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Limited Time Offer!

**Rapid Fluorescent
Fungal Detection!**

Fungi-White
Fluorescent Stain

See page 3 for details.

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High Potency Linear Polyethylenimine (PEI)

New New Cationic Polymer: Polyethylenimine "Max"

Cationic polymers with free nitrogen groups are difficult to produce from cationic monomers with unprotected amine groups as the starting materials.

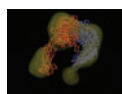
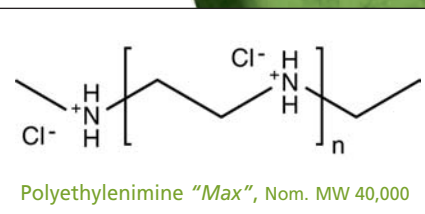
For many years Polysciences, Inc. has offered both linear polyethylenimine with secondary amine groups and branched polyethylenimines which contain a mixture of primary, secondary and tertiary amines.

Although both types of materials have proved their value in a variety of end use applications, a fully cationic linear polyethylenimine with high

charge density is potentially of great interest.

Alexander M. Klivanov¹ and coworkers at MIT have made remarkable advances in deactivating the influenza virus and pathogenic bacteria with charged polymeric coatings of cationic linear polyethylenimine. Their experience with glass slides coated with polyethylenimine polymers (*Proc. Natl. Acad. Sci. USA 2006, 103, 17667*) demonstrates that within five minutes of putting influenza virus on the glass slide, all the virus is inactivated.

continues, see Polyethylenimine pg. 4



Uranyl Formate

New Negative Imaging Stain for Electron Microscopy

Electron microscopy (EM) has become an increasingly vital part of ultra-fine structural determination. However, limitations to the use of EM in the study of biological molecules include their inherent sensitivity to radiation damage, their poor electron scattering properties and the tendency to dehydrate and undergo conformational changes under high vacuum.

Negative staining provides a way around many of these limitations. First identified (by accident) in the early 1950's, sample ghosts (white on a black background) were noticed after staining with phosphotungstic acid.

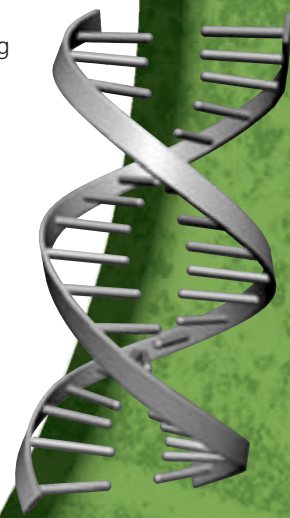
By embedding the sample material in a dried heavy metal solution, specimen contrast can be achieved by obtaining images of the negatively stained molecule. Most biological molecules have densities ranging from 1.0 - 1.7 g/cc but the dense stains are in the range from about 3.8 - 5.7 g/cc.

The main objective of negative staining is to provide a high contrast electron dense layer that preserves the fine structure of the target. Samples ranging from ribosomes and enzymes to bacteriophages and microtubules have been stained using this method.

In an informative technical paper by Thomas Walz of the Harvard Medical School¹, the advantages of negative staining techniques are outlined, including using image averaging to enhance signal to noise ratios and computation methods to develop 3D images. Protocols for imaging biomolecules (integrin and fibronectin complex) are provided.

Several heavy metal compounds may be options for negative staining.

*continues, see
Uranyl Formate pg. 4*



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New Tissue Marking Dyes & Kits

Orange & Purple Dyes and 7 Color Dye 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. The procedure 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**
- **Easy to use kits:**
 - 5 dye kit - black, blue, green, red & yellow
 - 7 dye kit - black, blue, green, red, yellow, orange & purple
- **Dyes can be used on fresh or formalin fixed specimens**
- **Maintains brilliant color through all phases of processing**
- **Replacement dyes available in convenient 2 and 8oz bottles**



5 Dye Kit & New 7 Dye Kit

[Technical Data Sheet Online](http://www.polysciences.com/shop/assets/datasheets/445.pdf)
 Marking Dyes for Tissue, TDS #445;
www.polysciences.com/shop/assets/datasheets/445.pdf

Description	Cat. #	Size
Marking Dye Kit for Tissue - 5 Color	24108	1kit
Marking Dye Kit for Tissue - 7 Color	24772	1kit
Orange Marking Dye for Tissue	24117	2oz or 8oz bottles
Purple Marking Dye for Tissue	24120	2oz or 8oz bottles

New Clear-Advantage

A Xylene Substitute Who's Name Says It All!

Achieve consistent results with excellent tissue morphology, nuclear detail and cell structure definition!

Clear-Advantage is a specific fraction of petrochemical derivatives that *creates a safer xylene substitute for processing, staining and coverslipping*. There are several types of xylene substitutes in the market today including both standard hydrocarbon and citrus limonene types that contain overpowering odors. Clear-Advantage is virtually odorless and offers improved clearing performance compared to these types.

Clear-Advantage Benefits:

- Slides dry 3 times faster
- Slides clear faster and crisper
- Paraffin dissolves 50% faster than with xylene
- Virtually odorless, low toxicity and stable on storage
- Decreases "tissue hardening" as experienced with xylene
- Compatible with automated processing units manufactured by TBS®, Leica, Sakura, Shandon, Lipshaw, Surgipath® and others
- Superior tissue morphology and cell structure definition

Description	Cat. #	Size
Clear-Advantage	24770-1	1gallon
	24770-4	4 x 1gallon (case)



Clear-Advantage!

- **Dries 3x Faster**
- **Virtually Odorless**
- **Exceptional Morphology**

Rat lung bronchi section, cleared with Clear-Advantage.



Identifying Microsporidia by Various Staining Methods

New Fungi-White Offers More Effective Method!

Microsporidia, (a term used for obligatory fungi) are, and have been quite a nuisance to the human race. These spores measure approximately 3 to 5µm and are oval in shape. They have caused gastrointestinal, sinus, pulmonary, muscular, eye and renal diseases.

Patients who are immunocompromised, HIV positive, on chemotherapy or are diabetic are quite susceptible to fungal infections. Definitive diagnosis of microsporidia is performed by light microscopy and many methods can be utilized to visualize the spores. Usually multiple methods are incorporated to assure the clinician that treatment is optimal. Many clinicians use both fluorescent and non-fluorescent methods.

Polysciences, Inc. offers a series of stains and kits for the diagnosis of microsporidia. We specialize in high performance stains and reagents for histology and cytology. The list below represents only a small portion of our commitment to manufacturing the highest quality stains and providing multiple options for technicians and pathologists. **PF**

For more information about our full line of stains and stain kits, visit: www.polysciences.com

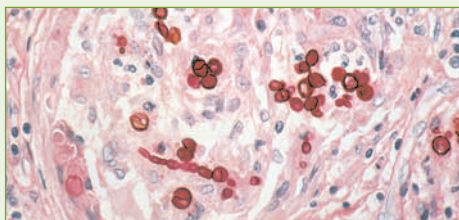
New

Fungi-White Stain Kit

Rapid and very effective method for visualizing microsporidia. Reveals intense staining of the spores with outstanding morphology and differentiation of inflammatory cells by the absence of fluorescence. Calcofluor white users will find this new stain easy to use and highly effective.

Periodic Acid Schiff's (PAS) Stain Kit

The organisms appear pink to almost translucent in color.



Histopathologic changes in phaeohyphomycosis due to *Wangiella dermatitidis* using PAS stain. Photo: CDC/Dr. Libero Ajello.

2% Acridine Orange, Ready-to-Use

Spores are oval and highly refractive. Intensity of stain can vary depending on the maturation stage or level of the microsporidia.

Polysciences, Inc. offers multiple sizes of dry certified powders and "ready-to-use" reagents for all your staining needs.

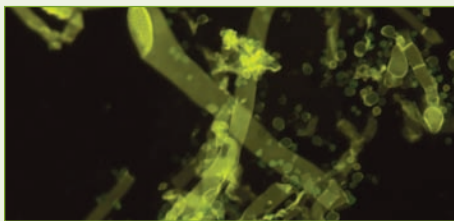
For easy to use Fungal and Pneumocystis detection, choose from our:

Fungi-Fluor® Kit for Fungal Detection

Detects many fungal species including *Candida*, *Aspergillus*, *Histoplasma* and *Coccidioides*.

Fungi-Fluor® Pneumocystis Kit

Identifies *Pneumocystis Carnii* by bright apple green fluorescence with a characteristic "double parenthesis" structure.

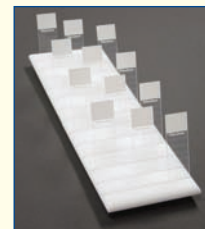


Aspergillus culture stained with Fungi-Fluor®, no counterstain, 40X, FITC filter.

New

Microscope Slide Holder Block

Our new durable, chemically resistant polyethylene



Microscope Slide Holder Block will accommodate up to 40 separate 3" X 1" microscope slides. The angled slide holder slots permit easy access to individual slides and rapid viewing of slide labels. The polymer composition of the block resists staining and washes clean with ethanol, isopropanol or other organic solvents. (Cat. #24764)

Visit www.polysciences.com to learn more about our full line of Microscopy products

20% Off
Fungi-White Kit!

New

Fungi-White Stain Kit

Rapid Fluorescent Fungal Detection!

Suitable for use in identification of fluorescent fungal elements and trichomonas detection. Rapid chemo-fluorescent method useful for the detection of microsporidia and *Acanthamoeba spp.* The Fungi-White dye fluoresces when exposed to ultraviolet light (below 400nm wavelength). The procedure is useful on fecal smears, cell cultures or other sample materials.

Description	Cat. #	Size
Fungi-White Kit	24692	1 Kit

To order, call or fax your local Polysciences office, and mention promotion code **FUNWH0207**. Web orders require promotion code **FUNWH0207** added to the "comments" field during final purchase approval.

Offer valid through April 27, 2007 on orders placed by phone, fax or web. Discount off local list price. To take advantage of this offer mention promotional code **FUNWH0207**. When ordering via the web, place promotional code **FUNWH0207** in the "comments" field during final purchase approval. Web orders will not show discount at the time of purchase. Discount will be applied to the order and appear on invoice. Offer can not be combined with any other discount or promotion on same products.

Description	Cat. #	Size
Fungi-White Stain	24692	1 Kit
Periodic Acid Schiff's Stain Kit	24200	1 Kit
2% Acridine Orange, Ready-to-Use	24603	10ml
Fungi-Fluor® Kit for Fungal Detection	17442	1 Kit
Fungi-Fluor® Pneumocystis Kit	22363	1 Kit

Polyethylenimine *continued from pg. 1*

The polymers stand up from the surface like spikes, which appear to poke holes in the virus's lipid envelope. The hydrophobic nature of the polymers allows them to interact with viral or bacterial lipids. To work, the cationic polymers must be charged to punch holes in the virus. The researchers mix the polymer with an organic solvent, which creates a coating that can be applied to any surface. The solvent evaporates, leaving the polymer adhered to the surface. In the future, high-risk public areas such as clinic waiting room door handles or air filters may benefit from this new discovery.

Polysciences' current range of linear polyethylenimines are offered in three molecular weights ranging from 2,500 to 25,000 to 250,000.

One synthetic procedure used to produce these products leaves blocks of unhydrolyzed propionamide groups on some of the nitrogen groups due to steric hinderance during hydrolysis.

Up to 8% or more of the nitrogens may bear residual amide functionality and are unavailable to take place in reactions involving the free amine.

Polysciences, Inc. is pleased to announce the availability of a virtually fully hydrolyzed linear polyethylenimine with longer contiguous ethyleneimine segments. Although N-deacylation reactions are notoriously difficult, our new linear polyethylenimine "Max" material is believed to contain more than 11% additional free (protonatable) nitrogens than our previous material. Estimates² of the average number of repeating ethyleneimine units ranges to approximately 581 per segment, resulting in dramatically increased lengths of protonatable nitrogens. **PF**

References

- 1) Klibanov etc. al. "Driving a Spike Into Viruses." *Chemical & Engineering News*, November 20, 2006: 17.
- 2) See Klibanov etc. al. *Proceedings of the National Academy of Sciences*, Vol. 102, No. 16, 5679-5684 (2005). Published on-line prior to printing on 4/11/05

Description	Mol. Wt.	Cat. #	Size
Polyethylenimine, Linear	MW 2,500	24313	2g
	MW 25,000	23966	2g
	MW 250,000	24314	2g
*Polyethylenimine "Max"	Nom. MW 40,000	24765	2g

Elemental Analysis of Polyethylenimine "Max"			
	Carbon	Nitrogen	Chloride
Theoretical	30.20	17.62	44.57
Found	29.92	17.35	44.25

*Our high potency Polyethylenimine "Max" is supplied as a hydrochloride salt for ease of handling.

Uranyl Formate

Negative Imaging Stain for Electron Microscopy *continued from pg. 1*

These include uranium, molybdenum and tungsten based stains. Negative stains are selected to be chemically inert, non-volatile and must deposit uniformly.

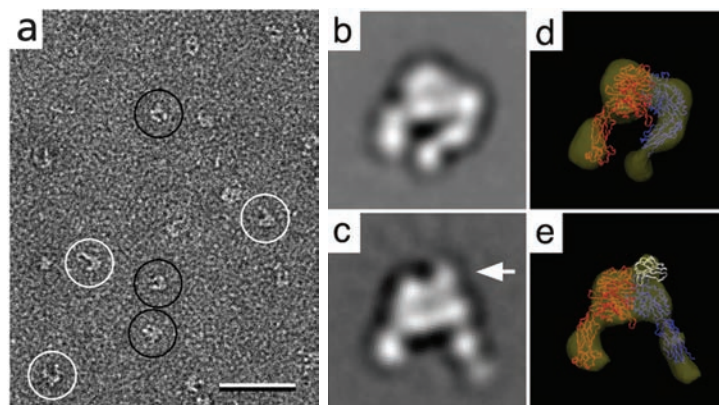
Among these, the uranium compounds often give the highest contrast images. Uranium acetate is selected due to its fast fixation properties, virtually eliminating pH induced changes in biomolecules.

Recent advances in EM negative staining have shown that uranyl formate is another tool in the development of high quality images due to its higher density and finer grain structure vs. uranium acetate. Polysciences, Inc. offers both uranyl acetate and uranyl formate for EM imaging. **PF**

Reference

- 1) See T. Walz et. al., "Negative Staining and Image Classification - Powerful Tools in Modern Electron Microscopy", *Biological Proceedings Online*, (6), pg. 23-34 (2004)

Description	Cat. #	Size
Uranyl Formate	24762	1g, 5g
Uranyl Acetate 98%	21447	25g



Negative stain electron microscopy of the integrin $\alpha 5 \beta 1$ headpiece with and without a bound fibronectin (Fn) fragment containing Fn domains 7 to 10 (Fn9-10). **a**: Negative stain electron microscopy reveals that the $\alpha 5 \beta 1$ headpiece adopts two conformations, namely a closed (black circles) and an open conformation (white circles). **b and c**: Class averages representing the closed (b) and the open conformation (c). Binding of Fn9-10 fragment (arrow in c) induces the open conformation of the headpiece, while the unliganded is in the closed conformation (b). **d and e**: 3D reconstructions of an unliganded (d) and an Fn9-10-liganded $\alpha 5 \beta 1$ headpiece (e) with the fit atomic structures of the αV and $\beta 3$ subunit ($\beta 3$) in red and blue, respectively, and of the Fn9-10 fragment ($\beta 4$) in white. The scale bar corresponds to 50 nm and panels b to e have a side length of 22 nm.

Electron Micrographs courtesy of Tom Walz, Harvard Medical School.



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