

Supplementary Table 3. Classification of overexpressed invasion-related genes.

Invasion - related genes classified by manual curation from GeneCards and UniProt

Gene	mRNA logFC	mRNA adj.p.value	Description	Classification	Comments
PIGR	4.55	1.1E-05	Polymeric Immunoglobulin Receptor	Cell surface receptor	Member of the immunoglobulin superfamily
CXCL5	3.77	0.0E+00	C-X-C Motif Chemokine Ligand 5	Cytokine	Chemokine; neutrophil recruitment and activation; thought to play a role in cancer cell proliferation, migration, and invasion
BIRC7	3.68	2.1E-03	Baculoviral IAP Repeat Containing 7	Apoptosis	Inhibitor of apoptosis
LCN2	3.47	5.9E-04	Lipocalin 2	Transporter	
IL11	3.29	2.1E-13	Interleukin 11	Cytokine	
FOSB	2.50	0.0E+00	FBJ Murine Osteosarcoma Viral Oncogene Homolog B	Transcription	Transcription factor
KLF4	2.45	9.6E-107	Kruppel-Like Factor 4 (Gut)	Transcription	Transcription factor
JUNB	2.23	2.9E-272	Jun B Proto-Oncogene	Transcription	Transcription factor
PDGFB	2.17	3.5E-72	Platelet Derived Growth Factor Subunit B	Growth factor	
SOCS2	2.07	9.6E-86	Suppressor Of Cytokine Signaling 2	Signal transduction	Cytokine-inducible negative regulators of cytokine receptor signaling
ICAM1	1.91	2.1E-304	Intercellular Adhesion Molecule 1	Cell-cell adhesion	Leukocyte transendothelial migration, integrin ligand
RELB	1.90	4.4E-158	RELB Proto-Oncogene, NF-KB Subunit	Transcription	
FOSL2	1.81	6.3E-225	FOS Like Antigen 2	Transcription	
RBM24	1.62	1.9E-18	RNA Binding Motif Protein 24	mRNA regulation	mRNA stability; myogenic differentiation

MAP3K14	1.43	9.8E-30	Mitogen-Activated Protein Kinase Kinase Kinase 14	Signal transduction	Cytokine signaling
EGR1	1.37	1.2E-147	Early Growth Response 1	Transcription	Transcription regulation
TLR2	1.34	4.0E-02	Toll Like Receptor 2	Cell surface receptor	Plays a fundamental role in pathogen recognition and activation of innate immunity
GLI1	1.27	1.4E-07	GLI Family Zinc Finger 1	Transcription	Transcription factor
ITGB6	1.22	5.1E-04	Integrin Subunit Beta 6	Cell adhesion	
BDNF	1.10	2.6E-02	Brain-Derived Neurotrophic Factor	Growth factor	Member of the nerve growth factor family of proteins; neuronal
CYR61	1.09	4.0E-158	Cysteine Rich Angiogenic Inducer 61	Growth factor	Promotes cell proliferation, chemotaxis, angiogenesis and cell adhesion; role in wound healing; ligand for integrins
HBEGF	1.04	2.5E-24	Heparin Binding EGF Like Growth Factor	Growth factor	Promotes smooth muscle and fibroblast proliferation
ETS2	1.03	5.0E-114	ETS Proto-Oncogene 2, Transcription Factor	Transcription	Transcription factor; development and apoptosis genes transcription
S100P	0.97	6.9E-33	S100 Calcium Binding Protein P	Cell cycle	Calcium binding protein
VIM	0.92	2.0E-150	Vimentin	Cytoskeleton scaffold protein	Intermediate filament
SLC9A1	0.91	1.2E-54	Solute Carrier Family 9 Member A1	Transporter	also known as NHE1; pH regulation
THBS1	0.89	1.1E-285	Thrombospondin 1	Cell adhesion	Can bind to fibrinogen, fibronectin, laminin, type V collagen and integrins alpha-V/beta-1
STC2	0.88	1.5E-89	Stanniocalcin 2	Metabolism	Secreted protein; calcium and phosphate homeostasis
MUC1	0.88	1.3E-02	Mucin 1, Cell Surface Associated	Signal transduction	Mucin; adhesion
JAK2	0.83	1.5E-08	Janus Kinase 2	Signal transduction	NRTK; cytokine receptor signaling
AHR	0.83	2.2E-57	Aryl Hydrocarbon Receptor	Transcription	Ligand-activated transcriptional activator;

TNFRSF12A	0.83	4.6E-46	Tumor Necrosis Factor Receptor Superfamily Member 12A	Cell surface receptor	Apoptosis; angiogenesis and proliferation of endothelial cells; cell adhesion
ITGB8	0.80	1.3E-04	Integrin Subunit Beta 8	Cell adhesion	
MFI2	0.79	3.4E-11	Melanotransferrin	Metabolism	Involved in iron cellular uptake
COL1A1	0.79	1.3E-02	Collagen Type I Alpha 1	Extracellular matrix protein	Type I collagen is found in most connective tissues and is abundant in bone, cornea, dermis and tendon
JUN	0.78	1.3E-55	Jun Proto-Oncogene	Transcription	Transcription factor
CDKN2B	0.78	2.3E-63	Cyclin-Dependent Kinase Inhibitor 2B	Cell cycle	CDK inhibitor
RND3	0.77	1.0E-49	Rho Family GTPase 3	Cytoskeletal signaling	Small G protein
SERPINE1	0.73	2.1E-128	Serpin Family E Member 1	Protease inhibitor	Inhibitor of fibrinolysis; inhibitor of tissue plasminogen activator (tPA) and urokinase (uPA)
CDKN1A	0.73	1.6E-04	Cyclin-Dependent Kinase Inhibitor 1A	Cell cycle	CDK2, 4 inhibitor; cell cycle inhibitor
BCAR1	0.72	1.9E-35	BCAR1, Cas Family Scaffolding Protein	Cytoskeletal signaling	p130Cas; adaptor protein; Src substrate, cytoskeleton
RHOB	0.71	2.2E-64	Ras Homolog Family Member B	Cytoskeletal signaling	Small G protein
WEE1	0.69	1.1E-53	WEE1 G2 Checkpoint Kinase	Cell cycle	Nuclear serine/threonine kinase
KLF5	0.66	5.9E-22	Kruppel-Like Factor 5 (Intestinal)	Transcription	Transcriptional activator
STAT5A	0.63	6.1E-09	Signal Transducer And Activator Of Transcription 5A	Transcription	Transcriptional activator; growth factor and cytokine signaling
DUSP4	0.63	1.7E-22	Dual Specificity Phosphatase 4	Signal transduction	Phosphatase; works in MAPK pathway
NES	0.60	2.6E-51	Nestin	Cytoskeleton scaffold protein	Neuronal intermediate filament family
CAV1	0.59	2.0E-14	Caveolin 1	Vesicular transport	Receptor-independent endocytosis

VEGFA	0.58	2.0E-50	Vascular Endothelial Growth Factor A	Growth factor	Angiogenesis
ZFP36	0.58	4.7E-20	ZFP36 Ring Finger Protein	mRNA regulation	Binds ARE-containing mRNAs and promotes their degradation
SRF	0.58	3.1E-30	Serum Response Factor	Transcription	Transcription factor; proliferation and differentiation
MYC	0.51	4.1E-24	V-Myc Avian Myelocytomatosis Viral Oncogene Homolog	Transcription	Transcription factor
RASSF1	0.50	6.5E-16	Ras Association Domain Family Member 1	Apoptosis	Tumor suppressor
SIRT1	0.50	3.0E-17	Sirtuin 1	Epigenetic regulation	NAD-dependent protein deacetylase that links transcriptional regulation directly to intracellular energetics
NFATC2	0.50	8.6E-30	Nuclear Factor Of Activated T-Cells 2	Transcription	Transcription activator; promotes invasive migration through activation of GPC6 expression and WNT5A signaling pathway
NUAK1	0.49	1.1E-28	NUAK Family Kinase 1	Cytoskeletal signaling	
TES	0.47	7.0E-28	Testin LIM Domain Protein	Cytoskeletal signaling	Scaffold protein
PAK7	0.45	2.3E-03	P21 Protein (Cdc42/Rac)-Activated Kinase 7	Cytoskeletal signaling	Serine/threonine kinase
ENAH	0.42	6.7E-29	Enabled Homolog (Drosophila)	Cytoskeletal signaling	Ena/VASP proteins
AKAP13	0.41	1.1E-19	A-Kinase Anchoring Protein 13	Signal transduction	Adaptor protein
LPAR2	0.41	2.7E-02	Lysophosphatidic Acid Receptor 2	Signal transduction	
SMAD3	0.41	1.6E-21	SMAD Family Member 3	Transcription	Transcription factor; activated by TGFb signaling pathway
SHH	0.39	3.2E-08	Sonic Hedgehog	Embryonic development	Embryo patterning
CREB1	0.38	7.3E-06	CAMP Responsive Element Binding Protein 1	Transcription	Activated by hormonal stimulation of cAMP pathway
PTP4A3	0.37	4.5E-09	Protein Tyrosine Phosphatase Type IVA, Member 3	Signal transduction/cell	Cell proliferation; metastasis

				cycle	
ANXA4	0.35	3.0E-18	Annexin A4	Vesicular transport	
JAK1	0.35	5.7E-17	Janus Kinase 1	Signal transduction	NRTK; cytokine receptor signaling
CTNND1	0.35	1.0E-37	Catenin Delta 1	Cell-cell adhesion/signal transduction	Wnt signaling pathway
GPR160	0.35	1.2E-02	G Protein-Coupled Receptor 160	Cell surface receptor	
LATS1	0.34	1.3E-06	Large Tumor Suppressor Kinase 1	Cell cycle	Serine/threonine kinase
SOX9	0.34	1.3E-13	SRY-Box 9	Transcription	Transcription factor; chondrocyte differentiation; skeletal development
FMNL2	0.32	6.9E-08	Formin Like 2	Actin remodeling	Formin-like protein
BMP1	0.32	6.0E-07	Bone Morphogenetic Protein 1	Growth factor	Involved in cartilage and bone formation; cleaves pro-collagen; peptidase
CMTM3	0.32	7.2E-11	CKLF Like MARVEL Transmembrane Domain Containing 3	Chemokine	Chemokine-like factor; B-cell signaling
SPAG9	0.32	1.6E-12	Sperm Associated Antigen 9	Signal transduction	Scaffold protein
CIC	0.30	2.3E-07	Capicua Transcriptional Repressor	Transcription	Transcriptional repressor which may play a role in development of the central nervous system
RHOC	0.30	2.7E-05	Ras Homolog Family Member C	Cytoskeletal signaling	Small G protein; overexpressed in cancer
MCAM	0.30	3.0E-04	Melanoma Cell Adhesion Molecule	Cell adhesion	
MMP14	0.28	1.0E-08	Matrix Metalloproteinase 14	Matrix metalloproteinase	Membranal MMP; activates MMP2; endopeptidase
MAMLD1	0.28	2.9E-04	Mastermind Like Domain Containing 1	Transcription	Transcriptional co-activator
PTPN11	0.27	2.5E-08	Protein Tyrosine Phosphatase, Non-Receptor Type 11	Signal transduction	Shp2; tyrosine phosphatase

CLDN6	0.27	1.6E-05	Claudin 6	Cytoskeleton scaffold protein	The protein is an integral membrane protein and is one of the entry cofactors for hepatitis C virus
MAPK7	0.26	5.1E-04	Mitogen-Activated Protein Kinase 7	Signal transduction	Proliferation, differentiation and cell survival
INSR	0.25	1.3E-08	Insulin Receptor	Metabolism	RTK
JUND	0.25	1.4E-04	Jun D Proto-Oncogene	Transcription	Component of transcription factor complex (AP1)
MAP3K2	0.24	3.8E-04	Mitogen-Activated Protein Kinase Kinase Kinase 2	Signal transduction	Serine/threonine kinase
FERMT2	0.24	2.6E-04	Fermitin Family Member 2	Cytoskeletal signaling	Scaffold protein
FOXO1	0.22	6.5E-05	Forkhead Box O1	Transcription	Transcription factor; triggers apoptosis genes
PXN	0.22	3.0E-05	Paxillin	Cytoskeletal signaling	Cell migration; focal adhesions
SETD2	0.21	7.6E-07	SET Domain Containing 2	Epigenetic regulation	Histone methyltransferase
ZDHHC7	0.21	1.1E-05	Zinc Finger DHHC-Type Containing 7	Metabolism	
ARF6	0.21	1.0E-05	ADP Ribosylation Factor 6	Vesicular transport	Small G protein
FUT8	0.20	2.0E-03	Fucosyltransferase 8	Metabolism	
IL6R	0.20	2.7E-04	Interleukin 6 Receptor	Cell surface receptor	Immune cell signaling; cytokine signaling
ROCK1	0.20	1.5E-03	Rho Associated Coiled-Coil Containing Protein Kinase 1	Cytoskeletal signaling	Serine/threonine kinase of Rho
BCL2L1	0.18	1.0E-04	BCL2 Like 1	Apoptosis	Inhibitor of apoptosis
CD9	0.17	4.0E-02	CD9 Molecule	Cell adhesion	
TJP1	0.16	4.3E-03	Tight Junction Protein 1	Cell-cell adhesion	Plays a role in the regulation of cell migration by targeting CDC42BPB to the leading edge of migrating cells

LGALS3	0.16	2.5E-02	Lectin, Galactoside Binding Soluble 3	Cell adhesion	Lectin; may mediate with the alpha-3, beta-1 integrin the stimulation by CSPG4 of endothelial cells migration
RAP1GAP	0.15	1.6E-02	RAP1 GTPase Activating Protein	Signal transduction	GAP of Rap1
ABL1	0.15	3.8E-03	ABL Proto-Oncogene 1, Non-Receptor Tyrosine Kinase	Cytoskeletal signaling	NRTK
NOTCH1	0.14	4.3E-02	Notch 1	Signal transduction	Differentiation, proliferation and apoptotic signaling
PTGER4	0.14	4.0E-02	Prostaglandin E Receptor 4	Metabolism	GPCR
SRC	0.14	3.1E-02	SRC Proto-Oncogene, Non-Receptor Tyrosine Kinase	Signal transduction	NRTK
NDRG1	0.13	3.6E-02	N-Myc Downstream Regulated 1	Signal transduction	Involved in stress responses, hormone responses, cell growth, and differentiation
HIF1A	0.13	1.3E-03	Hypoxia Inducible Factor 1 Alpha Subunit	Transcription	Transcription regulation; adaptation to hypoxia; angiogenesis related
BRAF	0.13	3.6E-02	B-Raf Proto-Oncogene, Serine/Threonine Kinase	Signal transduction	Serine/threonine kinase, MAPK pathway; proliferation and differentiation
BAMBI	0.13	2.3E-02	BMP And Activin Membrane-Bound Inhibitor	Signal transduction	Negatively regulates TGF-beta signaling
TP53	0.13	5.7E-03	Tumor Protein P53	Cell cycle	Tumor suppressor; induces growth arrest or apoptosis depending on the physiological circumstances and cell type
CRK	0.12	1.3E-02	V-Crk Avian Sarcoma Virus CT10 Oncogene Homolog	cytoskeletal signaling	Adaptor protein
CDKN1B	0.12	1.2E-02	Cyclin-Dependent Kinase Inhibitor 1B	Cell cycle	Cyclin-dependent kinase inhibitor
ADAM17	0.12	3.1E-02	ADAM Metalloproteinase Domain 17	Matrix metalloproteinase	
KEAP1	0.10	4.6E-02	Kelch Like ECH Associated Protein 1	Protein ubiquitination	E3 ligase
SNX9	0.09	4.9E-02	Sorting Nexin 9	Vesicular transport/actin remodeling	Works with dynamin 1 among others

SOX4	0.08	3.3E-03	SRY-Box 4	Transcription	Transcriptional activator; regulation of embryonic development and in the determination of the cell fate
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