

From scope to screen: A collection of online dermatopathology resources for residents and fellows



To the Editor: Although traditionally taught at the microscope, dermatopathology has become ensconced in the digital space in recent years. Despite a planned gradual shift toward virtual microscopy, the COVID-19 pandemic expedited the implementation of virtual didactics to maintain resident education. A number of virtual dermatopathology resources now exist online, providing opportunities to learn dermatopathology from experts across the

country. Shahriari et al¹ explored this in their 2017 study; since then, the landscape has markedly expanded. We have compiled a comprehensive list of online dermatopathology resources that residents and fellows may utilize (Tables I and II).

The full methodology is outlined in the Supplementary material (available via Mendeley at <https://data.mendeley.com/datasets/xpxh9h2ydp/1>). In short, we used Shahriari et al's¹ study that highlighted dermatopathology education with a subsection listing online dermatopathology resources. In addition to these resources, we utilized Youtube,

Table I. Free virtual slide libraries and digital unknown cases for dermatopathology education and training. Resources available as of October 2022

Interactive virtual slide libraries	Access
American Society of Dermatopathology Virtual Academic Slide Sets (under "free educational resources") https://www.asdp.org/about-asdp/covid-19-resources/	Free
<i>Fungal Infections Set</i> https://sherwood-asdp.informz.net/informzdataservice/onlineversion/ind/bWfPbGluZ2Luc3RhbmNlaWQ9OTlyNzg0NCZzdWJzY3JpYmVyaWQ9MTAxOTAxMDQxNw==	Free (need account)
Atlas of Dermatopathology: https://atlases.muni.cz/en/index.html	Free (need account)
CDLS (Slide Study Set for residents): https://dermpathlab.com/residents/slide-study-set-program/	Free (need account)
Juan Rosai's Collection of Surgical Pathology Seminars (Aperio): http://www.rosaicollection.org	Free
University of Iowa Virtual Slidebox: https://medicine.uiowa.edu/it/web-design-services/virtual-microscopy-virtual-slidebox (redirects to https://www.mbfbioscience.com/iowavirtualslidebox for Biolumida software)	Free (need Biolumida software)
University of Leeds: http://www.virtualpathology.leeds.ac.uk	Free
University of Michigan Virtual Slide Box https://www.pathology.med.umich.edu/slides/index.php	Free
PathPresenter (Virtual slides, multiple dermpath channels) https://pathpresenter.net	Free (need account)
Static virtual slides	
Dermatopathology Interactive Atlas: http://www.dermthatlas.com	Free (need account)
Dermatopathology Institute Slide Atlas: http://www.dermthatmd.com/dermatopathology_slide_atlas.htm	Free
University of Basel (Pathorama): http://pathorama.ch	Free
WebPathology: http://www.webpathology.com	Free
Interactive/unknown cases	
American Society of Dermatopathology (interactive Case Study of the month, Case Study Archives) https://www.asdp.org/education/case-study-of-the-month/case-archive/	Free
Pathology Outlines: http://www.pathologyoutlines.com	Free
DermOID Online Interactive Dermatopathology UCLA: https://derm-oid.ctrl.ucla.edu	Free (need account)
RecutClub: https://www.recutclub.com	Free (need account)

Table II. Online lecture and social media resources for dermatopathology education and training. Resources available as of October 2022

Dermatopathology courses/lectures/board review

Cockerell Dermatopathology: <http://www.dermopath.com/education>

Derm In-Review: <http://dermatologyinreview.com>

Dermpedia: <http://www.dermpedia.org> (Paid subscription)

DermpathPro: <https://dermpathpro.com/> (Paid subscription)

LLU Online Dermatology Course: https://drive.g.oogole.com/drive/folders/1R7CfSC3yNDmq4tF7H7nylO_cy4_ZMyR6?usp=sharing

Kiko

Dr Jerad M. Gardner (Geisinger): https://kikoxp.com/jerad_gardner1

Jerad Gardner's Social Media Guide for Pathologists and other Medical Doctors: <https://kikoxp.com/posts/15217>

Dr Viktoryia Kazlouskaya (University of Pittsburgh): https://kikoxp.com/viktoryia_kazlouskaya2

Dr Timothy McCalmont (University of California, San Francisco): https://kikoxp.com/tim_mccalmont1

YouTube

Cockerell Dermatopathology past webinars: <https://www.youtube.com/cockerelldermatopathology>

Dr Bonnie Lee (University of California - Irvine):

<https://www.youtube.com/channel/UCXtzEI70mNovpV-o3LTNv5Q>

<https://drive.g.oogole.com/drive/folders/1tjpUbLudejbeL1xX4wWTPNyCz8fGHBcN>

Dr Jerad M. Gardner (Geisinger): <https://www.youtube.com/user/JeradMGardnerMD/videos>

Dr Maxwell Fung (University of California - Davis): <https://www.youtube.com/channel/UCe8NW0l3LlFKrewvyJoG64g>

Dr Melanie Bourgeau (Emory University): <https://www.youtube.com/channel/UCa6F8-Mhg-ftfEpHvSX-4yA/videos>

Dr Peter Pavlidakey (University of Alabama Birmingham): https://www.youtube.com/playlist?list=PLnIH_jjzc6upUjISC4b95PyckgGkG0oYd

Dr Phillip McKee (Brigham and Women's Hospital—retired):

<https://www.youtube.com/channel/UCDMtR-TYs9ZKHU6x41YuMUw/videos>

Dr Rajendra Singh (Northwell Health New York): <https://www.youtube.com/channel/UCK1u1K6e-rgeb6OlqSCdBBQ>

Dr Robert Kirsner (University of Miami Miller School of Medicine): https://www.youtube.com/playlist?list=PLBnIDK3XUWwo8_j8BH2lW79id2JqACYjn&app=desktop

Medical University of South Carolina (Dr Dirk Elston): <https://www.youtube.com/channel/UCWfbV1KGZ6osM55IAMnYQeQ>

Dermatopathology Lecture Series (Dr Rajendra Singh): <https://www.youtube.com/playlist?list=PLQztEwN4gBUuoB2-GyfgjKJfNgEEVvt3>

Anand DermPath (Dr Dipti Anand): https://www.youtube.com/channel/UCP1cS7V3Zvu7TdtPQ_JOQag/featured

Facebook

Anand DermPath (Dr. Dipti Anand): <https://www.facebook.com/Anand-DermPath-101364964631539/>

Dermatopathology (private Facebook group): <https://www.facebook.com/groups/733566039992947>

Jerad M. Gardner, MD (public Facebook page): <https://www.facebook.com/JMGardnerMD/>

McKee Derm (Private Facebook Group + Archive)

<https://www.facebook.com/groups/mckeederm/>

<https://mckeederm.wixsite.com/archive>

Twitter/Instagram

DermPath Journal Club: <https://twitter.com/dermpathjc>

Anand DermPath (Dr Dipti Anand): <https://www.instagram.com/ananddermpath/?hl=en>

Facebook, and Twitter by searching “dermatopathology.” We also polled expert dermatopathologists with an interest in developing online education content (authors of this study) to find any additional resources. Any additional resources identified by this group were added to the list.

Digital dermatopathology has advanced over the years because of a number of factors. Perhaps most pertinent is the development of whole-slide imaging, a modality that allows for high resolution capture of histologic sections, image storage in digital libraries,

and subsequent transmission to mobile devices or computer screens. In addition, improvements in mass electronic media (eg, social media: Youtube, KiKo, etc.) and telecommunication (eg, video-conferencing: Zoom) have rendered digital dermatopathology highly accessible.

The technology has become so pervasive that the modality has been integrated into board examinations, such as the dermatopathology portion of the American Board of Dermatology's CORE Examination and the entirety of the Dermatopathology board

examination.² Residents have shown at least no preference in which modality to use, and sometimes actually prefer virtual microscopy.³

The concurrent use of virtual microscopy with electronic media allows for the live or recorded delivery of dermatopathology. This allows learners from all over the world, including those from low-resource settings or with limited dermatopathologist expertise to engage in a structured curriculum. Although virtual dermatopathology has great potential in both the clinical and educational realms across the globe, it is limited, in particular, by a significant cost in implementation in addition to the ever-changing palette of online content.⁴ Additionally, it may lead to neglect of light microscopy technical skills, requires fast and stable internet connection, and needs large amounts of computer memory for storage. Notably, certain histologic features may have variable appearances when noted on virtual versus light microscopy. Light microscopy also fares better than virtual microscopy in certain functions, such as identifying gram-positive bacteria.⁵ Other considerations, such as maintenance of patient anonymity and compliance with both state and federal mandates fall to the content creator.⁴ Despite this, the use of virtual dermatopathology for individual consumers/learners can be free in many cases. Empowering dermatopathologists and pathologists in the endeavor to enhance and refine these materials over time may result in long-lasting improvements in education, dermatopathology access, and collaborative patient care.

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Conflict of interest

None disclosed.

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