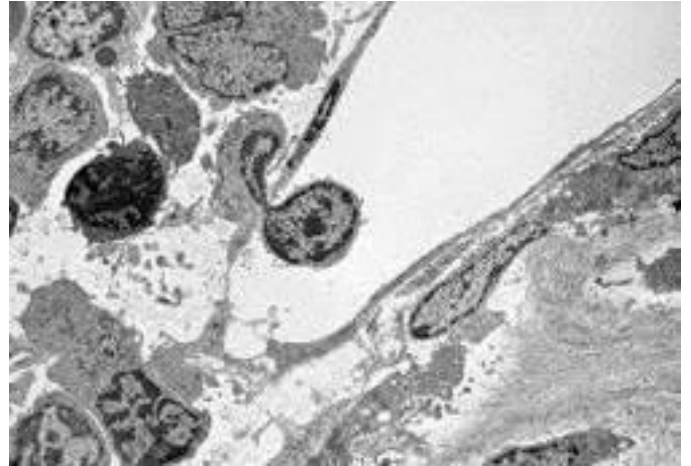
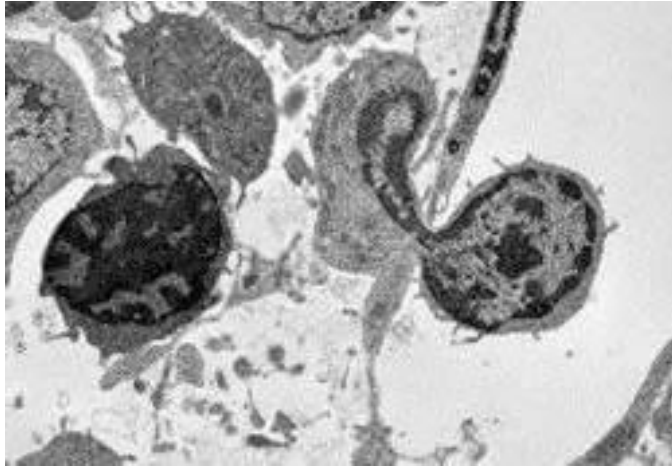


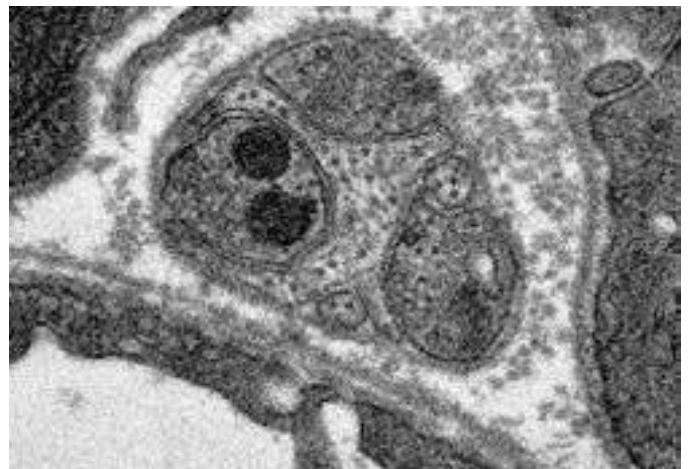
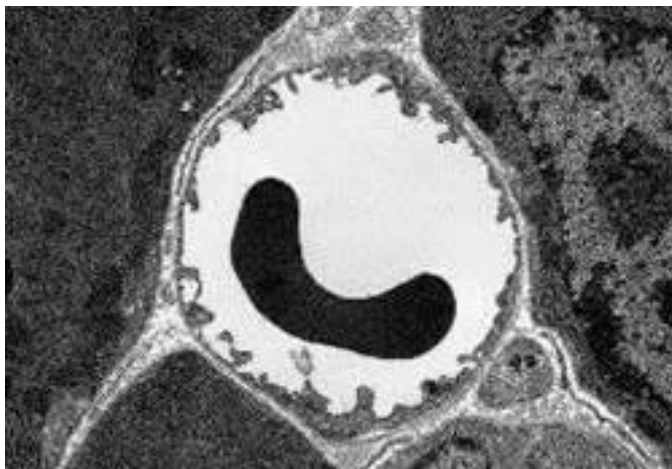
EMS MICROSCOPY ACADEMY

BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE

Examples of the endless possibilities in the field of Microscopy

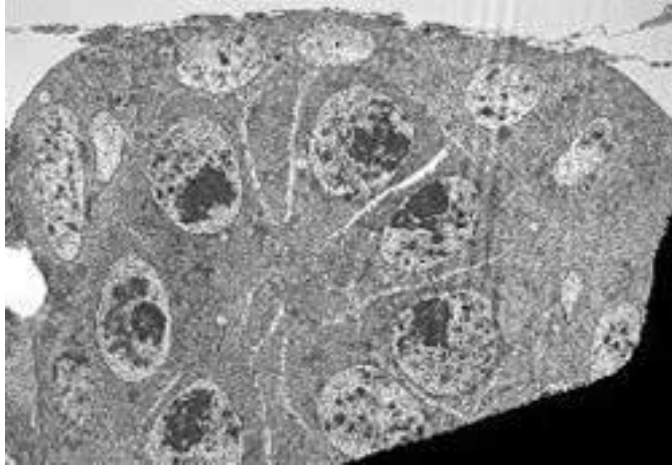


Bone Marrow: Transmission electron microscope image of a thin section cut through an area of bone marrow area near the cartilage/bone interface in a mouse kneecap. Image shows small opening in the thin endothelium of the vascular sinus wall, where a blood cell is crossing the thin vascular sinus wall and into the sinus lumen.
Louisa Howard, Dartmouth College.



Pancreas: Transmission electron microscope image of a thin section cut through the pancreas (mouse). Image shows a cross section through part of a nerve cell and part of a capillary within the pancreatic tissue. The capillary lining consists of long, thin endothelial cells, connected by tight junctions. The image shows a fenestration in this endothelial cell. Basal lamina is present at the edges of the acinar cells.
Louisa Howard, Dartmouth College.

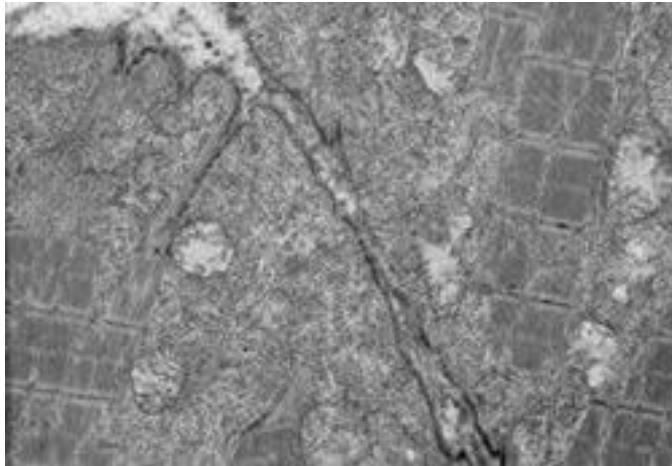
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BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE



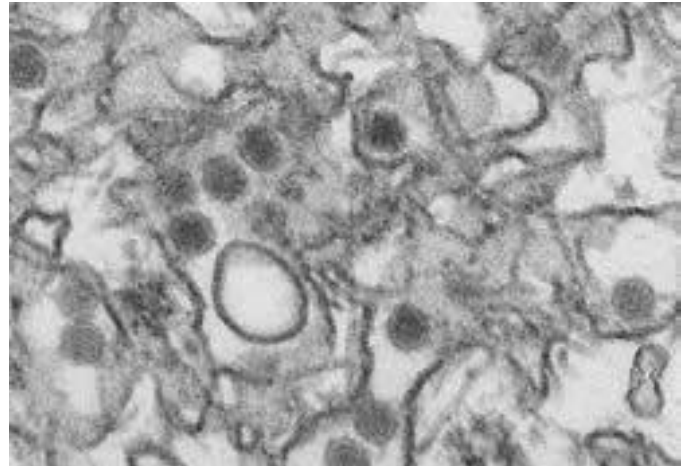
Transmission electron microscope image of a region in the *Drosophila* germarium. Specific cells in the germarium contain synaptonemal complex in their nuclei.



Transmission electron microscope image of synaptonemal complex in nuclei of *Drosophila* germarium cell.
Louisa Howard, Dartmouth College.



Transmission electron micrograph of Zebra Fish muscle.
Specimen courtesy of Dr J Leslie.



Transmission Electron micrograph of Zika Virus. Virus particles are 40 nm in diameter, with an outer envelope and an inner dense core.
Courtesy of Cynthia Goldsmith, CDC.

EMS MICROSCOPY ACADEMY

BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE

Details

Tuesday - Thursday
November 17 - 19, 2020
8:30 a.m. - 4:30 p.m.
Hatfield, Pennsylvania, USA

Targeted Participants

Individuals who are, or will be, responsible for chemical processing and sectioning of biological samples for TEM examination.

Scope of Class

The proper chemical processing of biological samples for TEM observation is essential to maintain representative morphology and ultrastructural detail. This course will cover the buffers, fixatives, dehydrants, and embedment resins most often used for EM, with their individual advantages and disadvantages discussed. The preparation of these various solutions, when necessary, will be calculated and preformed. The microwave will be utilized for all steps except polymerization. The need for specialized protocols when using specific tissues, such as myelinated nerve which requires extended infiltration, will be discussed. Epoxy (Embed 812) and acrylic (LR White) resins will be available.

The TEM's ability to provide sub-nanometer resolution is dependent ultimately on sample thickness, typically 60 nm or less. To obtain sections of this dimension requires specialized equipment, ultramicrotomes, high quality diamond knives, and a skilled technician. The process of trimming, thick sectioning for OLM observation, thin sectioning, section retrieval, and section assessment will be the major focus of this workshop. Basic operation of the TEM will include specimen insertion, condenser and objective astigmatism correction, and critical focusing.

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.

Format

Lecture, demonstration and hands-on practice as well as tips and tricks round table discussion. Individuals may bring their own samples when possible.

EMS MICROSCOPY ACADEMY

BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE

Main Curriculum

- Theory and practical preparation of buffers, fixatives, and other solutions required for chemical processing of biological samples for TEM
- Fixation theory and application of primary and secondary fixatives
- Dehydration, choosing the correct one, ETOH, Acetone, or propylene oxide
- Infiltration and choice of embedment resin, epoxy, methacrylate, or acrylic
- Embedment and maintaining orientation if applicable
- Block evaluation
- Trimming for thick survey and thin sections
- Practical aspects of microtomy and instrument parameters affecting section quality
- Adjustment of clearance angle and block face/knife edge alignment
- Thick (0.5 μm) sectioning and chromatic staining for OLM assessment
- Thin (≤ 60 nm) sectioning and section retrieval
- Post staining Pb and UA
- Section assessment and troubleshooting potential artifacts such as chatter, knife marks, and tears

Instruments Available

Leica UC7 Ultramicrotome	Boeckeler Autotome
EMS 9000 Microwave	Vacuum Oven

Faculty

Al Coritz has been working in the Electron Microscopy field for 39 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.

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 30 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.

EMS MICROSCOPY ACADEMY

BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE

Schedule

Tuesday, November 17, 2020

- 8:30-9:00 Introductions of staff and participants
9:00-9:45 Buffers and fixatives used in EM
9:45-10:00 Coffee break
10:00-11:00 Dehydrants and Resins
11:00-12:00 Prepare tissues for EM processing
12:00-12:30 Provided lunch
12:30-4:30 Divide into groups and perform station activities:
- Mixing solutions, trimming for thick and thin sectioning
- Processing tissue
- Sectioning, thick and thin, staining, and glass knife making
- TEM basic operation
6:00 Hosted dinner

Wednesday, November 18, 2020

- 8:30-9:00 Roundtable discussion of previous day's activities
9:00-12:00 Divide into groups and perform next scheduled group activity
12:00-12:30 Provided lunch
12:30-4:30 Divide into groups and perform next scheduled group activity

Thursday, November 19, 2020

- 8:30-9:00 Roundtable discussion of previous day's activities
9:00-12:00 Divide into groups and perform final group activity
12:00-12:30 Provided lunch
12:30-1:30 Workshop assessment
1:30-4:30 Extra work on individual stations

Schedule subject to change

EMS MICROSCOPY ACADEMY

BIOLOGICAL TEM WORKSHOP: A COMPLETE PICTURE

Registration Fee: \$1,200.00 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 night before class begins.

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.

EMS MICROSCOPY ACADEMY
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 \$1,200.00 per Person

Number of Participants _____

Total \$ _____

Pay by check: make payable to EMS and reference "Biological TEM Workshop Nov20".

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: info@emsdiasum.com or Fax: 215-412-8452

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