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GO term enrichment of up-regulated genes

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BP GO:0030154 cell differentiation

Annotate: 3280

Significant: 57

Expected: 36.44

topGO p-value: 0.0002

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005884 (ITGA3); ENSG00000005981 (ASB4); ENSG00000007062 (PROM1);
ENSG00000010278 (CD9); ENSG00000027075 (PRKCH); ENSG00000035862 (TIMP2);
ENSG00000038427 (VCAN); ENSG00000064300 (NGFR); ENSG00000069702 (TGFBR3);
ENSG00000070404 (FSTL3); ENSG00000074219 (TEAD2); ENSG00000078401 (EDN1);
ENSG00000091409 (ITGA6); ENSG00000099250 (NRP1); ENSG00000100097 (LGALS1);
ENSG00000100625 (SIX4); ENSG00000101265 (RASSF2); ENSG00000106003 (LFNG);
ENSG00000106541 (AGR2); ENSG00000107742 (SPOCK2); ENSG00000107984 (DKK1);
ENSG00000109321 (AREG); ENSG00000111145 (ELK3); ENSG00000112183 (RBM24);
ENSG00000113758 (DBN1); ENSG00000114115 (RBP1); ENSG00000118257 (NRP2);
ENSG00000124766 (SOX4); ENSG00000125378 (BMP4); ENSG00000134013 (LOXL2);
ENSG00000135919 (SERPINE2); ENSG00000137285 (TUBB2B); ENSG00000137819 (PAQR5);
ENSG00000139318 (DUSP6); ENSG00000140682 (TGFB1I1); ENSG00000144355 (DLX1);
ENSG00000147883 (CDKN2B); ENSG00000150782 (IL18); ENSG00000153071 (DAB2);
ENSG00000154127 (UBASH3B); ENSG00000154133 (ROBO4); ENSG00000155090 (KLF10);
ENSG00000156535 (CD109); ENSG00000162909 (CAPN2); ENSG00000163513 (TGFBR2);
ENSG00000164171 (ITGA2); ENSG00000164251 (F2RL1); ENSG00000165655 (ZNF503);
ENSG00000166145 (SPINT1); ENSG00000167601 (AXL); ENSG00000169548 (ZNF280A);
ENSG00000171345 (KRT19); ENSG00000177807 (KCNJ10); ENSG00000184371 (CSF1);
ENSG00000196154 (S100A4); ENSG00000197956 (S100A6); ENSG00000198910 (L1CAM)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005884 (integrin subunit alpha 3); ENSG00000005981 (ankyrin repeat and
SOCS box containing 4); ENSG00000007062 (prominin 1); ENSG00000010278 (CD9
molecule); ENSG00000027075 (protein kinase C; eta); ENSG00000035862 (TIMP
metallopeptidase inhibitor 2); ENSG00000038427 (versican); ENSG00000064300
(nerve growth factor receptor); ENSG00000069702 (transforming growth factor beta
receptor III); ENSG00000070404 (follistatin-like 3 (secreted glycoprotein));
ENSG00000074219 (TEA domain family member 2); ENSG00000078401 (endothelin 1);
ENSG00000091409 (integrin subunit alpha 6); ENSG00000099250 (neuropilin 1);
ENSG00000100097 (lectin; galactoside-binding; soluble; 1); ENSG00000100625 (SIX
homeobox 4); ENSG00000101265 (Ras association (RalGDS/AF-6) domain family
member 2); ENSG00000106003 (LFNG O-fucosylpeptide 3-beta-N-
acetylglucosaminyltransferase); ENSG00000106541 (anterior gradient 2; protein
disulphide isomerase family member); ENSG00000107742 (sparc/osteonectin; cwcv
and kazal-like domains proteoglycan (testican) 2); ENSG00000107984 (dickkopf
WNT signaling pathway inhibitor 1); ENSG00000109321 (amphiregulin);
ENSG00000111145 (ELK3; ETS-domain protein (SRF accessory protein 2));
ENSG00000112183 (RNA binding motif protein 24); ENSG00000113758 (drebrin 1);
ENSG00000114115 (retinol binding protein 1); ENSG00000118257 (neuropilin 2);
ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic protein 4);
ENSG00000134013 (lysyl oxidase like 2); ENSG00000135919 (serpin peptidase
inhibitor; clade E (nexin; plasminogen activator inhibitor type 1); member 2);
ENSG00000137285 (tubulin beta 2B class IIb); ENSG00000137819 (progesterone and
adipoQ receptor family member V); ENSG00000139318 (dual specificity phosphatase
6); ENSG00000140682 (transforming growth factor beta 1 induced transcript 1);
ENSG00000144355 (distal-less homeobox 1); ENSG00000147883 (cyclin-dependent

kinase inhibitor 2B (p15; inhibits CDK4)); ENSG00000150782 (interleukin 18); ENSG00000153071 (Dab; mitogen-responsive phosphoprotein; homolog 2 (Drosophila)); ENSG00000154127 (ubiquitin associated and SH3 domain containing B); ENSG00000154133 (roundabout guidance receptor 4); ENSG00000155090 (Kruppel-like factor 10); ENSG00000156535 (CD109 molecule); ENSG00000162909 (calpain 2; (m/II) large subunit); ENSG00000163513 (transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1); ENSG00000165655 (zinc finger protein 503); ENSG00000166145 (serine peptidase inhibitor; Kunitz type 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000169548 (zinc finger protein 280A); ENSG00000171345 (keratin 19; type I); ENSG00000177807 (potassium channel; inwardly rectifying subfamily J; member 10); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000196154 (S100 calcium binding protein A4); ENSG00000197956 (S100 calcium binding protein A6); ENSG00000198910 (L1 cell adhesion molecule)

BP GO:0048856 anatomical structure development

Annotate: 4996

Significant: 85

Expected: 55.5

topGO p-value: 0.0011

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005884 (ITGA3); ENSG00000005981 (ASB4); ENSG00000007062 (PROM1); ENSG00000010278 (CD9); ENSG00000027075 (PRKCH); ENSG00000035862 (TIMP2); ENSG00000038427 (VCAN); ENSG00000064300 (NGFR); ENSG00000069702 (TGFB3); ENSG00000070404 (FSTL3); ENSG00000072163 (LIMS2); ENSG00000074219 (TEAD2); ENSG00000078401 (EDN1); ENSG00000083857 (FAT1); ENSG00000085662 (AKR1B1); ENSG00000091409 (ITGA6); ENSG00000099250 (NRP1); ENSG00000100097 (LGALS1); ENSG00000100625 (SIX4); ENSG00000101265 (RASSF2); ENSG00000102359 (SRPX2); ENSG00000102934 (PLLP); ENSG00000106003 (LFNG); ENSG00000106541 (AGR2); ENSG00000107742 (SPOCK2); ENSG00000107984 (DKK1); ENSG00000109321 (AREG); ENSG00000111145 (ELK3); ENSG00000112183 (RBM24); ENSG00000112186 (CAP2); ENSG00000112852 (PCDHB2); ENSG00000113758 (DBN1); ENSG00000114115 (RBP1); ENSG00000118257 (NRP2); ENSG00000120318 (ARAP3); ENSG00000120875 (DUSP4); ENSG00000124766 (SOX4); ENSG00000125378 (BMP4); ENSG00000132688 (NES); ENSG00000133800 (LYVE1); ENSG00000134013 (LOXL2); ENSG00000135074 (ADAM19); ENSG00000135919 (SERPINE2); ENSG00000137285 (TUBB2B); ENSG00000137486 (ARRB1); ENSG00000137819 (PAQR5); ENSG00000138772 (ANXA3); ENSG00000139318 (DUSP6); ENSG00000140332 (TLE3); ENSG00000140682 (TGFB1I1); ENSG00000142798 (HSPG2); ENSG00000144355 (DLX1); ENSG00000146242 (TPBG); ENSG00000147883 (CDKN2B); ENSG00000150782 (IL18); ENSG00000153071 (DAB2); ENSG00000154127 (UBASH3B); ENSG00000154133 (ROBO4); ENSG00000155090 (KLF10); ENSG00000156453 (PCDH1); ENSG00000156535 (CD109); ENSG00000157654 (PALM2-AKAP2); ENSG00000158859 (ADAMTS4); ENSG00000162458 (FBLIM1); ENSG00000162909 (CAPN2); ENSG00000163513 (TGFB2); ENSG00000164171 (ITGA2); ENSG00000164251 (F2RL1); ENSG00000166145 (SPINT1); ENSG00000167601 (AXL); ENSG00000169548 (ZNF280A); ENSG00000171345 (KRT19); ENSG00000171346 (KRT15); ENSG00000177807 (KCNJ10); ENSG00000181104 (F2R); ENSG00000184371 (CSF1); ENSG00000186340 (THBS2); ENSG00000189143 (CLDN4); ENSG00000196154 (S100A4); ENSG00000197321 (SVIL); ENSG00000197956 (S100A6); ENSG00000198910 (L1CAM); ENSG00000198959 (TGM2); ENSG00000230456 (DDR1); ENSG00000253368 (TRNP1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005884 (integrin subunit alpha 3); ENSG00000005981 (ankyrin repeat and SOCS box containing 4); ENSG00000007062 (prominin 1); ENSG00000010278 (CD9 molecule); ENSG00000027075 (protein kinase C; eta); ENSG00000035862 (TIMP metalloproteinase inhibitor 2); ENSG00000038427 (versican); ENSG00000064300

(nerve growth factor receptor); ENSG00000069702 (transforming growth factor beta receptor III); ENSG00000070404 (follistatin-like 3 (secreted glycoprotein)); ENSG00000072163 (LIM and senescent cell antigen-like domains 2); ENSG00000074219 (TEA domain family member 2); ENSG00000078401 (endothelin 1); ENSG00000083857 (FAT atypical cadherin 1); ENSG00000085662 (aldo-keto reductase family 1; member B1 (aldose reductase)); ENSG00000091409 (integrin subunit alpha 6); ENSG00000099250 (neuropilin 1); ENSG00000100097 (lectin; galactoside-binding; soluble; 1); ENSG00000100625 (SIX homeobox 4); ENSG00000101265 (Ras association (RalGDS/AF-6) domain family member 2); ENSG00000102359 (sushi-repeat containing protein; X-linked 2); ENSG00000102934 (plasmolipin); ENSG00000106003 (LFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase); ENSG00000106541 (anterior gradient 2; protein disulphide isomerase family member); ENSG00000107742 (sparc/osteonectin; cwcv and kazal-like domains proteoglycan (testican) 2); ENSG00000107984 (dickkopf WNT signaling pathway inhibitor 1); ENSG00000109321 (amphiregulin); ENSG00000111145 (ELK3; ETS-domain protein (SRF accessory protein 2)); ENSG00000112183 (RNA binding motif protein 24); ENSG00000112186 (CAP; adenylate cyclase-associated protein; 2 (yeast)); ENSG00000112852 (protocadherin beta 2); ENSG00000113758 (drebrin 1); ENSG00000114115 (retinol binding protein 1); ENSG00000118257 (neuropilin 2); ENSG00000120318 (ArfGAP with RhoGAP domain; ankyrin repeat and PH domain 3); ENSG00000120875 (dual specificity phosphatase 4); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic protein 4); ENSG00000132688 (nestin); ENSG00000133800 (lymphatic vessel endothelial hyaluronan receptor 1); ENSG00000134013 (lysyl oxidase like 2); ENSG00000135074 (ADAM metallopeptidase domain 19); ENSG00000135919 (serpin peptidase inhibitor; clade E (nexin; plasminogen activator inhibitor type 1); member 2); ENSG00000137285 (tubulin beta 2B class IIb); ENSG00000137486 (arrestin; beta 1); ENSG00000137819 (progesterone and adiponectin receptor family member V); ENSG00000138772 (annexin A3); ENSG00000139318 (dual specificity phosphatase 6); ENSG00000140332 (transducin like enhancer of split 3); ENSG00000140682 (transforming growth factor beta 1 induced transcript 1); ENSG00000142798 (heparan sulfate proteoglycan 2); ENSG00000144355 (distal-less homeobox 1); ENSG00000146242 (trophoblast glycoprotein); ENSG00000147883 (cyclin-dependent kinase inhibitor 2B (p15; inhibits CDK4)); ENSG00000150782 (interleukin 18); ENSG00000153071 (Dab; mitogen-responsive phosphoprotein; homolog 2 (Drosophila)); ENSG00000154127 (ubiquitin associated and SH3 domain containing B); ENSG00000154133 (roundabout guidance receptor 4); ENSG00000155090 (Kruppel-like factor 10); ENSG00000156453 (protocadherin 1); ENSG00000156535 (CD109 molecule); ENSG00000157654 (PALM2-AKAP2 readthrough); ENSG00000158859 (ADAM metallopeptidase with thrombospondin type 1 motif 4); ENSG00000162458 (filamin binding LIM protein 1); ENSG00000162909 (calpain 2; (m/II) large subunit); ENSG00000163513 (transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1); ENSG00000166145 (serine peptidase inhibitor; Kunitz type 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000169548 (zinc finger protein 280A); ENSG00000171345 (keratin 19; type I); ENSG00000171346 (keratin 15; type I); ENSG00000177807 (potassium channel; inwardly rectifying subfamily J; member 10); ENSG00000181104 (coagulation factor II (thrombin) receptor); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000186340 (thrombospondin 2); ENSG00000189143 (claudin 4); ENSG00000196154 (S100 calcium binding protein A4); ENSG00000197321 (supervillin); ENSG00000197956 (S100 calcium binding protein A6); ENSG00000198910 (L1 cell adhesion molecule); ENSG00000198959 (transglutaminase 2); ENSG00000230456 (discoidin domain receptor tyrosine kinase 1); ENSG00000253368 (TMF1-regulated nuclear protein 1)

BP GO:0007267 cell-cell signaling
Annotate: 1343

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# Significant: 27
# Expected: 14.92
# topGO p-value: 0.0018
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000005884 (ITGA3); ENSG00000019505 (SYT13); ENSG00000078401 (EDN1);
ENSG00000083857 (FAT1); ENSG00000096433 (ITPR3); ENSG00000099250 (NRP1);
ENSG00000101188 (NTSR1); ENSG00000106070 (GRB10); ENSG00000107984 (DKK1);
ENSG00000109321 (AREG); ENSG00000112852 (PCDHB2); ENSG00000113758 (DBN1);
ENSG00000117394 (SLC2A1); ENSG00000124766 (SOX4); ENSG00000125378 (BMP4);
ENSG00000135919 (SERPINE2); ENSG00000137486 (ARRB1); ENSG00000137501 (SYTL2);
ENSG00000140332 (TLE3); ENSG00000140682 (TGFB1I1); ENSG00000150782 (IL18);
ENSG00000153071 (DAB2); ENSG00000155090 (KLF10); ENSG00000156453 (PCDH1);
ENSG00000167779 (IGFBP6); ENSG00000169213 (RAB3B); ENSG00000177807 (KCNJ10)
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# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000005884 (integrin subunit alpha 3); ENSG00000019505 (synaptotagmin 13);
ENSG00000078401 (endothelin 1); ENSG00000083857 (FAT atypical cadherin 1);
ENSG00000096433 (inositol 1;4;5-trisphosphate receptor; type 3); ENSG00000099250
(neuropilin 1); ENSG00000101188 (neurotensin receptor 1 (high affinity));
ENSG00000106070 (growth factor receptor bound protein 10); ENSG00000107984
(dickkopf WNT signaling pathway inhibitor 1); ENSG00000109321 (amphiregulin);
ENSG00000112852 (protocadherin beta 2); ENSG00000113758 (drebrin 1);
ENSG00000117394 (solute carrier family 2 (facilitated glucose transporter);
member 1); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic
protein 4); ENSG00000135919 (serpin peptidase inhibitor; clade E (nexin;
plasminogen activator inhibitor type 1); member 2); ENSG00000137486 (arrestin;
beta 1); ENSG00000137501 (synaptotagmin like 2); ENSG00000140332 (transducin
like enhancer of split 3); ENSG00000140682 (transforming growth factor beta 1
induced transcript 1); ENSG00000150782 (interleukin 18); ENSG00000153071 (Dab;
mitogen-responsive phosphoprotein; homolog 2 (Drosophila)); ENSG00000155090
(Kruppel-like factor 10); ENSG00000156453 (protocadherin 1); ENSG00000167779
(insulin like growth factor binding protein 6); ENSG00000169213 (RAB3B; member
RAS oncogene family); ENSG00000177807 (potassium channel; inwardly rectifying
subfamily J; member 10)
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### BP GO:0042592 homeostatic process
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# Annotate: 1511
# Significant: 28
# Expected: 16.79
# topGO p-value: 0.0048
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000007062 (PROM1); ENSG00000064300 (NGFR); ENSG00000069702 (TGFB3);
ENSG00000078401 (EDN1); ENSG00000085662 (AKR1B1); ENSG00000089127 (OAS1);
ENSG00000096433 (ITPR3); ENSG00000100097 (LGALS1); ENSG00000101188 (NTSR1);
ENSG00000101265 (RASSF2); ENSG00000103888 (CEMIP); ENSG00000116260 (QSOX1);
ENSG00000124766 (SOX4); ENSG00000125378 (BMP4); ENSG00000129566 (TEP1);
ENSG00000137486 (ARRB1); ENSG00000149212 (SESN3); ENSG00000150782 (IL18);
ENSG00000154127 (UBASH3B); ENSG00000164251 (F2RL1); ENSG00000167601 (AXL);
ENSG00000173702 (MUC13); ENSG00000177807 (KCNJ10); ENSG00000181104 (F2R);
ENSG00000184371 (CSF1); ENSG00000189143 (CLDN4); ENSG00000189334 (S100A14);
ENSG00000198959 (TGM2)
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# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000007062 (prominin 1); ENSG00000064300 (nerve growth factor receptor);
ENSG00000069702 (transforming growth factor beta receptor III); ENSG00000078401
(endothelin 1); ENSG00000085662 (aldo-keto reductase family 1; member B1
(aldose reductase)); ENSG00000089127 (2'-5'-oligoadenylate synthetase 1);
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ENSG00000096433 (inositol 1;4;5-trisphosphate receptor; type 3); ENSG00000100097 (lectin; galactoside-binding; soluble; 1); ENSG00000101188 (neurotensin receptor 1 (high affinity)); ENSG00000101265 (Ras association (RalGDS/AF-6) domain family member 2); ENSG00000103888 (cell migration inducing protein; hyaluronan binding); ENSG00000116260 (quiescin sulphydryl oxidase 1); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic protein 4); ENSG00000129566 (telomerase-associated protein 1); ENSG00000137486 (arrestin; beta 1); ENSG00000149212 (sestrin 3); ENSG00000150782 (interleukin 18); ENSG00000154127 (ubiquitin associated and SH3 domain containing B); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000173702 (mucin 13; cell surface associated); ENSG00000177807 (potassium channel; inwardly rectifying subfamily J; member 10); ENSG00000181104 (coagulation factor II (thrombin) receptor); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000189143 (claudin 4); ENSG00000189334 (S100 calcium binding protein A14); ENSG00000198959 (transglutaminase 2)

BP GO:0009790 embryo development

Annotate: 900

Significant: 19

Expected: 10

topGO p-value: 0.0054

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005884 (ITGA3); ENSG00000074219 (TEAD2); ENSG00000078401 (EDN1);

ENSG00000099250 (NRP1); ENSG00000100625 (SIX4); ENSG00000106003 (LFNG);

ENSG00000107984 (DKK1); ENSG00000118257 (NRP2); ENSG00000120875 (DUSP4);

ENSG00000124766 (SOX4); ENSG00000125378 (BMP4); ENSG00000132688 (NES);

ENSG00000139318 (DUSP6); ENSG00000144355 (DLX1); ENSG00000162909 (CAPN2);

ENSG00000163513 (TGFB2); ENSG00000164171 (ITGA2); ENSG00000166145 (SPINT1);

ENSG00000171345 (KRT19)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005884 (integrin subunit alpha 3); ENSG00000074219 (TEA domain family

member 2); ENSG00000078401 (endothelin 1); ENSG00000099250 (neuropilin 1);

ENSG00000100625 (SIX homeobox 4); ENSG00000106003 (LFNG O-fucosylpeptide 3-beta-

N-acetylglucosaminyltransferase); ENSG00000107984 (dickkopf WNT signaling

pathway inhibitor 1); ENSG00000118257 (neuropilin 2); ENSG00000120875 (dual

specificity phosphatase 4); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone

morphogenetic protein 4); ENSG00000132688 (nestin); ENSG00000139318 (dual

specificity phosphatase 6); ENSG00000144355 (distal-less homeobox 1);

ENSG00000162909 (calpain 2; (m/II) large subunit); ENSG00000163513

(transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit

alpha 2); ENSG00000166145 (serine peptidase inhibitor; Kunitz type 1);

ENSG00000171345 (keratin 19; type I)

BP GO:0008219 cell death

Annotate: 1841

Significant: 32

Expected: 20.45

topGO p-value: 0.0066

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000011422 (PLAUR); ENSG00000027075 (PRKCH); ENSG00000064300 (NGFR);

ENSG00000072163 (LIMS2); ENSG00000074219 (TEAD2); ENSG00000078401 (EDN1);

ENSG00000091409 (ITGA6); ENSG00000099250 (NRP1); ENSG00000100097 (LGALS1);

ENSG00000100625 (SIX4); ENSG00000101188 (NTR1); ENSG00000101265 (RASSF2);

ENSG00000106541 (AGR2); ENSG00000118971 (CCND2); ENSG00000124766 (SOX4);

ENSG00000125378 (BMP4); ENSG00000131746 (TNS4); ENSG00000132688 (NES);
ENSG00000137486 (ARRB1); ENSG00000139318 (DUSP6); ENSG00000144355 (DLX1);
ENSG00000153071 (DAB2); ENSG00000154133 (ROBO4); ENSG00000163513 (TGFB2);
ENSG00000167601 (AXL); ENSG00000171680 (PLEKHG5); ENSG00000180644 (PRF1);
ENSG00000181104 (F2R); ENSG00000189334 (S100A14); ENSG00000198959 (TGM2);
ENSG00000274538 (PHLDA2); ENSG00000276016 (ABR)

Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000011422 (plasminogen activator; urokinase receptor); ENSG00000027075
(protein kinase C; eta); ENSG00000064300 (nerve growth factor receptor);
ENSG00000072163 (LIM and senescent cell antigen-like domains 2); ENSG00000074219
(TEA domain family member 2); ENSG00000078401 (endothelin 1); ENSG00000091409
(integrin subunit alpha 6); ENSG00000099250 (neuropilin 1); ENSG00000100097
(lectin; galactoside-binding; soluble; 1); ENSG00000100625 (SIX homeobox 4);
ENSG00000101188 (neurotensin receptor 1 (high affinity)); ENSG00000101265 (Ras
association (RalGDS/AF-6) domain family member 2); ENSG00000106541 (anterior
gradient 2; protein disulphide isomerase family member); ENSG00000118971 (cyclin
D2); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic protein
4); ENSG00000131746 (tensin 4); ENSG00000132688 (nestin); ENSG00000137486
(arrestin; beta 1); ENSG00000139318 (dual specificity phosphatase 6);
ENSG00000144355 (distal-less homeobox 1); ENSG00000153071 (Dab; mitogen-
responsive phosphoprotein; homolog 2 (Drosophila)); ENSG00000154133 (roundabout
guidance receptor 4); ENSG00000163513 (transforming growth factor beta receptor
II); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000171680 (pleckstrin
homology and RhoGEF domain containing G5); ENSG00000180644 (perforin 1 (pore
forming protein)); ENSG00000181104 (coagulation factor II (thrombin) receptor);
ENSG00000189334 (S100 calcium binding protein A14); ENSG00000198959
(transglutaminase 2); ENSG00000274538 (pleckstrin homology-like domain; family
A; member 2); ENSG00000276016 (active BCR-related)

BP GO:0002376 immune system process

Annotate: 2266

Significant: 36

Expected: 25.17

topGO p-value: 0.0156

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005884 (ITGA3); ENSG00000027075 (PRKCH); ENSG00000064300 (NGFR);
ENSG00000069702 (TGFB3); ENSG00000070404 (FSTL3); ENSG00000078401 (EDN1);
ENSG00000084731 (KIF3C); ENSG00000089127 (OAS1); ENSG00000091409 (ITGA6);
ENSG00000100097 (LGALS1); ENSG00000100625 (SIX4); ENSG00000101265 (RASSF2);
ENSG00000106003 (LFNG); ENSG00000107201 (DDX58); ENSG00000114115 (RBP1);
ENSG00000117226 (GBP3); ENSG00000124766 (SOX4); ENSG00000125378 (BMP4);
ENSG00000132256 (TRIM5); ENSG00000138772 (ANXA3); ENSG00000147883 (CDKN2B);
ENSG00000149564 (ESAM); ENSG00000150782 (IL18); ENSG00000154127 (UBASH3B);
ENSG00000155090 (KLF10); ENSG00000156535 (CD109); ENSG00000163513 (TGFB2);
ENSG00000164171 (ITGA2); ENSG00000164251 (F2RL1); ENSG00000167601 (AXL);
ENSG00000169213 (RAB3B); ENSG00000180644 (PRF1); ENSG00000184371 (CSF1);
ENSG00000189334 (S100A14); ENSG00000196188 (CTSE); ENSG00000198910 (L1CAM)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005884 (integrin subunit alpha 3); ENSG00000027075 (protein kinase C;
eta); ENSG00000064300 (nerve growth factor receptor); ENSG00000069702
(transforming growth factor beta receptor III); ENSG00000070404 (follistatin-
like 3 (secreted glycoprotein)); ENSG00000078401 (endothelin 1);
ENSG00000084731 (kinesin family member 3C); ENSG00000089127 (2'-5'-
oligoadenylate synthetase 1); ENSG00000091409 (integrin subunit alpha 6);
ENSG00000100097 (lectin; galactoside-binding; soluble; 1); ENSG00000100625 (SIX

homeobox 4); ENSG00000101265 (Ras association (RalGDS/AF-6) domain family member 2); ENSG00000106003 (LFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase); ENSG00000107201 (DEAD (Asp-Glu-Ala-Asp) box polypeptide 58); ENSG00000114115 (retinol binding protein 1); ENSG00000117226 (guanylate binding protein 3); ENSG00000124766 (SRY-box 4); ENSG00000125378 (bone morphogenetic protein 4); ENSG00000132256 (tripartite motif containing 5); ENSG00000138772 (annexin A3); ENSG00000147883 (cyclin-dependent kinase inhibitor 2B (p15; inhibits CDK4)); ENSG00000149564 (endothelial cell adhesion molecule); ENSG00000150782 (interleukin 18); ENSG00000154127 (ubiquitin associated and SH3 domain containing B); ENSG00000155090 (Kruppel-like factor 10); ENSG00000156535 (CD109 molecule); ENSG00000163513 (transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000169213 (RAB3B; member RAS oncogene family); ENSG00000180644 (perforin 1 (pore forming protein)); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000189334 (S100 calcium binding protein A14); ENSG00000196188 (cathepsin E); ENSG00000198910 (L1 cell adhesion molecule)

BP GO:0006950 response to stress

Annotate: 3502

Significant: 51

Expected: 38.91

topGO p-value: 0.0191

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000010278 (CD9); ENSG00000011422 (PLAUR); ENSG00000027075 (PRKCH); ENSG00000057019 (DCBLD2); ENSG00000064300 (NGFR); ENSG00000069702 (TGFB3); ENSG00000074590 (NUAK1); ENSG00000078401 (EDN1); ENSG00000085662 (AKR1B1); ENSG00000088387 (DOCK9); ENSG00000089127 (OAS1); ENSG00000096433 (ITPR3); ENSG00000099250 (NRP1); ENSG00000100097 (LGALS1); ENSG00000101265 (RASSF2); ENSG00000102934 (PLLP); ENSG00000103187 (COTL1); ENSG00000106541 (AGR2); ENSG00000107201 (DDX58); ENSG00000109321 (AREG); ENSG00000111145 (ELK3); ENSG00000117226 (GBP3); ENSG00000117394 (SLC2A1); ENSG00000122861 (PLAU); ENSG00000124766 (SOX4); ENSG00000130592 (LSP1); ENSG00000132256 (TRIM5); ENSG00000133800 (LYVE1); ENSG00000134013 (LOXL2); ENSG00000135318 (NT5E); ENSG00000135919 (SERPINE2); ENSG00000137486 (ARRB1); ENSG00000138772 (ANXA3); ENSG00000139318 (DUSP6); ENSG00000140682 (TGFB1I1); ENSG00000149212 (SESN3); ENSG00000150782 (IL18); ENSG00000154127 (UBASH3B); ENSG00000155090 (KLF10); ENSG00000156535 (CD109); ENSG00000162909 (CAPN2); ENSG00000163513 (TGFB2); ENSG00000164171 (ITGA2); ENSG00000164251 (F2RL1); ENSG00000167601 (AXL); ENSG00000180644 (PRF1); ENSG00000181104 (F2R); ENSG00000184371 (CSF1); ENSG00000189334 (S100A14); ENSG00000198959 (TGM2); ENSG00000230456 (DDR1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000010278 (CD9 molecule); ENSG00000011422 (plasminogen activator; urokinase receptor); ENSG00000027075 (protein kinase C; eta); ENSG00000057019 (discoidin; CUB and LCCL domain containing 2); ENSG00000064300 (nerve growth factor receptor); ENSG00000069702 (transforming growth factor beta receptor III); ENSG00000074590 (NUAK family; SNF1-like kinase; 1); ENSG00000078401 (endothelin 1); ENSG00000085662 (aldo-keto reductase family 1; member B1 (aldose reductase)); ENSG00000088387 (dedicator of cytokinesis 9); ENSG00000089127 (2'-5'-oligoadenylate synthetase 1); ENSG00000096433 (inositol 1;4;5-trisphosphate receptor; type 3); ENSG00000099250 (neuropilin 1); ENSG00000100097 (lectin; galactoside-binding; soluble; 1); ENSG00000101265 (Ras association (RalGDS/AF-6) domain family member 2); ENSG00000102934 (plasmalipin); ENSG00000103187 (coactosin-like F-actin binding protein 1); ENSG00000106541 (anterior gradient 2; protein disulphide isomerase family member); ENSG00000107201 (DEAD (Asp-Glu-Ala-Asp) box polypeptide 58);

ENSG00000109321 (amphiregulin); ENSG00000111145 (ELK3; ETS-domain protein (SRF accessory protein 2)); ENSG00000117226 (guanylate binding protein 3); ENSG00000117394 (solute carrier family 2 (facilitated glucose transporter); member 1); ENSG00000122861 (plasminogen activator; urokinase); ENSG00000124766 (SRY-box 4); ENSG00000130592 (lymphocyte-specific protein 1); ENSG00000132256 (tripartite motif containing 5); ENSG00000133800 (lymphatic vessel endothelial hyaluronan receptor 1); ENSG00000134013 (lysyl oxidase like 2); ENSG00000135318 (5'-nucleotidase; ecto (CD73)); ENSG00000135919 (serpin peptidase inhibitor; clade E (nexin; plasminogen activator inhibitor type 1); member 2); ENSG00000137486 (arrestin; beta 1); ENSG00000138772 (annexin A3); ENSG00000139318 (dual specificity phosphatase 6); ENSG00000140682 (transforming growth factor beta 1 induced transcript 1); ENSG00000149212 (sestrin 3); ENSG00000150782 (interleukin 18); ENSG00000154127 (ubiquitin associated and SH3 domain containing B); ENSG00000155090 (Kruppel-like factor 10); ENSG00000156535 (CD109 molecule); ENSG00000162909 (calpain 2; (m/II) large subunit); ENSG00000163513 (transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000180644 (perforin 1 (pore forming protein)); ENSG00000181104 (coagulation factor II (thrombin) receptor); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000189334 (S100 calcium binding protein A14); ENSG00000198959 (transglutaminase 2); ENSG00000230456 (discoidin domain receptor tyrosine kinase 1)

BP GO:0000003 reproduction

Annotate: 1184

Significant: 21

Expected: 13.15

topGO p-value: 0.0223

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005884 (ITGA3); ENSG00000010278 (CD9); ENSG00000070404 (FSTL3); ENSG00000078401 (EDN1); ENSG00000085662 (AKR1B1); ENSG00000100625 (SIX4); ENSG00000106003 (LFNG); ENSG00000109321 (AREG); ENSG00000119669 (IRF2BPL); ENSG00000125378 (BMP4); ENSG00000135919 (SERPINE2); ENSG00000137486 (ARRB1); ENSG00000137819 (PAQR5); ENSG00000163513 (TGFB2); ENSG00000164171 (ITGA2); ENSG00000166145 (SPINT1); ENSG00000167601 (AXL); ENSG00000171345 (KRT19); ENSG00000184371 (CSF1); ENSG00000189143 (CLDN4); ENSG00000230456 (DDR1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005884 (integrin subunit alpha 3); ENSG00000010278 (CD9 molecule); ENSG00000070404 (follistatin-like 3 (secreted glycoprotein)); ENSG00000078401 (endothelin 1); ENSG00000085662 (aldo-keto reductase family 1; member B1 (aldose reductase)); ENSG00000100625 (SIX homeobox 4); ENSG00000106003 (LFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase); ENSG00000109321 (amphiregulin); ENSG00000119669 (interferon regulatory factor 2 binding protein-like); ENSG00000125378 (bone morphogenetic protein 4); ENSG00000135919 (serpin peptidase inhibitor; clade E (nexin; plasminogen activator inhibitor type 1); member 2); ENSG00000137486 (arrestin; beta 1); ENSG00000137819 (progesterin and adipoQ receptor family member V); ENSG00000163513 (transforming growth factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2); ENSG00000166145 (serine peptidase inhibitor; Kunitz type 1); ENSG00000167601 (AXL receptor tyrosine kinase); ENSG00000171345 (keratin 19; type I); ENSG00000184371 (colony stimulating factor 1 (macrophage)); ENSG00000189143 (claudin 4); ENSG00000230456 (discoidin domain receptor tyrosine kinase 1)

BP GO:0007010 cytoskeleton organization


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# Annotate: 1121
# Significant: 20
# Expected: 12.45
# topGO p-value: 0.0241
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000034510 (TMSB10); ENSG00000078401 (EDN1); ENSG00000083857 (FAT1);
ENSG00000100625 (SIX4); ENSG00000103647 (CORO2B); ENSG00000112186 (CAP2);
ENSG00000113758 (DBN1); ENSG00000120318 (ARAP3); ENSG00000132688 (NES);
ENSG00000137285 (TUBB2B); ENSG00000137486 (ARRB1); ENSG00000162909 (CAPN2);
ENSG00000164251 (F2RL1); ENSG00000167552 (TUBA1A); ENSG00000171345 (KRT19);
ENSG00000171346 (KRT15); ENSG00000171877 (FRMD5); ENSG00000171992 (SYNPO);
ENSG00000197321 (SVIL); ENSG00000205542 (TMSB4X)

# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000034510 (thymosin beta 10); ENSG00000078401 (endothelin 1);
ENSG00000083857 (FAT atypical cadherin 1); ENSG00000100625 (SIX homeobox 4);
ENSG00000103647 (coronin; actin binding protein; 2B); ENSG00000112186 (CAP;
adenylate cyclase-associated protein; 2 (yeast)); ENSG00000113758 (drebrin 1);
ENSG00000120318 (ArfGAP with RhoGAP domain; ankyrin repeat and PH domain 3);
ENSG00000132688 (nestin); ENSG00000137285 (tubulin beta 2B class IIb);
ENSG00000137486 (arrestin; beta 1); ENSG00000162909 (calpain 2; (m/II) large
subunit); ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1);
ENSG00000167552 (tubulin alpha 1a); ENSG00000171345 (keratin 19; type I);
ENSG00000171346 (keratin 15; type I); ENSG00000171877 (FERM domain containing
5); ENSG00000171992 (synaptopodin); ENSG00000197321 (supervillin);
ENSG00000205542 (thymosin beta 4; X-linked)
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### BP GO:0016192 vesicle-mediated transport
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# Annotate: 1394
# Significant: 23
# Expected: 15.49
# topGO p-value: 0.0356
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000010278 (CD9); ENSG00000019505 (SYT13); ENSG00000084731 (KIF3C);
ENSG00000099250 (NRP1); ENSG00000107984 (DKK1); ENSG00000109321 (AREG);
ENSG00000116260 (QSOX1); ENSG00000120318 (ARAP3); ENSG00000132669 (RIN2);
ENSG00000134013 (LOXL2); ENSG00000137486 (ARRB1); ENSG00000137501 (SYTL2);
ENSG00000138772 (ANXA3); ENSG00000153071 (DAB2); ENSG00000163513 (TGFBR2);
ENSG00000164171 (ITGA2); ENSG00000164251 (F2RL1); ENSG00000164265 (SCGB3A2);
ENSG00000167601 (AXL); ENSG00000169213 (RAB3B); ENSG00000175416 (CLTB);
ENSG00000198959 (TGM2); ENSG00000205542 (TMSB4X)

# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000010278 (CD9 molecule); ENSG00000019505 (synaptotagmin 13);
ENSG00000084731 (kinesin family member 3C); ENSG00000099250 (neuropilin 1);
ENSG00000107984 (dickkopf WNT signaling pathway inhibitor 1); ENSG00000109321
(amphiregulin); ENSG00000116260 (quiescin sulfhydryl oxidase 1); ENSG00000120318
(ArfGAP with RhoGAP domain; ankyrin repeat and PH domain 3); ENSG00000132669
(Ras and Rab interactor 2); ENSG00000134013 (lysyl oxidase like 2);
ENSG00000137486 (arrestin; beta 1); ENSG00000137501 (synaptotagmin like 2);
ENSG00000138772 (annexin A3); ENSG00000153071 (Dab; mitogen-responsive
phosphoprotein; homolog 2 (Drosophila)); ENSG00000163513 (transforming growth
factor beta receptor II); ENSG00000164171 (integrin subunit alpha 2);
ENSG00000164251 (coagulation factor II (thrombin) receptor-like 1);
ENSG00000164265 (secretoglobin; family 3A; member 2); ENSG00000167601 (AXL
receptor tyrosine kinase); ENSG00000169213 (RAB3B; member RAS oncogene family);
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ENSG00000175416 (clathrin; light chain B); ENSG00000198959 (transglutaminase 2);
ENSG00000205542 (thymosin beta 4; X-linked)

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GO term enrichment of down-regulated genes

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BP GO:0006790 sulfur compound metabolic process

Annotate: 369

Significant: 11

Expected: 2.92

topGO p-value: 0.0002

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000015413 (DPEP1); ENSG00000021826 (CPS1); ENSG00000060762 (MPC1);
ENSG00000088305 (DNMT3B); ENSG00000105398 (SULT2A1); ENSG00000117479 (SLC19A2);
ENSG00000124713 (GNMT); ENSG00000151224 (MAT1A); ENSG00000172840 (PDP2);
ENSG00000183747 (ACSM2A); ENSG00000184227 (ACOT1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000015413 (dipeptidase 1 (renal)); ENSG00000021826 (carbamoyl-phosphate
synthase 1); ENSG00000060762 (mitochondrial pyruvate carrier 1); ENSG00000088305
(DNA (cytosine-5-)-methyltransferase 3 beta); ENSG00000105398 (sulfotransferase
family 2A member 1); ENSG00000117479 (solute carrier family 19 (thiamine
transporter); member 2); ENSG00000124713 (glycine N-methyltransferase);
ENSG00000151224 (methionine adenosyltransferase I; alpha); ENSG00000172840
(pyruvate dehydrogenase phosphatase catalytic subunit 2); ENSG00000183747 (acyl-
CoA synthetase medium-chain family member 2A); ENSG00000184227 (acyl-CoA
thioesterase 1)

BP GO:0002376 immune system process

Annotate: 2266

Significant: 33

Expected: 17.94

topGO p-value: 0.0003

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000021852 (C8B); ENSG00000057593 (F7); ENSG00000105697 (HAMP);
ENSG00000106804 (C5); ENSG00000117601 (SERPINC1); ENSG00000120885 (CLU);
ENSG00000129354 (AP1M2); ENSG00000129988 (LBP); ENSG00000130707 (ASS1);
ENSG00000131187 (F12); ENSG00000137869 (CYP19A1); ENSG00000138207 (RBP4);
ENSG00000143669 (LYST); ENSG00000149131 (SERPING1); ENSG00000152804 (HHEX);
ENSG00000159403 (C1R); ENSG00000168077 (SCARA3); ENSG00000169856 (ONECUT1);
ENSG00000171560 (FGA); ENSG00000171564 (FGB); ENSG00000174371 (EXO1);
ENSG00000176208 (ATAD5); ENSG00000176919 (C8G); ENSG00000182326 (C1S);
ENSG00000183134 (PTGDR2); ENSG00000203896 (LIME1); ENSG00000228267 (C4B);
ENSG00000233312 (C4B_2); ENSG00000239754 (CFB); ENSG00000241534 (CFB);
ENSG00000242335 (CFB); ENSG00000243570 (CFB); ENSG00000257017 (HP)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000021852 (complement component 8; beta polypeptide); ENSG00000057593
(coagulation factor VII (serum prothrombin conversion accelerator));
ENSG00000105697 (hepcidin antimicrobial peptide); ENSG00000106804 (complement
component 5); ENSG00000117601 (serpin peptidase inhibitor; clade C

(antithrombin); member 1); ENSG00000120885 (clusterin); ENSG00000129354 (adaptor related protein complex 1 mu 2 subunit); ENSG00000129988 (lipopolysaccharide binding protein); ENSG00000130707 (argininosuccinate synthase 1); ENSG00000131187 (coagulation factor XII (Hageman factor)); ENSG00000137869 (cytochrome P450 family 19 subfamily A member 1); ENSG00000138207 (retinol binding protein 4); ENSG00000143669 (lysosomal trafficking regulator); ENSG00000149131 (serpin peptidase inhibitor; clade G (C1 inhibitor); member 1); ENSG00000152804 (hematopoietically expressed homeobox); ENSG00000159403 (complement component 1; r subcomponent); ENSG00000168077 (scavenger receptor class A member 3); ENSG00000169856 (one cut homeobox 1); ENSG00000171560 (fibrinogen alpha chain); ENSG00000171564 (fibrinogen beta chain); ENSG00000174371 (exonuclease 1); ENSG00000176208 (ATPase family; AAA domain containing 5); ENSG00000176919 (complement component 8; gamma polypeptide); ENSG00000182326 (complement component 1; s subcomponent); ENSG00000183134 (prostaglandin D2 receptor 2); ENSG00000203896 (Lck interacting transmembrane adaptor 1); ENSG00000228267 (complement component 4B (Chido blood group)); ENSG00000233312 (complement component 4B (Chido blood group); copy 2); ENSG00000239754 (complement factor B); ENSG00000241534 (complement factor B); ENSG00000242335 (complement factor B); ENSG00000243570 (complement factor B); ENSG00000257017 (haptoglobin)

BP GO:0071941 nitrogen cycle metabolic process

Annotate: 18

Significant: 3

Expected: 0.14

topGO p-value: 0.0004

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000021826 (CPS1); ENSG00000118520 (ARG1); ENSG00000130707 (ASS1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000021826 (carbamoyl-phosphate synthase 1); ENSG00000118520 (arginase 1);

ENSG00000130707 (argininosuccinate synthase 1)

BP GO:0006629 lipid metabolic process

Annotate: 1313

Significant: 22

Expected: 10.4

topGO p-value: 0.0006

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005187 (ACSM3); ENSG00000009950 (MLXIPL); ENSG0000015413 (DPEP1);

ENSG00000021826 (CPS1); ENSG00000055957 (ITIH1); ENSG00000066813 (ACSM2B);

ENSG00000091583 (APOH); ENSG00000100344 (PNPLA3); ENSG00000105398 (SULT2A1);

ENSG00000110245 (APOC3); ENSG00000112972 (HMGS1); ENSG00000120885 (CLU);

ENSG00000132855 (ANGPTL3); ENSG00000137561 (TTPA); ENSG00000137869 (CYP19A1);

ENSG00000138207 (RBP4); ENSG00000158555 (GDPD5); ENSG00000172840 (PDP2);

ENSG00000177984 (LCN15); ENSG00000183747 (ACSM2A); ENSG00000184227 (ACOT1);

ENSG00000274588 (DGKK)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005187 (acyl-CoA synthetase medium-chain family member 3);

ENSG00000009950 (MLX interacting protein-like); ENSG0000015413 (dipeptidase 1

(renal)); ENSG00000021826 (carbamoyl-phosphate synthase 1); ENSG00000055957

(inter-alpha-trypsin inhibitor heavy chain 1); ENSG00000066813 (acyl-CoA

synthetase medium-chain family member 2B); ENSG00000091583 (apolipoprotein H);

ENSG00000100344 (patatin like phospholipase domain containing 3);

ENSG00000105398 (sulfotransferase family 2A member 1); ENSG00000110245

(apolipoprotein C-III); ENSG00000112972 (3-hydroxy-3-methylglutaryl-CoA synthase 1); ENSG00000120885 (clusterin); ENSG00000132855 (angiopoietin like 3); ENSG00000137561 (tocopherol (alpha) transfer protein); ENSG00000137869 (cytochrome P450 family 19 subfamily A member 1); ENSG00000138207 (retinol binding protein 4); ENSG00000158555 (glycerophosphodiester phosphodiesterase domain containing 5); ENSG00000172840 (pyruvate dehydrogenase phosphatase catalytic subunit 2); ENSG00000177984 (lipocalin 15); ENSG00000183747 (acyl-CoA synthetase medium-chain family member 2A); ENSG00000184227 (acyl-CoA thioesterase 1); ENSG00000274588 (diacylglycerol kinase; kappa)

BP GO:0006520 cellular amino acid metabolic process

Annotate: 326

Significant: 9

Expected: 2.58

topGO p-value: 0.0012

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000021826 (CPS1); ENSG00000118520 (ARG1); ENSG00000119711 (ALDH6A1);

ENSG00000124713 (GNMT); ENSG00000130707 (ASS1); ENSG00000132437 (DDC);

ENSG00000151224 (MAT1A); ENSG00000171759 (PAH); ENSG00000172482 (AGXT)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000021826 (carbamoyl-phosphate synthase 1); ENSG00000118520 (arginase 1);

ENSG00000119711 (aldehyde dehydrogenase 6 family member A1); ENSG00000124713

(glycine N-methyltransferase); ENSG00000130707 (argininosuccinate synthase 1);

ENSG00000132437 (dopa decarboxylase); ENSG00000151224 (methionine

adenosyltransferase I; alpha); ENSG00000171759 (phenylalanine hydroxylase);

ENSG00000172482 (alanine-glyoxylate aminotransferase)

BP GO:0044281 small molecule metabolic process

Annotate: 1912

Significant: 32

Expected: 15.14

topGO p-value: 0.0014

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000005187 (ACSM3); ENSG00000009950 (MLXIPL); ENSG0000015413 (DPEP1);

ENSG00000021826 (CPS1); ENSG00000055957 (ITIH1); ENSG00000060762 (MPC1);

ENSG00000066813 (ACSM2B); ENSG00000088305 (DNMT3B); ENSG00000105398 (SULT2A1);

ENSG00000110245 (APOC3); ENSG00000112972 (HMGS1); ENSG00000117479 (SLC19A2);

ENSG00000118520 (ARG1); ENSG00000119711 (ALDH6A1); ENSG00000124713 (GNMT);

ENSG00000130707 (ASS1); ENSG00000132437 (DDC); ENSG00000132855 (ANGPTL3);

ENSG00000137561 (TTPA); ENSG00000138207 (RBP4); ENSG00000144908 (ALDH1L1);

ENSG00000151224 (MAT1A); ENSG00000152620 (NADK2); ENSG00000166126 (AMN);

ENSG00000169856 (ONECUT1); ENSG00000170482 (SLC23A1); ENSG00000171759 (PAH);

ENSG00000172482 (AGXT); ENSG00000172840 (PDP2); ENSG00000172955 (ADH6);

ENSG00000183747 (ACSM2A); ENSG00000184227 (ACOT1)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000005187 (acyl-CoA synthetase medium-chain family member 3);

ENSG00000009950 (MLX interacting protein-like); ENSG0000015413 (dipeptidase 1

(renal)); ENSG00000021826 (carbamoyl-phosphate synthase 1); ENSG00000055957

(inter-alpha-trypsin inhibitor heavy chain 1); ENSG00000060762 (mitochondrial

pyruvate carrier 1); ENSG00000066813 (acyl-CoA synthetase medium-chain family

member 2B); ENSG00000088305 (DNA (cytosine-5-)-methyltransferase 3 beta);

ENSG00000105398 (sulfotransferase family 2A member 1); ENSG00000110245

(apolipoprotein C-III); ENSG00000112972 (3-hydroxy-3-methylglutaryl-CoA synthase

1); ENSG00000117479 (solute carrier family 19 (thiamine transporter); member

2); ENSG00000118520 (arginase 1); ENSG00000119711 (aldehyde dehydrogenase 6 family member A1); ENSG00000124713 (glycine N-methyltransferase); ENSG00000130707 (argininosuccinate synthase 1); ENSG00000132437 (dopa decarboxylase); ENSG00000132855 (angiopoietin like 3); ENSG00000137561 (tocopherol (alpha) transfer protein); ENSG00000138207 (retinol binding protein 4); ENSG00000144908 (aldehyde dehydrogenase 1 family member L1); ENSG00000151224 (methionine adenosyltransferase I; alpha); ENSG00000152620 (NAD kinase 2; mitochondrial); ENSG00000166126 (amnion associated transmembrane protein); ENSG00000169856 (one cut homeobox 1); ENSG00000170482 (solute carrier family 23 (ascorbic acid transporter); member 1); ENSG00000171759 (phenylalanine hydroxylase); ENSG00000172482 (alanine-glyoxylate aminotransferase); ENSG00000172840 (pyruvate dehydrogenase phosphatase catalytic subunit 2); ENSG00000172955 (alcohol dehydrogenase 6 (class V)); ENSG00000183747 (acyl-CoA synthetase medium-chain family member 2A); ENSG00000184227 (acyl-CoA thioesterase 1)

BP GO:0016192 vesicle-mediated transport

Annotate: 1394

Significant: 21

Expected: 11.04

topGO p-value: 0.003

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000055955 (ITIH4); ENSG00000057593 (F7); ENSG00000091583 (APOH); ENSG00000106327 (TFR2); ENSG00000110245 (APOC3); ENSG00000113889 (KNG1); ENSG00000120885 (CLU); ENSG00000121410 (A1BG); ENSG00000129354 (AP1M2); ENSG00000129988 (LBP); ENSG00000149131 (SERPING1); ENSG00000166126 (AMN); ENSG00000167711 (SERPINF2); ENSG00000168077 (SCARA3); ENSG00000171557 (FGG); ENSG00000171560 (FGA); ENSG00000171564 (FGB); ENSG00000228267 (C4B); ENSG00000233312 (C4B_2); ENSG00000257017 (HP); ENSG00000261701 (HPR)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000055955 (inter-alpha-trypsin inhibitor heavy chain family member 4); ENSG00000057593 (coagulation factor VII (serum prothrombin conversion accelerator)); ENSG00000091583 (apolipoprotein H); ENSG00000106327 (transferrin receptor 2); ENSG00000110245 (apolipoprotein C-III); ENSG00000113889 (kininogen 1); ENSG00000120885 (clusterin); ENSG00000121410 (alpha-1-B glycoprotein); ENSG00000129354 (adaptor related protein complex 1 mu 2 subunit); ENSG00000129988 (lipopolysaccharide binding protein); ENSG00000149131 (serpin peptidase inhibitor; clade G (C1 inhibitor); member 1); ENSG00000166126 (amnion associated transmembrane protein); ENSG00000167711 (serpin peptidase inhibitor; clade F (alpha-2 antiplasmin; pigment epithelium derived factor); member 2); ENSG00000168077 (scavenger receptor class A member 3); ENSG00000171557 (fibrinogen gamma chain); ENSG00000171560 (fibrinogen alpha chain); ENSG00000171564 (fibrinogen beta chain); ENSG00000228267 (complement component 4B (Chido blood group)); ENSG00000233312 (complement component 4B (Chido blood group); copy 2); ENSG00000257017 (haptoglobin); ENSG00000261701 (haptoglobin-related protein)

BP GO:0051186 cofactor metabolic process

Annotate: 381

Significant: 9

Expected: 3.02

topGO p-value: 0.0033

Differentially expressed genes in this GO term (IDs and gene names):

ENSG0000009950 (MLXIPL); ENSG00000060762 (MPC1); ENSG00000124713 (GNMT);

ENSG00000144908 (ALDH1L1); ENSG00000151224 (MAT1A); ENSG00000152620 (NADK2);
ENSG00000172840 (PDP2); ENSG00000183747 (ACSM2A); ENSG00000184227 (ACOT1)

Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000009950 (MLX interacting protein-like); ENSG00000060762 (mitochondrial
pyruvate carrier 1); ENSG00000124713 (glycine N-methyltransferase);
ENSG00000144908 (aldehyde dehydrogenase 1 family member L1); ENSG00000151224
(methionine adenosyltransferase I; alpha); ENSG00000152620 (NAD kinase 2;
mitochondrial); ENSG00000172840 (pyruvate dehydrogenase phosphatase catalytic
subunit 2); ENSG00000183747 (acyl-CoA synthetase medium-chain family member 2A);
ENSG00000184227 (acyl-CoA thioesterase 1)

BP GO:0006810 transport

Annotate: 4414

Significant: 47

Expected: 34.95

topGO p-value: 0.0038

Differentially expressed genes in this GO term (IDs and gene names):

ENSG00000055955 (ITIH4); ENSG00000055957 (ITIH1); ENSG00000057593 (F7);
ENSG00000060762 (MPC1); ENSG00000091583 (APOH); ENSG00000100373 (UPK3A);
ENSG00000105697 (HAMP); ENSG00000106327 (TFR2); ENSG00000106804 (C5);
ENSG00000110245 (APOC3); ENSG00000113889 (KNG1); ENSG00000117479 (SLC19A2);
ENSG00000117601 (SERPINC1); ENSG00000117834 (SLC5A9); ENSG00000118520 (ARG1);
ENSG00000120885 (CLU); ENSG00000121410 (A1BG); ENSG00000129354 (AP1M2);
ENSG00000129988 (LBP); ENSG00000131242 (RAB11FIP4); ENSG00000132437 (DDC);
ENSG00000137561 (TTPA); ENSG00000137752 (CASP1); ENSG00000138207 (RBP4);
ENSG00000143669 (LYST); ENSG00000149131 (SERPING1); ENSG00000152804 (HHEX);
ENSG00000163884 (KLF15); ENSG00000166126 (AMN); ENSG00000167711 (SERPINF2);
ENSG00000168077 (SCARA3); ENSG00000170482 (SLC23A1); ENSG00000171557 (FGG);
ENSG00000171560 (FGA); ENSG00000171564 (FGB); ENSG00000172482 (AGXT);
ENSG00000173930 (SLCO4C1); ENSG00000174804 (FZD4); ENSG00000177984 (LCN15);
ENSG00000196632 (WNK3); ENSG00000196660 (SLC30A10); ENSG00000196814 (MVB12B);
ENSG00000198569 (SLC34A3); ENSG00000228267 (C4B); ENSG00000233312 (C4B_2);
ENSG00000257017 (HP); ENSG00000261701 (HPR)

Differentially expressed genes in this GO term (IDs and product descriptions):

ENSG00000055955 (inter-alpha-trypsin inhibitor heavy chain family member 4);
ENSG00000055957 (inter-alpha-trypsin inhibitor heavy chain 1); ENSG00000057593
(coagulation factor VII (serum prothrombin conversion accelerator));
ENSG00000060762 (mitochondrial pyruvate carrier 1); ENSG00000091583
(apolipoprotein H); ENSG00000100373 (uroplakin 3A); ENSG00000105697 (hepcidin
antimicrobial peptide); ENSG00000106327 (transferrin receptor 2);
ENSG00000106804 (complement component 5); ENSG00000110245 (apolipoprotein C-
III); ENSG00000113889 (kininogen 1); ENSG00000117479 (solute carrier family 19
(thiamine transporter); member 2); ENSG00000117601 (serpin peptidase inhibitor;
clade C (antithrombin); member 1); ENSG00000117834 (solute carrier family 5
(sodium/sugar cotransporter); member 9); ENSG00000118520 (arginase 1);
ENSG00000120885 (clusterin); ENSG00000121410 (alpha-1-B glycoprotein);
ENSG00000129354 (adaptor related protein complex 1 mu 2 subunit);
ENSG00000129988 (lipopolysaccharide binding protein); ENSG00000131242 (RAB11
family interacting protein 4 (class II)); ENSG00000132437 (dopa decarboxylase);
ENSG00000137561 (tocopherol (alpha) transfer protein); ENSG00000137752 (caspase
1); ENSG00000138207 (retinol binding protein 4); ENSG00000143669 (lysosomal
trafficking regulator); ENSG00000149131 (serpin peptidase inhibitor; clade G
(C1 inhibitor); member 1); ENSG00000152804 (hematopoietically expressed
homeobox); ENSG00000163884 (Kruppel-like factor 15); ENSG00000166126 (amion
associated transmembrane protein); ENSG00000167711 (serpin peptidase inhibitor;

clade F (alpha-2 antiplasmin; pigment epithelium derived factor); member 2);
ENSG00000168077 (scavenger receptor class A member 3); ENSG00000170482 (solute
carrier family 23 (ascorbic acid transporter); member 1); ENSG00000171557
(fibrinogen gamma chain); ENSG00000171560 (fibrinogen alpha chain);
ENSG00000171564 (fibrinogen beta chain); ENSG00000172482 (alanine-glyoxylate
aminotransferase); ENSG00000173930 (solute carrier organic anion transporter
family member 4C1); ENSG00000174804 (frizzled class receptor 4); ENSG00000177984
(lipocalin 15); ENSG00000196632 (WNK lysine deficient protein kinase 3);
ENSG00000196660 (solute carrier family 30 member 10); ENSG00000196814
(multivesicular body subunit 12B); ENSG00000198569 (solute carrier family 34
(type II sodium/phosphate cotransporter); member 3); ENSG00000228267 (complement
component 4B (Chido blood group)); ENSG00000233312 (complement component 4B
(Chido blood group); copy 2); ENSG00000257017 (haptoglobin); ENSG00000261701
(haptoglobin-related protein)

BP GO:0051301 cell division

Annotate: 559
Significant: 10
Expected: 4.43
topGO p-value: 0.0133
Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000115163 (CENPA); ENSG00000129173 (E2F8); ENSG00000129810 (SGOL1);
ENSG00000131242 (RAB11FIP4); ENSG00000135913 (USP37); ENSG00000136492 (BRIP1);
ENSG00000145386 (CCNA2); ENSG00000161888 (SPC24); ENSG00000164045 (CDC25A);
ENSG00000186185 (KIF18B)

Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000115163 (centromere protein A); ENSG00000129173 (E2F transcription
factor 8); ENSG00000129810 (shugoshin-like 1 (S. pombe)); ENSG00000131242
(RAB11 family interacting protein 4 (class II)); ENSG00000135913 (ubiquitin
specific peptidase 37); ENSG00000136492 (BRCA1 interacting protein C-terminal
helicase 1); ENSG00000145386 (cyclin A2); ENSG00000161888 (SPC24; NDC80
kinetochore complex component); ENSG00000164045 (cell division cycle 25A);
ENSG00000186185 (kinesin family member 18B)

BP GO:0003013 circulatory system process

Annotate: 429
Significant: 8
Expected: 3.4
topGO p-value: 0.0208
Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000005187 (ACSM3); ENSG00000021826 (CPS1); ENSG00000113889 (KNG1);
ENSG00000149131 (SERPING1); ENSG00000167711 (SERPINF2); ENSG00000171557 (FGG);
ENSG00000171560 (FGA); ENSG00000171564 (FGB)

Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000005187 (acyl-CoA synthetase medium-chain family member 3);
ENSG00000021826 (carbamoyl-phosphate synthase 1); ENSG00000113889 (kininogen 1);
ENSG00000149131 (serpin peptidase inhibitor; clade G (C1 inhibitor); member 1);
ENSG00000167711 (serpin peptidase inhibitor; clade F (alpha-2 antiplasmin;
pigment epithelium derived factor); member 2); ENSG00000171557 (fibrinogen gamma
chain); ENSG00000171560 (fibrinogen alpha chain); ENSG00000171564 (fibrinogen
beta chain)

BP GO:0030198 extracellular matrix organization

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# Annotate: 324
# Significant: 6
# Expected: 2.57
# topGO p-value: 0.044
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000163435 (ELF3); ENSG00000167711 (SERPINF2); ENSG00000171557 (FGG);
ENSG00000171560 (FGA); ENSG00000171564 (FGB); ENSG00000187045 (TMPRSS6)

# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000163435 (E74-like factor 3 (ets domain transcription factor;
epithelial-specific )); ENSG00000167711 (serpin peptidase inhibitor; clade F
(alpha-2 antiplasmin; pigment epithelium derived factor); member 2);
ENSG00000171557 (fibrinogen gamma chain); ENSG00000171560 (fibrinogen alpha
chain); ENSG00000171564 (fibrinogen beta chain); ENSG00000187045 (transmembrane
protease; serine 6)

### BP      GO:0000003 reproduction
# Annotate: 1184
# Significant: 15
# Expected: 9.37
# topGO p-value: 0.0472
# Differentially expressed genes in this GO term (IDs and gene names):
ENSG00000112972 (HMGCS1); ENSG00000118520 (ARG1); ENSG00000129173 (E2F8);
ENSG00000129810 (SGOL1); ENSG00000136492 (BRIP1); ENSG00000137561 (TTPA);
ENSG00000137869 (CYP19A1); ENSG00000138207 (RBP4); ENSG00000173930 (SLCO4C1);
ENSG00000174371 (EXO1); ENSG00000174804 (FZD4); ENSG00000176046 (NUPR1);
ENSG00000183134 (PTGDR2); ENSG00000187790 (FANCM); ENSG00000242265 (PEG10)

# Differentially expressed genes in this GO term (IDs and product descriptions):
ENSG00000112972 (3-hydroxy-3-methylglutaryl-CoA synthase 1); ENSG00000118520
(arginase 1); ENSG00000129173 (E2F transcription factor 8); ENSG00000129810
(shugoshin-like 1 (S. pombe)); ENSG00000136492 (BRCA1 interacting protein C-
terminal helicase 1); ENSG00000137561 (tocopherol (alpha) transfer protein);
ENSG00000137869 (cytochrome P450 family 19 subfamily A member 1);
ENSG00000138207 (retinol binding protein 4); ENSG00000173930 (solute carrier
organic anion transporter family member 4C1); ENSG00000174371 (exonuclease 1);
ENSG00000174804 (frizzled class receptor 4); ENSG00000176046 (nuclear protein 1;
transcriptional regulator); ENSG00000183134 (prostaglandin D2 receptor 2);
ENSG00000187790 (Fanconi anemia complementation group M); ENSG00000242265
(paternally expressed 10)

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