About the facility:

The Robert A. Jenkins Microscopy Facility is located in Room 29 of the Biological Sciences Building. It occupies about 2000 square feet and is equipped with both optical and electron microscopes. It serves four colleges (Agriculture, Arts & Sciences, Engineering and Health Sciences) at the University of Wyoming for their microscopy imaging needs. It also serves as an educational tool for Wyoming community colleges and K-12 schools in Wyoming.

To commemorate the great contributions made by Dr. Robert Jenkins to the University of Wyoming and to its Microscopy Facility, the trustees of the University of Wyoming approved recently the motion to rename the facility in his honor.

Dr. Jenkins was a faculty member in the Department of Zoology and Physiology at the University of Wyoming from 1966 to 1996. He served as the department head of Zoology and Physiology from 1977 to 1981 and then as Vice President for Research and Graduate Studies at UW from 1981 to 1985. He also established the UW Microscopy Facility, which continues to be an integral part of the University’s research infrastructure today.

2009-2010 Advisory Committee:

Chair
Dr. Jonathan Fox, Department of Veterinary Sciences

Members
Dr. Patricia Colberg, Department of Civil Engineering
Dr. Anne Sylvester, Department of Molecular Biology
Dr. Jeff Woodbury, Department of Zoology and Physiology
Dr. Mike Zawada, School of Pharmacology
Dr. Carol Frost, Associate VP for Research, ex officio

Contact us:

Dr. Zhaojie Zhang, Director
Robert A. Jenkins Microscopy Facility
Department of Zoology and Physiology
University of Wyoming
Laramie, WY 82071
http://www.uwyo.edu/microscopy
Phone: 307-766-3038
Fax: 307-766-5625
Email: zzhang@uwyo.edu
Transmission Electron Microscope (Hitachi H-7000)

The accelerating voltages of the TEM range from 25 – 125 kV. It is applicable to both biological and physical/material science specimens. Its resolution could be reached about 2 Å with lattice image and the magnification range is from 50X – 600,000X. The TEM was equipped with a 4000 X 4000 high resolution, cooled CCD digital camera.

TEM image of a yeast cell, showing immunogold labeling of A30P, a proteinaceous inclusion bodies, found in Parkinson’s disease. This study used the budding yeast as a model system, in attempt to understand the molecular mechanism of Parkinson’s disease. It is a collaborative research between Dr. Steve Witt (Louisiana State University) and Dr. Zhaojie Zhang (UW Jenkins Microscopy Facility) (Journal of Cell Biology, 177:1091)

Scanning Electron Microscope (Hitachi TM 1000 tabletop)

The tabletop SEM is purchased with the support of the UW Neuroscience COBRE grant. The SEM uses a back-scattered electron detector for image observation. It requires minimum sample preparation.

- **Accelerating voltage:** 15kV
- **Resolution:** 30 nm
- **Magnification:** 20 ~ 10,000×

SEM image of a insect head (*Andesipolis yanayacu*). This is a new species indentified by Dr. Scott Shaw’s lab (UW Renewable Resources). Journal of Insect Science: Vol. 9, Article 36

Laser Scanning Confocal Microscopes (Zeiss 710)

With the generous support of the UW Office for Research and Economic Development, UW Neuroscience COBRE (directed by Dr. Bill Flynn, Zoology and Physiology) and UW INBRE grants (directed by Dr. Jun Ren, Pharmacy), the Jenkins Microscopy Facility recently purchased a new Zeiss 710 Laser Scanning Confocal Microscope. The new confocal microscope is of the most current technology and capable for live cell imaging, multi-dimensional image acquisition, and many advanced imaging techniques, including Spectral imaging, FRAP and FRAT. Specific features of the confocal microscope include:
Major Equipment (cont’)

- A fully motorized inverted microscope (Axio Observer Z1)
- Objectives include a 10X, 20X, 40X, 63 X (oil) and 100X(oil)
- Seven laser lines: 405, 458, 488, 514, 561, 594 and 633 nm.
- Four detectors including one 32 channel spectral PMT, one transmitted light PMT and two regular fluorescence PMTs.
- An incubation chamber that can control temperature and CO₂. This allows for relatively long time live imaging.

Epi-fluorescence microscope
The Nikon TE300 inverted microscope is equipped with an Evolve monochrome digital camera, which is cooled to –80°C, making the chip very sensitive. It has a motorized motorized XYZ stage. With its sophisticated software (MetaMorph), users can acquire up to 6 dimensional images, and quantitative analysis.

Epi-fluorescence microscope
A satellite facility is available at the Animal Science/Molecular Biology complex. It is located in room 105 adjacent to the office of Animal Science Department. The facility has an Olympus microscope with a motorized stage, a digital camera, and sophisticated software for image acquisition and imaging analysis.

Raman Microscope
Raman microscopy is an information rich way to characterize samples in life sciences, geology, nanotechnology, semiconductor, forensic science and any other application where accurate chemical identification is needed. The Raman microscope, ExamineR, is a product of DeltaNu, a spin-off company from the University of Wyoming. It is equipped with an upright Olympus microscope and 785 nm laser.

Flow cytometer
A Millipore Guava easyCyte 8HT flow cytometer was purchased in 2009, funded by the UW INBRE grant. The flow cytometer has dual blue (488 nm) and red (635 nm) excitation lasers provide eight simultaneous detection parameters, including six fluorescent colors plus forward and side scatter for size and complexity determination.

Fluorescence Microplate Reader
A TECAN infinite M200 fluorescence microplate reader is available. It can read both fluorescence and OD for 96-well plates. Fluorescence intensity range is 230-600 nm (Ex), 330-600 nm (Em).

Equipment for sample preparation
- Glass knife maker
- Critical point dryer
- EMS-002 Rapid Immersion Freezer
- Ultramicrotome
- Spitter coater
- Microwave for tissue processing
Courses:
ZOO5725 - Transmission Electron Microscopy, offered once every two years (Fall semester in even years);
ZOO5740 - Biological Confocal Microscopy, offered once every two years (Spring semester in even years);
ZOO4900 - Problem in Microscopy, an independent study course available upon request;

Training/demonstration:
One-on-one trainings are available all year long to faculty/staff/students. Appointments can be by phone (307-766-3038) or email (zzhang@uwyo.edu). Demonstration/tour of the facility is available upon request.

User Fees (2010—2011)

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>USER CHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEM</td>
<td>$35/hour</td>
</tr>
<tr>
<td>Confocal</td>
<td>$38/hour</td>
</tr>
<tr>
<td>SEM</td>
<td>$20/hour</td>
</tr>
<tr>
<td>Epi-Fluorescence (Nikon)</td>
<td>$15.00/hour</td>
</tr>
<tr>
<td>Epi-Fluorescence (Olympus)</td>
<td>$10.00/hour</td>
</tr>
<tr>
<td>Stereo Dissecting Microscope</td>
<td>$5.00/hour</td>
</tr>
<tr>
<td>Ultramicrotomy</td>
<td>$15.00/half day, $20.00/day</td>
</tr>
<tr>
<td>Sputter coating/CPD</td>
<td>$15.00/run</td>
</tr>
<tr>
<td>Training for major instrument (TEM, Confocal etc.)</td>
<td>$150/session</td>
</tr>
<tr>
<td>Technical assistance*</td>
<td>$25.00/hour</td>
</tr>
<tr>
<td>*The $25/hour charge will apply when facility stuff operates the microscope for user(s).</td>
<td></td>
</tr>
<tr>
<td>Monthly charge</td>
<td>$10/lab</td>
</tr>
<tr>
<td>Supplies</td>
<td>At cost</td>
</tr>
</tbody>
</table>

Robert A. Jenkins Microscopy Facility
Room 29 of Biological Sciences Building
Department of Zoology and Physiology
University of Wyoming, Laramie, WY 82071
http://www.uwyo.edu/microscopy
307-766-3038
Natalee Raymond, a UW undergraduate student is working on the TEM. She works in Dr. Jing Zhou’s lab (Chemistry), making nanoparticles as catalysts. She is supported by the Wyoming EPScoR program for summer, 2010.

Students from Sheridan Community College visit the Jenkins Microscopy Facility.

Students from Laramie Junior High School touring the Jenkins Microscopy Facility.