Increasing Volocity’s Velocity

The computer running Improvision Volocity 3D rendering and analysis software has been replaced with a state-of-the-art high-end system. The new computer is a Dell Precision T7400n Mini-tower, containing two Quad Core Xenon processors and running Microsoft Vista. The system has 8 GB of memory and an nVidia video card, greatly enhancing the processing speed of large data sets, and exceeding the requirements of the software as recommended by the manufacturer. At the same time, we have upgraded to Volocity Version 5, which has a completely redesigned, more intuitive user interface. A new manual to accompany the Volocity system is being compiled, and in the meantime check with a MIC staff member for further details or training on the system. If you have confocal images requiring 3D processing or analysis, Volocity may be the right choice for you!

Brightness/Contrast – The Light and Dark of the Matter

Brightness/Contrast adjustments are tools that are readily available and frequently used in digital imaging. These adjustments are considered imaging manipulation, but where does image manipulation cross the line and become unintentionally unethical? Is anyone checking? The short answer is, yes. Publications such as the Journal of Cell Biology and the Office of Research Integrity are closely watching this issue and have led efforts to support scientific imaging integrity. As the ease and prevalence of image manipulation increases, many more journals are checking for image manipulation and, if found, the image will be rejected. What is acceptable and how much is too much? Our position in this discussion is that, if you are unwilling to list in your figure legend what image manipulation you have done post-capture, you probably should not be doing it. If you think of your digital image as a grid of intensities, any change in those intensities can drastically alter the image data in terms of quantitation and perception. Follow a short set of guidelines to ensure the best imaging techniques.

1. Always run controls with your incubations and image them at the same settings.
2. Always keep an unaltered copy of the original captured image.
3. Know the limitations of your sample and the instrument’s capabilities.
4. Small changes in brightness and contrast are usually acceptable as long as you have applied the same changes to your controls. These changes should be to the entire image, not a region within an image.
5. If you do make brightness or contrast changes, be aware that all programs are not the same. Programs such as Photoshop vary version to version as to how the brightness contrast controls operate – note in the following pictures…

Brightness is a linear correction to all pixel intensities, either brighter or darker. Contrast, takes a midpoint of the intensities and rotates on that axis, causing pixels that were not black to become black and pixels that were not white (saturated) to become white. Low level fluorescence is reduced and intensity changes in upper level pixels are eliminated. In Photoshop version CS3 or newer there is a check in the brightness/contrast dialog box that says “use legacy”. If this is selected, then the brightness and contrast control will operate as described above. However, if this is not checked then the controls will anchor the black intensities and proportionally change the remaining intensities similar to “levels” or “curves”; in other words, the change to the image is no longer “linear”. Photoshop uses algorithms that are not explained within the dialog box. Be sure you are aware of what digital changes are taking place before you use these controls. For any questions concerning the manipulation of digital images, please contact Marilyn or Doug in the MIC.

MIC H1N1 Preparedness

Along with the UVM campus and College of Medicine, the Microscopy Imaging Center is preparing for a possible pandemic of the H1N1 influenza virus. The facility has created an action plan that would allow us to maintain all services in the event of a pandemic at the University. To air on the side of caution we are also placing Lysol wipes and hand sanitizers in all of the imaging rooms and the main laboratory. Feel free to use these products on keyboards, countertops, focus knobs and stage controls of microscopes.

Negatively stained virus particles imaged with a JEOL 1210 TEM.
and resistant (C3H) H1R alleles differ by three amino acids (AA) within the third intracellular loop of H1R, which is a seven-pass transmembrane G-protein coupled receptor (GPCR). Being the largest intracellular "resistant" versions of H1R exist among different mouse strains, SJL or C3H, for example. Sensitive (SJL) H1R and how this may affect disease susceptibility. Not only for EAE, but findings from these studies together these approaches will shed light on how polymorphisms influence the trafficking and signaling of different signaling abilities for G-protein or non-G protein pathways using biochemical approaches. To-