD1;superoxide dismutase 1, soluble
2903;GRIN2A;glutamate ionotropic receptor NMDA type subunit 2A
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
3304;HSPA1B;heat shock protein family A (Hsp70) member 1B
834;CASP1;caspase 1
440;ASNS;asparagine synthetase (glutamine-hydrolyzing)
3303;HSPA1A;heat shock protein family A (Hsp70) member 1A
2908;NR3C1;nuclear receptor subfamily 3 group C member 1
2729;GCLC;glutamate-cysteine ligase catalytic subunit
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
4088;SMAD3;SMAD family member 3
5591;PRKDC;protein kinase, DNA-activated, catalytic polypeptide
5594;MAPK1;mitogen-activated protein kinase 1
1956;EGFR;epidermal growth factor receptor
2690;GHR;growth hormone receptor
4487;MSX1;msh homeobox 1
655;BMP7;bone morphogenetic protein 7
4303;FOXO4;forkhead box O4
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
5950;RBP4;retinol binding protein 4
1020;CDK5;cyclin-dependent kinase 5
355;FAS;Fas cell surface death receptor
55829;VIMP;VCP interacting membrane selenoprotein
3297;HSF1;heat shock transcription factor 1
5170;PDPK1;3-phosphoinositide dependent protein kinase 1
6402;SELL;selectin L
79602;ADIPOR2;adiponectin receptor 2
64210;MMS19;MMS19 homolog, cytosolic iron-sulfur assembly component
1281;COL3A1;collagen type III alpha 1
2203;FBP1;fructose-bisphosphatase 1
5536;PPP5C;protein phosphatase 5 catalytic subunit
949;SCARB1;scavenger receptor class B member 1
3485;IGFBP2;insulin like growth factor binding protein 2
51176;LEF1;lymphoid enhancer binding factor 1
10401;PIAS3;protein inhibitor of activated STAT 3
682;BSG;basigin (Ok blood group)
1312;COMT;catechol-O-methyltransferase

5020;OXT;oxytocin/neurophysin I prepropeptide
3320;HSP90AA1;heat shock protein 90kDa alpha family class A member 1
54331;GNG2;G protein subunit gamma 2
4780;NFE2L2;nuclear factor, erythroid 2 like 2
4015;LOX;lysyl oxidase
6891;TAP2;transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)
26060;APPL1;adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1
2787;GNG5;G protein subunit gamma 5
3312;HSPA8;heat shock protein family A (Hsp70) member 8
871;SERPINH1;serpin peptidase inhibitor, clade H
(heat shock protein 47), member 1, (collagen binding protein 1)
920;CD4;CD4 molecule
51593;SRRT;serrate, RNA effector molecule
1432;MAPK14;mitogen-activated protein kinase 14
929;CD14;CD14 molecule
31;ACACA;acetyl-CoA carboxylase alpha
1277;COL1A1;collagen type I alpha 1
10724;MGEA5;meningioma expressed antigen 5 (hyaluronidase)
3931;LCAT;lecithin-cholesterol acyltransferase
2185;PTK2B;protein tyrosine kinase 2 beta
5770;PTPN1;protein tyrosine phosphatase, non-receptor type 1
713;C1QB;complement component 1, q subcomponent, B chain
2782;GNB1;G protein subunit beta 1
716;C1S;complement component 1, s subcomponent
3326;HSP90AB1;heat shock protein 90kDa alpha family class B member 1
8660;IRS2;insulin receptor substrate 2
229;ALDOB;aldolase, fructose-bisphosphate B
5156;PDGFRA;platelet derived growth factor receptor alpha
890;CCNA2;cyclin A2
5155;PDGFB;platelet derived growth factor subunit B
594;BCKDHB;branched chain keto acid dehydrogenase E1, beta polypeptide
8854;ALDH1A2;aldehyde dehydrogenase 1 family member A2
3953;LEPR;leptin receptor
7436;VLDLR;very low density lipoprotein receptor
4257;MGST1;microsomal glutathione S-transferase 1
2805;GOT1;glutamic-oxaloacetic transaminase 1, soluble
3306;HSPA2;heat shock protein family A (Hsp70) member 2
2806;GOT2;glutamic-oxaloacetic transaminase 2
5265;SERPINA1;serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1
7033;TFF3;trefoil factor 3
7018;TF;transferrin
780;DDR1;discoidin domain receptor tyrosine kinase 1
2052;EPHX1;epoxide hydrolase 1
2475;MTOR;mechanistic target of rapamycin
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
111;ADCY5;adenylate cyclase 5
6261;RYR1;ryanodine receptor 1
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
6376;CX3CL1;C-X3-C motif chemokine ligand 1
2207;FCER1G;Fc fragment of IgE receptor Ig

185;AGTR1;angiotensin II receptor type 1
718;C3;complement component 3
149951;COMMD7;COMM domain containing 7
7341;SUMO1;small ubiquitin-like modifier 1
4092;SMAD7;SMAD family member 7
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
23411;SIRT1;sirtuin 1
5744;PTHLH;parathyroid hormone-like hormone
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
53833;IL20RB;interleukin 20 receptor subunit beta
3606;IL18;interleukin 18
3091;HIF1A;hypoxia inducible factor 1 alpha subunit
5580;PRKCD;protein kinase C delta
3084;NRG1;neuregulin 1
581;BAX;BCL2-associated X protein
5663;PSEN1;presenilin 1
9241;NOG;noggin
641;BLM;Bloom syndrome RecQ like helicase
328;APEX1;apurinic/apyrimidinic endodeoxyribonuclease 1
5092;PCBD1;pterin-4 alpha-carbinolamine dehydratase 1
545;ATR;ATR serine/threonine kinase
578;BAK1;BCL2 antagonist/killer 1
4277;MICB;MHC class I polypeptide-related sequence B
719;C3AR1;complement component 3a receptor 1

AGING_MODULE_29

Functional_annotation

GO:0060396~GROWTH HORMONE RECEPTOR SIGNALING PATHWAY
GO:0051781~POSITIVE REGULATION OF CELL DIVISION
GO:0007167~ENZYME LINKED RECEPTOR PROTEIN SIGNALING PATHWAY
GO:0060416~RESPONSE TO GROWTH HORMONE STIMULUS
GO:0007169~TRANSMEMBRANE RECEPTOR PROTEIN TYROSINE KINASE SIGNALING PATHWAY
GO:0006549~ISOLEUCINE METABOLIC PROCESS

Genes_entrezGene_symbol_name (AGING_MODULE_29)

2688;GH1;growth hormone 1
2690;GHR;growth hormone receptor
5295;PIK3R1;phosphoinositide-3-kinase regulatory subunit 1
3717;JAK2;Janus kinase 2
6774;STAT3;signal transducer and activator of transcription 3 (acute-phase response factor)
8835;SOCS2;suppressor of cytokine signaling 2
6776;STAT5A;signal transducer and activator of transcription 5A
6777;STAT5B;signal transducer and activator of transcription 5B
3481;IGF2;insulin like growth factor 2
7422;VEGFA;vascular endothelial growth factor A
3630;INS;insulin
2253;FGF8;fibroblast growth factor 8
2247;FGF2;fibroblast growth factor 2
7040;TGFB1;transforming growth factor beta 1
201161;CENPV;centromere protein V
3553;IL1B;interleukin 1 beta
2246;FGF1;fibroblast growth factor 1
847;CAT;catalase
7424;VEGFC;vascular endothelial growth factor C
5155;PDGFB;platelet derived growth factor subunit B
3725;JUN;jun proto-oncogene
3084;NRG1;neuregulin 1
6347;CCL2;C-C motif chemokine ligand 2
5371;PML;promyelocytic leukemia
2296;FOXC1;forkhead box C1
3480;IGF1R;insulin like growth factor 1 receptor
2321;FLT1;fms related tyrosine kinase 1
2885;GRB2;growth factor receptor bound protein 2
2059;EPS8;epidermal growth factor receptor pathway substrate 8
4087;SMAD2;SMAD family member 2
2324;FLT4;fms related tyrosine kinase 4
3643;INSR;insulin receptor
4088;SMAD3;SMAD family member 3
9241;NOG;noggin
2931;GSK3A;glycogen synthase kinase 3 alpha
5159;PDGFRB;platelet derived growth factor receptor beta
1956;EGFR;epidermal growth factor receptor
10342;TFG;TRK-fused gene
6885;MAP3K7;mitogen-activated protein kinase kinase kinase 7
2050;EPHB4;EPH receptor B4

2047;EPHB1;EPH receptor B1
5747;PTK2;protein tyrosine kinase 2
4487;MSX1;msh homeobox 1
5795;PTPRJ;protein tyrosine phosphatase, receptor type J
655;BMP7;bone morphogenetic protein 7
5791;PTPRE;protein tyrosine phosphatase, receptor type E
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
23542;MAPK8IP2;mitogen-activated protein kinase 8 interacting protein 2
10273;STUB1;STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
1950;EGF;epidermal growth factor
10628;TXNIP;thioredoxin interacting protein
92;ACVR2A;activin A receptor type 2A
4486;MST1R;macrophage stimulating 1 receptor
4092;SMAD7;SMAD family member 7
3667;IRS1;insulin receptor substrate 1
2353;FOS;FBJ murine osteosarcoma viral oncogene homolog
2260;FGFR1;fibroblast growth factor receptor 1
2261;FGFR3;fibroblast growth factor receptor 3
4303;FOXO4;forkhead box O4
1020;CDK5;cyclin-dependent kinase 5
1839;HBEGF;heparin binding EGF like growth factor
28996;HIPK2;homeodomain interacting protein kinase 2
4803;NGF;nerve growth factor
1281;COL3A1;collagen type III alpha 1
4916;NTRK3;neurotrophic tyrosine kinase, receptor, type 3
9185;REPS2;RALBP1 associated Eps domain containing 2
6711;SPTBN1;spectrin beta, non-erythrocytic 1
658;BMPR1B;bone morphogenetic protein receptor type 1B
10468;FST;follistatin
26060;APPL1;adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1
51295;ECSIT;ECSIT signalling integrator
8074;FGF23;fibroblast growth factor 23
9019;MPZL1;myelin protein zero like 1
1278;COL1A2;collagen type I alpha 2
9788;MTSS1;metastasis suppressor 1
920;CD4;CD4 molecule
1490;CTGF;connective tissue growth factor
9702;CEP57;centrosomal protein 57kDa
6272;SORT1;sortilin 1
5979;RET;ret proto-oncogene
2889;RAPGEF1;Rap guanine nucleotide exchange factor 1
2308;FOXO1;forkhead box O1
1942;EFNA1;ephrin-A1
6098;ROS1;ROS proto-oncogene 1 , receptor tyrosine kinase
91;ACVR1B;activin A receptor type 1B
2185;PTK2B;protein tyrosine kinase 2 beta
5770;PTPN1;protein tyrosine phosphatase, non-receptor type 1
654;BMP6;bone morphogenetic protein 6
2280;FKBP1A;FK506 binding protein 1A
8660;IRS2;insulin receptor substrate 2

5156;PDGFRA;platelet derived growth factor receptor alpha
780;DDR1;discoidin domain receptor tyrosine kinase 1
2064;ERBB2;erb-b2 receptor tyrosine kinase 2
6464;SHC1;SHC (Src homology 2 domain containing) transforming protein 1
773;CACNA1A;calcium voltage-gated channel subunit alpha1 A
5781;PTPN11;protein tyrosine phosphatase, non-receptor type 11
587;BCAT2;branched chain amino acid transaminase 2

AGING_MODULE_30

Functional_annotation

GO:0051318~G1 PHASE
GO:0022403~CELL CYCLE PHASE
GO:0051329~INTERPHASE OF MITOTIC CELL CYCLE
GO:0051325~INTERPHASE
GO:0000086~G2/M TRANSITION OF MITOTIC CELL CYCLE

Genes_entrezGene_symbol_name (AGING_MODULE_30)

4193;MDM2;MDM2 proto-oncogene, E3 ubiquitin protein ligase
158471;PRUNE2;prune homolog 2 (Drosophila)
4303;FOXO4;forkhead box O4
1028;CDKN1C;cyclin-dependent kinase inhibitor 1C
6872;TAF1;TATA-box binding protein associated factor 1
5925;RB1;retinoblastoma 1
6929;TCF3;transcription factor 3
995;CDC25C;cell division cycle 25C
1869;E2F1;E2F transcription factor 1
818;CAMK2G;calcium/calmodulin-dependent protein kinase II gamma
1030;CDKN2B;cyclin-dependent kinase inhibitor 2B
3688;ITGB1;integrin subunit beta 1
728642;CDK11A;cyclin-dependent kinase 11A
1029;CDKN2A;cyclin-dependent kinase inhibitor 2A
1026;CDKN1A;cyclin-dependent kinase inhibitor 1A
3070;HELLS;helicase, lymphoid-specific
675;BRCA2;breast cancer 2
8493;PPM1D;protein phosphatase, Mg2+/Mn2+ dependent 1D
1956;EGFR;epidermal growth factor receptor
8379;MAD1L1;MAD1 mitotic arrest deficient-like 1 (yeast)
4292;MLH1;mutL homolog 1
25;ABL1;ABL proto-oncogene 1, non-receptor tyrosine kinase
9611;NCOR1;nuclear receptor corepressor 1
5893;RAD52;RAD52 homolog, DNA repair protein
27436;EML4;echinoderm microtubule associated protein like 4
55320;MIS18BP1;MIS18 binding protein 1
51433;ANAPC5;anaphase promoting complex subunit 5
207;AKT1;v-akt murine thymoma viral oncogene homolog 1
10051;SMC4;structural maintenance of chromosomes 4
472;ATM;ATM serine/threonine kinase
201161;CENPV;centromere protein V
121441;NEDD1;neural precursor cell expressed, developmentally down-regulated 1
64151;NCAPG;non-SMC condensin I complex subunit G
899;CCNF;cyclin F
7013;TERF1;telomeric repeat binding factor 1
9221;NOLC1;nucleolar and coiled-body phosphoprotein 1
10270;AKAP8;A-kinase anchoring protein 8
25836;NIPBL;Nipped-B homolog (Drosophila)
4683;NBN;nibrin
8881;CDC16;cell division cycle 16
7329;UBE2I;ubiquitin conjugating enzyme E2I

351;APP;amyloid beta precursor protein
1785;DNM2;dynamin 2
6117;RPA1;replication protein A1
10982;MAPRE2;microtubule associated protein RP/EB family member 2
51529;ANAPC11;anaphase promoting complex subunit 11
701;BUB1B;BUB1 mitotic checkpoint serine/threonine kinase B
5536;PPP5C;protein phosphatase 5 catalytic subunit
9184;BUB3;BUB3 mitotic checkpoint protein
3925;STMN1;stathmin 1
51207;DUSP13;dual specificity phosphatase 13
3014;H2AFX;H2A histone family member X
5888;RAD51;RAD51 recombinase
10540;DCTN2;dynactin subunit 2
641;BLM;Bloom syndrome RecQ like helicase
10579;TACC2;transforming acidic coiled-coil containing protein 2
91;ACVR1B;activin A receptor type 1B
5424;POLD1;polymerase (DNA) delta 1, catalytic subunit
80254;CEP63;centrosomal protein 63kDa
5422;POLA1;polymerase (DNA) alpha 1, catalytic subunit
2177;FANCD2;Fanconi anemia complementation group D2
51547;SIRT7;sirtuin 7
983;CDK1;cyclin-dependent kinase 1
1018;CDK3;cyclin-dependent kinase 3
1647;GADD45A;growth arrest and DNA damage inducible alpha
890;CCNA2;cyclin A2
8841;HDAC3;histone deacetylase 3
5932;RBBP8;retinoblastoma binding protein 8
29945;ANAPC4;anaphase promoting complex subunit 4
25788;RAD54B;RAD54 homolog B (S. cerevisiae)
3306;HSPA2;heat shock protein family A (Hsp70) member 2
1639;DCTN1;dynactin subunit 1
80270;HSD3B7;hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7
259266;ASPM;abnormal spindle microtubule assembly
3609;ILF3;interleukin enhancer binding factor 3