

Cancer Biomarker Analysis

Different types of biomarker assays are listed below in table:

SAMPLE TYPE	ASSAY CATEGORY	ASSAY
Biological Fluids, cell or tissue lysates	Protein expression	<u>ELISA</u>
		<u>Multiplex immunoassays</u>
Tissues	Gene expression	<u>PCR/RT-PCR</u>
		<u>Multiplex Nucleic Acid Testing</u>
	Localisation	<u>Immunohistochemistry (IHC)</u>
		<u>Immunocytochemistry (ICC)</u>

LIST OF PROTEIN BIOMARKERS FOR CANCER:

Analytes available in the cancer panel

Human	Mouse
AFP A-Fetoprotein	AREG Amphiregulin
ALDH1A1 Aldehyde Hydrogenase fam 1A1	ANG-2 Angiopoietin-2
ANG-2 Angiopoietin-2	BTC Betacellulin
AT Antithrombin III	EGF Epidermal Growth Factor
BMP-9 Bone Morphogenic Protein 4	ENG Endoglin
CA125 Carbohydrate Antigen 125	EDN1 Endothelin-1
CA15-3 Carbohydrate Antigen 15-3	FGF-2 Fibroblast Growth Factor
CA19-9 Carbohydrate Antigen 19-9	FST Follistatin
CA9 Carbonic Anhydrase IX	G-CSF Granulocyte Colony-Stimulating Factor
CAT Catalase	HGF Hepatocyte Growth Factor
CTSD Cathepsin D	IL-17A Interleukin 17A
CD44 Cluster of Differentiation 44	IL-1 β Interleukin 1 β
CEA Carcinoembryonic Antigen	IL-6 Interleukin 6
Complement Factor H	KC/CXCL1 Chemokine (C-X-C motif) Ligand 1
CYFRA21-1 Cytokeratin-19 fragment	LEP Leptin
DKK-1 Dickkopf related protein 1	MCP-1 Monocyte Chemoattractant Protein-1
EGF Epidermal Growth Factor	MIP-1 α Macrophage inflammatory protein 1 alpha
ENG Endoglin	PLGF-2 Placental Growth Factor
EDN1 Endothelin-1	PRL Prolactin
EPCAM Epithelial Cell Adhesion Molecule	sALK-1 soluble Activin receptor-Like Kinase 1
ECM1 Extracellular Matrix Protein 1	sCD31/PECAM-1 Platelet Endothelial Cell Adhesion Molecule
FTL Ferritin	SDF-1 stromal cell derived factor 1
FGF-1 Fibroblast Growth Factor 1	sFasL soluble Fas Ligand
FGF-2 Fibroblast Growth Factor 2	TNF- α Tumour Necrosis Factor
FAP Fibroblast Activation Protein	VEGF-A Vascular Endothelial Growth Factors A
FST Follistatin	VEGF-C Vascular Endothelial Growth Factors C
G-CSF Granulocyte Colony-Stimulating Factor	VEGF-D Vascular Endothelial Growth Factors D
LGALS3 Galectin-3	
GDF-15 Growth Differentiation Factor 15	
HB-EGF Heparin-Binding EGF-like Growth Factor	

HE4 Human Epididymis protein 4	
HPN Hepsin	
HGF Hepatocyte Growth Factor	
IGFBP-3 Insulin-like Growth Factor-Binding Protein 3	
IL-6 Interleukin 6	
IL-8 Interleukin 8	
KLK6 Kallikrein-6	
L1CAM L1 Cell Adhesion Molecule	
LEP Leptin	
MIA Melanoma Inhibitory Activation Protein	
MSLN Mesothelin	
MK Midkine	
MIF Migration Inhibitory Factor	
MPO Myeloperoxidase	
NSE Neuron Specific Enolase	
OPG Osteoprotegerin	
OPN - Osteopontin	
SPARC Osteonectin	
POSTN Periostin	
PLGF Placental Growth Factor	
PRL Prolactin	
PSA free Prostate Specific Antigen	
PSA Total	
SCF Stem Cell Factor	
SHBG Sex Hormone Binding Globulin	
sFas soluble Fas	
sFasL soluble Fas Ligand	
TGF- α Tumour Growth Factor	
TNF- α Tumour Necrosis Factor	
TRAIL TNF-Related Apoptosis-Inducing Ligand	
TGM2 Transglutaminase 2	
TRAP5 Tartrate-Resistant Acid Phosphatase	
TWEAK TNF-like weak inducer of apoptosis	
VEGF-A Vascular Endothelial Growth Factor A	
VEGF-C Vascular Endothelial Growth Factor C	
VEGF-D Vascular Endothelial Growth Factor D	
DBP Vitamin D Binding Protein	
VTN Vitronectin	
YKL40 Chitinase-3-like protein 1	
β -HCG Human Chorionic Gonadotropin	

Panels for specific cancer characteristics

Apoptosis and Cancer	Angiogenesis	Circulating Tumour Markers	Metastasis
c-Kit	Angiopoietin-2	AFP	DKK1
c-Met/HGFR (panTyr)	BMP9	Antithrombin III	GDF15
EGFR (pan Tyr)	EGF	CA-125	HGF
ErbB2/HER2	Endoglin	CEA	MMP-2
ErbB3/HER3 (panTyr)	Endothelin-1	Ferritin	MMP-9
ErbB4/HER4 (panTyr)	Follistatin	Galectin 3	NSE
FGFR1	HGF	IGFBP3	OPG
FLT3 (pan Tyr)	sHER2	Leptin	Osteonectin
IGF-1R (pan Tyr)	sNeuropilin-1	MIF	Periostin
IR (panTyr)	Thrombospondin-2	Myeloperoxidase (MPO)	TRAP
M-CSFR (pan Tyr)	VEGF-C	Osteopontin	TWEAK
PDGFR- α (pan Tyr)	VEGF-D	PSA	YKL40
PDGFR β (pan Tyr)		TRAIL	
STAT1 (Tyr701)		VEGF-A-A	
STAT2 (Tyr690)		Vitamin D binding protein	
STAT3 (Tyr705)			
STAT5A/B (Tyr694/699)			
STAT6 (Tyr641)			
TIE1 (pan Tyr)			
Tie2 (pan Tyr)			
VEGFR1 (pan Tyr)			
VEGFR2 (pan Tyr)			
VEGFR3 (pan Tyr)			

Biomarker	Target	Material Required	Species
AFP – alpha fetoprotein	Circulating Tumour Markers	Tissue/Cell Lysate, Culture Supernatant, Serum or Plasma	H
ALDH1A1 - aldehyde hydrogenase fam 1A1	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
Amphiregulin	Angiogenesis	Serum, Plasma, And Cellular Tissue Culture Samples	M
Angiopoietin-2	Angiogenesis	Tissue/Cell Lysate, Culture Supernatant	H, M
Antithrombin III	Circulating Tumour Markers	Plasma	H
Betacellulin	Angiogenesis	Tissue/Cell Lysate, Culture Supernatant	M
BMP-9 bone morphogenetic protein 9	Angiogenesis	Serum, Plasma, And Cellular Tissue Culture Samples	H
CA125	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
CA15-3	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
CA19-9	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
Carbonic Anhydrase IX (CA9)	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
Catalase	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Samples	H
Cathepsin D	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Samples	H
CD44	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
CEA	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Samples	H
c-Kit	Apoptosis	Tissue and Cell Lysate Samples	H
c-Met/HGFR (panTyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Complement Factor H	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Samples	H
CYFRA21-1	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Samples	H
DKK-1	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H, M, R
EGF epidermal growth factor	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
EGFR (pan Tyr) epidermal growth factor receptor	Apoptosis	Tissue and Cell Lysate Samples	H
Endoglin	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
Endothelin-1	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
EpCam epithelial cell adhesion molecule	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
ErbB2/HER2	Apoptosis	Tissue and Cell Lysate Samples	H

Human epidermal receptor growth factor 2			
ErbB3/HER3 (panTyr) Human epidermal receptor growth factor 3	Apoptosis	Tissue and Cell Lysate Samples	H
ErbB4/HER4 (panTyr) Human epidermal receptor growth factor 4	Apoptosis	Tissue and Cell Lysate Samples	H
Extracellular Matrix Protein 1	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
Ferritin	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
FGF-1 Fibroblast growth factor 1	Angiogenesis, Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
FGF-2 Fibroblast growth factor	Angiogenesis, Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
FGFR1 Fibroblast growth factor receptor	Apoptosis	Tissue and Cell Lysate Samples	H
Fibroblast Activation Protein	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
FLT3 (pan Tyr) fms-like tyrosine kinase 3	Apoptosis	Tissue and Cell Lysate Samples	H
Follistatin	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
Galectin-3	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
G-CSF Granulocyte-colony stimulating factor	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
GDF-15 Growth/differentiation factor 15	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
HB-EGF Heparin-binding EGF-like growth factor	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
HE4 epididymis secretory protein 4	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
Hepsin	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples.	H
HGF hepatocyte growth factor	Angiogenesis, Metastasis	Tissue/Cell Lysate and Culture Supernatant Samples and Serum or Plasma Samples	H, M
IGF-1R (pan Tyr) inulin growth factor receptor	Apoptosis	Tissue and Cell Lysate Samples	H
IGFBP-3 Insulin-like growth factor-binding protein 3	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H, M
IL-17A	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
IL-1 β	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M

IL-6	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
IL-8	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
IR (panTyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Kallikrein-6	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
KC/CXCL1	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
L1CAM	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
Leptin	Circulating Tumour Markers	Serum, Plasma or Culture Supernatant Samples	H, M, R
MCP-1	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
M-CSFR (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Melanoma Inhibitory Activation Protein	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
Mesothelin	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
Midkine	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
MIF	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
MIP-1 α	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
MMP-2	Metastasis	Serum, Plasma, Tissue/Cell Lysate and Culture Supernatant Samples	H
MMP-9	Metastasis	Serum, Plasma, Tissue/Cell Lysate and Culture Supernatant Samples	H
Myeloperoxidase (MPO)	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
NSE	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
OPG	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
OPN - Osteopontin	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R
Osteonectin (SPARC)	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
PDGFR- α (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
PDGFR- β (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Periostin	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
PLGF	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
PLGF-2	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	M
Prolactin	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M, R

PSA free (cannot be plexed with PSA total)	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
PSA Total (cannot be plexed with PSA free)	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
sALK-1	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	M
sCD31/PECAM-1	Angiogenesis	Tissue/Cell Lysate and Culture Supernatant	M
SCF	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
SDF-1	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	M
Sex Hormone Binding Globulin	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
sFas	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
sFasL	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
sHER2	Angiogenesis		
sNeuropilin-1	Angiogenesis		
STAT1 (Tyr701)	Apoptosis	Cell Lysate	H
STAT2 (Tyr690)	Apoptosis	Cell Lysate	H
STAT3 (Tyr705)	Apoptosis	Cell Lysate	H
STAT5A/B (Tyr694/699)	Apoptosis	Cell Lysate	H
STAT6 (Tyr641)	Apoptosis	Cell Lysate	H
TGF- α	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
Thrombospondin-2	Angiogenesis		
TIE1 (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Tie2 (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
TNF- α	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
TRAIL	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H
Transglutaminase 2 (TGM2)	Circulating Tumour Markers	Serum, Plasma, And Cellular Tissue Culture Samples	H
TRAP5	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
TWEAK	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
VEGF	Angiogenesis, Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, R
VEGF-A	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
VEGF-C	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
VEGF-D	Angiogenesis	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H, M
VEGFR1 (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
VEGFR2 (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H

VEGFR3 (pan Tyr)	Apoptosis	Tissue and Cell Lysate Samples	H
Vitamin D Binding Protein	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture	H
Vitronectin	Cell adhesion	Serum, Plasma or Tissue/Cell Lysate and Culture	H
YKL40	Metastasis	Serum and Plasma or Tissue/Cell Culture Supernatant	H
β-HCG	Circulating Tumour Markers	Serum, Plasma or Tissue/Cell Lysate and Culture Supernatant	H

LIST OF GENE BIOMARKERS FOR CANCER:

SYMBOL	GENE NAME	SPECIES
ACSL3	Acyl-CoA synthetase Long-chain family member 3	H
ALK	Anaplastic Lymphoma Receptor Tyrosine Kinase	H
AMACR	Alpha-Methylacyl-CoA Racemase	H
AQP3	Aquaporin 3	H
AR	Androgen receptor	H, M, R
ARPC2	Actin Related Protein 2/3 Complex Subunit 2	H
BAD	BCL2-associated agonist of cell death	H
BAG1	BCL2-associated athanogene	H
BCL2	B-cell CLL/lymphoma 2	H, M
BCL2A1	BCL2 Related Protein A1	H
BCL2L2	BCL2-like 2	H
BCL6	B-Cell CLL/Lymphoma 6	H
BIRC5	Baculoviral IAP Repeat Containing 5	H, M
BRAF	B-Raf Proto-Oncogene, Serine/Threonine Kinase	H
BTG2	BTG Anti-Proliferation Factor 2	H
BUB1	BUB1 Mitotic Checkpoint Serine/Threonine Kinase	H
C10orf137	Chromosome 10 Open Reading Frame 137	H
C3	Complement Component 3	H, M
CACNA1D	Calcium Voltage-Gated Channel Subunit Alpha1 D	H
CASP8	Caspase 8	H
CCNA1	Cyclin A1	H
CCNA2	Cyclin A2	H
CCND1	Cyclin D1	H, M
CCNE1	Cyclin E1	H
CCR2	C-C Motif Chemokine Receptor 2	H, M
CCR7	C-C Motif Chemokine Receptor 7	H
CD44	CD44 molecule (Indian blood group)	H, M
CDH1	Cadherin 1, Type 1, E-Cadherin (Epithelial)	H, M,
CDH2	Cadherin 2	H
CDKN1A	Cyclin-Dependent Kinase Inhibitor 1A (P21, Cip1)	H, R
CDKN1B	Cyclin Dependent Kinase Inhibitor 1B	H, M, R
CDKN2A	Cyclin-Dependent Kinase Inhibitor 2A (Melanoma, P16, Inhibits CDK4)	H
CDKN2B	Cyclin Dependent Kinase Inhibitor 2B	H
CLDN7	Claudin 7	H
CLEC3B	C-Type Lectin Domain Family 3 Member B	H
CLU	Clusterin	H, M, R

COL6A1	Collagen, Type VI, Alpha 1	H
CRISP3	Cysteine Rich Secretory Protein 3	H
CTNNB1	Catenin (Cadherin-Associated Protein), Beta 1, 88kda	H, M
CTSB	Cathepsin B	H, M, R
CTSD	Cathepsin D	H
CXCL12	C-X-C Motif Chemokine Ligand 12	H
CYP19A1	Cytochrome P450, Family 19, Subfamily A, Polypeptide 1	H, M
DCT	Dopachrome Tautomerase	H
DLC1	Deleted in Liver Cancer 1	H
DSC1	Desmocollin 1	H
E2F1	E2F Transcription Factor 1	H
EGFR	Epidermal Growth Factor Receptor	H, M, R
ERBB2	V-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived oncogene homolog (avian)	H
ERBB3	Erb-B2 Receptor Tyrosine Kinase 3	H
ERG	ERG, ETS Transcription Factor	H
ESR1	Estrogen Receptor 1	H, D
ESR2	Estrogen Receptor 2 (ER beta)	H, Z
EZH2	Enhancer of Zeste 2 Polycomb Repressive Complex 2 Subunit	H, M
F10	Coagulation Factor X	H,
FAS	Fas (TNF receptor superfamily, member 6)	H, M, R
FASLG	Fas ligand (TNF superfamily, member 6)	H, M
FGF1	Fibroblast Growth Factor 1 (Acidic)	H, M
FLRT1	Fibronectin Leucine Rich Transmembrane Protein 1	H
FN1	Fibronectin 1	H, M, R, C
FOSL1	FOS-like antigen 1	H
GABRP	Gamma-Aminobutyric Acid (GABA) A receptor, pi	H
GATA3	GATA binding protein 3	H, M
GCNT1	Glucosaminyl (N-Acetyl) Transferase 1	H
GJB1	Gap Junction Protein Beta 1	H
GLI1	GLI Family Zinc Finger 1	M
GNAS	GNAS complex locus	H
GPC3	Glypican 3	H
GSN	Gelsolin	H
GSTP1	Glutathione S-Transferase Pi 1	H
GUSB	Glucuronidase, Beta	H, M, R
HIF1A	Hypoxia Inducible Factor 1 Alpha Subunit	H, M
HMGB1	High-Mobility Group Box 1	H
HPRT1	Hypoxanthine Phosphoribosyltransferase 1	H, M
HSPB1	Heat Shock 27kDa Protein 1	H
ID2	Inhibitor of DNA Binding 2, Dominant Negative Helix-Loop-Helix Protein	H
IGFBP2	Insulin-Like Growth Factor Binding Protein 2, 36kDa	H
IL2RA	Interleukin 2 Receptor, Alpha	H
IL6	Interleukin 6 (Interferon, Beta 2)	H, M, R
IL6R	Interleukin 6 Receptor	H
ITGA6	Integrin, Alpha 6	H
ITGB1	Integrin Beta 1	M
ITGB3	Integrin Beta 3	H, M
ITGB4	Integrin, Beta 4	H
JUN	Jun proto-oncogene	H, M

KIF20A	Kinesin Family Member 20A	H
KIT	V-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog	H
KLF5	Kruppel-like factor 5 (intestinal)	H
KLK3	Kallikrein-related peptidase 3	H
KLK5	Kallikrein-related peptidase 5	H
KRT18	Keratin 18	H
MAGEA1	MAGE Family Member A1	H
MAP2K7	Mitogen-Activated Protein Kinase Kinase 7	H, M
MCAM	Melanoma Cell Adhesion Molecule	H
MCM10	Minichromosome Maintenance 10 Replication Initiation Factor	H
MCM4	Minichromosome Maintenance 10 Replication Initiation Factor 4	H
MCM6	Minichromosome Maintenance 10 Replication Initiation Factor 6	H
MET	MET Proto-Oncogene, Receptor Tyrosine Kinase	H, M
MITF	Melanogenesis Associated Transcription Factor	H, M
MKI67	antigen identified by monoclonal antibody Ki-67	H
MLANA	Melan-A	H, M
MMP10	Matrix Metalloproteinase 10	H
MMP2	Matrix Metalloproteinase 2	H
MMP9	Matrix Metalloproteinase 9	H, M
MT3	Metallothionein 3	H
MUC1	Mucin 1, cell surface associated	H
MYLK	Myosin Light Chain Kinase	R
MYRIP	Myosin VIIA And Rab Interacting Protein	H
NCOA3	Nuclear Receptor Coactivator 3	H
NFYB	Nuclear transcription factor Y, beta	H
NGFR	Nerve Growth Factor Receptor	H
NME1	Non-metastatic cells 1, protein (NM23A) expressed in	H
NUSAP1	Nucleolar and Spindle Associated Protein 1	H
PAPPA	Pregnancy-Associated Plasma Protein A, Pappalysin 1	H
PCNA	Proliferating Cell Nuclear Antigen	H
PCSK6	Proprotein Convertase Subtilisin/Kexin Type 6	H
PGK1	Phosphoglycerate Kinase 1	H, M
PGR	Progesterone Receptor	H
PHIP	Pleckstrin Homology Domain Interacting Protein	H, M
PLAU	Plasminogen Activator, Urokinase	H
PLAUR	Plasminogen Activator, Urokinase Receptor	H
POU2F3	POU Class 2 Homeobox 3	H
PRAME	Preferentially Expressed Antigen in Melanoma	H
PRKCA	Protein Kinase C Alpha	H
PTEN	Phosphatase and Tensin Homolog	H, M, R
PTGS2	Prostaglandin-Endoperoxide Synthase 2 (Prostaglandin G/H Synthase and Cyclooxygenase)	H, M, R
RAB17	RAB17, Member RAS Oncogene Family	H
RAC2	Ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)	H
RAD54B	RAD54 Homolog B	H
RB1	RB Transcriptional Corepressor 1	H
RNF157	Ring Finger Protein 157	H
SCGB1D2	Secretoglobin, family 1D, member 2	H
SERPINA3	Serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin),	H

	member 3	
SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1	H, M
SLC7A1	Solute Carrier Family 7 Member 1	H
SLC7A5	Solute carrier family 7 (cationic amino acid transporter, y ⁺ system), member 5	H
SPARC	Secreted Protein Acidic and Cysteine Rich	H
SPARCL1	SPARC Like 1	H
SPP1	Secreted Phosphoprotein 1	H, M, R
SPRR1B	Small proline-rich protein 1B	H
STC2	Stanniocalcin 2	H
TBP	TATA box binding protein	H, M, R
TFF1	Trefoil Factor 1	H
TFRC	Transferrin Receptor (P90, CD71)	H, R
TGFA	Transforming Growth Factor, Alpha	H
THBS1	Thrombospondin 1	H
TNFAIP2	Tumour Necrosis Factor, Alpha-Induced Protein 2	H
TOP2A	Topoisomerase (DNA) II Alpha 170kda	H
TP53	Tumour Protein P53	H
TRPM4	Transient Receptor Potential Cation Channel Subfamily M Member 4	H
VCAN	Versican	H
VEGFA	Vascular Endothelial Growth Factor A	H, M
WNT2	Wnt Family Member 2	H
WNT5A	Wnt Family Member 5A	H
YWHAZ	Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Zeta	H, R
ZNF577	Zinc Finger Protein 577	H