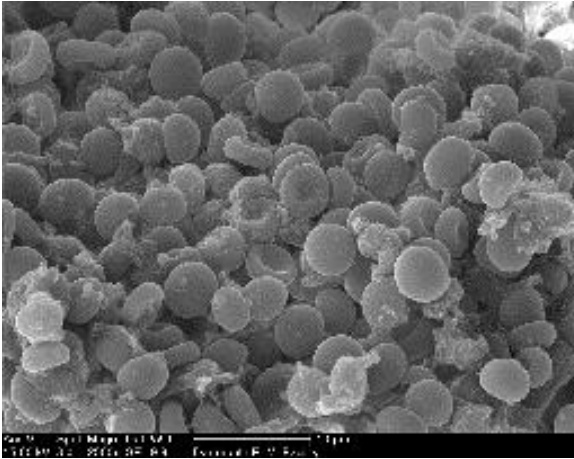


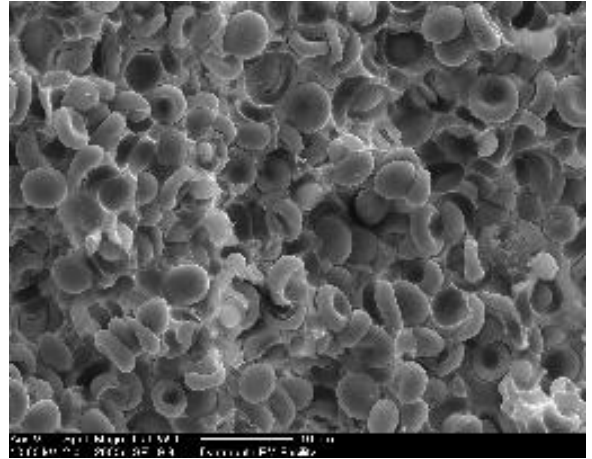
EMS MICROSCOPY ACADEMY

BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE

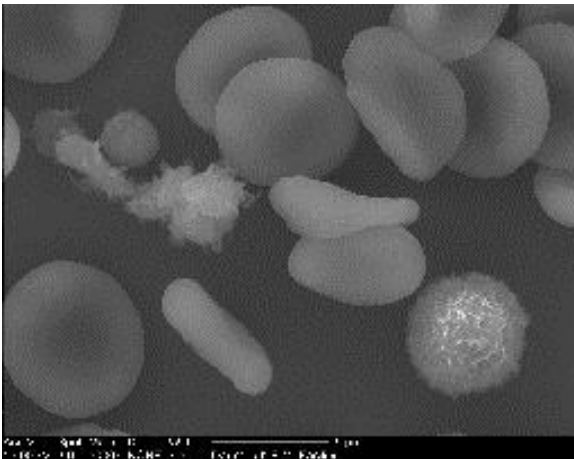
Examples of the endless possibilities in the field of Microscopy: SEM



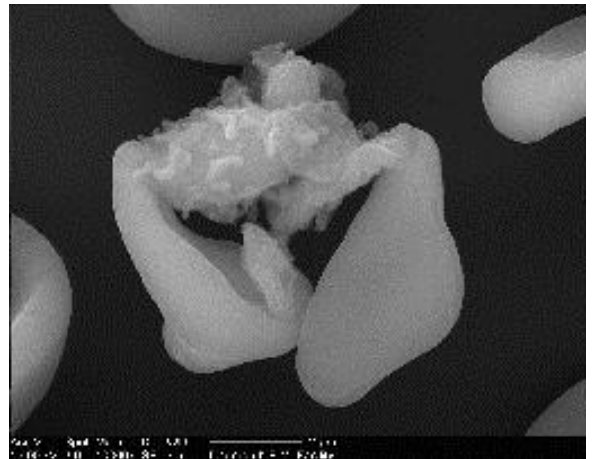
Mouse Lung Tissue: Red blood cells in the lung.
Louisa Howard, Dartmouth College



Mouse Lung Tissue: Trachea area. Red blood cells inside blood vessel in the lung.
Louisa Howard, Dartmouth College



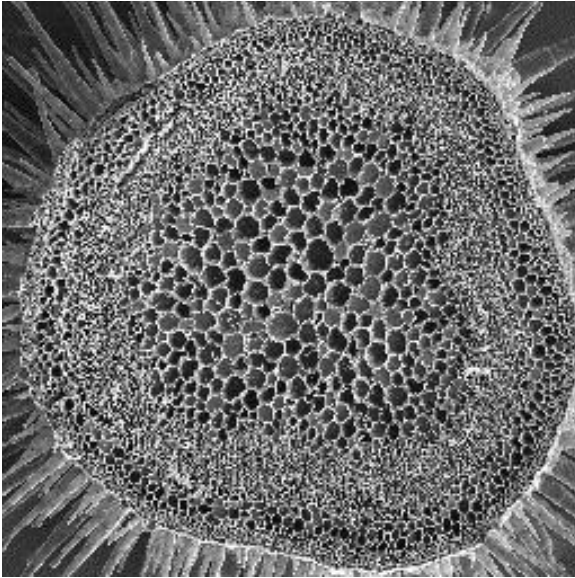
Human Blood Cells: Red blood cells/Platelets/White blood cells.
Louisa Howard, Dartmouth College



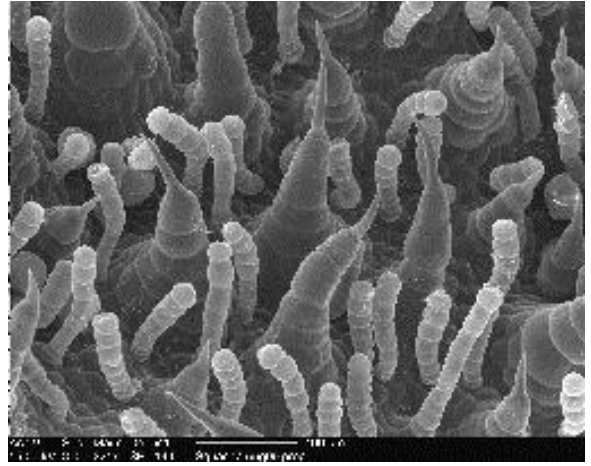
Human Blood Cells: Red blood cells/Platelets.
Louisa Howard, Dartmouth College

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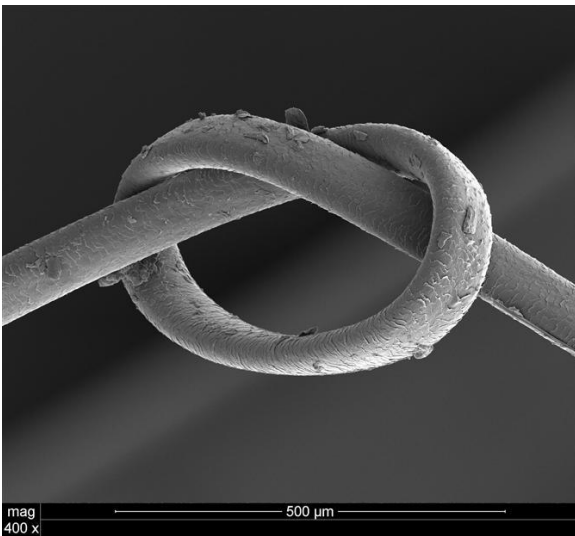
BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE



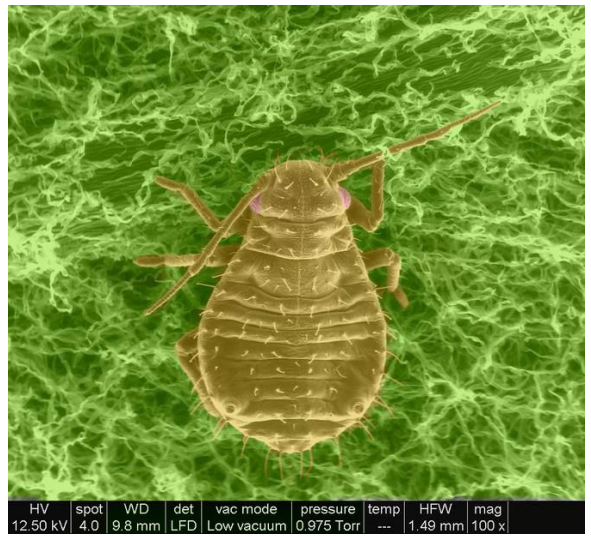
Scanning Electron Microscope image of *Nicotiana glauca* stem cross section. Image shows outer epidermal layer, followed by the cortex and then large vascular bundles. The vascular bundles contain the phloem (nearest the cortex) and xylem.
Louisa Howard, Dartmouth College



Scanning Electron Microscope image of sunflower lower leaf surface.
Louisa Howard, Dartmouth College



Knot of human hair.
Courtesy of Frans Holthuysen



Aphid on white poplar.
Courtesy of Riccardo Antonelli

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BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE

Targeted Participants

Individuals who currently perform or will be responsible for the preparation of samples and/or operation of the SEM in a research, academic, or industrial setting.

Details

Tuesday - Thursday

June 6 - 8, 2017

8:00 a.m. - 4:30 p.m.

Hatfield, Pennsylvania, USA

The EMS Microscopy Academy

Located in Hatfield, Pennsylvania, the Academy provides electron microscopy classes, workshops and training sessions for all fields of microscopy, including materials science and biological science.

Scope of Class

This course will introduce participants to methods of sample preparation and SEM parameters and operation needed for accurate analysis.

The preparation of samples will start with determination of ROI and subsequent selection of gross cut orientation and determination of which dehydration technique to use: freeze drying, HMDS, Hitachi's ionic liquid or critical point drying (CPD). The chemical processing required before CPD will be stressed. Special attention will be paid to orientation, stability and grounding of the sample when mounting to facilitate ease of imaging. The advantages, disadvantages and instrument requirements for the various coating materials: Au, Pt, Pt/Pd will be discussed.

Selection of accelerating voltage (kV) and spot size are critical for surface detail, resolution, and charging and will be covered in detail. Parameters such as working distance for depth of field (Dfi) and resolution, plus tilt and raster rotate will be examined for proper image collection.

Format

Lecture, demonstration, and hands-on practice, as well as round table tips and tricks discussions. Participants are encouraged to bring their own samples, if possible.

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BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE

Main Curriculum

Identification and isolation of ROI
Theory and hands-on chemical processing
Theory and hands-on CPD, HMDS, and Hitachi's ionic liquid
Theory and hands-on freeze drying
Mounting
Theory and hands-on sputter coating
SEM theory and discussion of parameters affecting image quality
Demonstration and hands-on practice of SEM operation and effects of parameters
Theory and demonstration and hands-on practice of variable pressure and Hitachi's ionic liquid

Equipment

Hitachi S3500 SEM	EMS 850 Critical Point Dryer
PP3010T Cryo Preparation System	TES 150T ES Sputter Coater

Faculty

1. **Michael Kostrna** was the program director of the Electron Microscopy Technician program at Madison Area Technical College and has more than 35 years in EM technical education and research experience. He has been training EM students for 29 years and has developed curricula and lab exercises for TEM, SEM, OLM, lab safety, introductory and advanced biological EM, EM, maintenance, and x-Ray microanalysis. He has worked with companies such as SC Johnson Polymer, Dow Chemicals, Io Genetics, Virent Technologies, ABS Global, NanoOnocology, and Microscopy Innovations, and in the process gained insight to the various applications of EM.
2. **Al Coritz** has been working in the Electron Microscopy field for 38 years, beginning at the Yale School of Medicine and ending up on the commercial side with several key EM companies. His specialty is Cryo-techniques and Thin Film Technology: i.e. Freeze Fracture/ Rotary Shadowing, High Pressure Freezing, and more. He is currently with Electron Microscopy Sciences where he has been the Technical Director for over 20 years.

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BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE

Schedule

Tuesday, June 6, 2017

8:00-8:30 Introductions of staff and participants
8:30-10:00 Bio processing theory
10:00-10:15 Coffee break
10:15-11:15 SEM theory
11:15-12:00 Mounting and coating theory
12:00-1:00 Lunch – Divide into groups A & B
1:00-3:00 Group A hands-on specimen prep
Group B hands-on SEM operation
3:00-4:30 Group A hands-on SEM operation + mount and coat prepared samples
6:30 Hosted dinner

Wednesday, June 7, 2017

8:00-8:30 Discussion of previous day's activities and experiences
8:30-12:00 Group A hands-on SEM operation + mount and coat samples
Group B added activity + mount and coat samples
12:00-1:00 Lunch
1:00-4:00 Group A added activity
Group B hands-on SEM operation

Thursday, June 8, 2017

8:00-8:30 Roundtable discussion of previous day's activities
8:30-9:30 Theory of variable pressure (VP) imaging – advantages and disadvantages
9:30-10:30 Demonstration of VP
10:30-10:45 Coffee break
10:45-12:00 Participant VP imaging
12:00-1:00 Provided lunch
1:00-1:30 Workshop assessment
1:30-4:30 Continued participant VP imaging

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Registration Fee: \$995.00 Includes

- Workshop syllabus
- All supplies
- Reagents and solutions
- Lunches
- Coffee
- Tea
- Dinner on the first evening of the workshop

Lodging

Participants are responsible for making their own hotel reservations.

The following hotel has been designated as the host hotel:

Homewood Suites

1200 Pennbrook Parkway
Lansdale, PA 19446
Phone: 215-362-6400

The special rate is \$119.00 per night (plus tax) which includes a hot breakfast and a light dinner in the evening.

Please make your reservations and mention you are participating in the EMS Workshop.
GROUP CODE: EMS WORKSHOP

Everyone should plan to arrive the evening of June 5th.

Enrollment Note

Registration will be limited to a maximum of 15 participants.
EMS will provide samples to those who prefer not to bring their own.

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BIOLOGICAL SEM WORKSHOP: A COMPLETE PICTURE

Printable Registration Form

_____ M / F
Name / Title

Institution

Department

Mailing address

City / Zip

Country

Telephone / Fax

Email:

Will you bring your own specimens? Yes___ / No___ (See Note on prior page)
What Samples are you bringing and most interested in?

All registrations must include payment.

Rate \$995.00 per Person

Number of Participants _____

Total \$_____

Pay by check: make payable to EMS and reference "Biological SEM Workshop".

Pay by credit card: Credit Card Type _____

Credit Card Number _____

Expiration Date _____ 3 Digit Code _____

Signature / Date

Return your registration to:

Stacie Kirsch

1560 Industry Road

Hatfield, PA 19440 USA

Phone: 215-412-8402

E-Mail: sgkcck@aol.com or Fax: 215-412-8452

TO REGISTER ONLINE, CLICK [HERE](#).