VIRTUAL MICROSCOPY: PLACING EDUCATION IN HISTOLOGY AND PATHOLOGY UNDER THE MICROSCOPE

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Introduction: Virtual microscopy (VM) is the use of computers to view scanned microscopic images. The technology has a broad range of applications in medical and scientific education. It is of particular utility to teachers of undergraduate or medical undergraduate histology or pathophysiology courses, as well as a valuable learning tool for graduate medical education in pathology.

Details: Recently, the Mayo Clinic College of Medicine transitioned the entire first year histology and pathohistology curriculum from a glass-slide based system to a computer based VM system. The transition to the VM system was driven by several factors, the most important of which was to increase the educational value of viewing histological specimens for the students. A VM system meets student needs better than traditional glass slides in a number of ways:

1. It is persistent; a student can view slides from anywhere he/she can connect to the Internet.
2. It is consistent; every student views the exact same slides. There are no variations in preparation, no lost or broken slides missing from the slide box.
3. It is efficient; in place of maintaining large numbers of microscopes, only one computer (the VM server) needs to be maintained.

The VM system implemented by the Mayo Clinic College of Medicine is driven by commercial software obtained from Bacus Laboratories, Inc. (http://www.bacuslabs.com/), a vendor of VM software for educational and clinical uses. The host computer for the VM software was an "off-the-shelf" IBM e-series rack mounted server. Slide scanning was conducted in-house at the by the Tissue and Cell Molecular Analysis (TACMA) Shared Resource of the Mayo Clinic Cancer Center.

Previously, students looked in their own microscopes at slides from their personal slide box. In the new model, groups of ten students are led through the slides by a Professor or Teaching Assistant using a large projector based touch screen display. Items of interest can be highlighted, and students are able to follow along on their own laptop computers. The new model facilitates communication and interaction between students and between students and instructors looking at the exact same images. This project will be of particular interest to educators interested in implementing a similar system for pre-medical or medical education, as well as those involved in research pathology.

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