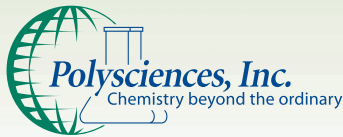


# PolyFacts

Vol. 3 | No. 3

## BioSciences

News | Views | Insights from



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## Guide to Special Stains

Polysciences' special stains are a diverse family of slide based stains that rely on chemical reactions for visualization by microscope to identify various tissues, structures, cells and microorganisms. Special stains are an important tool for pathologists in defining a patient's medical profile. Clinical applications for special stains cover a wide range of diseases and are key in detecting a specific pathogen. Polysciences' special stains are an integral part of the research laboratory in identifying and monitoring pathological diseases.

### Special Stain Kits and Certified Powdered Dyes for Visualizing Tissues, Structures, Cells and Microorganisms

Cat. #	Size	Stain Description	Visualization
24670	1 Kit	AFB (Acid-Fast Bacteria) Kinyoun Kit	Mycobacteria
02736	25g	Congo Red, C.I. 22120, certified	Amyloids
24199	1 Kit	Iron Stain (Prussian Blue)	Ferric iron and ferritin
24205	1 Kit	Gomori's Trichrome Stain Kit	Connective fiber, muscle in tissue
24668	1 Kit	Gram Stain Kit	Bacteria
24611	500ml	Luxol Fast Blue	Mitochondria
08824	100ml	Multiple Stain Solution	Mast cells
08711	470ml	Wright Giemsa Stain Solution	Mast cells, blood films, parasites
01220	10g	Thionine, C.I. 52000, certified	Mast cells
24200	1 Kit	Periodic Acid Schiff's Stain (PAS)	Polysaccharides, neutral mucosubstances and basement membranes
24208	1 Kit	Rapid Mucin Stain Kit	Mucin
22422	1 Kit	TB Fluorostain™ Kit	Fluorescent detection of <i>M. tuberculosis</i> and other acid-fast bacteria
16280	450ml	Villanueva Osteochrome Stain	Bone
24633	1 Kit	Von Kossa Method for Calcium	Mineralized bone, calcium deposits
01005	25g	Hematein, C.I. 75290, certified	Phospholipids (Hori's Method)
02760	25g	Methyl Green, C.I. 42590, certified	Plasma cells
06317	100g	Oil Red O, C.I. 26125, certified	Fats and lipids

We've listed only a small portion of our special stains and certified dyes that we currently offer. For a complete listing, visit [www.polysciences.com](http://www.polysciences.com)



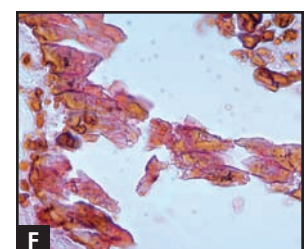
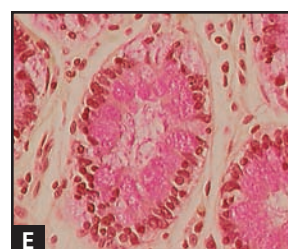
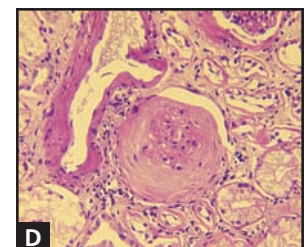
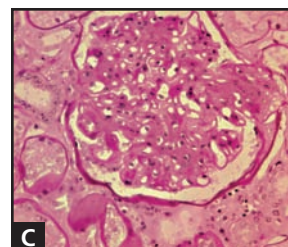
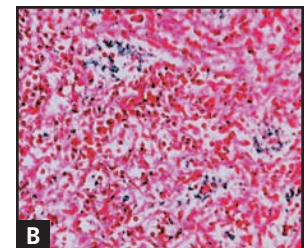
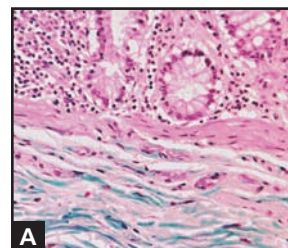
Visit Polysciences, Inc. at NSH in Pittsburgh, PA

- Fixatives
- Embedding Kits
- Paraffins
- Embedding Molds
- Certified Dyes, Stains and more



Visit Booth #1001-1003 to learn about new products to help increase productivity in your laboratory and enter for a chance to win a DVD player!

**September 14 - 16, 2008**



- A) Gomori's Trichrome** staining of human colon tissue.  
Results: Nuclei - black, cytoplasm, keratin, muscle fibers - red, collagen and mucus - green or blue.
- B) Iron Stain (Prussian Blue)** staining of human kidney tissue.  
Results: Iron (Hemosiderin) - blue, nuclei - red, background - pink
- C) Periodic Acid Schiff's (PAS) Stain Kit** staining of human kidney tissue.  
Results: Fungi, glycogen - red to hot pink, nuclei - blue
- D) Multiple Stain Solution** staining of human kidney tissue.  
Results: Cellular components - dark blue, connective tissue - pink
- E) Rapid Mucin Stain Kit** staining of human colon tissue.  
Results: Mucin - deep red or rose, other tissue - yellow, nuclei - black
- F) Von Kossa Method for Calcium Kit** staining of calcified necrotic human kidney.

# Comparison of Hematoxylin and Eosin Stains on Automated Stainers Instruction Manual Available Online

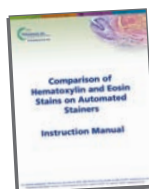
Polysciences, Inc. is a manufacturing leader of an extensive line of routine and special stains for histology, cytology and microbiology. All of our stains are manufactured to the highest possible standards. Hematoxylin and eosin staining is a routine technique in the histology laboratory but is considered a special stain when referring to the affinity of the dye that the hematoxylin has for the cell nucleus. This stain theory is based on the attraction of the opposite charges of the tissue.

As the medical community demands greater standardization, tissue staining continues to become increasingly automated. Polysciences' hematoxylin and eosins were recently tested by Sakina Sadiq, HT(ASCP), HTL(ASCP) in an outside independent study to test the performance of our hematoxylin and eosins using automated stainers. To help serve our histology professionals better we now offer an invaluable resource as a result of the study, the [Comparison of Hematoxylin and Eosin Stains on Automated Stainers Instruction Manual](#).

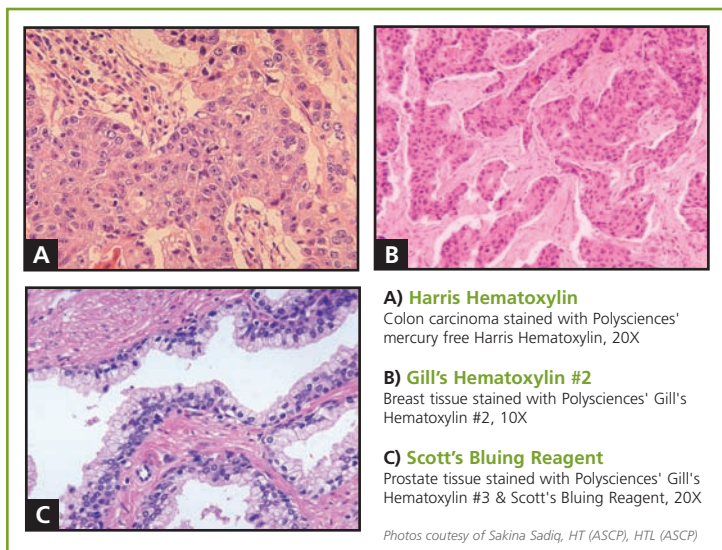
## EXCERPT

### Results from this Instruction Manual:

*Stained nuclei appeared blue and cytoplasm was pink. Polysciences' Harris and Gill's hematoxylin needed 7 to 8 minutes for optimal results. All Polysciences' bluing reagents demonstrated desirable qualities. Variations in tissue samples stained differently. For example, sections cut at 3 microns were stained lighter than those at 4 to 5 microns, which is ideal.*



To download a copy of the [Comparison of Hematoxylin and Eosin Stains on Automated Stainers Instruction Manual](#), go to: [www.polysciences.com/automated](http://www.polysciences.com/automated) or stop by booth #1001-1003 at NSH in September and request a copy.



## Hematoxylin, Eosins and Bluing Reagents

Cat. #	Description
24242	Gill's Hematoxylin #1 for Cytology
24243	Gill's Hematoxylin #2, 2x strength for Histology & Cytology
24244	Gill's Hematoxylin #3, 3x strength for Histology
24245	Harris Hematoxylin, Acidified (mercury free)
24821	Mayers Hematoxylin
17269	Eosin Y, 1% alcoholic solution
09859	Eosin Y, 0.5% alcoholic solution
24819	Ammonium Blue
24820	Lithium Blue
24605	Scott's Bluing Reagent

## Questions and Answers

### Pertaining to Hematoxylin & Eosin Staining

**Q. What is the difference between regressive and progressive staining procedures and why do we need both?**

**A.** In progressive staining, the desired intensity of the hematoxylin stain of the nucleus is halted by the slide or tissue section being removed from the hematoxylin solution. In regressive staining, the tissue is overstained in hematoxylin, to be decolorized or differentiated by a weak acidic water solution or alcoholic hydrochloric acid rinse to achieve the desired results. A color shift from purple to a dark red takes place in the nuclei. In order to bring the nuclei to the appropriate shade and detail or crispness it is then placed in dilute alkaline solution. The solution is usually ammonia water or a lithium carbonate rinse to blue the nuclei of the stained tissue section. The rinse established by the insoluble dye lake allows for the the blueish purple color of the nuclear components to be viewed as such under microscopic evaluation.

**Q. Why go through this whole process of over staining the nucleus and then go back and remove all that dye by decolorizing it in a weak hydrochloric acid solution?**

**A.** The nucleus reflects the mitotic or reproductive potential of the cell. The size and intensity of the staining of the nucleus chromasia is critical in the microscopic evaluation and diagnosis of a disease process. Optimal results, or correct hematoxylin staining shows a crispness of the nuclear chromatin. The crispness is a delineation of the nuclear membranes and appropriately stained or sharp condensed chromatin against an unstained cytoplasm. Harris', Erlich's and Delafield's formulations are known regressive hematoxylin stains.

## Questions and Answers

### Pertaining to Hematoxylin & Eosin Staining *cont.*

**Q. What about the counterstain or the cytoplasmic stain? What are the most important characteristics it should have to support the type of staining that is done within a laboratory?**

**A.** Due to the terminal amino group (-NH<sub>2</sub>) and carboxyl (-COOH) groups found on proteins as well as the side chains of amino acids, proteins may be both positively as well as negatively charged. The charge is largely dependent on the pH of the solution. Optimal pH of the Eosin or cytoplasmic stain should remain at 4.6-5.0. If the pH is too high the proteins in the cytoplasm may not have an affinity for the eosin and not stain properly.

**Q. What are the differences in hematoxylin formulations?**

**A.** Hematoxylin is extracted from the wood of the logwood tree and the most widely used dye in histology. Combining the extracted hematein with a metal mordant such as aluminum, iron or tungsten causes an oxidation reaction creating an excellent nuclear stain. Formulations vary in design based on the pH of the hematoxylin revealed in the intensity and specificity of the staining protocol.

**Q. Which hematoxylin use alum as the mordant?**

**A.** Harris, Gill's #1, #2, #3 and Mayers Hematoxylin formulations.

**Q. Which hematoxylin use iron as the mordant?**

**A.** Weigert's hematoxylin, because iron hematoxylin formulations resist decolorization in more acidic staining solutions, more so than the eosin, eosin-phloxine pH of the cytoplasmic stain.

**Q. What should the eosin or cytoplasmic stain look like if it stains cytoplasm properly?**

**A.** It should provide a varying shade of pink for erythrocytes, collagen and the cytoplasm of muscle and epithelial cells.

#### Polysciences, Inc. 2008-2009 Catalog

Processing & Embedding • Staining, Histology, Cytology  
Life Sciences Applications • Special Stains & Reagents  
Electrophoresis Products • Microbiology Products

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## Science Solutions

### Questions & Answers pertaining to Biosciences (Histology, Immunohistochemistry and Anatomic Pathology)

**Q. What is the difference between Micro-Cut and Polyfin® Paraffin?**

**A.** Personal preference. Micro-Cut is a slightly firmer wax. Polyfin® is more of a multifunctional paraffin that is used in infiltration and embedding.

**Q. Can Peel-A-Way® molds be used to freeze tissue samples?**

**A.** We recommend adding a small amount of freezing media to the bottom of the mold and allowing it to become cold to assist in orientation of the specimen. The slightly stiffer material will allow better placement of the specimen face. Then fill the mold to an area above the tissue so you have a good base and freeze as usual. The molds will be fine in liquid nitrogen, isopentane/liquid nitrogen, dry ice or on the freezer bar of the cryostat. The block face will be against the bottom of the mold and as the mold is peeled away, the top area will become the base for the cryostat chuck. Simply place a small amount of freezing media on the chuck to attach the block and place on the quick freeze bar (in most cryostats). This will allow you to have a very well oriented block face and cutting surface.

**Q. What fluorescent dyes does Polysciences, Inc. sell?**

**A.** Bisbenzimidazole, Calcein, CTC, DAPI, Ethidium Bromide, Fast Blue, FITC, Uvitex® 2B, Rhodamine B, CellVue®, NeuroVue® and SRflour® Dyes.

**Q. How do I cut my problem tissue?**

**A.** **HistoHeme** - for bloody specimens like placenta and products of conception. **Soft Block** - for hard to cut specimens like uterus, cervix, prostate chips and organ resections. **Soft Nail** - for nail specimens and other keratinized tissues. **Poly-NoCal & Fixative and Poly-NoCal End Point Determination Kit** - eliminates the problem of over decalcifying tissue that is unstainable and unable to undergo further histological processing.

**Q. How can I cut frozen sections of formalin fixed tissue?**

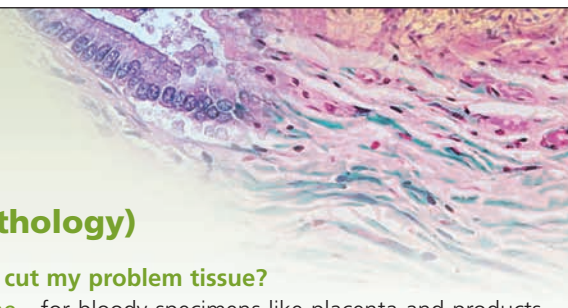
**A.** Soak the tissue in a 2% solution of sucrose overnight.

**Q. What specialty products do you carry for Immunohistochemistry?**

**A.** Lyophilized DAB Chromagen, L.A.B. Solution, Hope® Fixation System I and II, Immuno-Bed® Kit, buffers and more.

**Q. Is there a way for my lab to "Go Green"?**

**A.** We offer the following "Green" products - CitraMount® Medium, Clear-Advantage Xylene Substitute, ParaClear Odorless Xylene Substitute and Aqua-Poly/Mount Coverslipping Media.



# Product Spotlight

**New**

## Flash Dip FNA/H. Pylori Stain Kit

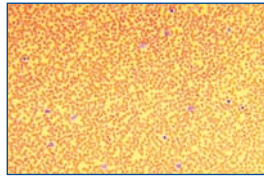
Flash Dip FNA/H. Pylori Stain Kit is a high quality, rapid turnaround time staining kit that serves many purposes in the cost conscious laboratory environment.

### USEFUL FOR:

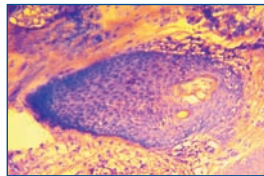
- Fine Needle Aspirations
- Frozen Sections
- Blood Smears
- Cytological Specimens
- Cytopreps, Touch Preps
- Bone Marrow Biopsies
- Microorganism Detection

### ADVANTAGES:

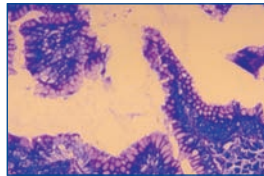
- Interpret results in 15 seconds
- Easy to visualize nuclear and cytoplasmic staining
- Differential stain designed to show metachromasia in most dermatopathology cells
- Optimal as a hematology stain
- Excellent cytological detail
- Consistent reliable results



Blood Smears



Frozen Skin Section, 6µm



*H. pylori* in human intestine, 3µm

Photos courtesy of: Sakina Saadig, HT (ASCP), HTL (ASCP)

Cat. #	Description	Size
24606	Flash Dip FNA/H. Pylori Stain Kit	1 Kit

## Tissue Marking Dyes - 7 Color Kit

Our Marking Dyes for Tissue are designed to perfect orientation of excised surgical specimens. This method of permanently marking the margins of tissue specimens is very beneficial to surgeons and pathologists testing for skin cancer. This method of marking multiple margins of specimens was originally documented by Dr. Frederick Mohs.



### Features:

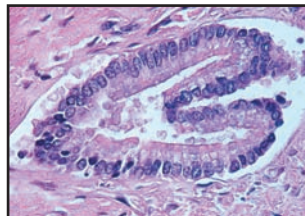
- Save time - no post fixative required
- Fast drying - high quality opaque pigments
- Dyes can be used on fresh or formalin fixed specimens
- Maintains brilliant color through all phases of processing
- Replacement dyes available in convenient 2oz. & 8oz. bottles

**Kit Contains:** Seven 2oz. bottles of dye: blue, black, yellow, red, green, orange & purple, convenient holder and application sticks.

Cat. #	Description	Size
24772	Marking Dye for Tissue - 7 Color	1 Kit

## Bluing Reagents

Our premixed and ready to use bluing reagents provide crisp nuclear detail obtained with hematoxylin and eosin stains.



### Ammonium Blue

Ammonium Blue is a very rapid formulation for bluing hematoxylin in only 3 minutes. Ammonium Blue is buffered at an alkalinity of (pH = 10.0).

### Lithium Blue

Lithium Blue is a gentle yet rapid formulation for bluing hematoxylin in only 5 minutes.

### Scott's Bluing Reagent

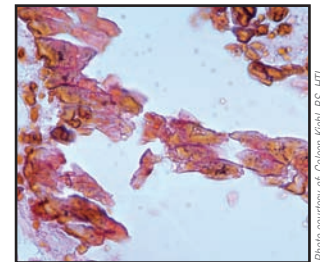
Gentle formulation of "bluing" reagent for those specimens that may be affected by more harsh agents. Our premixed and ready to use Scott's Bluing Reagent provides rapid bluing and crisp nuclear detail obtained with routine hematoxylin and eosin stains. For use in both Cytology and Histology.

Cat. #	Description	Size
24819	Ammonium Blue	1 gal
24820	Lithium Blue	1 gal
24605	Scott's Bluing Reagent	100ml, 1 gal

**New**

## Von Kossa Method for Calcium Kit

Abnormal deposits of calcium may be found in any area of the body. Polysciences' new **Von Kossa Method for Calcium Kit** demonstrates calcium phosphate and calcium carbonate salts.



Calcified necrotic Kidney, 4µm

Use as a bone stain to indicate osteomalacia, or in other paraffin embedded tissues to stain calcium deposits seen in metabolic diseases, such as: Paget's disease, renal osteodystrophy and hyperparathyroidism, necrotic areas associated with TB, infarction (Gandy Gamna bodies), atheroma in blood vessels and Malakoplakia in the bladder (Michaelis-Gutman bodies).

Cat. #	Description	Size
24633	Von Kossa Method for Calcium	1 Kit