

The Medical Educator's Resource Guide

John R. Cotter, Ph.D.

Ask Google (a search engine) for a definition of a search engine and you will be rewarded with a list of twenty-seven definitions. One of the shortest defines a search engine as “a computer program that retrieves documents or files or data from a database or from a computer network” such as the Internet (<http://wordnet.princeton.edu>).

Some search engines have the capacity to capture images from the World Wide Web. In this edition of the Guide, the performance of three of them is evaluated by searching for images of a cell structure. The other three reviews in this edition of the Guide deal with the morphology of blood cells, histology, and the morphology of nerve cells.

The performance of the three search engines was evaluated each time using the same protocol. A single keyword resulted in a large number of images. Two key words reduced the number of images to a fraction of the number that was found in the original search. In each instance, the websites for the images were identified by the search engine. The results show the search engines were efficient at locating images and defining the scope of a search.

If you are aware of a site that has the potential for being used in teaching or facilitates the learning of the basic and clinical sciences, consider submitting a review of the site to the Guide. Send all submissions to jrcotter@buffalo.edu. Please include the URL and a short critique that summarizes the essence and utility of the site.

AltaVista Images. Overture Services, Inc.

<http://www.altavista.com/>

AltaVista Images tracks down images incorporated into web pages on the World Wide Web. A quick test of the search engine yields over 1,000 hits when “microtubules” is used as a keyword. “Microtubules + electron microscopy” narrows the field to 22 hits some of which are different from those found in a similar search using Google Images (see below). All of the images are initially displayed on web pages as thumbnails. The thumbnails are linked to the content page for the image. The search engine can also be used to locate audio files, video files and news articles. *(Reviewed by John R. Cotter, Ph.D., University at Buffalo.)*

Atlas of Hematology. Nivaldo Medeiros.

<http://www.hematologyatlas.com/>

Dr. Medeiros has assembled an impressive digital library of stained blood and bone marrow smears that illustrate normal hemopoiesis and a very broad spectrum of hematological conditions and other diseases. He also presents an assemblage of diseases that display abnormal cells in the pleural and cerebrospinal fluids. The collection of images is suited for individuals with some experience in normal and abnormal morphologic hematology. A neophyte, in particular, will not always recognize why a given specimen offers diagnostic information or that the information is consistent with but not diagnostic of a given disease. Or in some cases, an entry level student may miss the cytological features displayed by an aggregate of cells that point to a given diagnosis. The supplementation of descriptive instructional comments to some or all slides would be a significant contribution to the atlas and of interest even to an

experienced hematologist. The atlas does reinforce an advanced user's knowledge of a given condition and contains examples of diseases or states with which one has minimal or no experience. An advanced user also has the opportunity to compare his/her interpretations with those of the author. Cytological interpretations can be subjective and it is instructional as well as stimulating to compare one's opinions with those of a respected expert. Dr. Medeiros has put a great deal of effort into making his atlas a useful resource for those working in the field. It is a significant contribution to hematology. *(Reviewed by Chester A. Glomski M.D., University at Buffalo.)*

General Histology. A Digital Atlas. University of Southern California School of Dentistry.

<http://www.usc.edu/hsc/dental/ghisto/index.html>

This is a very nicely organized collection of digital images that illustrates the topics considered in normal histology. First time users should go immediately to “Site Information” for a clear explanation of how the images are organized and used. The images are accompanied by a description of an image, the method used to stain a specimen, and the magnification at which a specimen was photographed. The organization of the site is straightforward making it easy to navigate to the available topics. The descriptions are brief and students taking histology will find the site is an appropriate supplement to the examples of cells, tissues and organs that they have seen in class. *(Reviewed by John R. Cotter, Ph.D., University at Buffalo.)*

Google Image Search. Google, Inc.

<http://images.google.com/imghp?%20hl=%20en&ie=UTF8&oe=UTF8&q>

Google, Inc. boasts their search engine is the “most comprehensive” means of finding images “with billions of images indexed and available for viewing.” Indeed, a test of the software yields over 4,000 hits and includes drawings, fluorescence photomicrographs and electron micrographs when “microtubules” is used as a keyword. “Google Image Search” finds the images by matching a keyword with the same word in the text that accompanies an image. A user can reduce the number of hits by using the advanced mode of the search engine. Adding the words “electron microscopy”, for example, yields 22 images. Beware however, the choice of keywords is critical and can lead to disparate results. For example, “microtubule” results in fewer hits than “microtubules”. A user can search the Web or a single website (instructions are found under “Image Search Help”). The Google company does point out in “Frequently Asked Questions” that every image on the Web is not captured in a search of the Web. The search engine displays pages of thumbnails; the image, if desired; and the web page from which the image is obtained. *(Reviewed by John R. Cotter, Ph.D., University at Buffalo.)*

Picsearch. Picsearch Company.

<http://www.picsearch.com/>

The Picsearch Company describes its image search technology as “cutting edge and user friendly.” The engine is comparable to the other two search engines reviewed in the Guide. The images are displayed as pages of thumbnails and a thumbnail is linked to the webpage that contains the image. The number of images found with “microtubules” and “microtubules + electron micrograph” are comparable to AltaVista Images and the way the images are displayed is comparable to Google Image Search. *(Reviewed by John R. Cotter, Ph.D., University at Buffalo.)*

Synapse Web. Medical College of Georgia.

<http://synapses.mcg.edu/index.asp>

A number of contributors under the leadership of Dr. Kristin M. Harris are responsible for the instructional content of this site. The site is a mix of basic science lessons and research that introduces the students of neurobiology to the cytology of the nervous system. The site is organized into “Tutorials”, “Procedures” and “Databases”. The tutorials are short and begin with a basic introduction to a topic that quickly becomes quite detailed. “Procedures” explains how tissues are prepared for electron microscopy and the way three dimensional reconstructions are made from electron micrographs. “Databases” contain examples of reconstructed dendrites, reconstructed tissues and an Atlas of Ultrastructural Neurocytology. The atlas contains a large number of excellent electron micrographs. A section of the atlas also illustrates structures that are difficult to interpret, pathological changes and artifacts. Being an atlas, it serves as a fine reference, and, as pointed out in the introduction to the atlas, is most useful as an aid to interpreting electron micrographs of the nervous system. *(Reviewed by John R. Cotter, Ph.D., University at Buffalo.)*