Core Immunohistochemical Stains

Antibody code	Antibody - primary designation	Antibody - secondary designations	Source	Cat#	Ab type	Species reactivity	dilution	Primary classification	Comments	Validated on human tissue	Validated on mouse tissue
AKT1	Akt1/PKBa		Epitomics	1085-1	rabbit monoclonal	human, mouse	1:600(H), 1:1000(M)	Signal transduction	A Ser/Thr protein kinase whose activity plays a key role in various cellular functions, including apoptosis, glycogen synthesis, and cell growth.	Y	Y
AKT-pS473	Akt1/PKBa (pS473)		Epitomics	2118-1	rabbit monoclonal	human, mouse	1:400(H), 1:200(M)	Signal transduction	Phosphorylation on Thr308, Ser473 and Tyr474 is required for full activity.	Y	Y
ALDH1A1	ALDH1A1	aldehyde dehydrogenase	Epitomics	2052-1	rabbit monoclonal	human, mouse, rat	1:750(H,M)	Stem cell marker	Erythrocyte enzyme and liver cytosolic enzyme, expressed in high level in some stem cells & in some tumor types.	Y	Y
bcat	beta-catenin		Epitomics	E247	rabbit monoclonal	human, mouse	1:500(H), 1:1000(M)	Signal transduction, Stem cell marker	Change of localization from cell surface to nuclear indicates Wnt signalling. Stem cells often have wnt signalling.	y	Y
BRCA1	BRCA1		Calbiochem	OP92	mouse monoclonal	human	1:50(H)	Genomic stability	Inactivation of the BRCA1 gene , located at 17q21, is responsible for some forms of familial breast and ovarian cancer aand sporadic ovarian cancer. The BRCA1 protein ts expressed predominantly in the nucleus and appears to undergo cell cycle regulation.	Y	N-no staining
CD31(H)	CD31	PECAM1	Epitomics	2530-1	rabbit monoclonal	human	1:800	Leukocyte & endothelial differentiation	CD31 is found on the surface of endothelial cells, platelets and leukocytes. It plays a major role in a number of cellular interactions, particularly in adhesion between endothelial cells and leukocytes during inflammation and angiogenesis. Angiogenesis is critical to tumor growth, neoplastic progression and metastasis	Y	N-no staining
CD31(H,M)	CD31	PECAM1	Abcam	ab28365	rabbit polyclonal	human, mouse	1:4	Leukocyte & endothelial differentiation	CD31 is found on the surface of endothelial cells, platelets and leukocytes. It plays a major role in a number of cellular interactions, particularly in adhesion between endothelial cells and leukocytes during inflammation and angiogenesis. Angiogenesis is critical to tumor growth, neoplastic progression and metastasis		Y
CD44	CD44		Epitomics	1998-1	rabbit monoclonal	human, mouse, rat	1:400(H)	Stem cell marker	Cell surface glycoprotein, expressed in lymphocytes, upregulated in some tumors. Present in some stem cells.	Y	
CD45	CD45		BD Biosciences	550539	rat monoclonal	mouse	1:80(M)	Leukocyte differentiation	CD45 is a transmembrane glycoprotein which is expressed at high level on leukocytes from hematopoietic cells. CD45 isoforms play roles in T-cell and B-cell antigen receptor signaltransduction.	N- no staining	Y
CD68	CD68		Novus Biologicals	NB100-683	mouse monoclonal	human,mouse	1:400(H)	Stem cell marker	Glycosylated transmembrane protein which is mainly located in lysosomes. It reacts with myeloid precursors and peripheral blood granulocytes.	Y	N-Non specific staining
Chro	Chromogranin A		Dako Cytomation	A0430	mouse monoclonal	human	1:800(H)	Neuroendocrine differentiation	Chromogranin A is a protein prohormone.Potentially biologically active peptides derived from chromograninaA are,vasostatins,chrmostatin,chrmocin,pancreastatin,WE-14 etc. It has been used as a marker for neuroendocrine cells and tumors.	Y	N-no staining
Cl Caspase-3	Cleaved Caspase-3		Cell Signaling	9661	rabbit polyclonal	human, mouse,rat	1:500(H.M)	Apoptosis	Caspase 3 is one of the key excutioners of apoptosis, as it is either partially or toatlly responsible for the proteolytic cleavage of many key proteins such as PARP.		
Cyclin D1	Cycline D1		Epitomics	4202-1	rabbit monoclonal	human, mouse, rat	1:75(H)	Cell cycle	Cyclin D1 is required for G1/s cell cycle transition. Cyclin D1 phosphorylates and inactivates retinoblastoma protein and promotes progression through G1/s phase. Amplification or over expression of cyclin D1 play a pivotal role in the development of various human cancers.	Y	N-no staining
Desmin	Desmin		Epitomics	1466-1	rabbit monoclonal	human, mouse, rat	1:250(H,M)	Smooth muscle differentiation	Intermediate filament protein, expressed during the formation of muscle cells or fibers.	Y	Y
Ecad	E-cadherin		Epitomics	1702-1	rabbit monoclonal	human, mouse	1:4000(H)	Cell-cell interaction, epithelial differentiation	E-cadherin is a glycoprotein with an extracellular domain that interacts with other E-cadherin molecules on adjacent cells, thereby establishing adhesion between epithelial cells.	Y	N-Non specific staining
EGFR	Epidermal Growth Factor Receptor		Thermo Scientific	MS-378-P1	mouse monoclonal	human	1:800 (H)	Signal transduction, epithelial differentiation	EGFR is type I receptor tyrosine kinase, activated by the EGF family of ligands. EGFR is overexpressed or mutated in many common forms of carcinoma.	Y	N-no staining
EpCAM	Epithelial cell adhesion molecule	GA733-2, EGP, KSA, KS 1/4, Trop 1, CD326	Epitomics	1144-1	rabbit monoclonal	human, mouse, rat	1:2500(H,M)	Epithelial differentiation	A monomeric membrane glycoprotein expressed on virtually all epithelial cells	Y	Y
pERK	Phospho-p44/42 MAPK (ERK1/2)(Thr202/Tyr204)		Cell Signaling	9101	rabbit polyclonal	human,mouse,rat	1:200(H)	Signal transduction	MAPKs are a widely conserved family of serine/threonine protein kinases involved in many cellular programs such as cell proliferation, differentiation, motility, and death. The p44/42 MAPK (Erk1/2) signaling pathway can be activated in response to a diverse range of extracellular stimuli including mitogens, growth factors, and cytokines (1-3) and is an important target in the diagnosis and treatment of cancer	Y	N-no staining

Her2	Her2	c-erbB-2,neu	Zymed Laboratories	18-7107	mouse monoclonal	human	1:100(H)	Signal transduction / oncogene	HER2 is a membrane receptor tyrosine kinase which exhibits extensive homology to EGFR. Activation of HER2 potentiates tumor cell motility,DNA repair and apoptosis response. Amplification of HER2 occurs in 20-30% of Breast cancer.	Y	N-no staining
K5/6	cytokeratin 5/6	CK5/6	Dako cytomation	M7237	mouse monoclonal	human	1:200(H)	Epithelial differentiation	Cytokeratins are alpha-type fibrous polypeptide. They are held to be the most ubiquitous markers of epithelial differentiation.	Y	N-no staining
K10	cytokeratin 10		Epitomics	2210-1	rabbit monoclonal	human	1:300(H)	Epithelial differentiation	Intermediate filament protein, expresed in suprabasal layers of stratified squamous epithelium. Expresion is related to degree of keratinocyte differentiation.	Y	N - no staining
K18	cytokeratin 18		Epitomics	1433-1	rabbit monoclonal	human, mouse, rat	1:200(H), 1:100(M)	Epithelial differentiation	Intermediate filament protein, expressed preferentially in simple glandular epithelia.	Y	Y
Ki67	Ki67		Epitomics	4203-1	rabbit monoclonal	human, mouse	1:400(H,M)	Proliferation / Cell cycle	Present in active phases of the cell cycle (late G1, S, G2, and mitosis), but absent in resting cells.	Y	Y
Napsin A	Napsin A		Leica microosystems	NCL-L-NapsinA	mouse monoclonal	human	1:400(H)	Differentiation - lung adenocarcinoma	Napsin is a pepsin-like aspartic proteinase. There are three isoforms. Napsin-A is also termed napsin-1, or TA02, a Tumor Adenocarcinoma marker. Napsin A may be involved in processing of pneumocyte surfactant precursors.	Y	N-no staining
NFKB-p65	Nuclear factor kappa B, p65 subunit		Epitomics	1546-1	rabbit monoclonal	human	1:500(H)	Signal transduction	Inducible transcription factor involved in apoptosis resistance. Bound to inhibitor (IKB) and retained in cytoplasm. During activation, the p65 subunit is released from IKB and translocates to the nucleus.	Y	N - no staining
Oct4	Oct-4	Oct-3, Oct-3/4	Santa Cruz	sc-8629	goat polyclonal	human, mouse, rat	1:1000(H)	Stem cell marker	POU domain-containing transcription factor, expressed in stem cells. Regulates stem cell renewal & differentiation.	Y	N - non specific staining
pMEK(Ser221)	Phospho-MEK 1/2(Ser221)	MAPK	Cell Signaling	2338	rabbit polyclonal	human, Mouse, Rabbit, Dog	1:100(H)	Signal transduction	MEK1 and MEK2 are dual-specificity protein kinases that function in a mitogen activated protein kinase cascade controlling cell growth and differentiation	Y	Y
c-Myb	c-Myb		Epitomics	1792-2	rabbit monoclonal	human	1:200(H)	Transcription factor / oncogene	The c-Myb proto-oncogene is a protein involved in growth regulation and differentiation in many different cell types . C-Myb activity is directly regulated by cyclin D and CDKs.	Y	not tested
p16	p16	cyclin-dependent kinase inhibitor 2A, CDKN2A	BD Pharmingen	550834	mouse monoclonal	human	1:100 (H)	Tumor suppressor gene	p16 protein is a specific inhibitor of cdk4, which regulates Rb and Rb related proteins, p107 and p130. p16 is inactivated in many tumor types by gene mutation or silencing, and its protein level is influenced by papillomavirus oncoproteins.	Y	N-no staining
p21	p21	WAF1/Cip1	Santa Cruz	sc-6246	mouse monoclonal	human, mouse, rat	1:100(H)	Proliferation/ cell cycle	Promotes cell cycle transitions.	Y	N - non specific staining
p53	p53		Abcam	ab26	mouse monoclonal	human, mouse, rat	1:1000(H)	Tumor suppressor gene	p53 plays a major role in the dellular response to DNA damage and ther genomic aberrations. Activation of p53 can lead to either cell cycle, arrest and DNA repair, or apoptosis.	Y	N - non specific staining
p63	p63		Sigma-aldrich	P3737	mouse monoclonal	human, mouse, rat	1:2000(H), 1:1000(M)	Epithelial differentiation	Expressed in many types of basal epithelium. Differentiates between basal and surface/lumenal epithelium.	Y	Y
PARP1	PARP-1 (Cleaved p25)		Epitomics	1051-1	rabbit monoclonal	human, mouse	1:500(H,M)	Apoptosis	Cleaved in vivo by caspase 3, hence is a marker of activated apoptotic pathway.	Y	Y
Plectin	Plectin 1		Abcam	ab32528	rabbit monoclonal	human, mouse, rat	1:400(H)	Epithelial differentiation / cancer biomarker	An intermediate filament binding protein,Could also bind muscle proteins such as actin to membrane complexes in muscle.	Y	Y
SMA	smooth muscle actin	alpha actin	Epitomics	1184-1	rabbit monoclonal	human, mouse, rat	1:200(H)	Dsmooth muscle differentiation	Contractile protein that makes up the cytoskeleton. SMA is restricted to smooth muscle cells (including vascular smooth muscle) and myoepithelial cells.	Y	N - non specific staining
SRC	cSRC		Epitomics	1587-1	rabbit monoclonal	human, Rat	1:100(H)	Signal transduction / oncogene	Src is a protein tyrosine kinase known to regulate cellular adhesion. Several cancers including colon and breast cancer have been associated with an increase of SRC activity.	Y	not tested
Stat5a	Stat 5a		Santa Cruz	sc-1081	rabbit polyclonal	human, mouse, rat	1:400(H)	Signal transduction	Membrane receptor signaling by variuos ligands, including interferons and growth hormones such as EGF,induces activation of Jak kinases which then leads to tyrosine phosphorylation of various transcription factors.	Y	N-no staining
Stat5b	Stat 5b		Santa cruz	sc-1656	mouse monoclonal	human, mouse, rat	1:125(H)	Signal transduction	Activation of Stat 5b via IL-2,IL-4,CSF1 and growth hormones influences TCR signaling,apoptosis, adult mammary gland development and sexual dimorphism of liver gene expression.	Y	Y
Stat5-pY694	Phospho-Stat5 (Tyr 694)		Epitomics	1208-1	rabbit monoclonal	human, mouse	1:50(H)	Signal transduction	Stat5 is tyrosine phosphorylated in response to IL2,IL3,IL7,IL15,GM-CSF, growth hormanone, prolactin, erythropoietin and thrombopoietin. Tyrosine phosphorylation is required for DNA-bonding activity and dimerization.	Y	Y

Core Immunohistochemical Stains

Snpt	Synaptophysin		Dako Cytomation	M0776	mouse monoclonal	human	1:400(H)	Neuroendocrine differentiation	The protein is a synaptic vesicle glycoprotein with four transmembrane domains weighing 38kDa. It is present in neuroendocrine cells and in virtually all neurons in the brain and spinal cord that participate in synaptic transmission. It acts as a marker for neuroendocrine tumors	Y	N-no staining
TTF-1	Thyroid transcription factor-1		Leica microsystems	NCL-TTF-1	Mouse monoclonal	human	1:400(H)	Differentiation-lung cancer	transcription factor that binds and activates the promoter of thyroid specific genes such as thyroglobulin, thyroperoxidase, and thyrotropin receptor. Crucial in the maintenance of the thyroid differentiation phenotype. May play a role in lung development and surfactant homeostasis.	Y	N-no staining
Vim(H)	Vimentin		Epitomics	4211-1	rabbit monoclonal	human	1:200(H)	Mesenchymal differentiation	Most common member of intermediate filament family and a main component of cytoskeleton structure. Most strongly expressed in mesenchymal cells and other cell types derived from mesoderm.	Y	N-no staining
Vim(H.M)	Vimentin		Abcam	ab45939	rabbit polyclonal	human, mouse	1:800	Mesenchymal differentiation	Most common member of intermediate filament family and a main component of cytoskeleton structure. Most strongly expressed in mesenchymal cells and other cell types derived from mesoderm.	Y	Y