

Immunopathology and Immunohistochemistry

I. Hours of Operation

Immunopathology: 7:30 AM - 4:00 PM; Monday - Friday

II. Contact Section

Phone: 449-4630, 449-4944

III. Staffing

Immunopathology is staffed 7:30 am – 4:00 pm Monday through Friday. Paraffin-embedded tissue received for immunoperoxidase (IPX) studies and sectioned by the department by 10:00 am will be worked up the same day. Immunofluorescence (IF) studies are generally completed the following day if the specimen has been received in the lab by 9:00 am. The pathologist is responsible for proper processing and dispersal of any tissue that comes from surgery (OR) or from CML (Creighton Medical Labs) after hours.

IV. Specimen requirements

Immunohistochemistry studies require routinely processed formalin-fixed, paraffin-embedded tissue (please send the block). Immunofluorescence (IF) studies often require unfixed, fresh tissue. Biopsies for IF can be stored up to 5 days at room temperature in Michel's transport media (Zeus fixative).

V. Scope of testing

Immunohistochemistry involves the use of antibodies to localize markers (proteins or other antigens) restricted in distribution to tissues or cellular compartments. The information provided by these studies will help the pathologist to identify tissue/cell origins of neoplasia, diagnose diseases, classify malignancies, and determine tumor prognosis. Usually the pathologist selects a panel of antibodies, because any single antibody alone is often neither specific nor sensitive enough for making a definitive diagnosis. Our pathology staff is available for consultation. We currently have more than 100 antibodies available for testing and most of the antibodies work well on paraffin-embedded sections.

VI. Markers available (IHC-Paraffin Sections)

1. Lymphoid and Hematopoietic Markers

ALK Protein (Anaplastic T NHL)	CD23 (B cell Follicular, Activated)	CD117 (c-kit, GIST, Precursor)
BCL-1 (Cyclin D1, PRAD1)	CD30 (B&T, Activation)	CD138 (Plasma cell)
BCL-2 (Anti-Apoptotic)	CD31 (Vascular)	CD163 (Macrophage)
BCL-6 (T&B, Follicular)	CD34 (Endothelial, Precursor)	Fascin (R-S, Follicular dendritic cells)
CD1A (Langerhan cell)	CD35 (B cell Follicular, Dendritic cells)	IgG (B cell, Plasma cell)
CD3 (T Cell)	CD38 (B cell)	IgM (B cell, Plasma cell)
CD4 (T helper cells)	CD43 (T&M cells)	Granzyme B (T cell, NK)
CD5 (T cell)	CD45 (Leukocyte common antigen)	Kappa (B cell, Plasma cell)
CD7 (T cell)	CD45RO (T cell)	Lambda (B cell, Plasma cell)
CD 8 (T Killer cell)	CD56 (NK cells)	MPO (Myeloid, AML)
CD10 (B cell, Precursor)	CD57 (Leu-7, NK, Endocrine)	PAX-5 (B cell)
CD15 (Myeloid, R-S cell)	CD68 (Macrophage, Histiocyte)	TdT (T, M, Precursor)
CD20 (B cell)	CD79A (B cell)	TIA-1 (T cell intracytoplasmic Ag)
CD21 (B cell Follicular)	CD99 (MIC-2, Ewing's, T cell)	ZAP-70 (CLL)

2. Epithelial (Carcinoma) Markers

AFP (Alpha-1-Fetoprotein)	Cytokeratin (AE1:3)	HPL (Placental lactogen)
AR (Androgen Receptor)	Cytokeratin CKPIN Cocktail (Prostate)	Mesothelin (Mesothelial)
B72.3 (Adenocarcinoma)	Cytokeratin Cocktail (AE1:3, CK8, CK34BE12)	MUC-1 (Epithelial)
CA125 (Ovarian, etc.)	Cytokeratin HMW CK34BetaE12	MUC-2 (Epithelial)

Creighton University Medical Center Laboratory Services Reference Manual

CA19-9 (Gastrointestinal, etc.)	Cytokeratin LMW (CK8/18)	PLAP (Germ cell tumor)
Calretinin (Mesothelial)	E-Cadherin (Epithelial)	PR (Progesterone Receptor)
CDX-2 (Colon)	EMA (Epithelial Membrane Ag)	PSA (Prostate)
CEA-Monoclonal	ER (Estrogen Receptor)	PSAP (Prostate)
CEA-Polyclonal	ERA (Epithelial Related Ag, MOC-31)	RCC (Renal Cell Carcinoma)
Cytokeratin CK14	ER-Beta (Estrogen Receptor-Beta)	TTF-1 (Thyroid, Lung)
Cytokeratin CK19	GCDFP-15 (Breast ductal)	Villin (Gastrointestinal, etc.)
Cytokeratin CK20	HBME (Epithelial)	WT-1 (Mesothelioma)
Cytokeratin CK5/6	HCC (Hepatocellular Carcinoma)	
Cytokeratin CK7	HCG (Chorionic gonadotropin)	

3. Mesenchymal (Sarcoma and Melanoma) Markers

AA (Amyloid A)	Factor XIII (Histiocytic dendrocytes)	PGP.9.5 (Sarcoma)
AAT (Alpha-1-Antitrypsin)	HHV-8 (Kaposi's sarcoma)	PU.1 (Histiocyte)
Caldesmon (Breast)	HMB-45 (Melanocyte)	S-100 (Melanocyte, etc.)
Calretinin (Mesothelial)	Lysozyme (Histiocyte)	S100A6 (Calcyclin)
CD117 (c-kit, GIST)	Melan A (MART-1/Melanocyte)	SMA (Smooth Muscle Actin)
CD34 (Endothelial)	Mesothelin (Mesothelial)	SMM (Smooth Muscle Myosin)
CD68 (Histiocyte)	MITF (Melanocyte)	Tyrosinase (Melanocyte)
CD99 (MIC-2, Ewing's)	MSA (Muscle Specific Actin)	Vimentin (Mesenchymal)
Desmin (Muscle)	Myogenin (Rhabdomyoblasts)	WT-1 (Wilm's tumor, Mesothelioma)
Factor VIII (Endothelial)	Myoglobin (Skeletal muscle)	

4. Neuroendocrine/Prognosis Markers

ACTH (Pituitary)	Glucagon (Islet cell, NE cell)	PGP9.5 (NE)
Alpha-Synuclein (CNS)	HER2/neu (Oncoprotein)	PMS2 (Colon CA)
APC (Tumor suppressor gene)	HER2/neu ACIS (IA)	PR ACIS (Progesterone receptor by IA)
APP (Amyloid precursor protein)		PRL (Prolactin, Pituitary)
Beta-Amyloid (CNS)	Insulin (Islet cell, NE cell)	PTEN (Prostate)
Beta-Catenin (Colorectal)	Ki-67 (Proliferation)	PTH (Parathyroid Hormone)
Calcitonin (Thyroid, C-cells)	Ki-67 ACIS (KI67 by IA)	S-100 (Neural, Melanoma)
CD56 (NE)	LH (Lutein Hormone, Pituitary)	Somatostatin (Islet cell, NE cell)
CD57 (Leu-7, NK, Endocrine)	MBP (Myelin Basic Protein)	Synaptophysin (NE)
Chromogranin A (NE)	MLH-1 (Colon CA)	Tau (CNS)
COX-2 (Prognostic, CA)	MSH-2 (Colon CA)	Thyroglobulin (Thyroid, F cells)
EGFR ACIS (Epidermal Growth Factor Receptor by IA)	MSH-6 (Colon CA)	
EGFR Manual (Epidermal Growth Factor Receptor)	NF (Neurofilaments)	Topoisomerase II (Proliferation)
ER ACIS (Estrogen receptor by IA)	NSE (Neuron specific enolase)	TP (Thymidine Phosphorylase)
FHIT	P16 (Squamous dysplasia, HGSIL)	TS (Thymidylate Synthase cocktail)
FSH (Follicle Stimulating Hormone, Pituitary)	P53 (Cell cycle, Oncoprotein)	TSH (Thyroid Stimulating Hormone, Pituitary)
Gastrin (Islet cell, NE cell)	P63 (Breast, Prostate basal cells)	Ubiquitin (Brain, etc.)
GFAP (Glial fibrillary)	PCNA (Proliferation)	WT-1 (Wilm's tumor)
GH (Growth Hormone)		

5. Infectious Agent Markers

CMV	HHV-8 (Human Herpesvirus)	Parvovirus B19
EBV-LMP	HPV (Human Papillomavirus screen)	PCP (Pneumocystis)
H. Pylori (Alcian-Blue)	HSV I/II (Simplex I/II)	T. gondii

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VII. Markers available (DIF-fresh/frozen tissue)

1. Immunofluorescence Markers

IgG-FITC
IgM-FITC
IgA-FITC
C1q-FITC

C3-FITC
C4-FITC
Fibrinogen-FITC

Properdin-FITC
Kappa-FITC
Lambda-FITC