**SOFTWARE REVIEWS**

### MedPics/Histology: An Image Library for Medical Education

Developed by the University of California, San Diego, School of Medicine, Office of Learning Resources (Hoffman HM, Irwin AE, Andernato SK, Kripalani M). Distributed by Micron Biosystems, 650 South Cherry Street, Suite 440, Denver, CO 80222-1806, 800/685-4668. Single user cost for one component (i.e., Histology) is $485.00. MedPics Histology/Pathology is $873.00. Discounts are available for multiple workstation environments. System requirements: CD-ROM, Macintosh, or Windows.

The MedPics Image Library for Medical Education series is a computer-based image display and tutorial program consisting of two modules, Histology and Pathology. Hematology is under development. Each module can be purchased and used independently, but they are designed to be used as a unit. This review will cover the Histology module. (For a review on the Pathology component, please see Michael Kornstein's review in *JAMA* 1995 Dec 6; 274(21): 1724-5.)

The software can run on either a Macintosh (II series or better) or PC Windows (386 with a minimum of four megabytes of RAM). Installing the software to run from our local area network optical server was straightforward; we used Novell NetWare and SCSI Express. We loaded the disc into a drive on one of our towers, and have found the speed of access to be satisfactory. Unlike many Windows applications, this one required no station installation.

The program is designed for use by medical students in their basic sciences years, and can be used as an enhancement for board study as well. MedPics/Histology is not required in our Histology curriculum, but is suggested as supplemental material. Students access the program quite regularly, which is not always the case with supplementary programs. The students can easily access MedPics in our computer lab by using the menu and then navigating through the program itself. The only difficulty in navigation is that the black marbleized background often makes the text and icons difficult to see.

The Histology series contains more than 200 images, organized by tissue or organ system, with accompanying text. These images occupy about one-fourth of the computer screen. To access the images one can use the Standard Mode, which gives the image, title, features, and reports, or the Quiz Mode, which gives only an image until one requests the labeling. Most of the images are high-quality light micrographs showing low-power or high-power views of H&E stained tissues and organs; in some cases special stained preparations, (e.g., PAS, elastic stain, silver stain) are shown. The images are generally comparable to those likely to be encountered in a medical school histology course, thus providing a useful learning aid that nicely complements traditional histology slide sets and atlases. In addition, occasional transmission electron micrographs can be found in some sections of the program, but the random selection of images (e.g., three TEM images of ciliated pseudo stratified columnar epithelium, but none of other epithelial types) and inconsistent usage throughout the program limit their value. A single scanning electron microscopic image is present in only one section (Respiratory System, alveoli); additional scanning images would probably be useful in demonstrating complex three-dimensional structures.

Some sections include explanatory diagrams, typically line drawings, in addition to the light and electron micrographs. Many of the diagrams are useful in clarifying the structural organization of specific tissues and organs, but the quality of the diagrams is variable. For example, one diagram contains drawings of only four of the types of epithelium and lacks captions or labeling. The well-drawn diagrams would be of greater value if used consistently throughout each section of the program.

The main interactive component of MedPics/Histology is found in the Features section of each screen, which permits one to click on one of the features listed, resulting in highlighting of the selected feature on the image with an outline or with arrows. This not only serves as a means of identifying specific structural features of a tissue or organ, but also provides an excellent opportunity for self-testing, which can be carried out either in Standard Mode or Quiz Mode. The features are generally well outlined or marked, but in some instances fine details are difficult to discern, particularly at low power (e.g., reticular fibers in silver-stained lymph node). While interactive feature identification is one of the strengths of the program, it was disappointing to find that one cannot also identify features in reverse, i.e., by first clicking on the image. In addition to the image and features list, each screen contains a Histology Report that includes information on the specimen, preparation, view, findings, impression, and image source credit. "Findings" is typically a brief description of the image, but a few screens contained rather lengthy "findings" (e.g., Peyer's patches). The only information given in "impression" is the statement that the tissue appears "normal"; this seems unnecessarily repetitive, as all the images in the program show normal tissue. In a few instances, the Histology Report also includes
a "histology hint" or a "clinical pathological correlation," but the
information in the latter two items often overlaps that given in the
"findings" section. The "histology hint" sometimes presents informa-
tion of questionable value (e.g., "The capillaries contain red blood
cells"), and at other times describes features not seen in the image. The
"clinical pathological correlation" in some cases simply presents func-
tional implications of a given structural feature, and in one case
contained an inappropriate attempt at humor ("The thymus is the
'schoolhouse' where thymocytes, studying to be T cells, learn the
self/non-self discrimination. Those who fail are killed. By compari-
son, medical school is not so bad.").

While this collection of images represents a fairly comprehensive
sampling of normal human tissues and organs, there are no images
representing cell structure, blood and hematopoiesis, or special sens-
es. Some sections also lack images of major organs, including the
larynx, ureter, penis, and vagina. In contrast, other sections show mul-
tiple views of the same tissue or organ (e.g., skeletal muscle, ground
bone); and in a few cases the same images are shown in two different
sections (e.g., myocardium, smooth muscle). The images are fairly well
organized into separate tissue and organ system sections; however, the
order of the sections is unusual, e.g., "Circulatory System and
Heart," "Endocrine System," "Digestive System," "Lymphoid Tis-
sue." Only two basic tissues, epithelial tissue and connective tissue,
are listed under the heading "Tissues" (on a rather confusing sub-
menu called "Big Picture"), while "Bone/Cartilage" and "Muscle" are inexplicably placed
together as a group with the organ systems. Each section begins with
a useful overview, which lists all

of the images in the section. How-
ever, the image titles contain fre-
quent errors and inconsistencies
(e.g., the titles in the overview are
often different from those on the
individual image screens). The use
of icons to represent organ systems
is helpful, although some of the
icons are difficult to recognize.

MedPics/Histology is a very
useful tutorial or review tool for
students of histology. The main
strengths of the software are the
high quality light microscopic im-
ages and interactive feature iden-
tification. The images provide an
excellent means of self-testing,
particular when used in Quiz
Mode. Potential improvements to
the program would be the addition
of a general index, to allow for rap-
id navigation to specific images; the
ability to generate a random set of
images from multiple organ sys-
tems for self-testing; a zoom mode
for enlarging images; and a split-
screen mode permitting compari-
sion of images.

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ProCite for Windows (version 3.1),
Biblio-Link II (version 1.1). Per-
sonal Bibliographic Software, Inc.,
P.O. Box 4250, Ann Arbor, MI
48106-4250; 313/996-1580. $345.00
for ProCite; $395.00 for ProCite
with Biblio-Link II. Standard ed-
ucational discount: 50% of the list
price. System requirements: Mi-
crosoft Windows 3.1 or higher.
ProCite for Windows, version 3.1,
is the most recent iteration of a
popular bibliographic manage-
ment program from Personal Bib-
liographic Software, Incorporated
(PBS). The program is essentially
a tool for organizing and manipu-
lating collections of references
("records") within a database.
Broadly speaking, ProCite can be
used by anyone interested in keep-
ing track of bibliographic entities,
whether reprints of articles in a file
cabinet, or records downloaded
from an online database like MED-
LINE. When used in conjunction
with the PBS data transfer module,
Biblio-Link II (version 1.1), Pro-
Cite can take downloaded citations
from any of a wide range of online
and CD-ROM databases and trans-
fer them directly into a ProCite da-
tabase. Other features of the pro-
gram include the ability to format
bibliographies according to an edi-
torial style, e.g., ALA, Turabian,
Science, Nature, etc.; a utility for
generating formatted lists of cita-
tions from manuscripts; extensive
"customizability"; elaborate data-
base search capabilities; a list of
more than two dozen "workforms" (templates for a particular
type of record, e.g., books, journal
articles, conference proceedings);
and the ability to incorporate large
blocks of text into individual rec-
ords.

Two manuals come with Pro-
Cite: the User Guide, containing
information on basic program fea-
tures, and the Reference Guide, pro-
viding instructions on customiza-
tion of ProCite. Biblio-Link II
comes with a separate manual. The
manuals are quite satisfactory, with
numerous examples and concise
instructions. Installation of Pro-
Cite and Biblio-Link is quick and
easy. Program response time on a
486/33 megahertz PC is generally
adequate. ProCite requires a min-
imum of four megabytes of RAM,
although eight megabytes is pre-
ferred. Biblio-Link requires eight
megabytes of RAM.

ProCite's initial viewing inter-
face, Quick Search, is markedly dif-
ferent from the record viewing in-
terfaces of other bibliographic
management programs, e.g., Ref-