Welcome to the Pathology Open House!

**FILL in** the Word Cloud with **how you would describe a pathologist:**

www.menti.com/oovhhuo25

*(see link also in the Zoom chat box or the QR code below)*
Perceptions of Pathologists and Pathology!

Association of Pathology Chairs • www.apcprods.org
Training Pathways for Pathologists

• Medical School: 4 years
• Pathology Residency
  • Anatomic Pathology (AP) only: 3 years
  • Clinical Pathology (CP) only: 3 years
  • AP/CP combined: 4 years
  • AP/NeuroPathology combined: 4 years
• Pathology Research Track: includes 6 months of research in AP or CP residency + 1 year research
• Subspecialty Fellowships: 1 year

American Board of Pathology Board Certification – within 5 years from the end of training
Meet Pathologists, Residents and Students today!

What is Anatomic Pathology?

Kayla Elliott, MD
PGY-2, GI/Liver/Surg Path

CJ Lucas, MD
PGY-3, Neuropath Fellow

Nicole Jackson, MD, MPH
Assistant Medical Examiner
Cook County Medical Examiner’s Office

What is Clinical Pathology?

Roya Zarpak, MD
PGY-1, AP/CP – BB/TM

Robert Christian, MD, MS
PGY-2, AP/CP – BB/TM

Why also a good fit for Research MD/PhD students?

Maryknoll Palisoc
4th Year MD/PhD Candidate
Cancer Research

The pathologist is a physician who specializes in the diagnosis and management of human disease by laboratory methods.
What is Anatomic Pathology?

- Whenever tissue is removed from the body (during biopsy and aspiration procedures, in surgery, or at autopsy), it must be examined to determine the precise cause of the illness that prompted its removal.

- **Gross and microscopic analysis** of tissue changes is the primary focus of anatomic pathology, aided by correlation with ancillary studies, such as immunohistochemical, molecular genetic, and flow cytometric analysis.

Subspecialties in Anatomic Pathology

- Cytopathology
- Dermatopathology
- Medical Autopsy and Forensic Pathology
- Neuropathology
- Pediatric Pathology
- Surgical Pathology (subspecialties include Bone/Soft Tissue, Cardiac, GI, Gyn, Head/Neck, Pulmonary)
What is Clinical Pathology?

• Specialty **laboratories** include hematology, microbiology, clinical chemistry/genetic sequencing, and blood bank (transfusion medicine).

• Pathologists are important **consultants to the clinician**, the “doctor’s doctor,” recommending appropriate **lab tests** and interpreting their **results** for fellow physicians.

**Subspecialties in Clinical Pathology**

• Blood Banking/Transfusion Medicine
• Chemical Pathology
• Hematology
• Medical Microbiology
• Molecular Genetic Pathology
• Clinical Informatics
Why is Pathology a good fit for MD/PhD students?

- **Clinical laboratory experience synergizes with physician-scientist career goals.**
  - Enables basic research on disease mechanisms with possible translation to therapeutics.
  - Roles in biobanking and tissue-based research create opportunities for collaborations with other researchers and clinicians.

- **Research Track:**
  - Core residency tracks* include up to 6 months research
  - **ABP Research Track** adds additional year of research within residency
    - Additional years of fellowship research may be added

- **Most Research Track trainees do AP only or CP only with a fellowship**, resulting in 3.5 years clinical training and several years of research training

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*American Board of Pathology-certified training pathways:

<table>
<thead>
<tr>
<th>Training Pathway</th>
<th>AP only: 3 years</th>
<th>AP/CP: 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP only</td>
<td>CP only 3 years</td>
<td>AP/NP: 4 years</td>
</tr>
</tbody>
</table>

**In many AP/CP subspecialties, generally 1 year clinical, research years may be added.

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1 Weiss & Johnson, 2016, Acad Pathol; Remick et al 2016, Acad Pathol
Clinical Case: GI (Gastrointestinal) System

PATIENT SYMPTOMS:
- 48 year old woman
- Severe abdominal pain
- Nausea and vomiting for past 18 hours
- No past medical history (PMH), no screenings, dislikes physicians

LABS – blood sample:
- Electrolyte imbalance
- Negative pregnancy test
- Iron deficiency anemia
- Blood bank work up

IMAGING:
- CT Scan for abdomen and pelvis with contrast
- Circumferential intraluminal mass in the sigmoid colon measuring 5 cm, involving pericolonic fat

SURGERY:
- Colonic lesion was palpated
- Segment of colon with lesion was excised (with a suture marker at the distal end) and sent to pathology – surgeon requests that a frozen section be performed on the mass and distal margin of the specimen

MORE PATHOLOGY...
- Pathology synoptic reporting and staging of cancer
- Submission of tissue for molecular markers (genomic/DNA sequencing for specific mutations in sample)
- Presentation of case at a “Tumor Board” with multiple specialists, such as radiology oncologists, hematology oncologists, surgical oncologists, radiology, and GI specialists

PATHOLOGY - SURGICAL
- Frozen section biopsy - mass/tissue is:
  - Measured
  - Quickly frozen,
  - Thinly sliced,
  - Stained, and
  - Analyzed under the microscope
- Pathologist reports to surgeon that the distal margin is positive for adenocarcinoma
- Surgeon removes additional tissue and sends second sample to pathologist for another frozen section and analysis resulting in being clear of carcinoma
- Surgeon stitches up the patient for recovery!
Staging the tumor in the TNM System:

- **T** – refers to size and extent of the main (primary) Tumor
- **N** – refers to the number of nearby lymph Nodes that have cancer
- **M** – refers to whether the cancer has Metastasized

https://www.cancer.gov/about-cancer/diagnosis-staging/staging
Photos courtesy of AJCC (left) and Univ of Michigan Virtual Slide Box (Right)

www.apcprods.org
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Association of Pathology Chairs • www.apcprods.org
Clinical Case: Autopsy

PATIENT (deceased)
- 55 year old obese man
- Found dead in bed following several days of fever, cough, shortness of breath, and diarrhea
- No evidence of trauma to the body.
- History of chronic alcohol use and poorly controlled diabetes

IMAGING:
- Full body CT scans:
  - Diffuse consolidations in both lungs
Clinical Case: Autopsy

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ORGANS:
- Lungs weighed 3x expected value, severely-fluid-logged and slippery, contained large blood clots.
Clinical Case: Autopsy

Exudative phase
Clinical Case: Autopsy

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- Full body CT scans:
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ORGANS:
- Lungs weighed 3x expected value, severely-fluid-logged and slippery, contained large blood clots.
- Heart, kidneys, liver, brain, and bowel showed no evidence of altered pathology aside from known natural disease (i.e., liver cirrhosis and some scarring of glomeruli in the kidneys).
- Nose and lung swabs were sent to a diagnostics (pathology) laboratory:
  - negative for Influenza A and B
  - positive for SARS-CoV-2

TOXICOLOGY:
- Negative for any common substances of abuse

MICROSCOPE:
- Lungs showed diffuse alveolar damage (DAD) consisting of:
  - thick, bright pink, hyaline membranes lining the walls of the alveolar airspaces,
  - intra-alveolar fibrin deposition,
  - type II pneumocyte hyperplasia, and
  - increased prominence of megakaryocytes in the walls of the airspaces.

PUBLIC HEALTH IMPACT
- Contact tracing and symptom recognition (family, emergency responders, body transporters, and/or law enforcement agents in contact with the body)
Note: Fields marked with an * are essential and should be completed.

**Item 1**

Patient first name: [ ]

Patient last name: [ ]

Street address: [ ]

City: [ ]

State: [ ]

County: [ ]

Zip code: [ ]

Phone: [ ]

Email: [ ]

**Item 2**

* Date of birth: [ ] mm/dd/yyyy or [ ] mm/yyyy

**Item 3**

* Sex: [ ] Male [ ] Female [ ] Unknown
COVID and Clinical Pathology

• Molecular Pathology
  • Mapping of Sars-CoV-2 genome
  • PCR primers and development of COVID PCR/amplification assay
  • Antibody assay development

• Clinical/Laboratory Pathology
  • Navigating testing kit, viral media, and reagent issues
  • Testing platforms
  • Validation of tests
  • Space issues
Meet Pathologists, Residents and Students today!

Amanda Herrmann, MD, PhD
PGY-2, AP/CP – BB/TM

Cheryl Hanau, MD
Chair and Professor

Kayla Elliott, MD
PGY-2, GI/Liver/Surg Path
University of Vermont Medical Center

CJ Lucas, MD
PGY-3, Neuropath Fellow
University of California San Francisco

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MAIN ROOM: Busting the Myths and Applying to a Pathology Residency
Nicole Jackson, Cheryl Hanau, and Specialty Pathologists in Practice

Residents and Trainees:

Breakout Room #1
Robert Christian
Maryknoll Palisoc

Breakout Room #2
Kayla Elliott
C J Lucas

Breakout Room #3
Amanda Herrmann
Roya Zarpak

Subspecialties
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- Chemical Pathology
- Clinical Informatics
- Cytopathology
- Dermatopathology
- Forensic Pathology
- Hematopathology
- Medical Microbiology
- Molecular Genetic Pathology
- Neuropathology
- Pediatric Pathology
- Selective (Surgical) Pathology

Organizations with Resources, Awards, and/or Free Memberships for Medical Students

Breakout Room #4
ASCP – American Society for Clinical Pathology

Breakout Room #5
CAP – College of American Pathologists

Breakout Room #6
NAME – National Association of Medical Examiners
The Top 5 Pathology Myths

Pathology is a mystery to the average clinician and general public. Because of the lack of exposure to our specialty, many rumors surround our field. Here we address the top 5 myths about pathology that couldn’t be further from the truth.

1. **Don’t Do Pathology**
   - **Myth:** People ask, “You are such a people person—why be a pathologist?”
   - **Truth:** In practice, pathologists have described a perceived decrease in difficulty finding a pathology position over the last five years. In fact, the majority accepted jobs in their desired practice setting and were satisfied or very satisfied with their positions.

2. **The Job Market is Terrible**
   - **Myth:**
   - **Truth:**

3. **Lack of Respect from Other Medical Specialties**
   - **Myth:**
   - **Truth:**

4. **The Only Thing Pathologists do are Autopsies**
   - **Myth:**
   - **Truth:**

5. **Artificial Intelligence is Taking Over Pathology**
   - **Myth:**
   - **Truth:**

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**NOTE:**

*cap.org*