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School of Medicine

2017

Digital Histology 2.0: An Open Educational Resource

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VCu

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Digital Histology 2.0: An open educational resource

John Bigbee, PhD
Thomas Woodward, MEd
Kenneth Foster, EdD
Alice Pakurar, PhD

Histology in medical education

Histology instruction has been a standard component of medical education since the middle of the 19th century.


Histology bridges the gaps between Physiology, Gross Anatomy and Pathology.

The microscope is an iconic image of medicine.



<https://clipartfest.com>

With increasing demands on medical education, time allotted to histology instruction has greatly diminished.



VCU School of Medicine

1987 115 hours

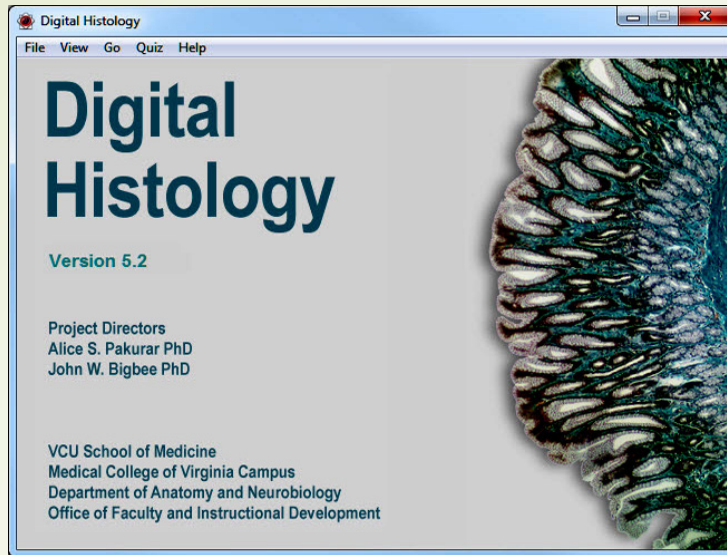
1996 79 hours

1999 56 hours

2001 33 hours

2013 24 hours (C3 curriculum)

} Elimination of microscope labs.
Introduction of Digital Histology
as a replacement for labs.



Title screen

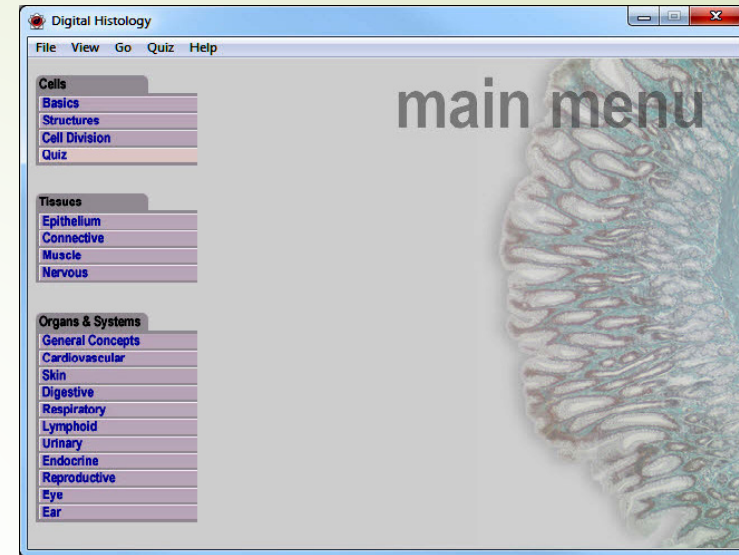
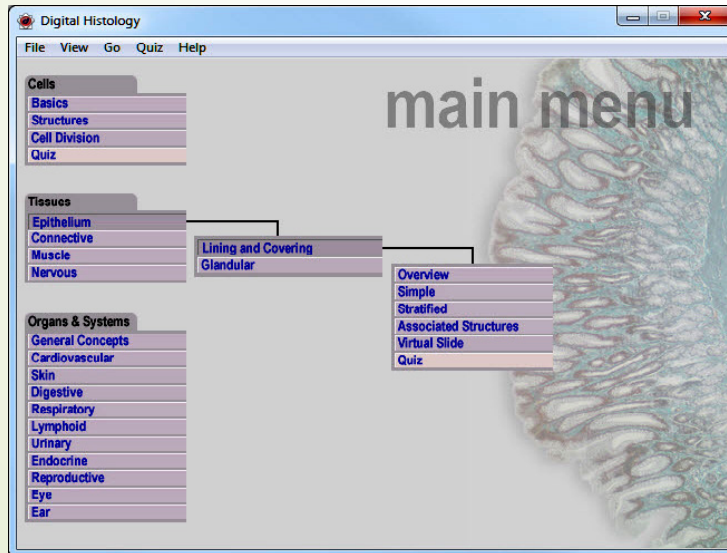
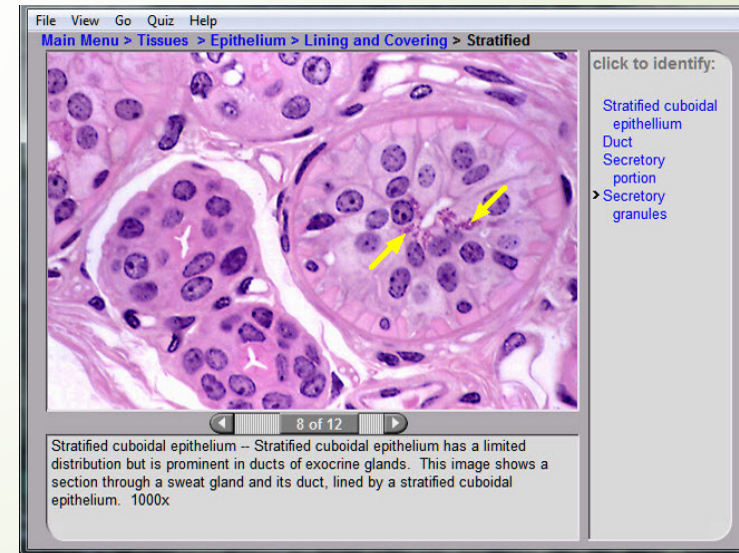


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Content menu



Sample content screen

Digital Histology

Pros and cons

Advantages

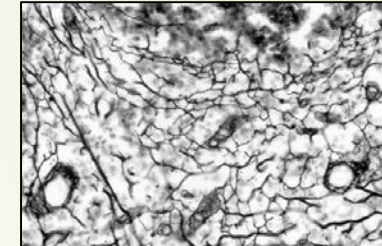
All students see the same, high quality images.

Eliminates misidentification of structures. →

Use of special microscopic preparations.

Students can study on their schedule.

Portable resource for use in other courses.




Disadvantages

Learning is more passive.

Appreciation of organ structure more difficult.

Removes the joy of discovery.

Disadvantages mostly overcome with the introduction of virtual digital slides.



How Digital Histology came to be

Project Directors

Alice S. Pakurar, PhD
John W. Bigbee, PhD

Medical Illustrator

Carole W. Christman, PhD

Instructional Developers

John Priestley, MA
Jeanne B. Schlesinger, MEd


Application Developers

John Priestley, MA
Chris L. Stephens, MS

Graphic Designer

John Priestley, MA

Office of Faculty & Instructional Development
Department of Anatomy & Neurobiology



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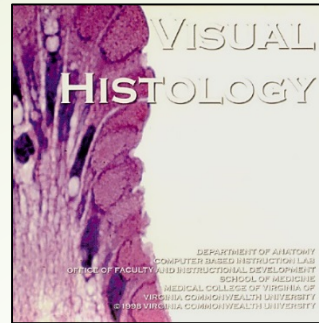
John Priestley, MA
Jeanne B. Schlesinger, MEd

Application Developers

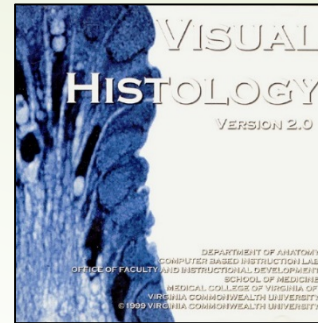
John Priestley, MA
Chris L. Stephens, MS

Graphic Designer

John Priestley, MA



1998



1999

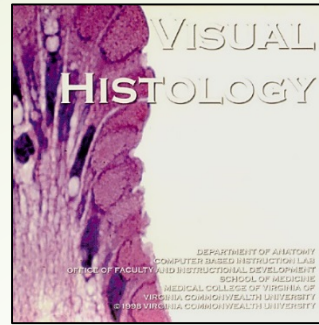
First versions were called *Visual Histology*.

Program was created using proprietary authoring software, Adobe Authorware.

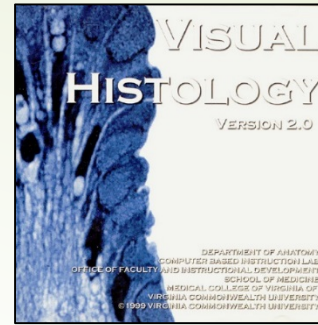
Compatible with Windows and Mac OS.

Easily navigated, interactive digital atlas with active, on-demand labeling of structures, quizzes with formative feedback.

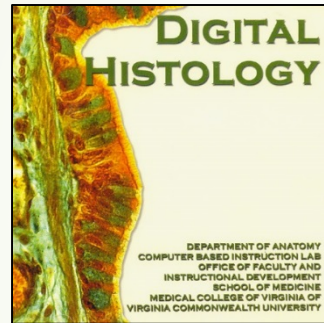
Distributed to students on CD-ROM.



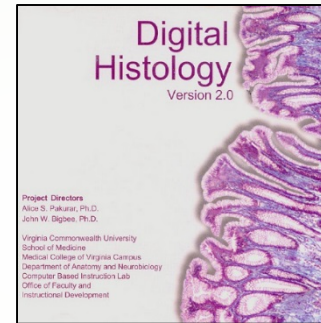
1998



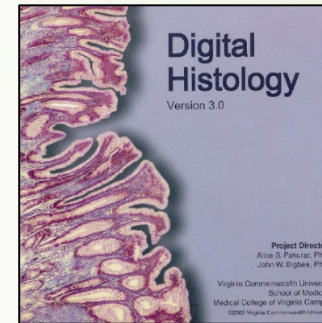
1999



2001



2002

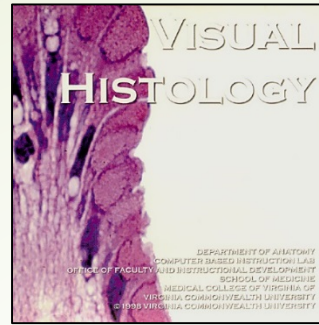


2003

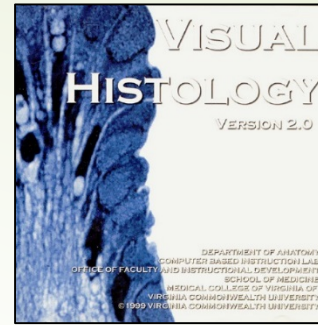
Project became *Digital Histology*.

Content was expanded and graphics were redesigned.

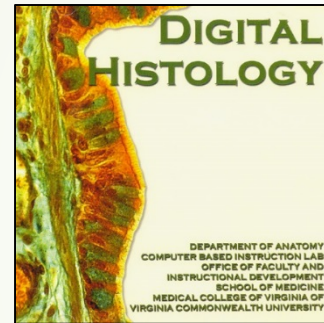
Distributed to students as a download from eCurriculum.



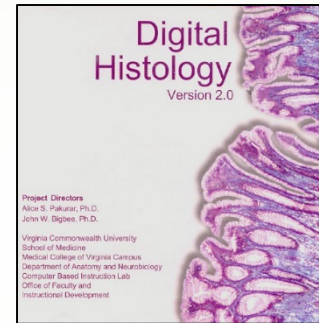
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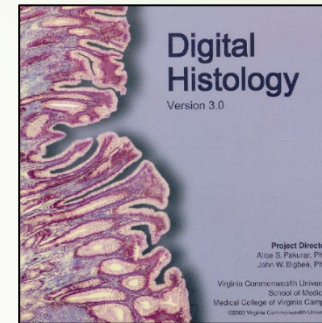
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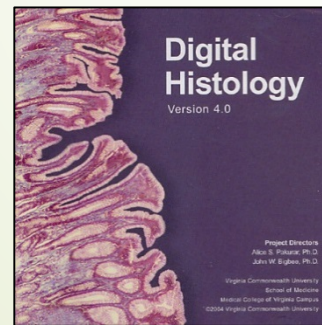
2001



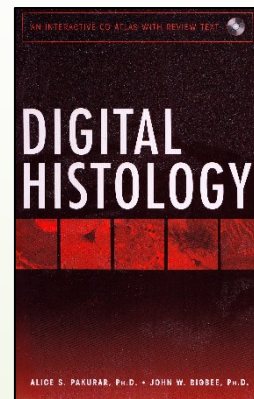
2002



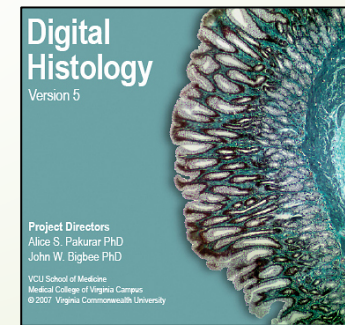
2003



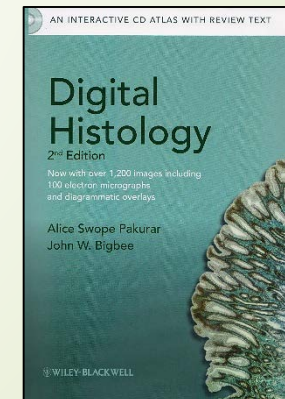
2004



ALICE S. PAKURAR, Ph.D. • JOHN W. BIGBEE, Ph.D.



2009



John Wiley & Sons. 1st edition, 2004; 2nd edition, 2009



Future Digital Histology editions

Obstacles to overcome

Authorware software no longer supported by Adobe.

Mac OS became incompatible with Authorware.

Editing and updating content became increasingly difficult.

User preferences for web-based applications.

Changing priorities at Wiley.



..... to the rescue!!



Ken Foster
Instructional Technologist for
Medical Education
Office of Faculty Affairs
VCU-SOM



Tom Woodward
Associate Director of
Learning Innovation, ALT Lab
VCU



DH2 software


Developed in the content management system called WordPress.

WordPress is licensed under the GNU General Public License, version 2, a free and open source license.

Custom theme for DH2 developed based on the Bootstrap framework enabling simple responsive design across screen sizes.

Content stored in a MySQL database, exportable in a variety of standardized formats.

Theme is freely sharable among the VCU community.



Open resource or published work

Expanded access to learning, extending beyond VCU.

No cost to the students. (Our contract with Wiley was unique.)

Easily revised with rapid circulation of program updates.

Authors maintain control. (Avoids publisher's "whims")

Flexible inclusion of multimedia elements.

Sustainability.



DH2 package advantages

Cross-platform and compatibility across devices and screen sizes.

Allows simple web-based editing and updating.

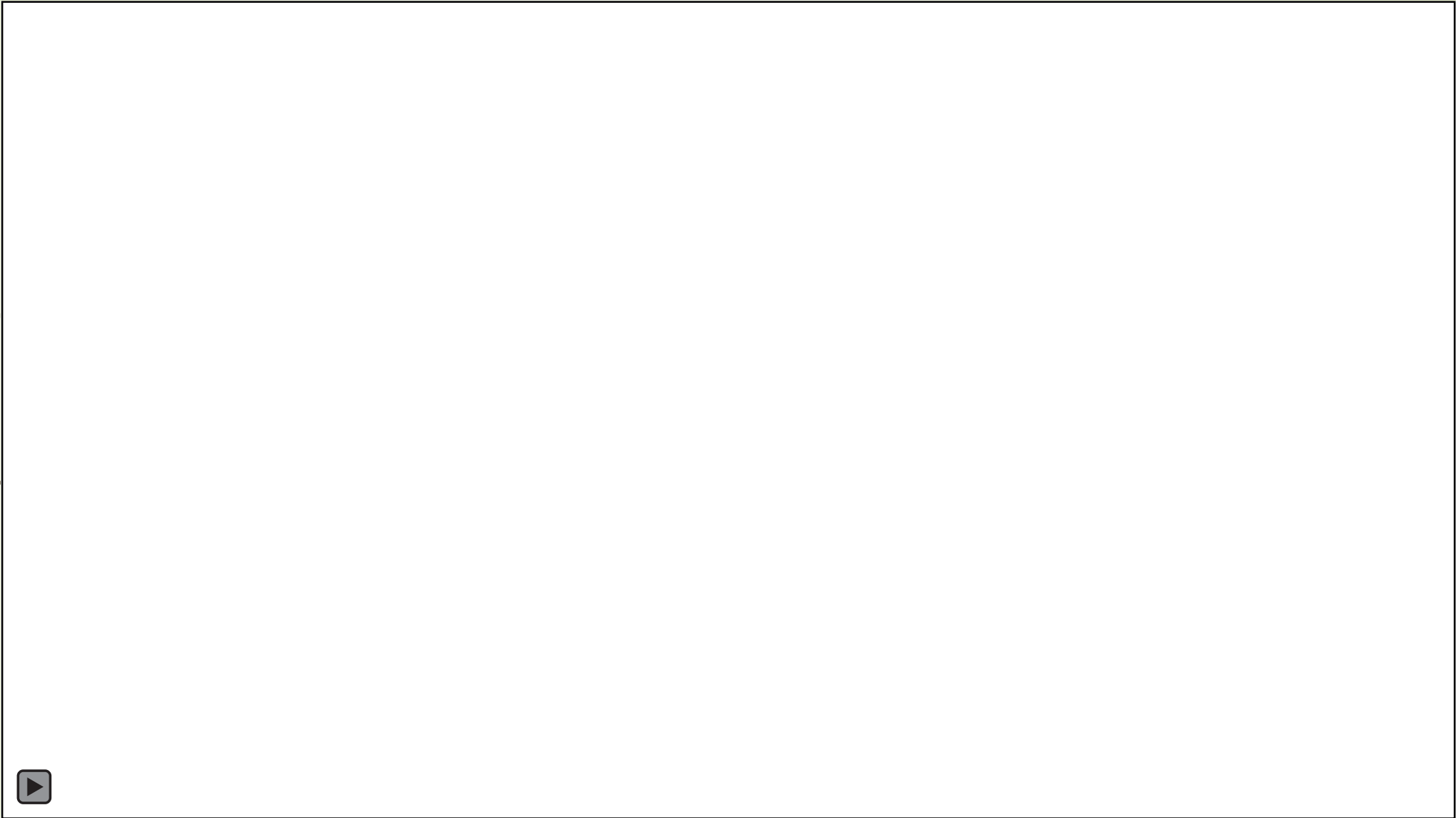
Higher resolution, zoomable images.

Expandable to include audio narrations and supplementary videos.

Inclusion of hyperlinks to digital virtual slides.

Employs non-proprietary software, avoids future incompatibilities.







Summary

DH2 builds on the success of our current program while adding:

Cross-platform and mobile compatibility

User-friendly editing

Larger, higher resolution images

Inclusion of multimedia elements

Open resource, expanded access and sustainability

The DH2 content management framework is freely sharable among the VCU community.



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