Center for Toxicology, Southwest Environmental Health Sciences Center (an NIEHS Center, ES06694)

Cellular Imaging Core Newsletter

Summer 2005 http://swehsc.pharmacy.arizona.edu/exppath/

Dust is the enemy!

Is the microscope in your lab regularly protected by a dust cover? If not, it's quite possible that your microscope optics have a layer of dust on them. Dust can scratch delicate optical coatings and that damage can alter the optical properties of the microscope. Dust typically collects on the eyepieces, the objective lenses on inverted microscopes and the condenser *(the part of the microscope that focuses the light on the sample)*. This type of dust can be cleaned by a careful user, ask the Core to show you how to clean these parts. Dust can also collect in less accessible places and this usually requires a professional cleaning.

Given that "inexpensive" microscopes can cost several thousand dollars, with really nice microscopes costing several tens of thousands of dollars, it is imperative that they be protected. It's a simple thing to get in the habit of using the provided dust cover. If you are missing the cover, we encourage you to buy one from the vendor or in a pinch to use a large plastic trash bag. Please note, hot microscope lamps and plastic bags are a dangerous combination. It is best to wait a few minutes for things to cool before covering the microscope with a plastic cover.

Interested in getting your microscope cleaned or repaired? Typically a thorough microscope cleaning will cost between $100.00-125.00 and take about 1-1½ hours. For a list of vendor service contacts see: http://swehsc.pharmacy.arizona.edu/exppath/core/equip/handouts/AZ_Microscopy_vendors.pdf

What is Laser Capture Microdissection?

Have you ever looked at a tissue section and wished you could do a more extensive analysis of just one of the cell types in the sample? Laser Capture Microdissection (LCM) was developed to allow users to select out specific cells or groups of cells from a microscopic field. To perform LCM, tissue sections *(paraffin or frozen)* are placed on a microscope slide, stained *(using routine or special stains, immunohistochemical stains, or labeled using GFP markers)* and brought without a coverslip to one of the two AHSC LCM systems. The LCM uses a special cap that is placed over the section, the user then guides a low power infrared laser to bond a plastic film to the cells of interest, and then the cap is removed with the specific cells attached. Once the specific cells have been isolated, the possibility exists for performing microarray or proteomics analysis on the sample *(contact the Genomics & Proteomics Facility Cores for more details before performing LCM)*. Note that the cost of the caps used to transfer the tissue, as well as the special microscope slides that are sometimes needed and the reagent kits for nucleic acid techniques are the responsibility of the users of these systems. Arcturus has several short video presentations to demonstrate LCM at: http://www.arctur.com/research_portal/resources/video_library/index.htm

AHSC – Laser Capture Microdissection systems

Proteomics Facility Core (Monks lab) – This LCM system is an Arcturus PixCell IIe that is located in the College of Pharmacy. To learn about this system, contact Matt Labenski <labenski@pharmacy.arizona.edu>.

Arizona Cancer Center – This LCM system is a leased Arcturus Veritas that is located in the AZCC. To learn more about this system, contact Kathy McDaniel at 626-2448 or <kmcdaniel@azcc.arizona.edu>.

If you are interested in learning to use the AZCC instrument, Ms. McDaniel is planning to have Arcturus come in September to provide training to interested users. Please contact her to be added to the email LCM announcement list.

Codonics dye-sublimation printer has retired

The Codonics NP-1600 dye-sublimation printer *(located in AHSC 4212)* provided ten years of beautiful full color prints at 300 dpi. Unfortunately usage dropped off to zero in the last year, so ARL has sent the printer to Surplus Property. If you need full color prints, Biomedical Communications can accommodate your needs with their 400dpi Fuji Pictrography printer. The Fuji is the current "gold standard" for hard copy color printing.

Biomedical Communications – AHSC 3403, 626-7343, http://www.biocom.arizona.edu

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Lab meetings, grant brainstorming and one-on-one consultation

We are available to assist the members of the SWEHSC and their labs with just about anything related to microscopy & imaging. Please feel free to call or email us with your questions or needs.

The importance of properly documenting changes in tissues & cells

Is one good image enough to properly document experimental changes? If that one good image was of a sample that can't be re-photographed six months later *(e.g., fluorescence)* and there are no other images of that particular sample, how do you know that the single image correctly captured the changes in the sample? Could you defend your interpretation to a journal editor, a colleague or your mentor? If this scenario sounds ludicrous to you, the next time that you are presented with image data, ask how much imaging data was examined to come up with the interpretation being given. In the meantime, consider this rather strong statement from a staffer at an NCI supported imaging core.

> I suspect that most published micrographs are "exemplary", "best of", or, "the only one we took", or "the only one that fit our hypothesis" (I call the latter two categories, "N=1 experiments"). If you are putting together figures, and you select for publication a micrograph based on any of these categories, at least be honest to the reviewers and editor and say so (hopefully they'll tell you to go back and collect data correctly … even better, your coauthors should tell you … best of all, your inner super-ego should tell you). What you should be publishing are *representative* micrographs. That means you need to acquire sufficient images to document/quantify the experiment. Your specimen and images should be good enough that any of the micrographs can be used. In fact, if you can only publish one micrograph per treatment group, use a random number generator to pick which one…

Crusade for Publishing Better Light Micrographs – Light Microscopy publication guidelines
Dr. George McNamara, Congressman Julian Dixon Image Core, The Saban Research Institute of Childrens Hospital Los Angeles, Los Angeles, CA http://home.earthlink.net/~geomcnamara/CrusadeBetterMicrographs.htm