

Master of Laboratory Animal Science

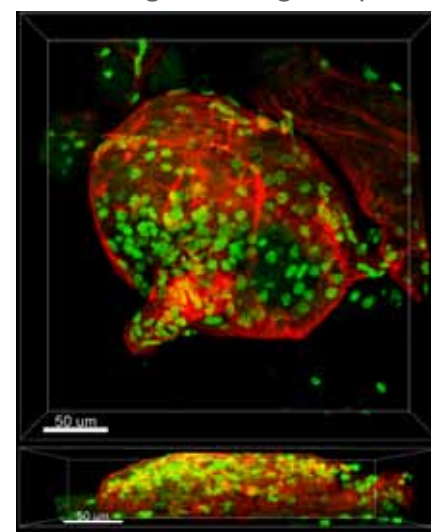
STATE-OF-THE-ART FACILITIES: TWO-PHOTON IMAGING

Two-photon laser scanning microscopy (TPLSM) enables the study of intact viable samples at subcellular resolution. TPLSM is based on the principle of two-photon excitation where simultaneous absorption of two near-infrared photons leads to the excited state of fluorescent molecules in the sample. Since two-photon excitation only occurs in the focal position of the microscope, out of focus absorption and excitation are absent. As a result, TPLSM possesses enhanced depth penetration, good optical sectioning, and good resolution in three dimensions. Moreover, photo-bleaching, photo-damage, and photo-toxicity are reduced outside the area of interest. The combination of all these features makes TPLSM advantageous over other microscopic techniques for visualization of structures located deeper in viable scattering or vulnerable tissues in three dimensions.

The two-photon core facility is equipped with two modern two-photon laser scanning microscope systems. The LaVision BioTec TrimScope two-photon microscope has a unique beam splitting device for simultaneous scanning of 64 foci enabling fast image acquisition (up to 35Hz) in a single channel up to a depth of 100µm in tissue (strongly dependent on type of sample) and makes it very well suited for in vivo imaging. The motorized sample table of the LaVision TrimScope enables the simultaneous imaging of different areas in the same sample for an effective study of time- and cost-consuming experiments. Furthermore, the fluorescence filter set offers a high flexibility in the imaging of fluorophores. The second multiphoton microscope system is an Olympus Fluoview 1000 MPE and is the best choice when maximal penetration depth (> 250µm deep in atherosclerotic plaques, > 600µm in brain) is required because of its highly efficient optics and its powerful laser. Moreover, its flexible layout (3 internal and 4 external detectors) allows simultaneous detection of a wide range of fluorescent molecules and easy adaptation to various preparation methods.

Both systems can be used for in-vitro, ex-vivo, in-situ, and in-vivo experiments and are mainly prepared for imaging in rodents or isolated 'whole mount' samples. Furthermore, the option for animal triggered in-vivo imaging, where ECG and respiration signals are used to limit the impact of motional disturbances that occur due to the heart- and respiration cycle on the imaging, are offered.

For further information regarding the two-photon microscopy services available please contact:
Dr. Michael Vogt | Tel.: +49 241 80 37360 | Mail: mvogt@ukaachen.de



3D image stack of a glomerulus (red: surface, green: cell nuclei). Top view (top) and sight view (bottom)

ACCREDITATION UPDATE

Further to the last newsletter, on 6th May the accreditation agency, ASIIN e.V., conducted an on-site audit as part of the M.Sc. Laboratory Animal Science accreditation process. We were very pleased that the program was positively evaluated by the panel of experts. The innovative program concept and future career prospects for graduates were highlighted as particularly praiseworthy. Our thanks go to all those who prepared or took part in the successful audit.

In order to ensure that the course meets industry standards and expectations we are seeking FELASA accreditation. However, following the introduction of EU 2010/63, FELASA is amending its packages to be compliant. The directive recognizes competencies in four personnel functions, however, these differ from the former FELASA categories. Furthermore the former FELASA category D will be amended to address the function "Specialist" for personnel involved in tasks described in articles 24 and 25 of the directive i.e. "persons overseeing the welfare and care of animals" and "designated veterinarians with expertise in laboratory animals medicine".

FELASA's latest recommendations for the accreditation of education and training courses in laboratory animal science can be viewed under: http://www.felasa.eu/media/uploads/E&T_Recommendations_Accreditation_Revised_20140217.pdf

As soon as the FELASA accreditation application process has been finalized our MLAS program, starting in September 2014, will be submitted for FELASA Specialist approval.

COURSE LECTURERS



We are pleased that PD Dr. Margarete Arras from the University Hospital Zurich has agreed to support our M.Sc. Laboratory Animal Science program.

PD Dr. Arras studied veterinary medicine at Justus-Liebig University in Giessen and was then appointed by the Department of Experimental Cardiology at the the Max-Planck Institute for Physiological and Clinical Research where her research interests included cardiology and circulation. In 1997 PD Dr. Arras joined the Institute of Laboratory Animal Science at the University of Zurich as an executive veterinarian. In 2009 she was appointed Head of the Surgical Skills Laboratories and Veterinary Services and in 2012 took on the additional role of Head of the Animal Facilities at the University Hospital Zurich. Her current research interests include laboratory animal welfare, anesthesiology and pain in laboratory animals.

PD Dr. Arras's expertise will be a great asset to the program and we are delighted that she has agreed to lead the MLAS microsurgery module and contribute to teaching applied anesthesia and analgesics.