







www.microscopy-today.com

INTRODUCING The NEW Hitachi HT7700 120kV Bio-TEM Brilliant Design, Brilliant Features, Brilliant Images

All new SEM's, TEM's, and FIB's are now offered with a 3-year parts warranty!*

The HT7700 features:

- Hitachi Dual Gap Objective Lens for optimum contrast and resolution
- High-speed CCD camera for clear, sharp image observation
- Ergonomically designed with the user friendliness of a SEM
- > Automated digital montage function with high-precision stitching software
- Auto focus, stigmatism, contract, and brightness functions
- Fully dry vacuum system
- Automated tomography and SDD EDX options

* Consumables and non-Hitachi accessories excluded. Offer valid in the United States only. Requires acceptance of additional Terms & Conditions. Hitachi High Technologies America reserves the right to terminate the 3-year parts warranty program at any time. Contact us for details.

Hitachi High Technologies America, Inc. toll free: 800-548-9001 (US & Canada) email: sales-LS@hitachi-hta.com

www.hitachi-hta.com





Feature Article

8 Immuno-Fluorescence Scanning Electron Microscopy of Biological Cells

Phyllis J. Fisher, William S. Wessels, Allan B. Dietz, and Franklyn G. Prendergast

Instrumentation

14 Hyperspectral Confocal Fluorescence Microscope: A New Look into the Cell

M. Cristina Pedroso, Michael B. Sinclair, Howland D.T. Jones, and David M. Haaland

- 20 AFM Measurements of DNA Molecule Electron Transport Properties Jim McMahon
- 24 Security Stripes: Visible Seals for Robust Documentation and Authentication of Digital Images Charles Bradley and James Mancuso

Materials Applications

28 X-Ray Microanalysis of Art Glass Surfaces R.B. Simmons

Microscopy Innovations

32 2010 Microscopy Today Innovation Award Winners

Microscopy Education

40 Promotion of Inquiry-Based Science Education: One Teacher's Story Justin A. Kraft

Microscopy Pioneers

44 Pioneers in Optics: Étienne-Jules Marey and Ignazio Porro Michael W. Davidson

Microscopy Protocols

48 *p*-Phenylenediamine: An Adjunct to and a Substitute for Osmium Tetroxide E. Ann Ellis

Departments

- 5 Editorial
- 6 Carmichael's Concise Review
- 52 Industry News
- 54 Product News

- 56 NetNotes
- 70 Calendar of Meetings
- 73 Dear Abbe
- 74 Index of Advertisers

About the Cover

Contents



Cathodoluminescence SEM imaging of human monocytes containing tumor cell exosomes.

See article by Fisher et al.



Truly integrated microanalysis at the tip of your fingers.

The Thermo Scientific NORAN System 7 delivers the ultimate in seamless integration of EDS, WDS and EBSD with a single system interface for all your data acquisition and processing.

NORAN System 7 speeds you to answers with blazing fast data acquisition and processing. UltraDry silicon drift detector EDS, MagnaRay WDS and QuasOr EBSD detector technologies provide virtually instant results. Advanced time saving features such as automated quantitative mapping, Direct-to-Phase, Point and Shoot analysis and guided acquisition setup help increase your analytical productivity without sacrificing control.

Our integrated suite of acquisition and processing software is unparalleled in the industry. Analyze your sample data at the microscope or at your desk. Produce your reports at the click of a button.

www.thermoscientific.com/microanalysis



Thermo Scientific EDS, WDS and EBSD The optimal integration of detectors, analyzer and software for all your microanalysis needs.



Part of Thermo Fisher Scientific

Moving science forward