Workshop Announcement

International Workshop in Confocal Microscopy & Quantitative Histology

March 7-11, 2022

Short Description
The purpose of this workshop is to provide a comprehensive background in the theory and practice of modern histological preparation and microscopic analysis for researchers in biomedical science. The workshop provides practical instruction in all aspects of microscopic analysis including experimental design, specimen preparation, use of fluorescence and confocal microscopes, quantitative histology using design-based stereology, and image preparation for scientific publication. Sessions on Rigor and Reproducibility have been added in response to the recent NIH criteria for grant funding. Other new sessions address tissue clearing, light sheet microscopy, handling of large image data sets, and use of artificial intelligence.

Virtual Format Due to the Covid-19 Pandemic
Due to the effects of the Covid-19 pandemic, three virtual workshops were held in 2020 and 2021. This workshop will follow their successful format. When in person events are considered to be safe, a three-day hands-on practical workshop will be offered.

Summary of Workshops

Virtual Workshop
- Attend on-line half-day webinars
- Participate in Zoom-based Discussion Groups
- Take advantage of subsequent individual consultation sessions on your research needs
- Save the time, expense, and uncertainty of traveling to Chicago
- Remain productive in the lab while participating in the workshop

Hands-on Workshop, Dates to-be-determined
- 3-day intensive instruction on various widefield and confocal microscopes
- Instruction on a number of stereology systems
- Use of high-end workstations for image analysis
- Consultation using participants' own samples
- To be scheduled when "in-person" is again safe

Virtual Workshop
The first workshop component is virtual and consist of live webinars, prerecorded practical demonstrations, and Zoom-based discussion sessions following the schedule of topics described below.

This virtual workshop provides practical instruction on qualitative and quantitative microscopy that can be applied directly to common research objectives. There is limited opportunity in graduate studies to obtain a comprehensive introduction to the fundamental properties of microscopy and stereology. To address this need, half-day long webinars will introduce the essential theoretical foundations of specimen preparation, microscopy, imaging, and obtaining quantitative information from tissue samples using design-based stereology. Zoom-based discussions will directly follow topics to allow for questions and additional explanation to address participants' research objectives.

The virtual workshop will be followed by scheduled, individual Zoom-based sessions, consulting with participants to address their particular research objectives. Other lab members may participate in these post-workshop, scheduled Zoom sessions.

Subsequent Hands-On intensive Workshop
Participants that registered and participated in the virtual workshop will have the opportunity to participate in a subsequent practical session that will be held in person. Like learning to drive, you can understand the theory, but you also have to spend time behind the wheel to make the training useful.

The intensive 3-day in-person practical session will be arranged when it is safe again to travel and resume in-person activities. The practical portion will be held in Chicago where there will be a variety of microscopes equipped for confocal microscopy and stereology available for use, along with high-end image analysis workstations.

Structured practical instruction will use provided samples and there will be ample opportunity for individual, assisted use of the various systems. Participants should bring examples of their material and problems for examination and discussion.

Who should attend?
… anyone who needs to utilize the cutting edge technologies of confocal microscopy and stereology to achieve an adequate level of analysis for their studies. These technologies are complex and often the scientists who need to perform this analysis have never had an opportunity to receive systematic instruction on their correct use. As a result, investigators may fail to obtain the full benefit of these approaches or, in some cases, may obtain incorrect results.

This workshop is designed to provide systematic instruction in microscopy and stereology for scientists who are actively engaged in qualitative and quantitative microscopy or for those who need to introduce these technologies into their work. The workshop is conducted at a graduate level and is suitable for experienced technicians and graduate students through to principal investigators.

Workshop Director
Prof. Daniel A. Peterson is Professor and Vice-Chairman of Neuroscience and Director of the Center for Stem Cell

and Regenerative Medicine at The Chicago Medical School in North Chicago. He received his Ph.D. from the University of Otago (New Zealand), obtained post-doctoral training at the University of California, San Diego, and worked as a Staff Scientist at the Salk Institute before joining the faculty of The Chicago Medical School at Rosalind Franklin University of Medicine and Science. Prof. Peterson maintains an active NIH-funded academic laboratory and his interests include the use of stem cells and gene therapy in brain repair. He had served as Chairman of a standing NIH study section (NCF) and chaired numerous Special Emphasis Panels. In addition, he serves on various editorial boards including *Neurobiology of Aging, Stem Cells and Development*, and *Frontiers of Neuroscience*. Prof. Peterson has been using stereology in his own work since 1985 and confocal microscopy since 1991. He has conducted microscopy courses annually in Europe and the US since 1995, teaching more than 700 young scientists. Prof. Peterson also has many years of experience as a director of core microscopy facilities.

Virtual Workshop Tuition

Graduate Student or Academic Lab Technician	
Early Bird Rate*	$1,450.00
Regular Registration	$1,650.00
Post-Doc or Academic Faculty	
Early Bird Rate*	$1,700.00
Regular Registration	$1,900.00
Technical or Research Staff from Industry	
Early Bird Rate*	$2,300.00
Regular Rate	$2,600.00

* *Early Bird Rates end:* ***January 21, 2022***

An additional discount is offered for members of:

- *International Society for Stereology and Image Analysis*
- *American Society for Neural Therapy and Repair*

Please email info@neurorenew.com for details.

The deadline for Virtual Workshop registration is:

March 6, 2022

Registration for the Virtual Workshop

Registration is available on-line at www.neurorenew.com. We accept Discover, American Express, VISA and MasterCard. To pay by institutional check or wire transfer, please request a form from president@neurorenew.com. The registration includes the on-line webinars, group Zoom discussions, and subsequent consultation session to address specific research needs.

Cancellation Policy

- Cancellations up to beginning date of the workshop will be entitled to a complete refund less a $200 processing fee.
- If NeuroRenew, Inc. must cancel the event, participants will have their registration refunded.

Hands-On Workshop Registration

There will be a separate registration for the subsequent in-person Hands-On Workshop. Details will be announced once it is safe to schedule in-person events.

Sponsorship

NeuroRenew, Inc.

Business arrangements are handled by NeuroRenew, Inc. NeuroRenew, Inc. can be contacted at
info@neurorenew.com or by mail at
300 North State Street, Suite 5321
Chicago, IL 60654
Phone: 847-414-8730
www.neurorenew.com

MBF Bioscience, Inc.

Suppliers of microscopy, imaging, and stereology equipment and software.
www.mbfbioscience.com

Nikon Instruments Inc.

Suppliers of microscope and imaging systems, including confocal microscopy systems.
http://www.nikoninstruments.com

Carl Zeiss USA, Inc.

Suppliers of microscope and imaging systems, including confocal microscopy systems.
http://www.zeiss.com/microscopy

Leica Microsystems, Inc.

Suppliers of microscope and imaging systems, including confocal microscopy systems.
https://www.leica-microsystems.com

International Workshop in Confocal Microscopy and Stereology

Virtual Program and Syllabus March 7 - 11, 2022

On-Line Webinar sessions will be presented every day from 11:00 AM to 3:30 PM (11:00-15:30) Chicago time. Each topic will be followed by an interactive discussion session.

Please see the table below for conversion to your local time. If there are a sufficient number of participants, an alternative presentation will be given for Asia-Oceania as shown below.

Day One	**Monday, March 7, 2022**
Topic 1	Systematic Sampling in Experimental Design
Topic 2	Specimen Preparation
Topic 3	Staining of Tissue for Multiple Label Detection
Topic 4	Rigor and Reproducibility in Research
Day Two	**Tuesday, March 8, 2022**
Topic 5	Optical Design and Microscopic Resolution
Topic 6	Digital Imaging and Image Analysis
Topic 7	Control of Image Data Channels
Topic 8	Composition of the Publication-Quality Scientific Image
Day Three	**Wednesday, March 9, 2022**
Topic 9	Principles of Fluorescence Microscopy
Topic 10	Confocal Microscopy: Evolution of Design
Topic 11	Parameters and Limitations for Image Acquisition
Topic 12	Practicum on the Confocal Microscope Image Acquisition
Day Four	**Thursday, March 10, 2022**
Topic 13	Introduction to Design-Based Stereology
Topic 14	Estimation of Cell Number
Topic 15	Estimation of Volume and Length
Topic 16	Sampling, Efficiency, Variation, and Pitfalls in Histological Quantitation
Day Five	**Friday, March 11, 2022**
Topic 17	Designing a Stereological Study
Topic 18	Computer-Assisted Stereology
Topic 19	Confocal Stereology and Large Image Data Sets
Topic 20	Artificial Intelligence for Unbiased Quantitation

Post-Workshop Individual Consultation Sessions
To be scheduled with each participant

Presentation Time Conversion Tables

Europe-Americas Times for the Workshop

USA- Pacific Time	09:00-13:30
USA- Mountain Time	10:00-14:30
USA- Central Time (Chicago)	11:00-15:30
USA- Eastern Time	12:00-16:30
São Paulo/Buenos Aires	13:00-17:30
London/Lisbon	17:00-21:30
Central European Time	18:00-22:30
Moscow	20:00-00:30

Potential Alternate Asia-Oceania Times
(*TBD- offered if there is sufficient enrollment*)

New Delhi	06:00-10:30
Shanghai	09:00-13:30
Seoul/Tokyo	10:00-14:30
Sydney	11:00-15:30
Auckland	13:00-17:30