



## **Transmission EM assistance from the Core**

Many people associate Doug Cromey's expertise with the confocal microscope, the image analysis workstation or light microscopes in general. We have often discovered that investigators and their staff are unaware that Doug spent 15 years performing transmission electron microscopy before joining the SWEHSC. If you would like someone to consult with you on your TEM project or would like to reduce your costs by having Doug operate the TEM, please contact Doug Cromey at 626-2824.

## **Campus digital imaging workshop – on the national stage**

The bi-annual campus digital imaging workshop has been offered as an example to other institutions as a way to “teach proper standards for working with scientific data”\*, specifically digital images. The digital imaging workshop at the UA was developed and is presented as collaborative effort between the SWEHSC, ARL, and the Departments of MCB, CBA, and Neurosciences. The opinion piece featured in the Sept. 2009 issue of Microscopy Today is based on Doug Cromey's presentation at the annual meeting of the Microscopy Society of America in July.

A modified version of this workshop was given by Doug Cromey as a 3hr workshop at the National Society for Histotechnology meeting earlier this month.

\* D.E. Wright, S.L. Titus and J.B. Cornelison, Mentoring and Research Misconduct: An Analysis of Research Mentoring in Closed ORI Cases, J Sci Eng Ethics 14 (2008) 323-336.

## **Digital imaging ethics – falsification of microarray, flow cytometry, and MALDI data**

The US Office of Research Integrity acknowledges that the most frequent type of “doctored” images that they see are protein gels. In addition to gels and images from microscopes, three recently completed investigations by the ORI were for falsifications of image data related to other types of image data. Excerpts from selected 2009 ORI case summaries:

- “Falsified the expression of IFN- $\gamma$  and KJ-126 in **flow cytometry dot plots** for the immunized, naive, tolerized and tolerized + IL-12 experimental groups in Figure 4, JEM 186:1119-1128, 1997, by using the same non-stained cell population in the lower left quadrant to falsely represent CD4+ T cells negative for IFN- $\gamma$  and KJ-126 in each experimental group.” (*additional findings encompassed seven published papers, three submitted papers, one submitted book chapter, and multiple presentations*)  
<http://ori.dhhs.gov/misconduct/cases/VanParijs.shtml>
- “Falsifying **MALDI-MS** images and mass spectral tracings and associated text...” (*in a grant application and in a presentation at a national meeting*) [http://ori.hhs.gov/misconduct/cases/Ningaraj\\_Nagendra.shtml](http://ori.hhs.gov/misconduct/cases/Ningaraj_Nagendra.shtml)
- “Falsified files containing raw scanned **microarray** images from another researcher's experiments to demonstrate that in experiments that she claimed to have conducted, she successfully observed gene amplifications with a copy number greater than two...” (*this research was supported by several federal grants*)  
<http://ori.hhs.gov/misconduct/cases/Afshar.shtml>

Note, one of the other recommendations from the article cited above was that mentors should “regularly review the original source data with their trainees”\*.

The Cellular Imaging Core has a list of guidelines for the appropriate and ethical use of scientific digital images at: [http://swehsc.pharmacy.arizona.edu/exppath/micro/digimage\\_ethics.php](http://swehsc.pharmacy.arizona.edu/exppath/micro/digimage_ethics.php)

## **Integrating with Biostatistics (IHSFC)**

The Cellular Imaging Core has been discussing ways to better integrate biostatistics within our facility core. We have met with Dr. Dean Billheimer (Director of Biostatistics) to compare ideas and come up with a plan. We are now encouraging all SWEHSC investigators who plan to perform image analysis experiments to meet with the Core and Dr. Billheimer as early as possible in the planning stages to ensure a statistically appropriate study design. Preferably, this meeting would occur even before the cells/animals are dosed.