**Supporting information**

Table S1 Proteins identified in sperm derived factors after mass spectrometric analysis by MS fit from NCBI data base

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Gene symbol | Accession no. | MOWSE score | Protein name | Functions in sperm | Gene/protein function | Pathways involved |
| Enzymes |
| Pgk2 | 582444 | 239 | phosphoglycerate kinase 2 (phosphoglycerate kinase, testis specific) | * sperm fertility (Liu *et al.*, 2016), motility and ATP levels (Danshina *et al.*, 2010)
 | * ATP binding
* kinase activity
* nucleotide binding
* phosphoglycerate kinase activity
* transferase activity
 | * glycolytic process
* mitophagy in response to mitochondrial depolarization
* phosphorylation
* sperm motility
 |
| Fer | 6636121 | 119 | tyrosine-protein kinase Fe | * present
 | * ATP binding
* Rab GTPase binding
* actin binding
* cadherin binding
* cell adhesion molecule binding
* cytoskeletal protein binding
* epidermal growth factor receptor binding
* gamma-catenin binding
* kinase activity
* lipid binding
* non-membrane spanning protein tyrosine kinase activity
* non-membrane spanning protein tyrosine kinase activity
* nucleotide binding
* protein binding
* protein kinase activity protein kinase binding
* protein phosphatase 1 binding
* protein tyrosine kinase activity
* receptor binding
* transferase activity
 | * Fc-epsilon receptor signalling pathway
* Kit signalling pathway
* actin cytoskeleton reorganization
* cell adhesion and proliferation
* cell-cell adhesion mediated by cadherin
* cellular response to insulin stimulus
* cellular response to macrophage colony-stimulating factor stimulus
* cellular response to reactive oxygen species
* chemotaxis
* cytokine-mediated signalling pathway
* diapedesis
* epidermal growth factor receptor signalling pathway
* extracellular matrix-cell signalling
* innate immune response
* insulin receptor signalling pathway via phosphatidylinositol 3-kinase
* interleukin-6-mediated signalling pathway
* microtubule cytoskeleton organization
* mitotic cell cycle
* negative regulation of mast cell activation involved in immune response
* peptidyl-tyrosine autophosphorylation
* peptidyl-tyrosine phosphorylation
* phosphorylation
* platelet-derived growth factor receptor signalling pathway
* positive regulation of NF-kappaB transcription factor activity
* positive regulation of actin filament polymerization
* positive regulation of cell migration
* positive regulation of cell proliferation
* protein autophosphorylation
* regulation of epidermal growth factor receptor signalling pathway
* regulation of fibroblast migration
* regulation of lamellipodium assembly
* regulation of mast cell degranulation
* regulation of protein phosphorylation
* response to lipopolysaccharide
* response to platelet-derived growth factor
* signal transduction
* substrate adhesion-dependent cell spreading
* tyrosine phosphorylation of Stat3 protein
 |
| Psmb10 | 15963453 | 122 | proteasome (prosome, macropain) subunit, beta type 10 (prosomeMecl1, partial ) | * sperm aster formation and pronuclear development/apposition in bovine and human zygotes (Rawe *et al.*, 2008)
 | * endopeptidase activity
* hydrolase activity
* peptidase activity
* threonine-type endopeptidase activity
 | * T cell proliferation
* cell morphogenesis
* proteolysis
* proteolysis involved in cellular protein catabolic process
 |
| Tshb | 192216  | 1593 | thyroid stimulating hormone, beta subunit (thyrotropin beta-subunit, partial) | * Not present
 | * hormone activity
 |  |
| Syk | 2780404 | 4957 | tyrosine-protein kinase SYK | * Present in Strongylocentrotus purpuratus] –Sea urchin
 | * ATP binding
* integrin binding
* kinase activity
* non-membrane spanning protein tyrosine kinase activity
* nucleotide binding
* protein binding
* protein domain specific binding
* protein kinase activity
* protein kinase binding
* protein serine/threonine kinase activity
* protein tyrosine kinase activity
* receptor binding
* receptor signaling protein tyrosine kinase activity
* transferase activity
 | * B cell receptor signaling pathway
* G-protein coupled receptor signaling pathway
* activation of JUN kinase and MAPK activity
* adaptive immune response
* angiogenesis
* beta selection
* blood vessel morphogenesis
* cell surface receptor signaling pathway
* cellular response to low-density lipoprotein particle stimulus , molecule of fungal origin
* defence response to bacterium
* enzyme linked receptor protein signaling pathway
* immune system process
* innate immune response
* integrin-mediated signaling pathway
* intracellular signal transduction
* leukocyte activation involved in immune response
* leukocyte cell-cell adhesion
* leukotriene biosynthetic process
* lymph vessel development
* neutrophil and macrophage activation involved in immune response
* neutrophil chemotaxis
* peptidyl-serine phosphorylation
* peptidyl-tyrosine autophosphorylation
* positive regulation of B cell differentiation and alpha-beta T cell differentiation
* positive regulation of bone resorption, calcium-mediated signalling, cell adhesion mediated by integrin, cytokine secretion, gamma-delta T cell differentiation, granulocyte macrophage colony-stimulating factor biosynthetic process, interleukin-3 biosynthetic process, mast cell degranulation, peptidyl-tyrosine phosphorylation, receptor internalization, type I interferon production
* receptor internalization
* regulation of ERK1 and ERK2 cascade, arachidonic acid secretion, immune response, neutrophil degranulation, phagocytosis, platelet activation, platelet aggregation, sequence-specific DNA binding transcription factor activity, superoxide anion generation, tumour necrosis factor-mediated signaling pathway
* serotonin secretion by platelet
* transcription factor import into nucleus
* transmembrane receptor protein tyrosine kinase signaling pathway
 |
| Channels |
| Slc2a1 | 3582350 | 1757  | solute carrier family 2 (facilitated glucose transporter), member 1 (type 1 glucose transporter protein) | * Sperm quality (Kim & Moley, 2008)
 | * D-glucose transmembrane transporter activity
* dehydroascorbic acid transporter activity
* glucose transmembrane transporter activity
* identical protein binding
* kinase binding
* protein binding
* protein self-association
* substrate-specific transmembrane transporter activity
* transmembrane transporter activity
* transporter activity
* xenobiotic transporter activity
 | * carbohydrate transport
* cellular response to glucose starvation
* dehydroascorbic acid transport
* glucose transport
* protein complex assembly
* transmembrane transport
* transport
* xenobiotic transport
 |
| Slc4a2 | 2707264 | 1155 | solute carrier family 4 (anion exchanger), member 2 (anion exchanger ) | * Sperm capacitation ( Chemn *et al.*, 2009)
 | * anion transmembrane transporter activity
* anion:anion antiporter activity
* antiporter activity
* chloride transmembrane transporter activity
* enzyme binding
* inorganic anion exchanger activity
* transporter activity
 | * anion transport
* chloride transport
* ion transport
* regulation of intracellular pH
* transport
 |
| Dpf1 | 6649548 | 808 | D4, zinc and double PHD fingers family 1 (zinc finger protein neuro-d4 ) | * Present in sperm whale and Drosophila
 | * metal ion binding
* nucleic acid binding
* zinc ion binding
 | * nervous system development
* nervous system development
* regulation of transcription, DNA-templated
* transcription, DNA-templated
 |
| Aebp1 | 25137551 | 888 | AE binding protein 1 (aor­­­­­­­tic carboxypeptidase-like protein ACLP) | * spermatogonial stem cell
 | * DNA binding
* RNA polymerase II regulatory region sequence-specific DNA binding
* calmodulin binding
* carboxypeptidase activity
* metallocarboxypeptidase activity
* serine-type carboxypeptidase activity
* transcription corepressor activity
* transcriptional repressor activity, RNA polymerase II transcription regulatory region sequence-specific binding
* zinc ion binding
 | * negative regulation of transcription from RNA polymerase II promoter
* peptide metabolic process
* protein processing
* proteolysis
* regulation of transcription, DNA-templated
* transcription, DNA-templated
 |
| Slc8a1 | 9757634 | 121 | solute carrier family 8 (sodium/calcium exchanger), member 1 (Na/Ca exchanger) | * No report
 | * ankyrin binding
* antiporter activity
* calcium:sodium antiporter activity involved in regulation of cardiac muscle cell membrane potential
* calmodulin binding
* cytoskeletal protein binding
* ion channel binding
* metal ion binding
* protein binding
 | * calcium ion export, homeostasis, import, transmembrane transport, transport into cytosol
* cardiac muscle cell development, contraction
* cell communication by electrical coupling involved in cardiac conduction
* cellular calcium ion homeostasis
* cellular response to cAMP
* cellular response to caffeine
* cellular sodium ion homeostasis
* embryonic heart tube development
* embryonic placenta development
* heart morphogenesis
* ion transport
* muscle fiber development
* negative regulation of cytosolic calcium ion concentration
* positive regulation of bone mineralization
* positive regulation of cytosolic calcium ion concentration , fibroblast migration, the force of heart contraction
* post-embryonic development
* regulation of calcium ion transport
* regulation of cardiac muscle cell membrane potential
* regulation of cardiac muscle contraction by regulation of the release of sequestered calcium ion
* regulation of heart rate
* regulation of sodium ion transport
* regulation of the force of heart contraction
* relaxation of smooth muscle
* response to ATP
* response to hypoxia
* response to muscle stretch
* sodium ion export
* sodium ion import
* sodium ion transmembrane transport
* sodium ion transport
* transmembrane transport
* transport
* vascular smooth muscle contraction
 |
| Cacna1s | 1524149 | 544 | calcium channel, voltage-dependent, L type, alpha 1S subunit (skeletal muscle specific calcium channel ) | * No report
 | * calcium channel activity
* high voltage-gated calcium channel activity
* ion channel activity
* metal ion binding
* voltage-gated calcium channel activity
* voltage-gated calcium channel activity
* voltage-gated ion channel activity
 | * calcium ion transmembrane transport
* calcium ion transport
* endoplasmic reticulum organization
* extraocular skeletal muscle development
* ion transport
* membrane depolarization during action potential
* muscle cell development
* muscle contraction
* myoblast fusion
* neuromuscular junction development
* regulation of ion transmembrane transport
* skeletal muscle adaptation
* skeletal muscle fiber development
* skeletal muscle tissue development
* skeletal system development
* striated muscle contraction
* transmembrane transport
* transport
 |
| Transcription factor |
| Pou2f1 | 13445262 | 376 | POU domain, class 2, transcription factor 1 (Oct-1L ) | * Present
 | * DNA binding
* chromatin binding
* chromatin binding
* protein binding
* receptor binding
* sequence-specific DNA binding
* transcription factor activity,
* transcription regulatory region sequence-specific DNA binding
 | * lens induction in camera-type eye
* negative regulation of transcription, DNA-templated
* olfactory placode formation
* positive regulation of transcription from RNA polymerase II promoter
* positive regulation of transcription from RNA polymerase II promoter
* regulation of transcription, DNA-templated
* transcription, DNA-templated
 |
| Extracellular exosome |
| Ganab | 5452938 | 61.6 | alpha glucosidase 2 alpha neutral subunit | * Present
 | * carbohydrate binding
* catalytic activity
* glucan 1,3-alpha-glucosidase activity
* glucosidase activity
* hydrolase activity
* hydrolase activity, acting on glycosyl bonds
* hydrolase activity, hydrolyzing O-glycosyl compounds
* poly(A) RNA binding
* protein binding
 | * N-glycan processing
* carbohydrate metabolic process
* metabolic process
 |
| Runx1 | 2213483 | 424 | runt related transcription factor 1 (AML1) | * Present (Jeong *et al.*, 2008)
 | * ATP binding
* DNA binding
* RNA polymerase II regulatory region sequence-specific DNA binding
* RNA polymerase II transcription factor activity, sequence-specific DNA binding
* core promoter binding
* promoter-specific chromatin binding
* protein binding
* regulatory region DNA binding
* repressing transcription factor binding
* sequence-specific double-stranded DNA binding
* transcription factor activity, sequence-specific DNA binding
* transcriptional activator activity, RNA polymerase II transcription regulatory region sequence-specific binding
 | * behavioural response to pain
* cellular response to transforming growth factor beta stimulus
* central nervous system development
* chondrocyte differentiation
* definitive haemopoiesis
* embryonic haemopoiesis
* hair follicle morphogenesis
* haemopoiesis
* *in utero* embryonic development
* liver development
* myeloid progenitor cell differentiation
* negative regulation of cell proliferation
* negative regulation of transcription, DNA-templated
* neuron development, differentiation and fate commitment
* ossification
* positive regulation of angiogenesis, cell maturation, granulocyte differentiation, interferon-gamma production, interleukin-2 production, transcription from RNA polymerase II promoter, transcription, DNA-templated
* progesterone secretion
* regulation of T cell anergy, hair follicle cell proliferation, signal transduction, transcription, DNA-templated
* response to retinoic acid
* skeletal system development
* transcription, DNA-templated
 |
| AGALS | 59011863 | 147 | insulin-like growth factor-binding protein complex acid labile subunit | * Present (Yuri Sano *et al.*, 2001)
 | * insulin-like growth factor binding
* insulin-like growth factor binding
* protein C-terminus binding
* protein binding
 | * cell adhesion
 |
| Cell membrane receptors |
| Oprm1 | 217330399  | 1129 | opioid receptor, mu 1 | * Present
 | * G-protein alpha-subunit binding
* G-protein beta-subunit binding
* G-protein coupled receptor activity
* beta-endorphin receptor activity
* filamin binding
* morphine receptor activity
* neuropeptide binding
* opioid receptor activity
* protein C-terminus binding
* protein binding
* protein domain specific binding
* signal transducer activity
* voltage-gated calcium channel activity
 | * G-protein coupled receptor signaling pathway
* adenylate cyclase-activating dopamine receptor signaling pathway
* adenylate cyclase-inhibiting G-protein coupled receptor signaling pathway
* adenylate cyclase-inhibiting opioid receptor signaling pathway
* behavioural response to ethanol
* cellular response to morphine, stress
* chemical synaptic transmission
* eating behaviour
* excitatory postsynaptic potential
* locomotory behaviour
* negative regulation of WNT protein secretion, adenylate cyclase activity, cAMP biosynthetic process
* opioid receptor signaling pathway
* phospholipase C-activating G-protein coupled receptor signaling pathway
* positive regulation of ERK1 and ERK2 cascade, appetite, neurogenesis
* regulation of N-methyl-D-aspartate selective glutamate receptor activity, sensory perception of pain
* response to ethanol
* sensory perception of pain
* signal transduction
 |
| Clec2i | 6166463 | 86.6 | C-type lectin domain family 2, member i | * Not reported
 | * carbohydrate binding
* natural killer cell lectin-like receptor binding
* protein binding
* transmembrane signaling receptor activity
 | * T cell receptor signaling pathway
* membrane raft assembly
* negative regulation of osteoclast differentiation
* positive regulation of immunological synapse formation
* receptor clustering
* regulation of T cell proliferation
* regulation of actin filament polymerization
* regulation of interleukin-2 biosynthetic process
 |
| Msr1 | 192740 | 1335 | macrophage scavenger receptor types I and II | * Not reported
 | * low-density lipoprotein particle binding
* scavenger receptor activity
 | * cholesterol transport
* endocytosis
* lipoprotein transport
* plasma lipoprotein particle clearance
* positive regulation of cholesterol storage
* positive regulation of macrophage derived foam cell differentiation
* receptor-mediated endocytosis
 |
| Ifnar1 | 755810 | 50 | interferon (alpha and beta) receptor 1 | * Reported
 | * interferon receptor activity
* phosphoribosylamine-glycine ligase activity
* type I interferon binding
* type I interferon receptor activity
 | * T cell activation
* cellular response to interferon-alpha
* cytokine-mediated signaling pathway
* defence response to virus
* positive regulation of interferon-beta production, interferon-gamma production, interleukin-1 beta secretion, transcription, DNA-templated
* regulation of peptidyl-tyrosine phosphorylation
* response to lipopolysaccharide
* type I interferon biosynthetic process
* type I interferon signaling pathway
 |
| H2-L | 2137547  | 1759 | MHC H2-L antigen | * Not reported
 | * peptide antigen binding
* receptor binding
 | * antigen processing and presentation
* antigen processing and presentation of peptide antigen via MHC class I
* defence response
* immune response
* immune system process
 |
| TCRα | 3187436531874299 | 5188  | T cell receptor alpha chain |  | * carbohydrate binding
* molecular function
 | * biological process
* protein transport
* transport
 |
| TCRβ | 3986239 | 1793 | T cell receptor (TCR) beta chain |  |  |  |
| Igh | 224492146224492328 | 1281569 | immunoglobulin heavy chain variable DJH region (immunoglobulin heavy chain complex) |  |  |  |
| Spag16 | 54042993 | 5318 | sperm associated antigen 16 (Pf20) | * human sperm axoneme , motility (Zhang *et al.*, 2006, 2007)
 | * protein binding
 | * axoneme assembly
* cell motility in response to calcium ion
* cell projection organization
* cilium assembly
* cilium movement involved in cell motility
* microtubule sliding
* sperm axoneme assembly
 |
| Components of cell junctions |
| Lcp1 | 1813738 | 210 | lymphocyte cytosolic protein 1 (L-plastin) | * Present (Pilatz *et al.*, 2014)
 | * GTPase binding
* actin binding
* actin filament binding
* actin filament binding
* calcium ion binding
* identical protein binding
* metal ion binding
* protein binding
 | * T cell activation involved in immune response
* actin filament bundle assembly
* cell migration
* extracellular matrix disassembly
* positive regulation of podosome assembly
* protein kinase A signaling
* regulation of intracellular protein transport
* response to wounding
 |
| Dsg3 | 2290198 | 1054 | desmoglein 3 | * Present in Physeter catodon
 | * calcium ion binding
* metal ion binding
 | * cell adhesion
* homophilic cell adhesion via plasma membrane adhesion molecules
 |
| Hcfc1 | 27902532 | 885 | host cell factor C1 (HCFC1 protein) | * Present in Physeter catodon
 | * chromatin binding
* contributes to histone acetyltransferase activity (H4-K16, K5,K8 specific)
* identical protein binding
* transcription coactivator activity
* transcriptional activator activity, RNA polymerase II distal enhancer sequence-specific binding
 | * cell cycle
* chromatin modification
* histone H4-K16, H4-K5, H4-K8 acetylation
* negative regulation of transcription from RNA polymerase II promoter
* positive regulation of gene expression
* protein stabilization
* regulation of protein complex assembly
* regulation of transcription, DNA-templated
* release from viral latency
 |
| Nuclear factor |
| Eif5a | 5804100533383434 | 550 | eukaryotic translation initiation factor 5A (Uorf1) | * Sperm fertility (Bonache *et al.*, 2012)
 |

|  |
| --- |
| * RNA binding
 |
| * U6 snRNA binding
 |
| * poly(A) RNA binding
 |
| * protein N-terminus binding
 |
| * ribosome binding
 |
| * translation elongation factor activity
 |

 | * apoptotic process
* mRNA export from nucleus
* mRNA transport
* negative regulation of apoptotic process
* positive regulation of apoptotic process
* and cardiac muscle cell apoptotic process
* positive regulation of cell proliferation and cytosolic calcium ion concentration, muscle cell differentiation, reactive oxygen species metabolic process, translational elongation and termination
* protein export from nucleus
* protein transport
* translation
* translational elongation
* translational frameshifting
* transport
 |
| Tbp | 2511436 | 6858 | TATA binding protein | * not reported
 | * DNA binding
* DNA binding
* RNA polymerase II core promoter proximal region sequence-specific DNA binding
* RNA polymerase II core promoter sequence-specific DNA binding
* RNA polymerase II repressing transcription factor binding
* enzyme binding
* protein binding
* repressing transcription factor binding
* contributes to transcription factor activity, sequence-specific DNA binding
* transcription factor binding
* transcription regulatory region DNA binding
 | * DNA-templated transcription, initiation
* positive regulation of transcription, DNA-templated
* regulation of transcription, DNA-templated
* transcription from RNA polymerase II promoter
* transcription from RNA polymerase II promoter
* transcription from RNA polymerase III promoter
* transcription from RNA polymerase III promoter
* transcription, DNA-templated
 |
| Eif4ebp1 | 13540382  | 1159 | eukaryotic initiation factor 4E |  | * eukaryotic initiation factor 4E binding
* protein phosphatase 2A binding
* translation initiation factor binding
* translation repressor activity
 | * G1/S transition of mitotic cell cycle
* IRES-dependent translational initiation
* TOR signaling
* cellular response to dexamethasone stimulus
* cellular response to hypoxia
* insulin receptor signaling pathway
* lung development
* negative regulation of protein complex assembly and translational initiation
* positive regulation of mitotic cell cycle
* response to amino acid starvation
* response to ethanol
* response to ischemia
 |
| Eif4a2 | 581985 | 3833 | initiation factor 4A (eukaryotic translation initiation factor 4A2) |  | * ATP binding
* ATP-dependent RNA helicase activity
* ATPase activity
* RNA binding
* helicase activity
* hydrolase activity
* nucleic acid binding
* nucleotide binding
* poly(A) RNA binding
* translation initiation factor activity
 | * RNA secondary structure unwinding
* negative regulation of RNA-directed RNA polymerase activity
* regulation of gene expression
* regulation of translational initiation
* translation
* translational initiation
 |
| Adat1 | 13345381 | 1246 | adenosine deaminase tRNA specific 1, partial |  | * RNA binding
* adenosine deaminase activity
* hydrolase activity
* metal ion binding
* tRNA-specific adenosine deaminase activity
 | * RNA processing
* tRNA processing
 |
| Rps18 | 2980874 | 215 | Ribosomal protein S18 |  | * RNA binding
* nucleic acid binding
* poly(A) RNA binding
* protein binding
* protein kinase binding
* rRNA binding
* structural constituent of ribosome
 | * ribosome biogenesis
* translation
 |
| Sf1 | 5102741 | 774 | splicing factor 1 (CW17) | * Present
 | * RNA binding
* metal ion binding
* nucleic acid binding
* pre-mRNA branch point binding
* zinc ion binding
 | * Leydig cell differentiation
* RNA splicing
* mRNA processing
* mRNA splicing, via spliceosome
* male sex determination
* negative regulation of smooth muscle cell proliferation
* regulation of steroid biosynthetic process
* regulation of transcription, DNA-templated
* transcription, DNA-templated
 |
| FLI1 | 1000864  | 1756 | Fli-1 proto-oncogene, ETS transcription factor (Friend leukemia virus integration 1) |  | * DNA binding
* RNA polymerase II core promoter proximal region sequence-specific DNA binding
* RNA polymerase II distal enhancer sequence-specific DNA binding
* RNA polymerase II transcription factor activity, sequence-specific DNA binding
* chromatin binding
* protein binding
* transcription factor activity, sequence-specific DNA binding
* transcriptional activator activity, RNA polymerase II core promoter proximal region sequence-specific binding
 | * blood circulation
* cell differentiation
* haemostasis
* megakaryocyte development
* organ morphogenesis
* positive regulation of transcription from RNA polymerase II promoter
* regulation of transcription from RNA polymerase II promoter
* transcription from RNA polymerase II promoter
 |
| Isozyme/Co-factor |
| ADH1A | 178094  | 1115 | alcohol dehydrogenase | * Not reported
 | * alcohol dehydrogenase (NAD) activity
* alcohol dehydrogenase activity, zinc-dependent
* alcohol dehydrogenase activity, zinc-dependent
* protein binding
* retinol dehydrogenase activity
* zinc ion binding
 | * alcohol metabolic process
* drug metabolic process
* ethanol oxidation
 |
| * Growth factor
 |
| Pgf | 9837316 | 50.9 | placental growth factor | * Not reported
 | * growth factor activity
* protein heterodimerization activity
 | * angiogenesis
* branching involved in ureteric bud morphogenesis
* cell differentiation
* multicellular organism development
* positive regulation of angiogenesis, cell division, cell proliferation, endothelial cell proliferation
* regulation of morphogenesis of a branching structure
* sprouting angiogenesis
 |
| * cytoplasmic vesicle
 |
| Zg16 | 1334245 | 550 | zymogen (zymogen granule membrane protein 16) | * Not reported
 | * carbohydrate binding
* molecular function
 | * biological process
* protein transport
* transport
 |
| Plasma membrane component |
| Apoa2 | 642826 | 1582 | apolipoprotein A-II | * Not reported
 | * apolipoprotein receptor binding
* cholesterol binding
* contributes to cholesterol transporter activity
* cholesterol transporter activity
* high-density lipoprotein particle binding
* high-density lipoprotein particle receptor binding
* lipase inhibitor activity
* lipid binding
* lipid transporter activity
* phosphatidylcholine binding
* phosphatidylcholine-sterol O-acyltransferase activator activity
* phospholipid binding
* protein heterodimerization activity
 | * beta-glucoside transport
* cholesterol efflux
* cholesterol homeostasis
* cholesterol homeostasis
* cholesterol homeostasis
* cholesterol homeostasis
* cholesterol metabolic process
* cholesterol metabolic process
* cholesterol transport
* diacylglycerol catabolic process
* fatty acid metabolic process
* high-density lipoprotein particle assembly
* high-density lipoprotein particle assembly
* high-density lipoprotein particle clearance
* high-density lipoprotein particle remodeling
* lipid transport
* lipoprotein metabolic process
* low-density lipoprotein particle remodeling
* negative regulation of cholesterol import
* negative regulation of cholesterol transport
* negative regulation of cholesterol transporter activity
* negative regulation of cytokine secretion involved in immune response
* negative regulation of lipase activity
* negative regulation of lipid catabolic process
* negative regulation of very-low-density lipoprotein particle remodeling
* organ regeneration
* peptidyl-methionine modification
* phosphatidylcholine biosynthetic process
* phospholipid catabolic process
* phospholipid efflux
* positive regulation of cholesterol esterification
* positive regulation of interleukin-8 biosynthetic process
* positive regulation of lipid catabolic process
* protein oxidation
* regulation of intestinal cholesterol absorption
* regulation of protein stability
* response to glucose
* reverse cholesterol transport
* transport
* triglyceride-rich lipoprotein particle remodeling
 |
|  |
|  |  |  | mCG3700, isoform CRA\_b | * Not present
 |  |  |