

The advantages of virtual microscopy for teaching histology

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The use of high resolution scanned digital images, which can be stored in virtual archives on local or distant servers, has resulted in novel approaches in e-learning (both in the classroom and also for distance learning) [1]. This is leading to major changes in the way practical histology and histopathology classes are taught. After an initial investment in the scanning stage microscope and associated software and servers, the financial and administrative advantages allow enormous economic savings in the long-term with regard to equipment, technical staff and laboratory facilities. There is no longer a need for individual student microscopes, for technical staff for microscope maintenance or repair or worries about the loss of valuable specimens. There is no longer a need for individual slide sets or to prepare new slides. It is a win-win situation that medical school administrators, teachers and students appreciate and which has led to widespread adoption of virtual microscopy systems in the life sciences. Students today, are all highly computer competent, and greatly appreciate the advantages of the virtual microscopy systems. If the virtual histology archive is web-based (and not just on a local server) then students can access the laboratory material at any time, day or night, prepare assignments and prepare for examinations. The virtual microscopy systems are ideal for computerized examinations of histology and histopathology material. The lecture will deal with the various hardware options (light microscope scanning stage systems), commercial software for e-learning, problems of copyright, and also the establishment of national repositories for virtual image archives. A description will be presented of the experience of introducing a virtual microscopy system in the Faculty of Medicine in Haifa, where some 450 of the most outstanding histology slides have been scanned and placed on the virtual microscopy archive and made available for students. In addition to e-learning, establishment of a virtual microscopy system allows telepathology, storage of histopathology archives especially in hospital environments including tissue array images, automated diagnostics of specific diseases, and quantitative image analysis. It is likely that in the coming decade all medical and nursing teaching units will move to virtual microscopy. This is an inevitable process and it is important to understand the advantages and disadvantages before taking decisions on the specific system to be adopted.

References

- [1] Coleman R (2012) Virtual Microscopy. Infocus Magazine. Proc Royal Microsc Soc Issue 28, December, 4-13.

Key words

Virtual microscopy, virtual histology, e-learning, virtual image archives.