Announcing the

Seventh Annual Workshop on Basic Confocal Microscopy

June 11-15, 2012
University of South Carolina School of Medicine Instrumentation Resource Facility

The South Carolina EPSCoR/IDeA Program, USC School of Medicine Instrumentation Resource Facility and Clemson University are pleased to announce the 7th annual workshop on Basic Confocal Microscopy. The hands-on workshop will target beginning and intermediate users of confocal microscopes and will provide lectures from experts in the field of confocal microscopy and the use of Adobe Photoshop and 3-D software for processing confocal images. Lecture material will provide information on the basics of fluorescence and fluorescent probes, biological specimen preparation (fixation, staining, optical properties and mounting materials), strategies and protocols for selection of antibody labeling, the basic components of a confocal microscope (lasers, dichroic mirrors, microscope objectives, photomultiplier tubes, etc.) and an overview of some applications of confocal microscopy.

During the laboratory portion of the workshop specimens will be processed for double and triple labeling and proper selection of user adjustable parameters to optimize image collection will be addressed and demonstrated. Participants are welcome to process their own samples or to use samples that will be provided. Several point scanning and spinning disk confocal systems from various manufacturers will be available for use so participants will have ample time for hands on use of the instruments during the workshop.

For further information contact Bob Price (Bob.Price@uscmed.sc.edu)
Workshop on Basic Confocal Microscopy

Monday June 11, 2012

8:30-9:00  Registration and Continental Breakfast – AMRL Lobby
9:00-9:15  Welcome and Logistics – Conference Room 1
9:15-10:30 Introduction and Overview of Confocal Microscopy: Price
10:30-11:00 Break, Discussion, Meet with staff to arrange specimen processing
11:00-12:00 Specimen Fixation and Processing: Jerome
12:00-12:45 Lunch (Provided) and discussion – AMRL Lobby
12:45-2:00 Basics of Fluorescence: Jerome
2:00-2:15  Break
3:15-3:30  Break
3:30-4:30  Antigen: Antibody Interactions, Labeling Protocols and Strategies: Continued
4:30-4:45  Organization of Lab Groups and Instructions - Price
4:45-5:45  Lab – Specimen Preparation and Processing
5:45- 6:30  Dinner Provided
6:30-8:30  Additional lecture material on specimen preparation, labeling strategies, etc.

Tuesday June 12, 2012

8:30-9:00  Continental Breakfast – AMRL Lobby
9:00-10:00 Lab - Wash specimens and secondary antibody incubation
10:00-11:00 Correlative Techniques: Albrecht
11:00-12:00 Digital I – Basics and Definitions: Jerome
12:00-1:30  Lunch (Provided) and Specimen Processing
1:30-2:45  Components, operating parameters, and types of confocal microscopes: Price
2:45- 3:00  Break
3:00-5:00  Lab – finish specimen processing
5:00-6:30  Dinner Provided: Seminar by Dr. Regan Baird: Live Cell Imaging
6:30-9:00  Time on Instruments

Wednesday June 13, 2012

8:30-9:00  Continental Breakfast – AMRL Lobby
9:00-10:15 Components, operating parameters, and types of confocal microscopes: Price
10:15-10:30 Break
10:30-11:15 Digital II - Resolution, Digital Images, Image Formats: Jerome
11:15-12:00 Photoshop, etc with confocal images: Mackenzie
12:00-12:45 Lunch (Provided):Seminar by Dr. Regan Baird: Photomanipulation Experiments
12:45-2:00  Photoshop, etc with confocal images: Mackenzie
2:00-2:15  Break
2:15-3:00  Photoshop, etc with confocal images: Mackenzie
3:00-5:30  Time on Instruments
Dinner on your own

**Thursday** June 14, 2012

8:30-9:00  Continental Breakfast – AMRL Lobby
9:00-10:30 3-D reconstruction of confocal data sets with AMIRA: Trusk
10:30-10:45 Break
10:45-12:00 3-D reconstruction of confocal data sets with AMIRA: Continued
12:00–1:15 Lunch (Provided): Seminar by Hilary Hicks: Devices for Image Capture
1:15-4:15 Additional Time on Confocal Instruments and Software; Time on Computers with
Facility for Image Enhancement and Analysis with Photoshop and AMIRA
6:00-9:00  Reception at the Madren Center

**Friday** June 15, 2012

8:30-9:00  Continental Breakfast – AMRL Lobby
9:00-10:00 Ethics in Use of Confocal Images, Available Resources, Discussion
10:00-12:00 Additional Time on Confocal Instruments and Software; Time on Computers with
Facility for Image Enhancement and Analysis with Photoshop and AMIRA
12:00-1:00 Lunch (Provided)
1:00-2:00 Additional Time on Confocal Instruments and Software; Time on Computers with
Facility for Image Enhancement and Analysis with Photoshop and AMIRA
Registration of $1,000.00 includes:
Continental breakfasts and lunches for five days and dinner for four days during the workshop
Thursday evening reception at the Madren Center
Supplies (buffers, primary and secondary antibodies for a cytoskeletal protein, phalloidin, DAPI) to process provided specimens
A copy of “Basic Confocal Microscopy”
Those wishing to process their own specimens for the workshop should provide the primary and secondary antibodies of their choice or contact Bob Price for further information on supplies that will be available

Registration fees (check or money order) should be made out to Clemson University and sent to the following address:
Clemson University
Electron Microscopy
Attn: Dayton Cash
91 Technology Drive
Anderson, SC 29625

In addition, please send the following information to: JOANH@clemson.edu

Name:
Affiliation:
Mailing Address:
Email Address:
Telephone:
Fax:
Specimen Prep (1, 2 or 3):
Please choose one of the three:
1- Bring your own tissue with primary and secondary antibodies to stain during lab time.
2- You will bring samples already stained (you will not be participating in the lab time)
3- You would like to use tissue we will be providing- choose either cells grown on coverslips or vibratome sections of mouse heart
Travel and Hotel Information

Location:
Information Technology Center is located on S.C. Highway 187 in Anderson County, midway between Charlotte, N.C. and Atlanta, Ga. This research park is only a few miles from U.S. Interstate 85 and 9 miles from the Clemson University campus.

EM Facility From I-85: Exit at exit #14 and take Hwy 187 North for 3.5 miles, turn left on Bainbridge Rd. to stop sign, turn left and continue to intersection, turn left and left again at the first driveway. We are located on the ground floor at the left side of the building. Visit MapQuest for maps and driving directions

Information about Advanced Materials Center may be found here:
http://www.clemson.edu/centers-institutes/cuadvancedmaterialscenter/

Information about the Madren Center may be found here:
http://www.clemson.edu/centers-institutes/madren/directions.html

Rates for hotels per night at exit 19 are as follows...

$100 Holiday Inn Express
$72 Comfort Suites
$89 Country Inn & Suites
$48 Microtel Inn & Suites
$85 Fairfield Inn & Suites
$82 Jameson Inn
$84 Hampton Inn
$55 Days Inn
$54 Royal American
$103 Hilton Garden Inn & Suites
A Workshop on Introductory Confocal Microscopy and Digital Imaging

Confocal scanning laser microscopy has become a primary method in many laboratories for visualizing microscopic structure in the third and fourth dimensions. However, in many cases individual users are expected to understand and operate complex confocal microscopes without being given the opportunity to learn basic principles. The workshop will target beginning and intermediate users of confocal microscopy and will include information that students, technologists and researchers need to know to efficiently prepare samples and to collect and analyze data to obtain publication quality images.

The first part of the workshop will provide information on a number of topics including the basics of fluorescence and fluorescent probes, biological specimen preparation (fixation, staining, optical properties and mounting materials), strategies and protocols for antibody labeling, the basic components of a confocal microscope (lasers, dichroic mirrors, microscope objectives, photomultiplier tubes) and an overview of some confocal microscopy applications.

Hands-on time for sample preparation will be provided. A variety of specimens will be provided or attendees can bring their own samples to the workshop. Double and triple label staining protocols will be performed. Time will be available on a number of confocal microscopes supplied by Leica, Nikon, Olympus and Zeiss to examine specimens and to learn how to properly select user adjustable parameters to optimize image collection.

Enhancement, analysis, and 3-dimensional reconstruction of images collected by confocal microscopy are integral components of the imaging process. Often, users do not have a complete understanding of changes that are made in the structure of digital images when using imaging programs that are commonly available. The second part of the workshop will provide information about the structure and enhancement of digital confocal images. This includes the use of enhancement functions such as contrast, brightness, smoothing, sharpening, and unsharpening. Information concerning optimum resolution of digital images, printers that are available, and ethical considerations when handling digital images will also be presented. The final part of this section of the workshop will address programs and techniques available for the 3-dimensional reconstruction of data sets collected by confocal microscopy.

Instructors for the workshop will include:

**Robert Price**, Research Professor, Cell and Developmental Biology and Anatomy, and Director, Instrumentation Resource Facility, University of South Carolina School of Medicine (http://dba.med.sc.edu/price/irf/irf.htm)

**Dr. Ralph Albrecht**, Professor, Department of Animal Sciences, University of Wisconsin-Madison (http://www.ansci.wisc.edu/facstaff/Faculty/pages/albrecht/index.htm)
Dr. Jay Jerome, Associate Professor, Pathology and Cancer Biology, Vanderbilt University
(http://www.vicc.org/research/display.php?id=4150)

Dr. John Mackenzie, Professor, Microbiology, North Carolina State University
(http://www.ncsu.edu/cem/index.html)

Dr. Tom Trusk, Associate Professor, Department of Cell Biology and Anatomy, Medical University of South Carolina (http://cba.musc.edu/faculty/TruskT.htm)