



Center for Toxicology, Southwest Environmental Health Sciences Center (an NIEHS Center)

Experimental Pathology Core Newsletter

R. Clark Lantz, Ph.D.

Core Director

626-6716

LSN 447

clark-lantz@ns.arizona.edu

Douglas W. Cromey, M.S.

Core Manager

626-2824

AHSC 4212A

doug-cromey@ns.arizona.edu

Claire M. Payne, Ph.D.

626-2870

AHSC 6111

claire-payne@ns.arizona.edu

Department of Cell Biology & Anatomy, Arizona Health Sciences Center, 1501 N. Campbell Ave., Tucson, AZ 85724-5044

<http://swehsc.pharmacy.arizona.edu/exppath/>

Web awards and announcements:

- The Core's "Microscopy & Imaging Resources on the WWW" pages were selected for the June 7, 2000 issue of the "Scout Report for Science & Engineering". The Scout Report for Science & Engineering is provided by the Internet Scout Project, an NSF-funded, university-based project at University of Wisconsin-Madison. According to the Scout report, the basic criteria for selection include "quality and depth of content, author credibility, information maintenance, and presentation."
- The CBA Histology Core lab has updated their web site and invites everyone to come take a look at: <http://www.cba.arizona.edu/histology-lab.html>

Oil immersion lenses:

Earlier this month the Leica confocal serviceman complained to us about the excessive amounts of oil on the microscope lenses. Gina Zhang carefully cleans the lenses every few weeks, but it is up to confocal users to make sure that they do not use too much oil and that they clean up after each use. If you have any questions about how to use the confocal, please contact Doug Cromey.

Image Processing using the Histogram Tool:

One of the most useful tools in any image processing program is the histogram tool (*located on the IMAGE menu in Photoshop*). A histogram shows the distribution of intensity values in an image.

Histogram A is of a low-contrast black & white image. Notice that the histogram does not show any values at the extremes of the scale. There are no true blacks or whites in this image, only mid-range grays. This is a "muddy" looking image. Histogram B shows the image (*after processing with Photoshop*) with much better contrast.

The best place to improve image contrast is at the beginning, when the user is sitting at the microscope. Try to capture the best images possible, ones that will require little or no image processing. There are several things that users can do to improve image quality, they include:

- Make sure that the microscope is properly aligned
- Use only high-quality specimen preparations (*i.e., no artifacts, low background staining, etc.*)
- Use the full dynamic range of the image acquisition device (*e.g., CCD or film-based camera*) without over-saturating or over-exposing the device

Over-exposing a device causes problems in the image that are similar to those caused by over-exposing film. In certain areas of a film-based image, information is lost because of the over-saturation of the film (*e.g., outdoor photos where someone's face has too much sunlight on it*). Detection devices (*e.g., cameras, photo-multipliers*) can be over-saturated and lose information as well. A similar problem is that the images themselves can be so over-processed that they lose information. Histogram C shows what happens when the original image from A was over-processed in Photoshop, although it could easily be from a piece of over-exposed film or an over-saturated detector. Notice that the information represented by the far right side of the histogram has now been truncated.

For more help with understanding histograms, or if you have any other questions, please contact Doug Cromey.

