



# Zev Leifer's Lab – Access to an International Collection of Digital Pathology Images: Archiving and Retrieval in a Database Format

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## Abstract

Diagnostic Pathology is a critical aspect in determining the nature of the disease process. Typically, a biopsy sample is converted to a slice of tissue on a glass slide, which is analyzed by a pathologist using a microscope.

Today, we are in the world of digital pathology. The slide is digitized. The digital image is stored and retrievable. The image is viewed on a computer functioning as a microscope. Now, multiply this by hundreds or thousands of slides per day in a large medical center. Each slide may contain between 50 and 400 MB of data.

In parallel, there is an obvious need to train medical students in the analysis of many pathologies, more so for the training of residents and the review of new or uncommon conditions by senior clinicians.

Enter "Zev Leifer's Lab" using Quartzzy.com.

This system, using a commercial product designed to track lab chemicals and supplies, has been adapted to deal with the data mining challenge of the massive storage of digital images. It is a listing of links to images stored in the collections of numerous medical institutions.

The unique aspect lies in the metadata tags and the sorting capacity. One may search and organize by tissue type, pathology type, etc. This mined data of digital images can be used for study, testing and research.

## Background

At the New York College of Podiatric Medicine, the Pathology course is conducted using virtual microscopy/Digital Pathology.

We digitized 105 glass slides, store the images in-house and present them to the students, per topic, for a semester.

On the other hand, when considering the massive number of images, stored in numerous medical institutions and made available publicly, the task of locating a desired image in this vast decentralized array becomes daunting.

The challenge of accessing this often megabyte-size data point (image) without the need for local peta-by storage, archival and retrieval, is addressed in the current work.

## Method

This project has adapted the commercial project found at [Quartzzy.com](https://quartzzy.com).

To join and use:

- Register at <https://quartzzy.com>
- Join the group (for details, contact ZL at email address above).

While originally set up for lab equipment inventory, it has been modified for use as a slide inventory system. Access to slides is via URL links. Slides are labeled as to tissue, pathology and collection.

A large number of sites have been accessed. Some are listed below.

This is an ongoing project. Collaborators are invited to join.

## Sources

- University of Leeds
- University of Iowa
- New York University
- University of Indiana
- Universitat of Basel
- Armed Services University
- Emory University
- University of Ontario
- University of British Columbia
- University Ontario and others.
- Independent and commercial sources are also accessed – Digital Scope, Clearpath, Aperio and Proscia. See Digital Pathology Association's Whole Slide Imaging Repository.

## Features

- Can view a wide variety of pathologies in a wide variety of tissue.
- Can sort by tissue, pathology, collection and other parameters
- Can use for constructing pathology courses, for Tumor Boards and for constructing exams.
- For students, faculty, clinicians and pathologists

Products	Name	Location	URL / URL 2	Vendor (Cat. No.)
Vendor Catalogs				
Settings				
Default View				
Inventory Backup				
	<input type="checkbox"/> Cirrhosis	liver	<a href="http://slidebox.uwo.ca/vm_path/liver/paget.html">http://slidebox.uwo.ca/vm_path/liver/paget.html</a>	Univ Western Ontario
	<input type="checkbox"/> Tuberculosis	lung	<a href="http://slidebox.uwo.ca/vm_path/respiratory/pa...">http://slidebox.uwo.ca/vm_path/respiratory/pa...</a>	Univ Western Ontario
	<input type="checkbox"/> Cirrhosis	liver	<a href="http://histo.an.usbc.ca/PATHOLOGY/liver/200s...">http://histo.an.usbc.ca/PATHOLOGY/liver/200s...</a>	Univ British Columbia
	<input type="checkbox"/> Hepatocellular carcinoma	liver	<a href="http://www.virt.uspathology.leeds.ac.uk/slides...">http://www.virt.uspathology.leeds.ac.uk/slides...</a>	University of Leeds
	<input type="checkbox"/> Cirrhosis	liver	<a href="http://www.virt.uspathology.leeds.ac.uk/slides...">http://www.virt.uspathology.leeds.ac.uk/slides...</a>	University of Leeds
	<input type="checkbox"/> Small Cell Carcinoma	lung	<a href="http://www.virt.uspathology.leeds.ac.uk/slides...">http://www.virt.uspathology.leeds.ac.uk/slides...</a>	University of Leeds
	<input type="checkbox"/> Silicosis	lung	<a href="http://www.virt.uspathology.leeds.ac.uk/slides...">http://www.virt.uspathology.leeds.ac.uk/slides...</a>	University of Leeds
	<input type="checkbox"/> Tuberculosis	lung	<a href="http://www.virt.uspathology.leeds.ac.uk/slides...">http://www.virt.uspathology.leeds.ac.uk/slides...</a>	University of Leeds

