

## Anatomic Pathology Special Stains

### Group I for Microorganisms

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#### Special Stains Group I 88312

Fite stain  
Gomori's methenamine silver (GMS)  
Gram  
Gridley  
Steiner  
PAS/light green counterstain  
Warthin-Starry  
Ziehl-Neelsen AFB

#### Primary Demonstration of:

Stains for *mycobacteria leprae*  
Fungus, Pneumocystis, Bacteria  
Gram-positive and gram-negative bacteria  
Fungus  
Spirochetes, Bacteria  
Fungus  
Bacteria, Spirochetes  
Acid-fast mycobacterium

### Group II (All Other)

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#### Special Stains Group II 88313

Alcian Blue, pH 2.5  
Alcian Blue/Hyaluronidase  
Alcian Blue/PAS  
Aldehyde fuchsin  
ASD 'Leder's modification'  
Bielschowsky  
Bile, Hall's method  
Bodian  
Colloidal iron  
Colloidal Iron/Hyaluronidase  
Congo Red  
Copper (Rhodanine)  
Crystal Violet  
Elastic stain (EVG)  
Fontana-Masson  
Giemsa (mast cell)  
Grimelius  
Iron stain  
Jones methenamine silver  
Luxol fast blue  
Masson trichrome  
Melanin bleach  
Movat  
Mucicarmine  
Oil Red O  
Orcein  
PAS/amylase (PAS/D)  
Periodic acid-Schiff (PAS)  
PTAH  
Reticulum  
SAB  
Thioflavin S

#### Primary Demonstration of:

Acid mucopolysaccharides  
Differentiation of epithelial and connective tissue mucins  
Acid and neutral mucins  
Copper-binding protein, Elastic fibers  
Esterase, Mast cells  
Neurofibrils  
Bilirubin  
Nerve fibers  
Mucopolysaccharides, Collagen  
Differentiation of epithelial and connective tissue mucins  
Amyloid  
Copper  
Amyloid  
Elastic fibers, Collagen  
Argentaffin granules or Melanin  
Eosinophilic granules and Mast cells  
Argyrophil granules, Argentaffin  
Iron  
Basement membranes, Reticular fibers  
Myelin  
Collagen  
Eliminates melanin  
Elastic fibers, Collagen, Mucin, Fibrin and Muscle  
Mucosubstances  
Fat  
Copper-binding Protein, Elastic fibers  
Eliminates glycogen  
Glycogen, Neutral mucopolysaccharides and Basement membranes  
Collagen, Fibrin, Coarse elastic fibrils  
Stains for reticulum fibers  
Amyloid  
Amyloid

## Group II (All Other cont.)

### Special Stains Group II 88313

Toluidine Blue  
Uric acid  
Von Kossa

### Primary Demonstration of:

Mast cell granules  
Urate crystals  
Calcium

### Histochemical Stains (Enzyme) 88319

Acetylcholinesterase (ACE)  
Acid phosphatase  
Alkaline phosphatase  
ATP (4.6, 9.8)  
Cytochrome C  
Esterase  
NADH  
Phosphofructokinase  
Phosphorylase  
Succinic dehydrogenase (SDH)

### Primary Demonstration of:

Nerve fibers/Hirschsprung's disease  
Muscle fibers undergoing degeneration  
Basement membranes and regenerating fibers  
Muscle fiber types  
Cytochrome oxidase  
Denervated muscle fibers  
Whorls, Target fibers, Central cores, Moth-eaten fibers  
PFK activity  
Phosphorylase activity  
Mitochondrial disease

## Immunohistochemistry Stains

### Stain

### Antibody Specificity

ACTH  
Actin HHF35  
Actin SM  
Adenovirus  
AFP  
ALK (D5F3)  
ALK-1  
Amyloid A (AMY-A)  
Amyloid Kappa (AMY-K)  
Amyloid Lambda (AMY-L)  
Androgen Recept  
Arginase 1  
β-Catenin  
BCL-2  
BCL2 EP36  
BCL-6  
  
B72.3  
BOB-1  
BRAF  
CA9  
CA 125  
Calcitonin (CALC)  
Calretinin (CALR)  
C3d  
C4d  
CD1a  
CD2  
CD3 (2VG6)

Human adrenocorticotrophic hormone  
Human muscle actin  
Alpha-smooth muscle isoform, Myoepithelium, etc.  
Adenovirus  
Alpha fetoprotein  
Anaplastic lymphoma kinase, clone D5F3  
ALK-1  
Amyloidosis  
Amyloidosis  
Amyloidosis  
Androgen Receptor  
Identify normal liver cells  
Beta Catenin  
Follicular lymphoma, Apoptosis inhibin protein  
BCL2, clone EP36  
Follicular and diffuse lymphomas, Burkitt's lymphoma &  
Lymphocyte predominant Hodgkin's disease  
Tumor associated glycoprotein  
Transcription coactivator for Oct-1 and Oct-2  
Hairy cell Leukemia  
Carbonic Anhydrase IX  
Tumor marker for ovarian, endometrial, breast, GI cancer  
Calcitonin  
Calcium-binding protein, Mesothelial cells  
Complement 3d, transplant rejection biomarker  
Complement 4d, transplant rejection biomarker  
Cortical thymocytes-langerhans cells  
Lymphocyte function-associated antigen 2  
T-Cells

## Stain

## Antibody Specificity

CD4	T-Cells, Helper T
CD5	Pan T-cells, B-cell subset, Thymic carcinomas
CD7	Thymocytes, Immature t-cells, NK cells
CD8	T-Cells, Suppressor T
CD10	Common acute lymphoblastic leukemia
CD15	Epithelial/Hodgkin's/Myeloid
CD19	B-Lymphocyte antigen
CD20	Human B-lymphocyte antigen
CD21	Dendritic cells, B-cells
CD22	Mature B-cells
CD23	Activated B-cells
CD25	Activated T-cells and B-cells
CD30	Ki-1: Activated T, B, RS cells
CD31	Endothelium (tumor angiogenesis)
CD33	Monocytes
CD34	Endothelium, Stem cells, Stromal tumors
CD35	Dendritic cells
CD43	T-cells, B-cell subset, Myeloid, Histiocytes, Plasma cells (leukosialin)
CD44	Phagocytic glycogen-1
CD45	Helper, Inducer T-cells
CD45RO	Helper, Inducer T-cells
CD56	Natural killer cells
CD57	Neural and neuroendocrine marker NK cells, Stromal tumors
CD61	GP111A
CD68 (KP1)	Sarcomas and leukemia
CD68 (PG-M1)	Monocytes/Macrophages
CD71	Erythroid precursor marker
CD79a	B-cells
CD99	Ewing's sarcoma/PNET
CD117	C-kit
CD123	Alpha receptor for IL3
CD138	Plasma cell marker, Syndecan
CD163	Ber-MAC3
CDX-2	Metastatic colon CA
CEA	Carcinoembryonic antigen
Chromogranin (CHROMO)	Chromogranin A
Clusterin	Apoptosis
Cox-2	Inflammation
Cyclin-D1	Cyclin D1/PRAD-1 oncogene product, Mantle cell
CMV	Cytomegalovirus
c-MYC	Lymphoma marker
CXCL-13	B-Lymphocyte chemoattractant
D2-40	Podoplanin, lymphatic endothelial marker
Desmin	Desmin
EBNA-2	Stains nuclei of EBV-infected lymphoblastoid cells
DOG-1	GIST marker
EBV	Epstein-Barr virus
E-cadherin (CADH)	Epithelial marker
EGFR	Epithelial growth-factor receptor
EMA	Epithelial membrane antigen
Enolase (NSE)	Neuron specific enolase

## Stain

EP4-Ber  
ERG  
ER  
Factor VIII  
Factor XIII  
Fascin  
FGFR3  
FOXP1  
FOX-P3  
FSH  
Galectin  
Gastrin  
GATA3  
GCDFP-24  
GCET1  
GFAP  
GH  
Glucagon  
Glutamine Synthetase  
Glypican-3  
Granzyme-B  
Hemoglobin-A  
HBcAg  
HBsAg  
H-Caldesmon (HCAL)  
H.pylori  
BHCG  
Hepatocyte  
Herpes (HSV I&II)  
HER2 Neu (4B5)  
HHV8  
HMB 45  
HPV  
IDH-1  
IgA  
IgD  
IgG  
IgG4  
IgM  
INI1  
Inhibin  
Insulin  
Ki67  
Kappa  
Lambda  
Langerin  
LEF1  
LH  
LMO2  
Mammaglobin  
MDM2

## Antibody Specificity

Epithelial antigen  
Vascular marker and prostate malignancy marker  
Estrogen receptor  
Von Willebrand factor, Endothelium and megakaryocytes  
Fibrohistiocytic tumors, Dendritic interstitial cells  
Hodgkin's disease, High grade breast carcinoma  
CD333, Fibroblast growth factor receptor 3  
Prognosis of lymphoma, leukemia, carcinoma  
T regulatory cell marker  
Follicle stimulating hormone  
Inflammation and cancer  
Gastrin secreting tumors, G-cell hyperplasia  
Urothelial carcinoma marker  
Gross cystic disease fluid protein-15  
Germinal center B-cell marker  
Human glial fibrillary acidic protein  
Growth hormone  
Glucagon  
Hepatocellular carcinoma marker  
Hepatocellular carcinoma marker  
Serine protease  
Hemoglobin-A  
Hepatitis B core antigen  
Hepatitis B surface antigen  
Smooth muscle differentiation  
Helicobacter pylori  
HCG in trophoblastic elements of germ cell tumors  
Hep-par1  
HSV I/II  
Erb-2 oncoprotein, Clone 4B5  
Human herpesvirus 8  
Melanoma associated marker  
Human papilloma virus subtype  
Glioma Marker  
Immunoglobulin A  
Immunoglobulin D  
Immunoglobulin G  
Autoimmune pancreatitis  
Immunoglobulin M  
Malignant rhabdoid tumor marker  
Granulosa cell tumor, Sex cord stromal tumor  
Insulin  
Cell proliferation marker  
Kappa light chain  
Lambda light chain  
Langerhans cell histiocytosis  
Chronic lymphocytic (CLL)/small lymphocytic (SLL) leukemias  
Luteinizing hormone  
Large B-cell lymphoma marker  
Primary and metastatic breast carcinoma marker  
Liposarcoma

## Stain

## Antibody Specificity

Melan A	Malignant melanoma marker
MitF	Melanocyte development regulator, melanoma oncogene
MLH-1	Mismatch repair gene MLH-1
MOC-31	Differentiate carcinomas from mesothelial cells and mesotheliomas
MSH-2	Mismatch repair gene MSH-2
MSH-6	Mismatch repair gene MSH-6
MUC-4	Fibromyxoid sarcoma
MUM-1	Multiple myeloma oncogene-1
Muramidase	Muramidase/Lysozyme
Myeloperoxidase	Neutrophilic granulocytes and monocytes
MyoD1	Rhabdomyosarcoma marker
Myogenin	Rhabdomyosarcoma marker
Napsin A	Lung adenocarcinoma marker
Neurofilament	Neurofilament
Neurofilament Cocktail	Cocktail of clones 2F11 and SMI-32
NKI/C3	Melanoma marker
NKX3.1	Differential marker for prostate carcinoma vs. urothelial carcinoma
OCT-2	Octamer transcription factor 2
OCT3/4	Marker for undifferentiated cells
p16	Cervical cancer marker
p40	Pulmonary squamous cell carcinoma marker
P501s Protein	Confirm prostatic origin of metastatic carcinoma
p53	Overexpression of the p53 oncogene
p57	Differential diagnosis of complete vs partial hydatidiform molar pregnancy
p63	Prostate cancer marker
p63/ERG Double Stain	A double stain for prostate cancer
PAP	Normal hyperplastic and neoplastic, Prostatic cells
PAX-2	Tumor marker for kidney, prostate, breast, ovary
PAX-5	B-cell specific activator protein
PAX-8	Nephritic cell lineage marker
P-Component	Amyloidosis
Perforin	T-cell and NK cell lymphoma
PD1	T-cell regulator
PDGFR	oligodendrocytic progenitor cells
PIN cocktail (p63&AMACR)	p63 and AMACR
Prolactin	Prolactin in pituitary
PLAP	Placental alkaline phosphatase, Germ cell and adenocarcinoma
PMS2	Mismatch repair gene PMS-2
PR	Progesterone receptor
PSA	Prostate specific antigen
PSMA	Prostate specific membrane antigen
PTEN	Differentiate breast, prostate carcinoma from normal
PTH	Parathyroid hormone
Racemase (AMACR)	Prostate adenocarcinoma marker
RCC	Renal Cell Carcinoma marker
S-100	S100 protein
SALL4	Yolk sac tumor marker
Serotonin	Carcinoid syndrome
SF-1	Adrenocortical tumor marker
SMMS1	Smooth muscle myosin
SOX-10	Identify melanoma and nerve sheath tumors
SOX-11	Mantle cell lymphoma marker

## Stain

pSTAT 5  
Synaptophysin  
Syph  
Tau/Beta-amyloid DS  
TCL-1A  
TCR  $\beta$  F1  
TCR-Gamma  
TdT  
TFE-3  
Thyroglobulin  
TIA  
Transthyretin  
Tryptase (MC trypt)  
TSH  
TTF-1  
Tyrosinase  
Ubiquitin  
Vimentin  
VS38C  
WT1 (6F-H2)  
14-3-3

## CISHs (+NEG & ALU or U6)

CISH EBER  
CISH Kappa  
CISH Lambda

## KERATINS (App/T/Prost)

AE1/3  
CAM 5.2  
CK 5/6  
CK 7  
CK 19  
CK 20  
KER 903

## Antibody Specificity

Surrogate marker of JAK2 V617F mutation  
Synaptophysin  
T. pallidum  
Neurofibrillary tangle and amyloid in Alzheimer's postmortem specimens  
Mature T-cell leukemia  
T-cells  
T-cells  
Blasts, Immature lymphocytes  
Xp11 translocation renal cell carcinoma  
Thyroglobulin  
Cytolytic effector cells in lymphocytic infiltrates  
Amyloidosis  
Human mast cells  
Thyrotropic cells of pituitary  
Thyroid and pulmonary carcinomas  
Metastatic melanoma  
Neurofibrillary tangles of Alzheimer's disease  
Vimentin  
Plasma cell  
Wilms tumor  
14.3.3 Sigma, epithelial cell marker

Chromogenic *in situ* hybridization for EBV  
Chromogenic *in situ* hybridization for Kappa  
Chromogenic *in situ* hybridization for Lambda

Keratin cocktail: 40, 48, 50, 50, 6, 58, 65, 5 kD  
Keratin: 39, 43, 500 kD  
Intermediate filament protein, Cytokeratin 5/6  
Keratin: 54 kD  
Human cytokeratin 19 polypeptide  
Keratin: 54 kD  
High molecular weight cytokeratins



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