



Introduction to Digital Imaging Workshop

Last August this workshop filled up 50 places in less than a week and the January workshop (100 places) is already filling up fast! The workshop is being held at an AHSC site on Jan 10, 2008 from 8:30am to 1pm. To register for the workshop (required) go to: <http://www.mcb.arizona.edu/imagingWorkshop.cfm>

What is imaging?

In this Core, it means what we do with microscopes, over in Proteomics the term refers to a cutting edge technique for obtaining proteomics information with spatial resolution (see below), in Radiology it may mean MRI or CT scanning and we won't even go into what the word means to astronomers. This month we would like to bring to your attention some imaging-related facilities that may be less well known.

TACMASS is an Arizona Cancer Center shared service. The Tissue Acquisition and Cellular/Molecular Analysis Shared Service provides a wide range of services, but of particular interest are:

- **Automated Immunohistochemistry** - performed on a Ventana Medical Systems Discovery XT automated staining platform. The service has over 80 antibodies that have been quality controlled and are ready for use. Most are human tissue antigens, but there are a smaller number of mouse antibodies that have been QC-ed.
- **Tissue microarray** - Small pieces of paraffin-embedded tissue can be assembled into a single block and then the user can stain the sections with a panel of antibodies, comparing controls and affected tissues on the same slide.
- **Contact** - Kathy McDaniel, Manager (AZCC 3959, 626-7319, tacmass@azcc.arizona.edu)
http://www.azcc.arizona.edu/R_M/shared_services/tacmass/index.php

Proteomics Imaging is a technique undergoing development in the laboratory of Dr. Serrine Lau, Director of the SWEHSC, in collaboration with the Arizona Proteomics Consortium. The goal is to begin to make this technique available in one of the SWEHSC Facility Cores in 2008. Contact Dr. Lau for additional information.

- Cryostat sections are cut from snap frozen tissue, the sections are then coated with a MALDI matrix, the slide is mounted in a MALDI-TOF, specific spots (approx. 50µm resolution) on the section are "zapped" with a Nitrogen laser, and the mass spectrometer can measure the mass of the proteins that are released from that selected area.
- Caveats - sample preparation is extremely important, please consult with the lab to learn about sample requirements. The MALDI-tissue imaging can be used as a discovery tool to examine differential expression of proteins in tissue regions of interest. Analysis of the proteins can also be guided with ease if the user knows (based on genomics or other data) what proteins they are specifically looking for.

SWAIR is a service of the University's Advanced Research Institute in Biomedical Imaging (ARIBI), funded by the NCI and the NIBIB. The ARL Biological Magnetic Resonance facility is included under the SWAIR "umbrella". The Southwest Animal Imaging Resource has a variety of whole animal and other imaging modalities available, such as:

- **Single Photon Emission Computed Tomography (SPECT)**, along with **microCT** and **CT/SPECT**.
- **Magnetic Resonance Imaging (MRI)** - for anatomic and physiological experiments.
- **In vivo Bioluminescence Imaging** - using a highly sensitive CCD camera, fluorescent markers inside a live (sedated) animal can be localized to fairly specific spaces or organs.
- **Optical Coherence Tomography (OCT)** - "OCT is a non-destructive imaging technique which uses infrared light to visualize subsurface structure in biological tissues. Depths of a few millimeters can be imaged with about 15 micrometer (µm) resolution."
- **Contact** - visit their website for more information about specific techniques: <http://www.swair.arizona.edu/>