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GO term enrichment of down-regulated genes (D13 vs. D6)

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### BP GO:0007165 signal transduction  
# Annotate: 567  
# Significant: 95  
# Expected: 41.19  
# topGO p-value: 0.0002  
# Differentially expressed genes in this GO term: Smp\_000900 (neuropeptide FF receptor 1); Smp\_001070 (G protein coupled receptor fragment); Smp\_008850 (fmrfamide receptor); Smp\_011700 (proto oncogene tyrosine protein kinase ROS); Smp\_012920 (class A rhodopsin G protein coupled); Smp\_023710 (G protein coupled receptor fragment); Smp\_032750 (guanine nucleotide binding protein G(i) alpha); Smp\_041700 (G protein coupled receptor fragment); Smp\_041880 (peptide (allatostatin:somatostatin)); Smp\_047870 (LIM domain kinase 1); Smp\_052250 (Ras associated and pleckstrin y); Smp\_052660 (metabotropic glutamate receptor 3); Smp\_058080 (neuropeptide Y receptor); Smp\_058380 (latrophilin 3); Smp\_059570 (hypothetical protein); Smp\_072450 (rhodopsin orphan GPCR); Smp\_073270 (neuroendocrine protein 7b2); Smp\_078230 (cGMP dependent protein kinase); Smp\_081190 (GTP binding protein rhoA); Smp\_084270 (rhodopsin orphan GPCR); Smp\_085910 (smad family member 2); Smp\_101630 (segment polarity protein dishevelled); Smp\_123050 (Regulator of G protein signaling 20); Smp\_124210 (ephrin type A receptor 4 A); Smp\_124250 (high affinity cGMP specific 3'); Smp\_124990 (ras protein family 2 like); Smp\_125420 (corticotropin releasing factor receptor 2); Smp\_125450 (retinal guanylyl cyclase 2); Smp\_126140 (integrin alpha 5); Smp\_127770 (ras GTP exchange factor); Smp\_128230 (neurogenic locus notch protein); Smp\_129270 (camp specific 3'); Smp\_130930 (multiple C2 and transmembrane domain containing protein); Smp\_131190 (eye specific diacylglycerol kinase); Smp\_131980 (putative tachykinin-like receptor); Smp\_132220 (G protein coupled receptor fragment); Smp\_132500 (ras and EF hand domain containing protein); Smp\_133550 (neuropeptide receptor type; neuropeptide ff receptor); Smp\_134100 (G protein coupled receptor fragment); Smp\_134140 (cAMP specific 3'); Smp\_134500 (calcium:calmodulin dependent 3'); Smp\_134670 (ral gtpase activating); Smp\_134820 (5 hydroxytryptamine receptor 1B); Smp\_135040 (gamma aminobutyric acid receptor subunit); Smp\_136470 (pleckstrin y domain containing family G); Smp\_138150 (rho type gtpase activating protein); Smp\_139220 (hypothetical protein); Smp\_141310 (neurexin 2 alpha); Smp\_142790 (guanine nucleotide binding protein alpha); Smp\_142880 (protein tag d; protein tag c; minor histocompatibility protein ha); Smp\_143710 (gamma aminobutyric acid receptor subunit); Smp\_144650 (hypothetical protein); Smp\_146060 (Ral GTPase activating protein subunit alpha 1); Smp\_148210 (biogenic amine (5HT) receptor); Smp\_149170 (Probable G protein coupled receptor B0563); Smp\_149580 (fmrfamide receptor); Smp\_149770 (5 hydroxytryptamine receptor 1A); Smp\_150170 (Ras associated and pleckstrin y); Smp\_150180 (octopamine receptor oamb); Smp\_150300 (MAP kinase activating death domain); Smp\_150830 (EF hand calcium binding domain containing protein); Smp\_151040 (cyclin dependent kinase 5 activator 1); Smp\_152540 (muscarinic acetylcholine receptor); Smp\_153200 (rhodopsin orphan GPCR); Smp\_153210 (rhodopsin orphan GPCR); Smp\_153500 (guanylate cyclase); Smp\_154850 (GTPase activating Rap:Ran GAP domain); Smp\_155040 (cyclic nucleotide gated cation channel); Smp\_155340 (frizzled receptor); Smp\_156210 (serotonin receptor partial); Smp\_156390 (growth factor receptor bound protein); Smp\_157050 (rhodopsin orphan GPCR); Smp\_157100 (sphingoid long chain base kinase); Smp\_159860 (dopamine receptor I); Smp\_161120 (metastasis suppressor protein 1); Smp\_164730 (rhodopsin orphan GPCR); Smp\_167650 (rho guanine nucleotide exchange factor 17); Smp\_169130 (myeloid:lymphoid or mixed lineage leukemia); Smp\_170020

(tachykinin receptor protein like); Smp\_172640 (guanine nucleotide binding protein G(s) subunit); Smp\_172650 (rho guanine nucleotide exchange factor); Smp\_173010 (neuropeptide receptor a); Smp\_176730 (Cys loop ligand gated ion channel subunit); Smp\_176820 (hypothetical protein); Smp\_176920 (neuronal RhoA GEF protein); Smp\_178730 (rap guanine nucleotide exchange factor 6); Smp\_179590 (dual 3'); Smp\_186780 (hypothetical protein); Smp\_187640 (regulator of G protein signaling 3 rgs3); Smp\_194700 (cyclic nucleotide gated cation channel); Smp\_197150 (high affinity cGMP specific 3'); Smp\_198360 (ankyrin repeat and death domain containing protein); Smp\_202290 (hypothetical protein); Smp\_212750 (smad); Smp\_241450 (hypothetical protein)

### BP GO:0030238 male sex determination

# Annotate: 6

# Significant: 4

# Expected: 0.44

# topGO p-value: 0.0004

# Differentially expressed genes in this GO term: Smp\_125630 (cell transcription factor short terminal; cell transcription factor long terminal); Smp\_131260 (pangolin); Smp\_148110 (transcription factor SOX 14); Smp\_161600 (sox transcription factor)

### BP GO:0006813 potassium ion transport

# Annotate: 78

# Significant: 14

# Expected: 5.67

# topGO p-value: 0.0013

# Differentially expressed genes in this GO term: Smp\_008170 (calcium activated potassium channel); Smp\_015020 (sodium potassium transporting ATPase alpha subunit); Smp\_090430 (potassium voltage gated channel subfamily C); Smp\_094560 (Kv4 class voltage gated potassium channel); Smp\_126580 (calcium activated potassium channel); Smp\_139410 (small conductance calcium activated potassium); Smp\_141570 (TWiK family of potassium channels protein 7); Smp\_142280 (hyperpolarization activated cyclic); Smp\_142290 (hyperpolarization activated cyclic); Smp\_146750 (sodium:hydrogen exchanger 2 (nhe2)); Smp\_160780 (potassium voltage gated channel protein); Smp\_161450 (small conductance calcium activated potassium); Smp\_194710 (potassium voltage gated channel protein Shaker); Smp\_196370 (potassium voltage gated channel subfamily H)

### BP GO:0006836 neurotransmitter transport

# Annotate: 31

# Significant: 8

# Expected: 2.25

# topGO p-value: 0.0013

# Differentially expressed genes in this GO term: Smp\_028690 (sodium/chloride dependent transporter); Smp\_129900 (sodium and chloride dependent GABA transporter); Smp\_129920 (sodium dependent neurotransmitter transporter); Smp\_137990 (complexin); Smp\_143800 (sodium:chloride dependent neurotransmitter); Smp\_175010 (vesicular glutamate transporter); Smp\_193800 (high affinity octopamine transporter protein); Smp\_214230 (sodium dependent serotonin transporter)

### BP GO:0016042 lipid catabolic process

# Annotate: 24

# Significant: 6

# Expected: 1.74  
# topGO p-value: 0.0062  
# Differentially expressed genes in this GO term: Smp\_011000 (sterol esterase 1/lysosomal acid lipase-related/lipase 1); Smp\_129330 (Acetyl-CoA acetyltransferase); Smp\_141810 (hypothetical protein); Smp\_142980 (palmitoyl protein thioesterase); Smp\_151420 (phospholipase D); Smp\_177020 (PhosphoLipase C Like family member (pll 1))

### BP GO:0044765 single-organism transport

# Annotate: 623  
# Significant: 71  
# Expected: 45.26  
# topGO p-value: 0.009  
# Differentially expressed genes in this GO term: Smp\_004730 (high voltage-activated calcium channel cav2b); Smp\_008170 (calcium activated potassium channel); Smp\_015020 (sodium potassium transporting ATPase alpha subunit); Smp\_015630 (Glutamate-gated chloride channel subunit 2 isoform 1); Smp\_022300 (sulfate transporter); Smp\_028690 (sodium/chloride dependent transporter); Smp\_036470 (oxalate:formate antiporter); Smp\_046790 (solute carrier family 2 facilitated glucose); Smp\_047650 (Ferritin-2 heavy chain); Smp\_047660 (Ferritin-2 heavy chain); Smp\_047680 (Ferritin-2 heavy chain); Smp\_052990 (globin X); Smp\_073270 (neuroendocrine protein 7b2); Smp\_083770 (anoctamin 7); Smp\_083980 (FMRFamide activated amiloride sensitive sodium); Smp\_089200 (multidrug resistance protein); Smp\_090430 (potassium voltage gated channel subfamily C); Smp\_091820 (bestrophin 3); Smp\_094560 (Kv4 class voltage gated potassium channel); Smp\_105410 (glucose transport protein); Smp\_123010 (high affinity cationic amino acid transporter 1); Smp\_124530 (voltage dependent calcium channel subunit); Smp\_124690 (voltage dependent calcium channel); Smp\_126580 (calcium activated potassium channel); Smp\_129900 (sodium and chloride dependent GABA transporter); Smp\_129920 (sodium dependent neurotransmitter transporter); Smp\_131350 (Ileal sodium:bile acid cotransporter); Smp\_134000 (junction plakoglobin); Smp\_135020 (oxalate:formate antiporter); Smp\_135040 (gamma aminobutyric acid receptor subunit); Smp\_136030 (anion exchange protein); Smp\_137990 (complexin); Smp\_139330 (nicotinic acetylcholine receptor non alpha); Smp\_139410 (small conductance calcium activated potassium); Smp\_140920 (Glutamate receptor); Smp\_141570 (TWiK family of potassium channels protein 7); Smp\_141800 (oxalate:formate antiporter); Smp\_142280 (hyperpolarization activated cyclic); Smp\_142290 (hyperpolarization activated cyclic); Smp\_142980 (palmitoyl protein thioesterase); Smp\_143710 (gamma aminobutyric acid receptor subunit); Smp\_143800 (sodium:chloride dependent neurotransmitter); Smp\_144760 (monocarboxylate transporter); Smp\_146750 (sodium:hydrogen exchanger 2 (nhe2)); Smp\_150030 (hypothetical protein); Smp\_150520 (high affinity choline transporter 1); Smp\_152960 (rab effector MyRIP); Smp\_155040 (cyclic nucleotide gated cation channel); Smp\_160160 (solute carrier family 17); Smp\_160780 (potassium voltage gated channel protein); Smp\_161430 (Monocarboxylate transporter 12); Smp\_161450 (small conductance calcium activated potassium); Smp\_161640 (transient receptor potential cation channel); Smp\_165660 (polycystic kidney disease 2 1 protein like); Smp\_169870 (cystinosin); Smp\_170140 (hypothetical protein); Smp\_175010 (vesicular glutamate transporter); Smp\_176450 (ATP binding cassette sub family A); Smp\_176730 (Cys loop ligand gated ion channel subunit); Smp\_180950 (band 3 anion transport protein); Smp\_181230 (phospholipid transporting atpase); Smp\_187090 (hypothetical protein); Smp\_190970 (phosphatidylcholine transfer protein); Smp\_191220 (anion exchange protein 2); Smp\_191730 (degenerin unc 8); Smp\_193800 (high affinity octopamine transporter protein); Smp\_194700 (cyclic nucleotide gated cation channel); Smp\_194710 (potassium voltage gated channel protein Shaker); Smp\_196370 (potassium voltage gated channel subfamily H);

Smp\_212410 (hyperpolarization activated cyclic); Smp\_214230 (sodium dependent serotonin transporter)

### BP GO:0007218 neuropeptide signaling pathway  
# Annotate: 7  
# Significant: 3  
# Expected: 0.51  
# topGO p-value: 0.0107  
# Differentially expressed genes in this GO term: Smp\_058380 (latrophilin 3); Smp\_073270 (neuroendocrine protein 7b2); Smp\_176820 (hypothetical protein)

### BP GO:0072593 reactive oxygen species metabolic process  
# Annotate: 7  
# Significant: 3  
# Expected: 0.51  
# topGO p-value: 0.0107  
# Differentially expressed genes in this GO term: Smp\_095980 (Extracellular superoxide dismutase (Cu Zn)); Smp\_174810 (Extracellular superoxide dismutase (Cu Zn)); Smp\_193400 (hypothetical protein)

### BP GO:0030154 cell differentiation  
# Annotate: 79  
# Significant: 12  
# Expected: 5.74  
# topGO p-value: 0.011  
# Differentially expressed genes in this GO term: Smp\_051920 (nanos 2); Smp\_059820 (hypothetical protein); Smp\_067430 (oligodendrocyte transcription factor 2); Smp\_125630 (cell transcription factor short terminal; cell transcription factor long terminal); Smp\_128230 (neurogenic locus notch protein); Smp\_130530 (hypothetical protein); Smp\_131260 (pangolin); Smp\_148110 (transcription factor SOX 14); Smp\_149420 (held out wings); Smp\_151040 (cyclin dependent kinase 5 activator 1); Smp\_161600 (sox transcription factor); Smp\_168610 (myelin transcription factor 1 protein)

### BP GO:0007275 multicellular organism development  
# Annotate: 283  
# Significant: 37  
# Expected: 20.56  
# topGO p-value: 0.0146  
# Differentially expressed genes in this GO term: Smp\_000650 (E3 ubiquitin-protein ligase sina); Smp\_003900 (T box transcription factor TBX20); Smp\_012010 (forkhead box subgroup O); Smp\_024860 (Basic helix loop helix transcription factor); Smp\_047460 (astacin protein); Smp\_050520 (neurogenic locus notch protein); Smp\_051920 (nanos 2); Smp\_059820 (hypothetical protein); Smp\_067430 (oligodendrocyte transcription factor 2); Smp\_079260 (LIM:homeobox protein Lhx2); Smp\_101630 (segment polarity protein dishevelled); Smp\_123250 (headcase protein); Smp\_125060 (kinase suppressor of Ras (KSR)); Smp\_125630 (cell transcription factor short terminal; cell transcription factor long terminal); Smp\_127090 (forkhead protein: forkhead protein domain C3503); Smp\_128230 (neurogenic locus notch protein); Smp\_129480 (LIM:homeobox protein Lhx1); Smp\_129490 (LIM:homeobox protein Lhx3); Smp\_130530 (hypothetical protein); Smp\_131260 (pangolin); Smp\_138140 (homeobox protein MOX 2); Smp\_142980 (palmitoyl protein thioesterase); Smp\_148110 (transcription factor SOX 14); Smp\_149420 (held out wings); Smp\_151040 (cyclin dependent kinase 5 activator 1);

Smp\_155340 (frizzled receptor); Smp\_160670 (paired box protein pax 6);  
Smp\_161120 (metastasis suppressor protein 1); Smp\_161270 (hypothetical protein);  
Smp\_161530 (myocyte specific enhancer factor 2a); Smp\_161600 (sox transcription  
factor); Smp\_162190 (cysteine and glycine rich protein 2); Smp\_163140 (pituitary  
homeobox protein); Smp\_167190 (fibrillin 1); Smp\_168610 (myelin transcription  
factor 1 protein); Smp\_169500 (homeobox containing protein); Smp\_196950 (one cut  
domain family member)

### BP GO:0006355 regulation of transcription; DNA-templated  
# Annotate: 856  
# Significant: 77  
# Expected: 62.19  
# topGO p-value: 0.0159  
# Differentially expressed genes in this GO term: Smp\_003900 (T box  
transcription factor TBX20); Smp\_012010 (forkhead box subgroup O); Smp\_016750  
(zinc finger protein 488); Smp\_018590 (endothelial transcription factor GATA 2);  
Smp\_021340 (max dimerization protein 3); Smp\_021870 (CCR4 NOT transcription  
complex subunit 7); Smp\_024860 (Basic helix loop helix transcription factor);  
Smp\_034300 (transcription factor ETV6); Smp\_041760 (chromodomain helicase DNA  
binding protein 2); Smp\_043580 (histone lysine N methyltransferase SETMAR);  
Smp\_046360 (Zinc finger protein 143); Smp\_055810 (inositol 5 phosphatase);  
Smp\_067430 (oligodendrocyte transcription factor 2); Smp\_079260 (LIM:homeobox  
protein Lhx2); Smp\_085910 (smad family member 2); Smp\_094930 (early growth  
response protein 1); Smp\_105090 (Tr4/Tr2 (homologue)); Smp\_123810 (interferon  
regulatory factor 2 binding protein); Smp\_124090 (B cell lymphoma:leukemia);  
Smp\_125630 (cell transcription factor short terminal; cell transcription factor  
long terminal); Smp\_125890 (dna photolyase); Smp\_127090 (forkhead protein:  
forkhead protein domain C3503); Smp\_128350 (PR domain zinc finger protein 1);  
Smp\_129480 (LIM:homeobox protein Lhx1); Smp\_129490 (LIM:homeobox protein Lhx3);  
Smp\_130200 (FTZ F1 nuclear receptor protein); Smp\_131260 (pangolin); Smp\_131320  
(myst histone acetyltransferase); Smp\_134040 (Ecdysone induced protein 74EF B);  
Smp\_134870 (early growth response protein); Smp\_138140 (homeobox protein MOX 2);  
Smp\_138350 (zinc finger protein basonuclin 2); Smp\_143180 (zinc finger protein);  
Smp\_147010 (zinc finger protein 425); Smp\_148110 (transcription factor SOX 14);  
Smp\_148180 (hypothetical protein); Smp\_148830 (hypothetical protein); Smp\_149240  
(chromobox protein 2); Smp\_150940 (zinc finger protein 608); Smp\_151950 (zinc  
finger protein); Smp\_152730 (histone lysine N methyltransferase MLL3);  
Smp\_155250 (nuclear receptor subfamily 2 group E member); Smp\_155960  
(serine:threonine protein kinase D1); Smp\_156890 (hypothetical protein);  
Smp\_157520 (zinc finger protein zas; shn zinc finger protein); Smp\_157530  
(hypothetical protein); Smp\_157840 (transcription factor AP 2 epsilon);  
Smp\_160670 (paired box protein pax 6); Smp\_160730 (zinc finger protein);  
Smp\_161000 (histone lysine); Smp\_161270 (hypothetical protein); Smp\_161280  
(hypothetical protein); Smp\_161530 (myocyte specific enhancer factor 2a);  
Smp\_161600 (sox transcription factor); Smp\_162080 (MLX interacting protein);  
Smp\_162190 (cysteine and glycine rich protein 2); Smp\_163140 (pituitary homeobox  
protein); Smp\_163790 (nuclear receptor 2DBD gamma); Smp\_164180 (par domain  
protein); Smp\_168610 (myelin transcription factor 1 protein); Smp\_169500  
(homeobox containing protein); Smp\_170670 (hypothetical protein); Smp\_170750  
(paired box protein pax 6); Smp\_170760 (bromodomain adjacent to zinc finger  
domain); Smp\_174150 (myeloid ecotropic viral integration site 1); Smp\_174170  
(homeobox protein Meis1); Smp\_181630 (hypothetical protein); Smp\_191310 (histone  
deacetylase 4); Smp\_194420 (hypothetical protein); Smp\_196950 (one cut domain  
family member); Smp\_202120 (hox class homeodomain protein djabd bb; hox class  
homeodomain protein djabd ba; hox class homeodomain containing protein post2);  
Smp\_212350 (forkhead box protein P1); Smp\_212430 (nuclear hormone receptor);

Smp\_212750 (smad); Smp\_212780 (Tubulin polymerization-promoting protein (TPPP));  
Smp\_241450 (hypothetical protein); Smp\_241480 (hypothetical protein)

### BP GO:0006879 cellular iron ion homeostasis  
# Annotate: 8  
# Significant: 3  
# Expected: 0.58  
# topGO p-value: 0.0162  
# Differentially expressed genes in this GO term: Smp\_047650 (Ferritin-2 heavy chain); Smp\_047660 (Ferritin-2 heavy chain); Smp\_047680 (Ferritin-2 heavy chain)

### BP GO:0006814 sodium ion transport  
# Annotate: 65  
# Significant: 10  
# Expected: 4.72  
# topGO p-value: 0.0179  
# Differentially expressed genes in this GO term: Smp\_015020 (sodium potassium transporting ATPase alpha subunit); Smp\_083980 (FMRamide activated amiloride sensitive sodium); Smp\_131350 (Ileal sodium:bile acid cotransporter); Smp\_142280 (hyperpolarization activated cyclic); Smp\_146750 (sodium:hydrogen exchanger 2 (nhe2)); Smp\_150520 (high affinity choline transporter 1); Smp\_175010 (vesicular glutamate transporter); Smp\_180950 (band 3 anion transport protein); Smp\_191220 (anion exchange protein 2); Smp\_191730 (degenerin unc 8)

### BP GO:0006820 anion transport  
# Annotate: 100  
# Significant: 16  
# Expected: 7.27  
# topGO p-value: 0.0221  
# Differentially expressed genes in this GO term: Smp\_022300 (sulfate transporter); Smp\_036470 (oxalate:formate antiporter); Smp\_123010 (high affinity cationic amino acid transporter 1); Smp\_131350 (Ileal sodium:bile acid cotransporter); Smp\_135020 (oxalate:formate antiporter); Smp\_135040 (gamma aminobutyric acid receptor subunit); Smp\_136030 (anion exchange protein); Smp\_141800 (oxalate:formate antiporter); Smp\_143710 (gamma aminobutyric acid receptor subunit); Smp\_144760 (monocarboxylate transporter); Smp\_160160 (solute carrier family 17); Smp\_161430 (Monocarboxylate transporter 12); Smp\_169870 (cystinosin); Smp\_176730 (Cys loop ligand gated ion channel subunit); Smp\_180950 (band 3 anion transport protein); Smp\_191220 (anion exchange protein 2)

### BP GO:0006821 chloride transport  
# Annotate: 9  
# Significant: 3  
# Expected: 0.65  
# topGO p-value: 0.023  
# Differentially expressed genes in this GO term: Smp\_135040 (gamma aminobutyric acid receptor subunit); Smp\_143710 (gamma aminobutyric acid receptor subunit); Smp\_176730 (Cys loop ligand gated ion channel subunit)

### BP GO:0006811 ion transport  
# Annotate: 409  
# Significant: 53

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# Expected: 29.71
# topGO p-value: 0.0237
# Differentially expressed genes in this GO term: Smp_004730 (high voltage-activated calcium channel cav2b); Smp_008170 (calcium activated potassium channel); Smp_015020 (sodium potassium transporting ATPase alpha subunit); Smp_015630 (Glutamate-gated chloride channel subunit 2 isoform 1); Smp_022300 (sulfate transporter); Smp_036470 (oxalate:formate antiporter); Smp_047650 (Ferritin-2 heavy chain); Smp_047660 (Ferritin-2 heavy chain); Smp_047680 (Ferritin-2 heavy chain); Smp_083770 (anoctamin 7); Smp_083980 (FMRFamide activated amiloride sensitive sodium); Smp_090430 (potassium voltage gated channel subfamily C); Smp_091820 (bestrophin 3); Smp_094560 (Kv4 class voltage gated potassium channel); Smp_123010 (high affinity cationic amino acid transporter 1); Smp_124530 (voltage dependent calcium channel subunit); Smp_124690 (voltage dependent calcium channel); Smp_126580 (calcium activated potassium channel); Smp_131350 (Ileal sodium:bile acid cotransporter); Smp_135020 (oxalate:formate antiporter); Smp_135040 (gamma aminobutyric acid receptor subunit); Smp_136030 (anion exchange protein); Smp_139330 (nicotinic acetylcholine receptor non alpha); Smp_139410 (small conductance calcium activated potassium); Smp_140920 (Glutamate receptor); Smp_141570 (TWiK family of potassium channels protein 7); Smp_141800 (oxalate:formate antiporter); Smp_142280 (hyperpolarization activated cyclic); Smp_142290 (hyperpolarization activated cyclic); Smp_143710 (gamma aminobutyric acid receptor subunit); Smp_144760 (monocarboxylate transporter); Smp_146750 (sodium:hydrogen exchanger 2 (nhe2)); Smp_150030 (hypothetical protein); Smp_150520 (high affinity choline transporter 1); Smp_155040 (cyclic nucleotide gated cation channel); Smp_160160 (solute carrier family 17); Smp_160780 (potassium voltage gated channel protein); Smp_161430 (Monocarboxylate transporter 12); Smp_161450 (small conductance calcium activated potassium); Smp_161640 (transient receptor potential cation channel); Smp_165660 (polycystic kidney disease 2 1 protein like); Smp_169870 (cystinosin); Smp_170140 (hypothetical protein); Smp_175010 (vesicular glutamate transporter); Smp_176730 (Cys loop ligand gated ion channel subunit); Smp_180950 (band 3 anion transport protein); Smp_181230 (phospholipid transporting atpase); Smp_191220 (anion exchange protein 2); Smp_191730 (degenerin unc 8); Smp_194700 (cyclic nucleotide gated cation channel); Smp_194710 (potassium voltage gated channel protein Shaker); Smp_196370 (potassium voltage gated channel subfamily H); Smp_212410 (hyperpolarization activated cyclic)
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### BP GO:0048522 positive regulation of cellular process
# Annotate: 14
# Significant: 3
# Expected: 1.02
# topGO p-value: 0.0286
# Differentially expressed genes in this GO term: Smp_142980 (palmitoyl protein thioesterase); Smp_150300 (MAP kinase activating death domain); Smp_151040 (cyclin dependent kinase 5 activator 1)
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### BP GO:0007156 homophilic cell adhesion via plasma membrane adhesion molecules
# Annotate: 61
# Significant: 9
# Expected: 4.43
# topGO p-value: 0.0307
# Differentially expressed genes in this GO term: Smp_016230 (protocadherin 17); Smp_069720 (cadherin); Smp_131010 (protocadherin gamma a10); Smp_141740 (protocadherin 11); Smp_151620 (protocadherin 9); Smp_151630 (protocadherin
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alpha); Smp\_158870 (protocadherin 11); Smp\_176540 (protocadherin 18); Smp\_196990 (protocadherin 11)

### BP GO:0015711 organic anion transport  
# Annotate: 60  
# Significant: 9  
# Expected: 4.36  
# topGO p-value: 0.0309  
# Differentially expressed genes in this GO term: Smp\_036470 (oxalate:formate antiporter); Smp\_123010 (high affinity cationic amino acid transporter 1); Smp\_131350 (Ileal sodium:bile acid cotransporter); Smp\_135020 (oxalate:formate antiporter); Smp\_141800 (oxalate:formate antiporter); Smp\_144760 (monocarboxylate transporter); Smp\_160160 (solute carrier family 17); Smp\_161430 (Monocarboxylate transporter 12); Smp\_169870 (cystinosin)

### BP GO:0035023 regulation of Rho protein signal transduction  
# Annotate: 26  
# Significant: 5  
# Expected: 1.89  
# topGO p-value: 0.0365  
# Differentially expressed genes in this GO term: Smp\_127770 (ras GTP exchange factor); Smp\_136470 (pleckstrin y domain containing family G); Smp\_167650 (rho guanine nucleotide exchange factor 17); Smp\_172650 (rho guanine nucleotide exchange factor); Smp\_176920 (neuronal RhoA GEF protein)

### BP GO:0007420 brain development  
# Annotate: 5  
# Significant: 2  
# Expected: 0.36  
# topGO p-value: 0.0455  
# Differentially expressed genes in this GO term: Smp\_142980 (palmitoyl protein thioesterase); Smp\_151040 (cyclin dependent kinase 5 activator 1)

### BP GO:0007205 protein kinase C-activating G-protein coupled receptor signaling pathway  
# Annotate: 5  
# Significant: 2  
# Expected: 0.36  
# topGO p-value: 0.0455  
# Differentially expressed genes in this GO term: Smp\_131190 (eye specific diacylglycerol kinase); Smp\_157100 (sphingoid long chain base kinase)

### BP GO:0007586 digestion  
# Annotate: 5  
# Significant: 2  
# Expected: 0.36  
# topGO p-value: 0.0455  
# Differentially expressed genes in this GO term: Smp\_136840 (subfamily A1A unassigned peptidase (A01 family)); Smp\_194090 (subfamily S1A unassigned peptidase (S01 family))

### BP GO:0042445 hormone metabolic process



# Annotate: 5  
# Significant: 2  
# Expected: 0.36  
# topGO p-value: 0.0455  
# Differentially expressed genes in this GO term: Smp\_033930  
(phosphatidylcholine transfer protein); Smp\_073270 (neuroendocrine protein 7b2)

### BP GO:0051049 regulation of transport  
# Annotate: 5  
# Significant: 2  
# Expected: 0.36  
# topGO p-value: 0.0455  
# Differentially expressed genes in this GO term: Smp\_073270 (neuroendocrine  
protein 7b2); Smp\_142980 (palmitoyl protein thioesterase)

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GO term enrichment of up-regulated genes (D13 vs. D6)

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### BP GO:0000070 mitotic sister chromatid segregation  
# Annotate: 15  
# Significant: 5  
# Expected: 0.99  
# topGO p-value: 0.0006  
# Differentially expressed genes in this GO term: Smp\_056350 (mitotic spindle  
assembly checkpoint protein); Smp\_137780 (sister chromatid cohesion protein  
PDS5); Smp\_137790 (sister chromatid cohesion protein PDS5); Smp\_166820  
(hypothetical protein); Smp\_167810 (family C50 non peptidase ue (C50 family))

### BP GO:0007049 cell cycle  
# Annotate: 225  
# Significant: 35  
# Expected: 14.9  
# topGO p-value: 0.0007  
# Differentially expressed genes in this GO term: Smp\_004060 (cell division  
cycle 20); Smp\_009600 (serine:threonine protein kinase PLK1); Smp\_032500 (DNA  
replication licensing factor MCM7); Smp\_037590 (dna replication licensing factor  
mcm3); Smp\_046280 (actin binding protein anillin); Smp\_047610 (cell division  
control protein 45); Smp\_047620 (G2:mitotic specific cyclin B3); Smp\_054840 (DNA  
replication licensing factor MCM2); Smp\_056350 (mitotic spindle assembly  
checkpoint protein); Smp\_065150 (N acetyltransferase ESCO2); Smp\_072560  
(hypothetical protein); Smp\_078920 (condensin complex subunit 3); Smp\_079560  
(DNA replication licensing factor MCM2); Smp\_082490 (G2:mitotic specific cyclin  
B2); Smp\_093450 (u3 small nucleolar rna associated protein 6); Smp\_094140 (DNA  
replication licensing factor MCM6); Smp\_128870 (nibrin); Smp\_130740 (chromosome  
transmission fidelity protein 8); Smp\_132510 (breast cancer type 1  
susceptibility protein); Smp\_136160 (hypothetical protein); Smp\_137780 (sister  
chromatid cohesion protein PDS5); Smp\_137790 (sister chromatid cohesion protein  
PDS5); Smp\_143490 (DNA replication licensing factor MCM5); Smp\_145030 (deleted  
in lung and esophageal cancer protein 1); Smp\_149490 (hypothetical protein);  
Smp\_151560 (dna replication licensing factor mcm9); Smp\_153660 (G1:S specific

cyclin D2); Smp\_166820 (hypothetical protein); Smp\_167540 (dna replication factor cdt1); Smp\_167810 (family C50 non peptidase ue (C50 family)); Smp\_169970 (kinetochore protein ndc80); Smp\_172610 (hypothetical protein); Smp\_176010 (cytoskeleton associated protein 5); Smp\_181870 (dna replication licensing factor mcm8); Smp\_193330 (kinesin II 85 kDa subunit)

### BP GO:0006817 phosphate ion transport

# Annotate: 19

# Significant: 6

# Expected: 1.26

# topGO p-value: 0.0011

# Differentially expressed genes in this GO term: Smp\_023240 (complement C1q tumor necrosis factor); Smp\_123830 (collagen alpha (xi) chain); Smp\_135560 (collagen alpha 2(I) chain); Smp\_164590 (fibrillar collagen chain FAp1 alpha); Smp\_196840 (collagen alpha 1(II) chain); Smp\_197370 (hypothetical protein)

### BP GO:0006941 striated muscle contraction

# Annotate: 160

# Significant: 21

# Expected: 10.6

# topGO p-value: 0.0019

# Differentially expressed genes in this GO term: Smp\_020070 (hypothetical protein); Smp\_032490 (tropomyosin); Smp\_124600 (hypothetical protein); Smp\_126970 (WD repeat containing protein 96); Smp\_129710 (Uveal autoantigen with coiled coil domains); Smp\_135300 (hypothetical protein); Smp\_141900 (centrosomal protein of 290 kDa); Smp\_144020 (glutamine rich protein 2); Smp\_147890 (Rootletin); Smp\_148130 (fas binding factor 1); Smp\_148420 (coiled coil domain containing 88A); Smp\_150750 (centrosomal protein 110 kDa); Smp\_158760 (dynein beta chain); Smp\_159840 (dynein heavy chain); Smp\_165620 (dynein heavy chain); Smp\_172210 (leucine rich repeat and coiled coil); Smp\_174090 (coiled coil domain containing protein 40); Smp\_176570 (hypothetical protein); Smp\_198230 (hypothetical protein); Smp\_198820 (DNA replication complex GINS protein PSF3); Smp\_213950 (citron Rho interacting kinase)

### BP GO:0006334 nucleosome assembly

# Annotate: 36

# Significant: 8

# Expected: 2.38

# topGO p-value: 0.002

# Differentially expressed genes in this GO term: Smp\_002930 (histone H2A); Smp\_031720 (histone H2A); Smp\_040020 (histone H3); Smp\_074610 (histone H3); Smp\_082240 (histone H3); Smp\_086860 (histone H2A); Smp\_162370 (histone H1 gamma); Smp\_210630 (histone H2A)

### BP GO:0000075 cell cycle checkpoint

# Annotate: 5

# Significant: 3

# Expected: 0.33

# topGO p-value: 0.0026

# Differentially expressed genes in this GO term: Smp\_056350 (mitotic spindle assembly checkpoint protein); Smp\_128870 (nibrin); Smp\_167540 (dna replication factor cdt1)

### BP GO:0007017 microtubule-based process  
# Annotate: 105  
# Significant: 22  
# Expected: 6.95  
# topGO p-value: 0.0043  
# Differentially expressed genes in this GO term: Smp\_016780 (alpha tubulin); Smp\_019310 (dynein light chain); Smp\_027920 (Tubulin alpha 1 chain); Smp\_028360 (tubulin epsilon chain); Smp\_095520 (dynein light chain); Smp\_125020 (dynein light chain); Smp\_128200 (kinesin protein kif23); Smp\_132300 (kinesin protein KIF3A like); Smp\_137660 (kinesin protein KIF20A); Smp\_147440 (tektin a1); Smp\_147970 (kinesin protein KIF14); Smp\_149260 (kinesin family 1); Smp\_158760 (dynein beta chain); Smp\_159840 (dynein heavy chain); Smp\_173450 (chromosome associated kinesin KIF4A); Smp\_174510 (dynein light chain); Smp\_192110 (Tubulin beta 2C chain); Smp\_193330 (kinesin II 85 kDa subunit); Smp\_197070 (kinesin protein KIF6); Smp\_200180 (dynein light chain); Smp\_201060 (dynein light chain); Smp\_213950 (citron Rho interacting kinase)

### BP GO:0006695 cholesterol biosynthetic process  
# Annotate: 6  
# Significant: 3  
# Expected: 0.4  
# topGO p-value: 0.005  
# Differentially expressed genes in this GO term: Smp\_070710 (farnesyl pyrophosphate synthase/geranyltranstransferase/dimethylallyltransferase); Smp\_124300 (Lamin B receptor (ERG24)); Smp\_198690 (HMG-CoA synthase)

### BP GO:0007155 cell adhesion  
# Annotate: 222  
# Significant: 24  
# Expected: 14.7  
# topGO p-value: 0.0052  
# Differentially expressed genes in this GO term: Smp\_001100 (fibrillin 2); Smp\_024660 (cell adhesion molecule); Smp\_027500 (heat shock protein beta 11); Smp\_042340 (catenin delta 2); Smp\_104390 (kin of IRRE protein 3); Smp\_123830 (collagen alpha (xi) chain); Smp\_127250 (kinesin associated protein 3); Smp\_127870 (neurotrimin (hnt)); Smp\_129830 (protocadherin alpha 2); Smp\_135560 (collagen alpha 2(I) chain); Smp\_137200 (chondroitin sulfate proteoglycan 4); Smp\_145210 (protocadherin 1); Smp\_159600 (collagen alpha 1(IV) chain); Smp\_164590 (fibrillar collagen chain FAp1 alpha); Smp\_167790 (hypothetical protein); Smp\_170280 (integrin alpha ps); Smp\_171020 (calsyntenin); Smp\_176350 (contactin; neuroglian; septate junction protein); Smp\_193580 (hypothetical protein); Smp\_196840 (collagen alpha 1(II) chain); Smp\_197370 (hypothetical protein); Smp\_198240 (anosmin 1); Smp\_208030 (hypothetical protein); Smp\_211020 (cell adhesion molecule)

### BP GO:0006414 translational elongation  
# Annotate: 29  
# Significant: 6  
# Expected: 1.92  
# topGO p-value: 0.0105  
# Differentially expressed genes in this GO term: Smp\_009690 (deoxyribonuclease); Smp\_030690 (eukaryotic translation elongation factor 1 beta); Smp\_039400 (eukaryotic translation initiation factor 5A); Smp\_041980 (ribosomal protein lp1); Smp\_083410 (eukaryotic translation elongation factor 1); Smp\_134420 (mrna turnover protein 4)

### BP GO:0055114 oxidation-reduction process  
# Annotate: 136  
# Significant: 15  
# Expected: 9.01  
# topGO p-value: 0.0108  
# Differentially expressed genes in this GO term: Smp\_008490 (glycogenin 1); Smp\_009030 (ribonucleoside diphosphate reductase large); Smp\_012380 (voltage gated potassium channel subunit beta 2); Smp\_022960 (aldehyde dehydrogenase); Smp\_047370 (malate dehydrogenase mitochondrial); Smp\_050390 (aldehyde dehydrogenase); Smp\_059930 (cytochrome b c1 complex subunit 6); Smp\_061870 (ubiquinol cytochrome c reductase); Smp\_073300 (Chaperone protein DnaJ 1); Smp\_082370 (NAD(P) transhydrogenase); Smp\_093820 (glutamate dehydrogenase); Smp\_125500 (prenylcysteine oxidase); Smp\_129610 (malate dehydrogenase); Smp\_150700 (aldo keto reductase family 1); Smp\_163050 (nadp dependent isocitrate dehydrogenase; isocitrate dehydrogenase (nadp) mitochondrial)

### BP GO:0018205 peptidyl-lysine modification  
# Annotate: 8  
# Significant: 3  
# Expected: 0.53  
# topGO p-value: 0.0126  
# Differentially expressed genes in this GO term: Smp\_039400 (eukaryotic translation initiation factor 5A); Smp\_056370 (deoxyhypusine hydroxylase:monooxygenase); Smp\_086960 (Lipoyltransferase 1)

### BP GO:0010608 posttranscriptional regulation of gene expression  
# Annotate: 113  
# Significant: 8  
# Expected: 7.48  
# topGO p-value: 0.0126  
# Differentially expressed genes in this GO term: Smp\_039400 (eukaryotic translation initiation factor 5A); Smp\_047330 (hypothetical protein); Smp\_079290 (RNA binding protein 4); Smp\_101780 (ebna2 binding protein P100); Smp\_118190 (staphylococcal nuclease domain containing protein); Smp\_131640 (rna binding protein musashi); Smp\_166190 (nucleolysin TIA 1 p40); Smp\_185230 (arginine:serine rich splicing factor)

### BP GO:0007283 spermatogenesis  
# Annotate: 10  
# Significant: 3  
# Expected: 0.66  
# topGO p-value: 0.0244  
# Differentially expressed genes in this GO term: Smp\_022870 (protein lin 54); Smp\_075140 (mitochondria eating protein); Smp\_178740 (protein lin 54)

### BP GO:0007067 mitotic nuclear division  
# Annotate: 91  
# Significant: 15  
# Expected: 6.03  
# topGO p-value: 0.0257  
# Differentially expressed genes in this GO term: Smp\_004060 (cell division cycle 20); Smp\_046280 (actin binding protein anillin); Smp\_047620 (G2:mitotic

specific cyclin B3); Smp\_056350 (mitotic spindle assembly checkpoint protein); Smp\_078920 (condensin complex subunit 3); Smp\_082490 (G2:mitotic specific cyclin B2); Smp\_137780 (sister chromatid cohesion protein PDS5); Smp\_137790 (sister chromatid cohesion protein PDS5); Smp\_149490 (hypothetical protein); Smp\_153660 (G1:S specific cyclin D2); Smp\_166820 (hypothetical protein); Smp\_167810 (family C50 non peptidase ue (C50 family)); Smp\_169970 (kinetochore protein ndc80); Smp\_176010 (cytoskeleton associated protein 5); Smp\_193330 (kinesin II 85 kDa subunit)

### BP GO:0015986 ATP synthesis coupled proton transport  
# Annotate: 38  
# Significant: 6  
# Expected: 2.52  
# topGO p-value: 0.0344  
# Differentially expressed genes in this GO term: Smp\_000880 (ATP synthase lipid-binding protein-like protein); Smp\_002880 (ATP synthase subunit alpha); Smp\_019750 (ATP synthase); Smp\_038100 (ATP synthase); Smp\_064330 (ATP synthase subunit epsilon); Smp\_082120 (ATP synthase)

### BP GO:0044242 cellular lipid catabolic process  
# Annotate: 5  
# Significant: 2  
# Expected: 0.33  
# topGO p-value: 0.0383  
# Differentially expressed genes in this GO term: Smp\_073300 (Chaperone protein DnaJ 1); Smp\_126120 (LAMA protein 2)

### BP GO:0008285 negative regulation of cell proliferation  
# Annotate: 5  
# Significant: 2  
# Expected: 0.33  
# topGO p-value: 0.0383  
# Differentially expressed genes in this GO term: Smp\_045470 (prospero homeobox protein 2); Smp\_137780 (sister chromatid cohesion protein PDS5)

### BP GO:0030162 regulation of proteolysis  
# Annotate: 5  
# Significant: 2  
# Expected: 0.33  
# topGO p-value: 0.0383  
# Differentially expressed genes in this GO term: Smp\_056350 (mitotic spindle assembly checkpoint protein); Smp\_136160 (hypothetical protein)

### BP GO:0045786 negative regulation of cell cycle  
# Annotate: 20  
# Significant: 4  
# Expected: 1.32  
# topGO p-value: 0.0394  
# Differentially expressed genes in this GO term: Smp\_056350 (mitotic spindle assembly checkpoint protein); Smp\_128870 (nibrin); Smp\_136160 (hypothetical protein); Smp\_145030 (deleted in lung and esophageal cancer protein 1)

```
### BP      GO:0006281 DNA repair
# Annotate: 139
# Significant: 17
# Expected: 9.21
# topGO p-value: 0.0405
# Differentially expressed genes in this GO term: Smp_033700
(deoxyribodipyrimidine photo lyase); Smp_055500 (DNA polymerase theta);
Smp_075110 (cell cycle checkpoint protein rad1); Smp_083710 (Fanconi anemia);
Smp_106040 (Structure specific endonuclease SLX1); Smp_124230 (dna repair
protein rad51 1); Smp_128870 (nibrin); Smp_132510 (breast cancer type 1
susceptibility protein); Smp_133990 (DNA topoisomerase 2 binding protein 1);
Smp_136160 (hypothetical protein); Smp_138940 (ubiquitin protein ligase BRE1);
Smp_152670 (crossover junction endonuclease EME1); Smp_154610 (hypothetical
protein); Smp_160630 (DNA repair protein RAD51 3); Smp_169580 (hypothetical
protein); Smp_186980 (flap endonuclease 1); Smp_213420 (mitotic and DNA damage
checkpoint protein hus1)
```