Supplemental Table 1. Genes associated with pancreatic growth and development whose expression increased during CVB4 infection

Gene name	Gene product	Relevant Function
Embryonic expression		
Apod	apolipoprotein D	Secreted protein, lipocalin family, role in embryogenesis
Growth and differentiation signals		
Ngrn-pending [P]	neugrin	Neuronal differentiation
Ccnd1	cyclin D1	G1/S phase transition, cell cycle control
Sparc	secreted acidic cysteine rich glycoprotein	Matricellular protein, inhibits cell proliferation and increases ECM
Unc93b	unc93 homolog B	Cell-to-cell communication, tumor suppressor gene? normal function?
Nisch	nischarin	Inhibits cell proliferation via cytoskeleton organization
Igfbp5	insulin-like growth factor binding	Modulate IGF actions, role in tissue development
Apoptosis		
[1]*Reg3g* [P] •	regenerating islet-derived 3 gamma	Inhibits apoptosis
[1]*Pap* (*reg2*) [P]	pancreatitis-associated protein	Inhibits apoptosis
Bcl2a1b	B-cell leukemia/lymphoma 2 related	Related to BCL-2, pro-apoptosis
Bcl2a1d	B-cell leukemia/lymphoma 2 related	Related to BCL-2, pro-apoptosis
Biklk	Bcl2-interacting killer-like	Interacts with BCL2 and BCL-XL, pro-apoptosis
Bnip2	BCL2/adenovirus E1B 19 kDa-interacting protein	Activation of caspase 3, pro-apoptotic gene
Bak1	BCL2-antagonist/killer 1	BCl-2 homolog, potent inducer of apoptosis
[1]*Ctsb*	cathepsin B	Lysosomal protease, possible role in TNF-induced cell death signaling
Cdkn1c	cyclin-dependent kinase inhibitor	Similarly to p53 in the ability to induce cell-cycle arrest and apoptosis,
Rtn4	reticulon 4	Role in regulating apoptosis
Prkcd	protein kinase C, delta	Required for mitochondrial-dependent apoptosis
Apaf1	apoptotic protease activating factor	Role in apoptosis, activator of caspase family proteases
[1]*Tieg*	TGFB inducible early growth	Transcription factor, TGF-beta signaling, analogous to SMAD
[1]*Tnfrsf1a*	tumor necrosis factor receptor	TNFR1 signaling, apoptosis
[1]*Tnfrsf1b*	tumor necrosis factor receptor	Pro-inflammatory, TNF signaling induction, apoptosis, growth
Serine proteases / serpins		
[1]*Klk 6,9,13,16,26* [P]	kallikreins	
[1]*Spint1* [P]	serine protease inhibitor, Kunit	Serpin
[1]*Spi6* [P]	serine protease inhibitor 6	Serpin
Adn	adipsin	Adipocyte differentiation-dependent serine protease gene
Kdap	kidney-derived aspartic protease-like	Aspartic proteinase-like
Ambp	alpha 1 microglobulin/bikunin	Serpin
Serpina3n	serine (or cysteine) proteinase	Serpin-encoding gene family, expressed during mouse fetal development
Acinoductular metaplasia		
[1]*Mmp7* •	matrix metalloproteinase 7	Homeostasis and remodeling of ECM, acinoductular metaplasia
Lgals3	lectin, galactose binding, soluble 3	Growth regulation, cell adhesion, ductular complex formation
Iqgap1	IQ motif containing GTPase activity	Potential target of S100b during membrane rearrangement

Supplemental Table 1. Genes associated with pancreatic growth and development whose expression increased during CVB4 infection (ctd)

Gene name	Gene product	Relevant Function
Angiogenesis / blood		
[1]*Klk 6,9,13,16,26* [P]	kallikreins	
Bpgm [P]	2,3-bisphosphoglycerate mutase	Dissociation of oxygen from hemoglobin
Hbb-b1 [P]	hemoglobin, beta adult major chain	Blood
Ptafr [P]	platelet-activating factor receptor	Coagulation
[1]*Procr* [P]•	protein C receptor, endothelial	Enhances activation of anticoagulant protein C
[1]*Spint1* [P]	serine protease inhibitor, Kunitz type 1	Serpin
[1]*Spi6* [P]	serine protease inhibitor 6	Serpin
Figf	c-fos induced growth factor	Potent angiogenic factor
Tie1	tyrosine kinase receptor 1	Expressed in endothelial cells during embryonic angiogenesis
Lcp2	lymphocyte cytosolic protein 2	Roles in lymphatic vessel development
Timp3	tissue inhibitor of metalloproteinase	Balance between tissue degradation / remodeling, inhibits angiogenesis
Nervous system		
Shyc	selective hybridizing clone	Nervous system development, neronal cells expression
App	amyloid beta (A4) precursor protein	Nerve derivative
Stxbp3	syntaxin binding protein 3	Neuronal specific
Ninj1	ninjurin 1	Promotes neuron/epithelial cell growth and migration
P2rx4	purinergic receptor P2X, ligand-g	Mediates extracellular ATP-induced effects
Sema4d	sema domain, immuno globulin domain	Axon guidance? Also on various hemopoetic cell types
[1]*Pmp22*	peripheral myelin protein, 22 kDa	Progenitor cells that produce neurons and smooth muscle- like cells
Bone		
Atp6v1b2	ATPase, H+ transporting	Role in bone resorption
Atp6v1a1	ATPase, H+ transporting	Bone resorption
Atp6v0c	ATPase, H+ transporting	Bone resorption
Mglap	matrix gamma-carboxyglutamate	Role in endochondral ossification? expressed during embryogenesis
Ewsh	Ewing sarcoma homolog	Encodes a putative RNA binding protein, expressed during development

[P], indicates a gene whose expression was greater during CVB4-P infection. All other genes were expressed at higher levels during CVB4-V infection. [1], present in more than one category. •, most significant outliers ($p>0.001$).

Supplemental Table 2. Genes associated with extracellular matrix formation whose expression was increased during CVB4 infection

Gene name	Gene product	Relevant Function
Extracellular matrix / adhesion		
Cldn3,4,7 [P]	claudins 3, 4, 7	Tight junctions
Fibrosis		
Col15a1	procollagen, type XV	Extracellular matrix
Col1a1	procollagen, type I, alpha 1	Extracellular matrix and connective tissue
Col1a2	procollagen, type I, alpha 2	Fibrosis, extracellular matrix
Col4a1	procollagen, type IV, alpha 1	Fibrosis, extracellular matrix
Col4a2	procollagen, type IV, alpha 2	Extracellular matrix, fibrosis
Col3a1	procollagen, type III, alpha 1	Fibrosis, extracellular matrix
Col6a1	procollagen, type VI, alpha 1	Fibrosis, extracellular matrix
Col6a3	procollagen, type VI, alpha 3	Fibrosis, extracellular matrix
Col6a2	procollagen, type VI, alpha 2	Extracellular matrix, expressed during mouse development
Fbn1	fibrillin 1	Component of fibroid formation, fibrosis
Fbln2	fibulin 2	Extracellular matrix protein, suggested role in organogenesis
ECM formation		
Grn	granulin	Wound-related growth factor, mitogenic for keratinocytes and fibroblasts
Sdfr2	stromal cell derived factor receptor	Receptor for SDF-1, growth factor
Dcn	decorin	Proteoglycan, growth-factor role in tissue remodeling and cancer
Bgn	biglycan	TGFbeta1-induced formation of extracellular matrix
[1]*Sparc*	secreted acidic cysteine rich glycoprotein	Matricellular protein, inhibits cell proliferation, increases ECM by regulating TGFbeta1 and type 1 collagens; arrest cells in G1
Sparcl1	SPARC-like 1 (mast9, hevin)	ECM glycoprotein, regulates cell adhesion, cell cycle
Remodeling ECM		
[1]*Mmp7*	matrix metalloproteinase 7	Remodeling ECM; acinoductular metaplasia
Mmp14	matrix metalloproteinase 14	Proteinase involved in ECM breakdown/ remodeling
Timp3	tissue inhibitor of metalloproteinase	Tissue specific inhibitor of Mmps, inhibits angiogenesis
Anxa2	annexin A2	Stress-fiber development, enhances ECM formation, receptor for tPA
Anxa11	annexin A11	Plasminogen receptor. Tissue remodeling
Saa3	serum amyloid A 3	Stimulates collagenase expression, tissue remodeling
Transforming growth factor beta-associated		
Tgfb1	transforming growth factor, beta	Fibrosis, inhibits acinar cell mitosis
[1]*Tieg*	TGFB inducible early growth	Transcription factor / TGF-beta signaling pathway, analogous to SMAD
Bgn	biglycan	TGF beta1-induced formation of extracellular matrix
[1]*Sparc*	secreted acidic cysteine rich glycoprotein	Matricellular protein inhibits cell proliferation, increases ECM
[1]*Tgfbi*	transforming growth factor, beta	TGF beta 1 inhibitor
Thbs1	thrombospondin 1	Adhesive glycoprotein, cell attachment, spreading, and migration
Eng	endoglin	TGF beta 1-binding cell-surface glycoprotein, vascular endothelial cells
Emr1	EGF-like module	B / T / and macrophages cell surface receptor
Fstl	follistatin-like	activin-binding protein (inhibitor), induced by TGFbeta1, EGF, KGF
[1]*Pmp22*	peripheral myelin protein, 22 kDa	Progenitor cells that produce neurons and smooth muscle- like cells

Supplemental table 3. Genes associated with tissue injury / response to injury whose expression was increased during CVB4 infection

Gene name	Gene product	Relevant Function
Protective role		
Gstt2 [P]	glutathione S transferase theta 2	Protects from oxidative stress
Tm4sf7 [P]	transmembrane 4 superfamily member 7	Wound healing
Autodigestion		
[1]*Ctsb*	cathepsin B	Autodigestion of pancreas during pancreatitis
Pla2g7	phospholipase A2 group VII	Pancreatic enzyme, increased in necrotic regions during pancreatitis
Coagulation		
F7	coagulation factor VII	Plasma serine protease, participates in blood coagulation
F10 •	coagulation factor X	Plasma protein involved in blood coagulation cascade
Pros1	protein S (alpha)	Plasma protein, functions as a cofactor for activated protein C
Hp	haptoglobin	C-reactive acute -phase protein, increases expression of fibrinogen
Oxidative stress response		
Sod2	superoxide dismutase 2,	Antioxidant
Hmox1	heme oxygenase (decycling) 1	Stress protein produced by inflammatory cells
Metabolism		
Carbohydrate / insulin		
Stx4a	syntaxin 4A (placental)	Expressed by adipocytes, role in insulin-dependent movement of glut 4
Prkacb	protein kinase, cAMP dependent	Triggers insulin secretion in beta cells
Hk2	hexokinase 2	Role in facilitating glucose uptake in response to insulin
Pfkp	phosphofructokinase, platelet	Phosphofructokinase family, role in glucose metabolism
Prom	prominin	Blood-glucose responsive gene , upregulates expression of GAPDH
Fatty acid / cholesterol metabolism		
Apoe	apolipoprotein E	Cholesterol metabolism
Npc2	Niemann Pick type C2	Role in cholesterol accumulation in lysosomes
Npc1	Niemann Pick type C1	Roles in cholesterol homeostasis
Acrp30	adipocyte complement	Adipocyte-derived hormone, affects lipid and glucose metabolism
Abca1	ATP-binding cassette, sub-family	
Lpl	lipoprotein lipase	Lipid metabolism
Acaa	acetyl-Coenzyme A acyltransferase	Peroxisomal beta-oxidation system
Gdap10	ganglioside-induced differentiation associated protein 10	Signal transduction, glycolipid formation
Pon2	paraoxonase 2	Catalyzes hydrolysis of organophosphates , prevents oxidation of LDL
Sptlc2	serine palmitoyltransferase	Sphingolipid biosynthesis

Supplemental table 4. Genes associated with immune responses whose expression was increased during CVB4 infection

Gene name	Gene product	Relevant Function
Innate immunity		
Acute phase proteins		
[1]*Klk 6,9,13,16,26* [P]	kallikreins	Released during inflammation
[1]*Reg3g* [P] •	regenerating islet-derived 3 gamma	
[1]*Pap* [P]	pancreatitis-associated protein	
Saa3	serum amyloid A 3	NFkB target, stimulate collagenase expression, tissue remodeling
Apbb1ip- pending	amyloid beta (A4) precu	induced by pro-inflammatory cytokines; marker of degeneration?
Hp	haptoglobin	C-reactive acute -phase protein, increases expression of fibrinogen
Adhesion / Migration / inflammation		
Lrg-pending [P]	leucine-rich alpha-2-glycoprotein	Marker for early neutrophilic granulocyte differentiation
Klra2 [P]	killer cell lectin-like receptor	NK cell receptor. Inhibitory
[1]*Procr* [P] •	protein C receptor, endothelial	Protection from sepsis. Anti-inflammatory
Itgb2	integrin beta 2	Neutrophil activation
Itgp	integrin-associated protein	Hematopoetic cell signaling
Cd9	CD9 antigen	Cell motility/ adhesion/ spreading, signal transduction, wound healing
Tm4sf7	transmembrane 4 superfamily	Cell adhesion, migration, proliferation and differentiation
Tln	talin	Cytoskeleton organization, cell migration/adhesion
Thbs1	thrombospondin 1	Cell attachment, spreading, and migration
Actr2	ARP2 actin-related protein 2 homo	Migration and movement
Vcam1	vascular cell adhesion molecule 1	Adhesion molecule involved in cell mobility and recruitment
Icam1	intercellular adhesion	Adhesion molecule, lymphocyte mobility and recruitment
Adam8	a disintegrin and metalloprotease	Cell adhesion/signaling
Selpl	selectin, platelet(p-selectin) l	Recruitment and chemotaxis
Ctsc •	cathepsin C	Leukocyte recruitment, regulate cytokine production
Chi3l3 •	chitinase 3-like 3	Chemotactic, extravasion of eosinophils, T cells, bone marrow-PMNs
Sdcbp	syndecan binding protein	Signaling/chemotaxis of leukocytes
Myh9	myosin heavy chain IX	Secretion and migration of mast cells
Pglyrp	peptidoglycan recognition protein	ubiquitous proteins involved in innate immunity
Cebpb	CCAAT/enhancer binding protein	Transcription factors, pro-inflammatory
Gp49b	glycoprotein 49 B	Surface glycoprotein on mast cells
Ierepo1- pending	immediate early response	Pro-inflammatory, innate
Emp3	epithelial membrane protein 3	Expressed in hematopoetic/lymphoid lineage cells,
Complement		
C1qb	complement component 1, q subcomponent	Innate immunity
C1qc	complement component 1, q subcomponent	Innate immunity
C1qa	complement component 1, q subcomponent	Innate immunity
C1qr1	complement component 1, q subcompnent	Innate immunity
C3ar1	complement component 3a receptor	Regulator of innate immunity, regulatory role in Th2 development

Supplemental table 4. Genes associated with immune responses whose expression was increased during CVB4 infection (ctd)

Gene name	Gene product	Relevant Function
Cytokines and chemokines		
Ccl8 [P]	chemokine (C-C motif) ligand 8	MCP-2
Ccl7	chemokine (C-C motif) ligand 7	MCP-3
Cxcl10	chemokine (C-X-C motif) ligand 1	IP-10, chemotactic for monocytes/macrophages, T cells; M1, angiostatic?
Cxcl2	chemokine (C-X-C motif) ligand 2	MIP-2, iNOS stimulates expression
Ccl3	chemokine (C-C motif) ligand 3	MIP-1alpha, induced by IFN-alpha/beta
Ccl4	chemokine (C-C motif) ligand 4	MIP-1beta, chemotactic activity for lymphocytes
Ccl5	chemokine (C-C motif) ligand 5	Expressed by M1 macrophages
Cxcl9	chemokine (C-X-C motif) ligand 9	MIG, increased during M1 macrophage activation
[1]*Tgfbi*	transforming growth factor, beta	TGF beta 1 inhibitor
Cmkbr5	chemokine (C-C) receptor 5	Increases responsiveness of murine eosinophils to MIP-1beta
Il17r	interleukin 17 receptor	Ligand (IL-17) proinflammatory
Ptpns1	protein tyrosine phosphatase, non-receptor type substrate 1	Cytokine signal transduction
[1]*Tnfrsf1b*	tumor necrosis factor receptor	Pro-inflammatory, TNF signaling induction, apoptosis, growth
[1]*Tnfrsf1a*	tumor necrosis factor receptor	TNFR1 signaling, apoptosis
Nek7	NIMA (never in mitosis gene a)-related expressed kinase 7	Immediate-early cytokine responsive gene
Peli1	pellino 1	May have roles in IL-1 dependent signaling
Interferon- related		
Ifi202a [P] •	interferon activated gene 202A	Negative role in cell growth
Ifrd2 [P]	interferon-related developmental	Cell proliferation
Gbp1 [P]	guanylate nucleotide binding protein	GTPase
Ifi205	interferon activated gene 205	Interferon-induced nuclear factor, overexpression decreases cell growth
Ifi204	interferon activated gene 204	p200 family, interferon-induced
Mx1	myxovirus (influenza virus) resistance 1, interferon-inducible protein	Interferon-induced, antiviral, GTPase, amplified via IRF& IRF3
Gbp2	guanylate nucleotide binding protein	Interferon-induced, G-protein, antiviral effects
Ifit3	interferon-induced protein with tetratricopeptide repeats 3	In peritoneal macrophages, pro-inflammatory
Ifit2	interferon-induced protein with tetratricopeptide repeats 2	Expressed in peritoneal macrophages, pro-inflammatory
Macrophages		
Gc [P] •	group specific component	Macrophage activation
Arg1	arginase 1, liver	M1 macrophages?
Irg1	immunoresponsive gene 1	Activated macrophages
Il1rn	interleukin 1 receptor antagonist	Immune modulation, expressed by M2 macrophages, NFkB target
Gp49a	glycoprotein 49 A	Ig-like receptor on mast cells, NK cells, macrophages
Samhd1	SAM domain and HD domain, 1	Pro-inflammatory, innate, macrophage activation
Spp1	secreted phosphoprotein 1	Osteropontin, activated macrophages
Litaf	LPS-induced TN factor	Regulate TNF alpha gene expression in macrophages
Tmsb10	thymosin, beta 10	Activate bone marrow-derived macrophages –> iNOS, TNF alpha, IL-1
Rbm3	RNA binding motif protein 3	Role in proliferation and monocyte differentiation
Slc11a1	solute carrier family 11	Regulate macrophage function, expressed during neutrophil maturation
Clecsf8	C-type lectin superfamily 8	On macrophages and dendritic cells
Mpeg1	macrophage expressed gene 1	
Serpinb2	serine (or cysteine) proteinase inhibitor	Serpin, expressed by monocytes, macrophages
Clecsf9 •	C-type lectin superfamily 9	Role in activating macrophages, expression increased by IL-6, IFN-g
Clecsf6	C-type lectin superfamily 6	Surface molecule expressed by APCs, potential regulator of DC function
Irg1	immunoresponsive gene 1	Expression regulated by IFN-alpha, expressed by macrophages
Ptpro	protein tyrosine phosphatase, receptor type O	May play a role in macrophage survival, and/or differentiation

Supplemental table 4. Genes associated with immune responses whose expression was increased during CVB4 infection (ctd)

Gene name	Gene product	Relevant Function
Immune regulation (mainly innate response)		
Ctsk	cathepsin K	May regulate inflammatory reactions
Pla2g7	phospholipase A2 group VII	Pancreatic enzymes, may have role in modulating immune response
Hck	hemopoietic cell kinase	Enhanced innate immune response
Csf1r	colony stimulating factor 1 receptor	Regulator of mononuclear phagocyte production
Csf2rb2	colony stimulating factor 2 receptor	Negative regulator of signaling in immune cells
Ptx3	pentaxin related gene	Roles in controlling acute phase inflammatory response
H2-T10	histocompatibility 2, T region l	Immunoregulatory (* T cells, transduce a negative signal to NK cells
H2-T23	histocompatibility 2, T region l	Encodes Qa-1 molecule, "$ T and (* T cells, negative signal to NK cells
Adpative immunity		
B cells		
Pigr [P]	polymeric immunoglobulin receptor	B cells
Igj [P]	immunoglobulin joining chain	B cells
Igk-V8 [P]	immunoglobulin kappa chain V8	Ig light chain
Laptm5	lysosomal-associated protein transmembrane 5	Increased in resting B cells, decreased in activated B cells
Cd72	CD72 antigen	Immune activation, B cell antigen receptor
Sema4d	sema domain, immunoglobulin domain	Surface proteins on lymphocytes, may have role in the immune system
Ly86	lymphocyte antigen 86	Growth-promoting signals to B cells, role in B cell autoantibody prod'n?
Ly9	lymphocyte antigen 9	Expressed on NK, B and T cells, marker of lymphocyte differentiation
Pirb	paired-Ig-like receptor B	Ig-like surface receptor, inhibits inflammation and humoral responses
[1]Il7r	interleukin 7 receptor	Growth factor for B and T cell precursors
Lsp1	lymphocyte specific 1	Marker of activated lymphocytes
T cells		
Pnp	purine-nucleoside phosphorylase	Role in T cell development
Lcp1	lymphocyte cytosolic protein 1	Increased expression in IL-2 stimulated T cells
Slfn2	schlafen 2	Role in later thymocyte maturation
Bat1a	HLA-B-associated transcript 1A	RNA helicase DEAD-box protein family, protein processing
Slfn1	schlafen 1	Role in early thymocyte maturation
Sgpl1	sphingosine phosphate lyase 1	T cell migration into tissue site, regulate T cell proliferation
Ptpn1	protein tyrosine phosphatase, non-receptor type 1	hematopoetic tumor-suppressor gene
Ncl	nucleolin	T cell activation augmented by TCR/CD3-mediated signaling
Hsd17b11	hydroxysteroid (17-beta) dehydrogenase 11	Expressed on T lymphocytes,
Zfp36l2	zinc finger protein 36	Possible role in T cell proliferation
Ptpns1	protein tyrosine phosphatase, non-receptor type substrate 1	Recognition/signaling receptor in both the immune and nervous systems
Fkbp5	FK506 binding protein 5 (51 kDa)	Immunophilin,, mediate calcineurin inhibition in T cells
[1]Il7r	interleukin 7 receptor	Growth factor for B and T cell precursors
Lsp1	lymphocyte specific 1	Marker of activated lymphocytes
Thy1	thymus cell antigen 1, theta	Upregulated on activated lymphocytes
Antigen processing /presentation		
Ehd1	EH-domain containing 1	Role in recycling the MHC class I molecules to the plasma membrane

Supplemental table 5. Genes associated with transcriptional regulation whose expression was increased during CVB4 infection

Gene name	Gene product	Relevant Function
Pathways (MAP, NFKb, JAK/STAT)		
Csrp2 [P]	cysteine-rich protein 2	JAK-STAT signaling
Stat6	signal transducer and activator of transcription	T-cell activation
Tank	TRAF family member-associated Nfkb activator	NFkB activation
Nfkbia	nuclear factor of kappa light chain	Inhibitor of NFKb activation, blocks receptor signaling
Dusp1	dual specificity phosphatase 1	MAP kinase phosphatase (MKP1), involved in ERK signaling pathway
Mapk6	mitogen-activated protein kinase	Extracellular signal-regulated kinase (ERK3)
Mapkapk2	MAP kinase-activated protein kinase	Central role in inflammatory response-signal transduction
Stk10	serine/threonine kinase 10	Roles in MAPK, extracellular signal transduction
Osmr	oncostatin receptor	Activate Jak1, Jak2, Tyk2 receptor-associated tyrosine kinases, STAT3,5
Transcription		
Npm3 [P]	nucleoplasmin 3	Nuclear chaperone. Transcription. DNA replication
Hnrpc [P]	heterogeneous nuclear ribonucleoprotein C	Post-transcriptional regulation
Anp32a [P]	acidic (leucine-rich) nuclear phosphoprotein 32 family	Regulation of histone acetylation and transcription
Nme3 [P]	expressed in non-metastatic cells	Transcriptional regulation
Zfp144 [P]	zinc finger protein 144	Polycomb group. Transcriptional repression
Stat6	signal transducer and activator o	T-cell activation
Cited2	Cbp/p300-interacting transactivator	Transcriptional co-activator
Cebpb	CCAAT/enhancer binding protein	Leucine zipper transcription factors, pro-inflammatory
Klf4	Kruppel-like factor 4 (gut)	Transcription factor, acts synergistically with Sp-1
Klf13	Kruppel-like factor 13	Transcription factor expressed in activated T cells, NFkB pathways
Lims1l	LIM and senescent cell antigen-l	LIM domains play key roles in regulating developmental pathways
[1]*Tieg*	TGFB inducible early growth	Transcription factor / TGF-beta signaling pathway, analogous to SMAD
Oncogenes		
Fos	FBJ osteosarcoma oncogene	Oncogene, signal transduction, transcription factor activator
Lyn	Yamaguchi sarcoma viral oncogene homolog	Oncogene, cellular homolog of v-Yes
Sfpi1	SFFV proviral integration	Putative oncogene
Nras	neuroblastoma ras oncogene	Oncogene
Rasa3	RAS p21 protein activator 3	Stimulate intrinsic GTP-ase activities of normal RAS
Hnrpa2b1	heterogeneous nuclear ribonucleoprotein	Mediates intracellular trafficking of specific RNAs

Supplemental table 6. Genes associated with signaling whose expression was increased during CVB4 infection

Gene name	Gene product	Relevant Function
Cytoskeleton / signaling		
Cotl1 [P]	coactosin-like 1 (Dictyostelium)	Actin binding
Gsn	gelsolin	Cell proliferation, restructuring actin filaments
Msn	moesin	Cell-to-cell junctions, cleavage furrows, cell division
Capg	capping protein (actin filament),	Actin-capping, cytoskeleton regulation
Coro1c	coronin, actin binding protein 1	Actin binding protein, cell adhesion , signal transduction
Pstpip1	proline-serine-threonine phosphatase interacting protein	Actin cytoskeleton rearrangement, T cell activation
Cfl1	cofilin 1, non-muscle	Actin-binding protein, essential regulator of actin filament turnover
Lasp1	LIM and SH3 protein 1	Actin-binding protein, role in cytoskeleton organization
Aclp7	actin-crosslinking protein 7	
Calcium / Potassium		
Clca1 [P]	chloride channel calcium activated	Chloride channel
Clca1 [P]	chloride channel calcium activated	Ion channel. Signal transduction
S100a10	S100 calcium binding protein A1	Signal transduction
S100a4	S100 calcium binding protein A4	Signal transduction
S100a6	S100 calcium binding protein A6	Signal transduction
Cab39	calcium binding protein, 39 kDa	
Calu	calumenin	Ca+ binding protein that can be observed in the ER
Mlp	MARCKS-like protein	Calmodulin-binding
Aplp2	amyloid beta (A4) precursor-like	Role in calmodulin signal transduction
Calm1	calmodulin 1	Calcium regulation in skeletal muscles, liver, pancreas, heart
Chgb	chromogranin B	Ca++ storage proteins, transcription factor
Anxa2	annexin A2	phospholipid/Ca+2 binding protein, ECM formation; receptor for tPA
Anxa11	annexin A11	Plasminogen receptor. Tissue remodeling
Signal transduction		
GTPases		
Arhu [P]	ras homolog gene family, member U	GTPase. Activates JNK pathway
Iqgap1	IQ motif containing GTPase activ	potential target of S100b during rearrangement of membrane morphology
Cdc42	cell division cycle 42 homolog (S	signals between cell surface receptor and actin cytoskeleton
Arhgef3	Rho guanine nucleotide exchange	activation of Rho GTPases
G-protein coupled signaling		
Gnai2	guanine nucleotide binding protein	G-protein family of signal transducers
Gna13	guanine nucleotide binding protein	
Gnai2	guanine nucleotide binding protein	
Tm7sf1	transmembrane 7 superfamily	G-protein coupled receptor
Arhgef1	Rho guanine nucleotide exchange	G protein receptor signaling
Gpcr25	G-protein coupled receptor 25	Induced during activation-induced apoptosis of T cells Essential role in induction of apoptosis, coupling TCR / Fas
Adrbk1	adrenergic receptor kinase, beta	Promotes rapid receptor uncoupling from G proteins
Additional pathways		
Sh3yl1 [P]	Sh3 domain YSC-like 1	Promotes Src kinase family signaling
PDE9A [P]	phosphodiesterase 9A homolog	Regulates second messengers (cAMP, cGMP)
Nifie14-pending [P]	7-transmembrane domain protein	Signaling
Hrmt1l2 •	heterogeneous nuclear ribonucleoprotein methyltransferase-like	RNA binding protein, signal transduction
Sh3bp2	SH3-domain binding protein 2	Protein-protein interactions, cytoplasmic signaling
Ddef1	development and differentiation enhancing	Involved in differentiation
Hcls1	hematopoietic cell specific Lyn substrate 1	Signal transduction, regulation of gene expression
Ppap2a	phosphatidic acid phosphatase 2a	Membrane bound protein with role in cell signaling?
Lrp1	low density lipoprotein receptor-r	Binds intracellular adaptor proteins involved in cell signaling

Supplemental table 7. Genes associated with cellular function whose expression was increased during CVB4 infection

Gene name	Gene product
Organelles	
Bckdhb [P]	branched chain ketoacid dehydrogenase E1, beta polypeptide
Dbt [P]	dihydrolipoamide branched chain transacylase E2
Grpel1 [P]	GrpE-like 1, mitochondrial
Ndufa6 [P]	NADH dehydrogenase
Rrbp1	ribosome binding protein 1
Atp6v1a1	ATPase, H+ transporting, V1 subunit A, isoform 1
Atp6ip1	ATPase, H+ transporting, lysosomal accessory protein 1
Atp6v1d	ATPase, H+ transporting, V1 subunit D
Atp1b3	ATPase, Na+/K+ transporting, bet
M6pr	mannose-6-phosphate receptor,
Ces3	carboxylesterase 3
Cyp1b1	cytochrome P450, 1b1, benz[a]ant
Protein Synthesis / Folding /Degradation	
Rpl13a [P]	ribosomal protein L13a
Rnu22 [P]	RNA, U22 small nucleolar
Dnajb9 [P]	DnaJ (Hsp40) homolog, subfamily B, member 9
Hal [P]•	histidine ammonia lyase
Dnajc8	DnaJ (Hsp40) homolog, subfamily c, member 8
Acp2	acid phosphatase 2,
Ubc	ubiquitin C
Ubl3	ubiquitin-like 3
Ubc	ubiquitin C
Sf3b1	splicing factor 3b, subunit 1, 15
Rbx1	ring-box 1
Cytoskeleton	
Krt1-18 [P]	keratin complex 1
Adip [P]	synovial sarcoma, X breakpoint 2-interacting protein
Dnchc1	dynein, cytoplasmic, heavy chain
Kif5b	kinesin family member 5B
Nude-pending	nuclear distribution gene
Cell function	
Gapd	glyceraldehyde-3-phosphate dehydrogenase
Xdh	xanthine dehydrogenase
Tkt	transketolase
Mtm1	X-linked myotubular myopathy
Adss1	adenylosuccinate synthetase 1
Nudt9	nudix (nucleoside diphosphate linked moiety-X) type motif
Ampd3	AMP deaminase 3
Xrn1	5'-3' exoribonuclease 1
Pk3	pyruvate kinase 3

Supplemental table 8. Genes that are specifically upregulated during CVB4-P infection

Gene name	Gene product	Relevant Function
Cell growth and development		
Nes	nestin	Embryogenesis. Marker of progenitor pancreas cell?
Ngfa•	nerve growth factor, alpha	Embryogenesis. Neurotrophin
Ngfg•	nerve growth factor, gamma	Embryogenesis. Neurotrophin
Sel1h	Sel1 (suppressor of lin-12) 1 homolog	Embryogenesis. Down-regulation of Notch system
Mgat1	mannoside acetylglucosaminyltransferase	Embryogenesis. Required during morphogenesis
Nupr1	nuclear protein 1	Growth promoting, expressed in regenerating pancreas
Vnn1	vanin 1	Tissue regeneration
Egf	epidermal growth factor	Mitogenic. Liver regeneration
Vil	villin	Actin binding. Associated with differentiation
[1]*Pla2g1b*	phospholipase A2, group IB, pancreas	Stimulates DNA synthesis
[1]*Arg2*	arginase type II	Provides L-ornithine
Aldh1a7	aldehyde dehydrogenase family 1	Critical for normal development
[1]*P2rx1*	purinergic receptor P2X, ligand-g	Membrane ion channel
Arhgdig•	Rho GDP dissociation inhibitor	Growth inhibitory. Inhibitor of Rho family of proteins
Birc4	baculoviral IAP repeat-containing 4	Caspase inhibitor. Inhibitor of apoptosis
Pawr	PRKC, apoptosis WT1 regulator	Tissue remodeling
Perp-pending	p53 apoptosis effector related to Pmp22	Growth inhibitor
[1]*Reg3a•*	regenerating islet-derived 3 alpha	Inhibits apoptosis
Ang	angiogenin	Angiogenesis
[1]*Hpn*	hepsin	Vascular function and angiogenesis, blood coagulation
Ramp1	receptor (calcitonin) activity modifying protein 1	Accessory protein for receptor that binds calcitonin gene-related peptide
[1]*P2rx1*	purinergic receptor P2X, ligand-g	ATP-gated membrane ion channel
[1]*Klk5•*	kallikrein 5	Kallikrein/kinin system. Kinins stimulate vascular growth
[1]*Serpina6*	serine (or cysteine) proteinase	Serpin
[1]*Serpina10*	serine (or cysteine) proteinase	Serpin
[1]*Ptger3•*	prostaglandin E receptor 3 (subtype EP3)	Signaling
Extracellular matrix		
Vtn•	vitronectin	Extracellular matrix
Gjb2	gap junction membrane channel protein beta 2	Gap junction
Ctse	cathepsin E	Aspartic proteinase. Upregulated by IFN-(Upregulates IL-2
Gene expression		
Foxa3	forkhead box A3	Transcription factor in pancreas
Ahcy	S-adenosylhomocysteine hydrolase	Central role in methylation reactions
Nr5a2	nuclear receptor subfamily 5, A2	Interacts with Dax-1. Transcriptional regulation
Fkbp11	FK506 binding protein 11	Transcription. Trafficking
Pole3	polymerase (DNA directed), epsilon 3	Interacts with nucleosomal structures
Polr2e	polymerase (RNA) II (DNA directed)	Transcription
Supt4h	suppressor of Ty4 homolog	Chromatin formation and activity
Dmd	dystrophin, muscular dystrophy	Signal transduction. Cytoskeleton
Nucb2	nucleobindin 2	Binds calcium; calcium homeostasis
Kcnj15	potassium inwardly-rectifying channel	Potassium channel
Wbp5	WW domain binding protein 5	Protein-protein interaction
Als2	amyotrophic lateral sclerosis 2	Cell signaling. Mutation linked to juvenile ALS
Gna14	guanine nucleotide binding protein	Signal transduction. Hematopoetic cell differentiation
Srcasm	Src activating and signaling molecule	Promotes Src kinase family signaling

Supplemental table 8 (ctd). Genes that are specifically upregulated during CVB4-P infection

Gene name	Gene product	Relevant Function
Immune Responses		
[1]*Pla2g1b*	phospholipase A2, group IB, pancreas	Role in regulating inflammation
[1]*Klk*5•	kallikrein 5	Released during inflammation
[1]*Klk6,9,13,16,26*	kallikreins	Released during inflammation
[1]*Reg3a*•	regenerating islet-derived 3 alpha	
Irf6	interferon regulatory factor 6	Transcription factor
C4bp	complement component 4 binding protein	Regulates C' cascade
[1]*Ptger3*•	prostaglandin E receptor 3 (subtype EP3)	Pro-inflammatory; mast cell activation
[1]*Arg2*	arginase type II	M2 / Th2
H2-Ea•	histocompatibility 2, class II antigen	
	E alpha	Antigen presentation to Th cells
Igh-VS107	immunglobulin heavy chain (S107 family)	B cells. Superantibody
Tissue injury and response		
[1]*Ptger*3•	prostaglandin E receptor 3 (subtype EP3)	Protects against injury
[1]*Gamt*	guanidinoacetate methyltransferase	Protects against tissue injury
[1]*Gatm*	glycine amidinotransferase	Protects against tissue injury
Gif	gastric intrinsic factor	Cobalt ion transport; absorption of food
LOC228816	similar to putative "-mannosidase	Carbohydrate metabolism
Lcat	lecithin cholesterol acyltransferase	Cholesterol metabolism
Cell function		
Phgdh	3-phosphoglycerate dehydrogenase	Oxidoreductase
Mrpl53	mitochondrial ribosomal protein	Mitochondria ribosome
Ak3l	adenylate kinase 3 alpha like	Mitochondial matrix protein
Bckdha	branched chain ketoacid dehydrogenase E1,	
	alpha polypeptide	Oxido-reductase activity
Rps4x	ribosomal protein S4, X-linked	Ribosome
Ggh	gamma-glutamyl hydrolase	Lysosome
Eif2b	eukaryotic translation initiation factor 2B	Protein synthesis
Wars	tryptophanyl-tRNA synthetase	Protein synthesis
Psmd3	proteasome	Protein degradation
Ubd	ubiquitin d	Protein degradation
Aqp8	aquaporin 8	Water, small solute transport
Slc22a1	solute carrier family 22	Ion transport
Slc41a1	solute carrier family 41	Ion transport
Pcbd	6-pyruvoyl-tetrahydropterin synthase	Catabolism
Functional pancreas		
Rib1	ribonuclease 1, pancreatic	Pancreatic enzyme
Pnliprp2 •	pancreatic lipase-related protein 2	Pancreatic enzyme
Pnliprp1	pancreatic lipase related protein 1	Pancreatic enzyme
Trygn16	tyrpsinogen 16	Pancreatic enzyme
Ctrl	chymotrypsin-like	Pancreatic enzyme
Cpn1	carboxypeptidase N, polypeptide 1	Pancreatic enzyme
Lypla1	lysophospholipase 1	Pancreatic enzyme
[1]*Pla2g1b*	phospholipase A2, group IB, pancreas	Pancreatic enzyme
Rab3d	RAB3D, member RAS oncogene family	Localized to secretory granules, role in exocytosis
Cckar•	cholecystokinin A receptor	Secretion
Crpd	crp-ductin	Mucin-like glycoprotein, expressed in pancreatic ducts
[1]*P2rx1*	purinergic receptor P2X, ligand-g	ATP-gated membrane ion channel

Supplemental table 9. Genes that are specifically upregulated during CVB4-V infection

Gene name	Gene product	Relevant Function
Cell Growth and Development		
H19	H19 fetal liver mRNA	Embryogenesis. Essential role in development
Bag3	Bcl2-associated athanogene 3	Synergy with Bcl-2 to prevent apoptosis
Extracellular Matrix		
Tnxb	tenascin XB	ECM protein. Regulate collagen synthesis / deposition
Mmp12 •	matrix metalloproteinase 12	ECM breakdown/ remodeling
Itga5	integrin alpha 5	Cell spreading/adhesion, fibrosis formation
Gene Expression		
Sox18	SRY-box containing gene 18	Transactivator of gene expression
Nfib	nuclear factor I/B	Transcription factor. Cell growth and development
Nfix	nuclear factor I/X	Transcription factor. Cell growth and development
Atf3	activating transcription factor 3	Transcription factor. Transcriptional repressor
Temt	thioether S-methyltransferase	Methylation
Fliih	flightless I homolog	Gelsolin family; actin organization
Kcnn4	potassium intermediate/small conductance Ca2+-activated K+ channel	Ca2+-activated K+ channel
Ptpn8	protein tyrosine phosphatase, non-receptor type 8	Signal transduction through the src homology region
Emk	ELKL motif kinase	Serine/threonine kinases
Immune Responses		
Cish3 (SOCS3)	cytokine inducible SH2-containing	Suppresses JAK/STAT. Increases protein degradation
Marco	macrophage receptor with collagen	
Tap2	transporter 2	Antigen processing
Tissue injury and response		
Vwf	Von Willebrand factor homolog	Proteinase that participates in blood coagulation
Aqp1	aquaporin 1	Edema. Role in CO2 exchange
Prdx2	peroxiredoxin 2	Protects from oxidative damage
Dpm2	dolichol-phosphate (beta-D)	Carbohydrate metabolism
Facl2	fatty acid Coenzyme A ligase	Fatty acid metabolism
Cell function		
Mtap4	microtubule-associated protein 4	Microtubules
Dpep1	dipeptidase 1 (renal)	Hydrolyses dipeptides
Adh1	alcohol dehydrogenase 1	Alcohol/aldehyde interconversions, expressed in liver