DECEMBER 2019

PATHWAYS

JOHNS HOPKINS PATHOLOGY

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DIRECTOR'S CORNER

Ralph H. Hruban, M.D.

We cannot forget patient care, or as Osler famously said,

"He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all."

This spring the Department underwent a broad and in-depth five-year external review. **Dr. Peter McDonnell**, the director of Ophthalmology, chaired the review which included prominent pathologists from outside of Hopkins—**George Michalopoulos, M.D., Ph.D.**, **Michael Shelanski, M.D., Ph.D.**, and **Jon Morrow, M.D., Ph.D.** The Department prepared a 212-page book with 24 appendices for the reviewers, and the reviewers spent a full day in meetings with leadership, faculty and trainees. Preparation for the review provided the Department with the opportunity to reflect on where we are and where we should be going.

Let me share a few highlights with you:

Research. With $49,831,627 in funding in FY18, we again rank #1 among all pathology departments in NIH funding (see page 20). We host the #1, #7, #25, and #31 most highly NIH-funded pathologists, as well as the most highly cited pathologist, based on H-index, in the world. More important than dollars and ranking, our scientists continue to conduct exciting and impactful science. To give just one example, this year **Abdel Rahim Hamad, Ph.D.**, discovered a new type of immune cell, the X cell (*Cell,* May 30, 2019). Like *Helicobacter pylori* in the 1970s, this newly recognized cell was sitting in plain sight but overlooked for decades. Importantly, the X cell may play a critical role in juvenile diabetes. Pushing boundaries to create hope!

Education. Our faculty teach at many levels and in many forums—everything from continuing medical education, to one-on-one teaching of fellows, residents, medical students, and staff. When they teach, our faculty often employ novel technologies including iPad apps (this year our faculty created two new beautifully illustrated apps—one on renal transplant pathology, and the other on thyroid pathology, see page 19), live online multi-headed microscope teaching sessions (PathCasts), and web-based interesting case conferences (visit **http://pathology.jhu.edu/department/training/clinicians.cfm** for a listing of some of our publicly available educational products). It should not be surprising that this year our residency program was again ranked #1 by Doximity. Our educational efforts will only grow as we have formed a new Education Advisory Committee, chaired by **Drs. Marissa White and Laura Wake** (see page 18). This committee provides vision and support to our faculty and trainees interested in pursuing careers as educators. Knowledge for the world!

Patient Care. We cannot forget patient care, or as Osler famously said, "He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all." We run an astounding 10 million laboratory tests a year. On an average day, our clinical labs report 200,000 discrete results on 22,000 specimens. We are particularly excited that in July the Immunogenetics Laboratory (HLA Lab) will join the Department. This lab provides innovative and high quality testing for our bone marrow and solid organ transplant patients. Serving humanity at its best!

Quality Assurance/Quality Improvement. Our QA/QI team continuously looks for ways to improve patient care with fewer errors and delays (see page 17). This year we underwent a successful CAP inspection within months of the Epic Beaker go-live, and the team identified and initiated significant cost savings for the Hospital. We look forward to systemwide reporting and integration of our QA/QI efforts.

People. Of course, this all could not happen without people. Our faculty and staff make the Department great! Diversity and inclusion remain high priorities, and we could not be happier that **Dr. Alisha Ware** received the 2019 Inspiration Award from the Association of Pathology Chairs for her presentation on our outreach efforts to increase diversity in pathology (see page 9). Diversity of people, ideas, backgrounds and experiences!

The Future. The future is bright for the Department. Our diverse and collaborative faculty and staff have broad and deep expertise, and our clinical, research and educational missions are aligned. We look forward to celebrating new accomplishments at our next five-year external review! ■

DIVERSITY is any dimension that can be used to differentiate groups and people from one another. In a nutshell, it's about empowering people by respecting and appreciating what makes them different, in terms of age, gender, ethnicity, religion, disability, sexual orientation, education, and national origin.

THE AAMC DEFINITION OF UNDERREPRESENTED IN MEDICINE IS:
"Underrepresented in medicine means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population."

MICROBIOLOGY DIVISION IN HIGHLIGHT: ADVANCING INFECTIOUS DISEASES DIAGNOSTICS IN THE 21ST CENTURY

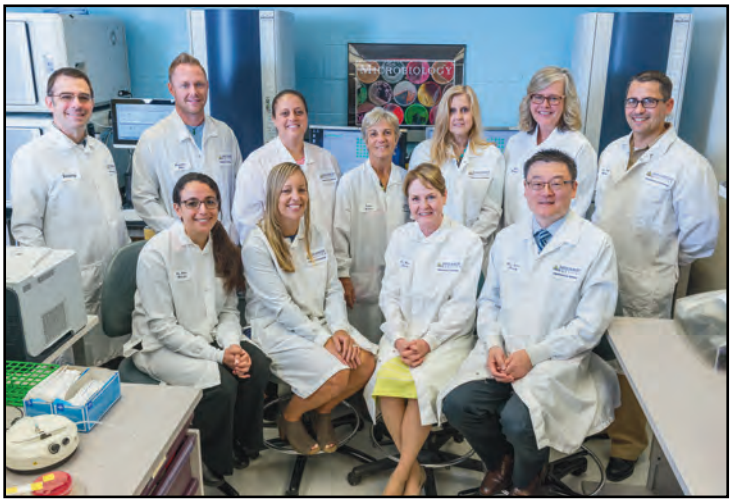
Much has happened in the Microbiology Division since the Division was last highlighted in PathWays in 2004. Sadly, the Division lost one of its icons, **Patricia Charache, M.D.**, in 2015, and to ensure her legacy our Medical Microbiology Fellowship Program is named after her, and Meyer B105 was dedicated as the Patricia Charache, M.D. Conference Room in 2017. We welcomed three new faculty members—**Sean Zhang, M.D., Ph.D., D(ABMM)**, director of the Mycology and Parasitology Laboratories; **Patricia Simner, Ph.D., D(ABMM)**, director of Bacteriology and the new Next Generation Sequencing Laboratory; and most recently, **Heba Mostafa, M.D., Ph.D., D(ABMM)**, as director of the Molecular Virology and Virology Laboratories. Among the constants are **Nicole Parrish, Ph.D., D(ABMM)**, and **Karen Carroll, M.D.**, who has been at the helm of the Division for over 17 years.

Since 2004, the reach of our clinical services has extended systemwide as we provide complete microbiology services for The Johns Hopkins Hospital and its clinics, Howard County General Hospital and Johns Hopkins Bayview Medical Center, and reference laboratory services to Sibley Memorial and Suburban Hospitals. Growing our outreach while simultaneously meeting the demands of modern diagnostics for an increasingly more complex and sicker patient population has required creative solutions. The Division has risen to the occasion through implementation of cutting edge technology such as automated specimen processing, matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS) and a large repertoire of molecular platforms and syndromic panel tests. We have implemented a quarterly microbiology systemwide meeting, improved specimen transport, and initiated systemwide quality improvement initiatives.

Clinical Services

All major areas of infectious diseases diagnostics are well covered by the Division. This is reflected in the extensive test menu and volume of testing in the Division (700,000 tests annually!).

Continuing education in the microbiology labs



Standing (left to right): Brian Parkinson, Brandon Ellis, Renee Harris, Paula Mister, Melissa Geahr, Ann Hanlon, Paul Morris
Seated (left to right): Heba Mostafa, Trish Simner, Karen Carroll, Sean Zhang

Our administrative team—Laboratory manager **Brandon Ellis, MLS(ASCP)CM** (who succeeded **Amelia Maters, MLS(ASCP), MS** after 42 years of service!) and Laboratory supervisors, **Renee Harris, MLS(ASCP)CM** and **Melissa Geahr, M(ASCP)CM, MHS**—maintain 24/7 operations that provide excellent service to The Johns Hopkins Hospital and Johns Hopkins Medicine patients. They train new generations of technologists and pathologists alike, troubleshoot assays and instruments, and perform a multitude of other tasks.

In the past several years, the world has seen the emergence and/or spread of several novel viruses including the MERS coronavirus, Ebola, Zika virus, and the Powassan virus. Novel therapies for Hepatitis C, B, and HIV have driven laboratory development of quantitative viral load tests, as well as genotyping to monitor therapy. Implementation of MALDI-TOF MS has allowed us to advance the knowledge of the contribution of unusual bacteria, fungi and mycobacteria to human diseases. Increasing antimicrobial resistance, such as the global emergence of carbapenemase production among Gram-negative pathogens, has challenged laboratories and clinicians alike. These extremely drug-resistant organisms have resulted in significant morbidity and mortality. Previously innocuous saprophytic organisms, such as molds, are now causing devastating infections. These opportunistic fungal pathogens must be detected quickly among our most vulnerable immunocompromised patient populations.

What are we doing to meet these challenges? Are we up to the task? The following highlights from the various sections of the Medical Microbiology Division emphasize the diverse knowledge and range of expertise of our five faculty members and dedicated clinical staff.

continued on page 4

MICROBIOLOGY DIVISION IN HIGHLIGHT: ADVANCING INFECTIOUS DISEASES DIAGNOSTICS IN THE 21ST CENTURY

Bacteriology

Stacks of plates on laboratory benches are slowly being replaced by syndromic panel tests for identification and susceptibility testing of positive blood cultures, enteric pathogen detection, detection of agents responsible for vaginosis/vaginitis, and Group B Streptococcus surveillance in pregnant women. **Patricia Simner, Ph.D., D(ABMM)**, directs the Bacteriology Section of the Laboratory and she, along with her associate director **Karen Carroll, M.D.**, have improved instrumentation and expanded the test menu. An area in the laboratory was added for rapid diagnostics facilitated by the acquisition of instruments generously provided by The Women's Board of The Johns Hopkins Hospital. This section provides rapid (<1 hour) and sensitive detection of Group A streptococcal pharyngitis in adult and pediatric clinic and emergency room patients, Norovirus gastroenteritis, respiratory infections caused by influenza A, B, and RSV, and presurgical screening for methicillin-resistant and susceptible *Staphylococcus aureus*. It is anticipated that more pathogens will be added to this rapid diagnostics area.

The Bacteriology Sanger Sequencing Laboratory will soon be merged with the Next Generation Sequencing (NGS) Laboratory under Dr. Simner's direction as validation of the first metagenomics NGS assay for CSF is just about completed.

Mycobacteriology

The Mycobacteriology Laboratory, directed by **Nicole Parrish, Ph.D., D(ABMM)**, performs smear microscopy, isolation, and identification of mycobacteria from clinical specimens, and antibiotic susceptibility testing of both *Mycobacterium tuberculosis* and nontuberculous mycobacteria. The Mycobacteriology Lab also provides Microbiology Lab support to The Johns Hopkins Hospital Biocontainment Unit, which is designed to care for patients infected with pathogens of significant public health consequence such as SARS, MERS, and Ebola. Recently, new tests have been implemented for the rapid detection of *M. tuberculosis* and rifampin resistance directly from sputum using the Xpert MTB/RIF assay. This assay is now in routine use for respiratory specimens and is currently being validated for use with extrapulmonary specimens as well.

In addition, several new diagnostic assays are being validated for clinical use, including mycobacterial identification using rpoB sequencing and specialized antibiotic susceptibility testing methods for multidrug-resistant, nontuberculous mycobacterial species.

Virology/Molecular Virology

The team in the Molecular Virology Laboratory under the direction of **Heba Mostafa, M.D., Ph.D.**, strives to offer the most sensitive molecular diagnostic modalities that ensure the optimal patient care. The laboratory is in the final stages of discontinuing viral cell culture, which has been largely replaced by molecular assays that offer targeted pathogen detection. The FDA-cleared assays include quantitative HIV, CMV, HCV, and HBV viral load tests and HSV-1/2 and VZV in skin vesicles. Besides our rapid influenza/RSV assay, we recently added an extensive respiratory panel for the qualitative detection of 15 different viruses and *Mycoplasma pneumoniae*. Using highly sensitive laboratory developed tests, we are capable of detecting the most common viral causes of meningitis, along with monitoring the loads of several viruses including EBV, adenovirus, and BK viruses which is critical for care of patients with impaired immunity. In 2018, our testing load witnessed a twofold increase with a volume close to 200,000 assays per year.

Mycology

The Medical Mycology Laboratory, under the direction of **Sean Zhang, M.D., Ph.D., D(ABMM)**, is one of the largest diagnostic mycology laboratories in the country, and performs a variety of fungal diagnostic tests that range from culture-based identification of medically important yeasts and molds to nonculture-based methods for rapid detection of fungal pathogens directly from critical clinical samples (e.g., blood, CSF, BAL). The laboratory also performs antifungal drug testing to assist clinicians with patient management. The Mycology Laboratory contributed to the investigation of the 2013 nationwide fungal meningitis outbreak by being one of the first laboratories to identify and report the culprit fungus *Exserohilum rostratum* mainly responsible for the outbreak in the United States. Most recently, the Mycology Laboratory assisted with early guidance to clinical laboratories for rapid and accurate detection of the nosocomial multidrug-resistant yeast, *Candida auris*. Dr. Zhang serves as an editor of *Medical Mycology* and an editorial board member of the *Journal of Clinical Microbiology*. He has served as an advisor to the Clinical and Laboratory Standards Institute (CLSI) Antifungal Susceptibility Testing Subcommittee and a voting member for the CLSI document, "Principles and Procedures for Direct Detection and Culture of Fungi in Clinical Specimens." Dr. Zhang is a co-chair of the recently created "Fungal Diagnostics Laboratory Consortium" which aims to establish guidelines and standards for laboratory diagnosis of fungal infections. Mycology rounds with Dr. Zhang is a highlight of the pathology residents' microbiology rotation.

Research

A focus on the diagnosis of healthcare-associated infections born from collaborations with infection control and hospital

MICROBIOLOGY DIVISION IN HIGHLIGHT: ADVANCING INFECTIOUS DISEASES DIAGNOSTICS IN THE 21ST CENTURY

epidemiology is a major thrust of **Dr. Karen Carroll's** research program. In addition, she has a long track record of evaluating novel diagnostics for identification and detection of a broad range of bacterial infections. The laboratories' cost-effectiveness study of the MALDI-TOF MS was a model for other clinical laboratories interested in this disruptive technology. Another long-standing focus has been the epidemiology and diagnosis of bloodstream infections. Soon she and Dr. Simner will implement the GenMark ePlex BCID

The Division of Microbiology plate rounds

Gram-negative organism identification panel from positive blood culture bottles after participating in the clinical trial for this assay. Dr. Carroll is an associate editor of the *Journal of Clinical Microbiology* and continues her long-standing participation on numerous professional society committees.

Dr. Patricia Simner's research has focused on understanding the epidemiology and molecular mechanisms of resistance of Gram-negative bacteria, in particular those harboring β-lactamase enzymes. She is also interested in novel diagnostic tools for infectious diseases and is actively involved in developing metagenomic next-generation sequencing as a diagnostic tool. Dr. Simner is active in the clinical microbiology community as a voting member on the Subcommittee on Antimicrobial Susceptibility Testing for the CLSI. She is also the early career at-large representative for the American Society for Microbiology Council on Microbial Sciences, a member of the Microbiology Resource Committee for the College of American Pathologists, and an editorial board member of the *Journal of Clinical Microbiology.*

Dr. Nicole Parrish's basic research focus is the development of more rapid diagnostics for the detection, identification, and determination of antibiotic resistance in *M. tuberculosis* and other nontuberculous mycobacteria of clinical importance. In tandem with this, Dr. Parrish also conducts research designed to advance our understanding of how antibiotic resistance develops in mycobacteria and aids in development of novel antibiotics and compounds which provide the scaffold for new drugs.

In recognition of the need for rapid and reliable fungal identification, **Dr. Sean Zhang's** research focuses on developing rapid and nonculture-based tools. These include identifying fungal pathogens from FFPE tissue blocks, fungal antigen assays, host-driven response assays, multiplex and next generation sequencing to rapidly identify fungal pathogens directly from clinical samples. These new methods allow clinicians to initiate proper antifungal management without delay. Over the years, Dr. Zhang's laboratory utilized mycological and molecular tools to identify and characterize a number of emerging fungal pathogens that caused invasive fungal infections in different hosts. He is also interested in studying the role of fungal pathogens in cystic fibrosis patients and antifungal drug resistance.

Our central role in research extends beyond verifying and optimizing diagnostic molecular assays to basic and translational research. **Dr. Heba Mostafa** is developing a research program that will focus on the applications of whole genome sequencing in the clinical virology lab. Dr. Mostafa is interested in understanding the correlation between viral polymorphism and disease spectrum changes. Specific examples include enteroviruses, a large group of continuously evolving RNA viruses that cause devastating outbreaks, and newly emerging serotypes have been associated with poliomyelitis-like paralysis. Dr. Mostafa will apply whole genome sequencing to dissect the genomic evolution that drives the neurovirulence of enteroviruses. In addition, whole genome analyses will be used to understand the respiratory virome in health and disease with a focus on immunocompromised populations.

The Division had the highest number of attendees ever at the American Society for Microbiology Microbe Meeting this past June with 17 clinical and research staff and faculty, as well as the microbiology fellow, in attendance. There were ten posters and nine oral presentations. We will have a noticeable presence at several other international and national meetings later in 2020. Finally, the faculty and some of the staff contribute to publications to advance microbiology education. Among them are the following textbooks: Jawetz, Melnick & Adelberg, *Medical Microbiology* (Carroll); *Diagnostic Microbiology of the Immunocompromised Host* (Carroll); Mahon/Lehman, *Textbook of Diagnostic Microbiology*, 6th ed. (Mister–contributor); Barker and Iacobuzio-Donahue, *Hidden Beauty* (contributors from Micro: Mister, Dumler, Aneela Mahmud); and *Manual of Clinical Microbiology*, 12th ed. (Carroll, editor-in chief; Parrish, Simner, Zhang, Martin, Forman; Valsamakis and Dumler (former faculty).

In summary, the Microbiology Division is a diverse, dynamic area dedicated to fulfilling the Johns Hopkins Medicine tripartite mission. The Division prides itself on quality patient care, impactful research, and tremendous contributions to education. ■

OUR NEW FACULTY

Heba Mostafa, M.D., Ph.D., D(ABMM), completed her M.D. at the Faculty of Medicine, Alexandria University, Egypt. She then moved to the United States where she earned her Ph.D. in microbiology at the University of Kansas, followed by three years of postdoctoral research fellowship at St. Jude Children's Research Hospital. From 2017 to 2019, Dr. Mostafa completed her clinical microbiology fellowship training at the University of Rochester Medical Center and earned her ABMM certification. Dr. Mostafa joined the Division of Medical Microbiology as the director of the Molecular Virology Laboratory in July 2019. Dr. Mostafa's research program focuses on implementing whole genome sequencing in the molecular virology laboratory with applications that include genomic surveillance of viruses and the correlation between viral evolution and disease severity, with a particular interest on enteroviruses, understanding the respiratory virome, and developing personalized molecular diagnostic panels for immunocompromised populations.

Tatianna Larman, M.D., earned her B.A. in organismal and evolutionary biology from Harvard University. After working in a DNA microarray fabrication start-up company in Italy for two years, she began medical school at the University of California San Diego School of Medicine. As a medical student, she spent two additional years as a Howard Hughes Medical Institute medical fellow in the Harvard Medical School Department of Genetics. She then completed residency training in anatomic pathology here at Johns Hopkins. During her clinical training, Dr. Larman spent a year as a postdoctoral fellow in the Rong Li Lab in the Department of Cell Biology. After residency she completed the Advanced Specialty Training Program in GI/Liver Pathology. Dr. Larman joined the faculty in the Division of GI/Liver Pathology and the Center for Cell Dynamics as a physician-scientist on July 1, 2019. She is eager to leverage insights from her clinical efforts in GI pathology to study colonic crypt biology and dissect how perturbations to the pericryptal niche lead to neoplasia.

Ying Zou, M.D., Ph.D., was born in Shanghai, China. She received her M.D. from Peking University/Peking Union Medical College, and her Ph.D. in genetics and development at UT Southwestern in the labs of Jerry Shay and Woody Wright. Her Ph.D. work focused on telomere biology, in particular replication and recombination with an emphasis on telomere function in cancer. She completed her clinical cytogenetics fellowship at the Mayo Clinic, and her clinical molecular genetics fellowship at Boston University, where she was also on the faculty and helped run the cytogenetics and molecular genetics laboratories. She then moved to Spokane, Washington to set up new clinical genetics laboratories and genetics training programs. Prior to coming to Johns Hopkins in July 2019, she was associate professor and director of the Clinical Cytogenetic and Genomic Laboratory in the Department of Pathology at the University of Maryland School of Medicine. Dr. Zou will be extending her work on the cytogenetics of cancer, particularly in the hematologic malignancies realm. In addition to clinical service in cytogenetics, she will help build the clinical molecular genetics service in the area of cancer predisposition syndromes. Her educational efforts will include teaching in the newly revitalized Lab Genetics and Genomics Fellowship.

BLAST FROM THE PAST

What is this?

Answer on page 23

PRIMARY FACULTY CHANGES - 2019-2020

New Faculty

Faculty Name	Rank	Division
Ying Zou, M.D., Ph.D.	Associate Professor	Molecular Pathology
Tatianna Larman, M.D.	Assistant Professor	Gastrointestinal/Liver Pathology
Heba Mostafa, M.D., Ph.D.	Assistant Professor	Microbiology
Ram Al-Sabti, M.D.	Assistant	Surgical Pathology
Daniel Anderson, M.D., MBA	Assistant	Surgical Pathology
Elise Gelwan, M.D.	Assistant	Gynecologic Pathology
Danielle Hutchings, M.D.	Assistant	Gastrointestinal/Liver Pathology
Ryan Jones, M.D.	Assistant	Surgical Pathology
Amy Plotkin, M.D., Ph.D.	Assistant	Gynecologic Pathology
David Priemer, M.D.	Assistant	Autopsy
Sara Rutter, M.D.	Assistant	Surgical Pathology
Kevan Salimian, M.D., Ph.D.	Assistant	Gastrointestinal/Liver Pathology
Maryam Shahi, M.D.	Assistant	Gynecologic Pathology
Annika Windon, M.D.	Assistant	Gastrointestinal/Liver Pathology

Promotions

Faculty Name	Rank	Division
Tamara Lotan, M.D.	Professor	Kidney-Urologic Pathology
Robert E. Miller, M.D.	Associate Professor Emeritus	Informatics
Evan Bloch, M.D., M.S.	Associate Professor	Transfusion Medicine
Amy Duffield, M.D., Ph.D.	Associate Professor	Hematopathology
Andres Matoso, M.D.	Associate Professor	Kidney-Urologic Pathology

Departures

Faculty Name	Rank	Current Location and New Role
Frederic B. Askin, M.D.	Professor	University of North Carolina School of Medicine, Chapel Hill, NC (retired from Hopkins)
Christopher Heaphy, Ph.D.	Assistant Professor	Assistant Professor of Medicine, Boston University, Boston, MA
Gang Zheng, M.D., Ph.D.	Assistant Professor	Associate Professor, Mayo Clinic, Rochester, MN
Jessica Dillion, M.D., M.S.	Assistant	Assistant Professor of Pathology and Laboratory Medicine, Dartmouth-Hitchcock Medical Center, Lebanon, NH
Judd Fite, M.D., MBA	Assistant	Staff Pathologist, Northwest Specialty Hospital, Post Falls, ID
Zena Jameel, M.B.Ch.B.	Assistant	Assistant Member, Breast Pathologist, Moffitt Cancer Center, Tampa, FL
James A. Miller, M.D.	Assistant	Assistant Professor of Pathology, Medical College of Wisconsin, Milwaukee, WI
Jorge Novo, M.D.	Assistant	Assistant Professor of Pathology, Northwestern University, Chicago, IL
Casey Phan, M.D.	Assistant	Staff Pathologist, Hawaii Pathologists' Laboratory, Honolulu, HI
Yang Zhang, M.D.	Assistant	Staff Pathologist, Joint Pathology Center, Silver Spring, MD

CONNIE GRIFFIN COMMEMORATION

In April 2019, **Dr. Christopher Gocke**, director of the Division of Molecular Pathology, recognized the contributions of **Connie Griffin, M.D.**, by hosting an unveiling celebration of a commemorative display in her memory located by the office of the Constance A. Griffin Fellow on the second floor of the 1812 Ashland Avenue Building on the Johns Hopkins East Baltimore campus. Dr. Griffin served as director of the Division from 2005 to 2012. Members of her family and pathology colleagues gathered for this special tribute.

Allan and Katie Spradling, Ralph Hruban, Jennifer Bynum, and Chris Gocke

Dedicated to Constance A. Griffin, M.D. 1951 – 2012

Constance A. Griffin, M.D. was born on June 8, 1951 in Evansville, Indiana, and grew up in Akron, Ohio. Like her father, a pediatrician, she attended the University of Chicago for her undergraduate degree in biology before earning her medical degree from the University of Cincinnati School of Medicine in 1977. After completing her internal medicine residency at Indiana University in Indianapolis, Dr. Griffin was accepted into the medical oncology fellowship program at Johns Hopkins in 1981. Her strong belief in the importance of somatic genetic changes in cancer motivated her to pursue a fellowship in cytogenetics in the Department of Pathology at the University of Pennsylvania School of Medicine. In 1986, Dr. Griffin was appointed assistant professor of oncology and medicine in the Johns Hopkins School of Medicine where she split her time between caring for oncology patients and directing the cytogenetics laboratory. Her team analyzed the chromosomes of solid tumors, rather than the more accessible blood malignancies, and took an early and sustained interest in pancreatic cancer. Dr. Griffin moved to the Department of Pathology in 1994 where she spearheaded the adoption of new molecular cytogenetic methods and contributed to the identification of specific cancer-relevant genes located at the site of chromosome breaks. In 1998, she established and directed the Cancer Risk Assessment Program to counsel patients with a familial history of certain cancers and, beginning in 2005, she served as the interim director of the Division of Molecular Pathology in the Johns Hopkins Department of Pathology. Dr. Griffin was promoted to professor of pathology and oncology in 2008, becoming the 142nd woman to achieve the rank of full professor in the Johns Hopkins University School of Medicine, a position she held until her passing in 2012 from pancreatic cancer. During her distinguished career, Dr. Griffin made impactful discoveries in the field of medical oncology and pathology. Her work helped researchers to better understand pancreatic cancer, paving the way for development of more effective ways to treat tumors of the pancreas. The Constance A. Griffin Fellowship in Molecular Pathology was established in 2012 in Dr. Griffin's memory to honor her tremendous legacy as an outstanding leader, teacher, and mentor in the Department of Pathology, the Johns Hopkins University School of Medicine, and beyond.

Allan and Katie Spradling with Jennifer Bynum, the 2018-2019 Constance A. Griffin Fellow in Molecular Pathology

From left to right: Denise Batista, Raluca Yonescu, Barbara Kurgansky, Patty Long, Katie Spradling, Laura Morsberger, Jennifer Bynum, Ralph Hruban, Chris Gocke, Jim Eshleman, Allan Spradling, Betty May, M. Aqeel Ahmad, Ming-Tseh Lin, Alison Klein, and Penny Spencer

To make a gift in memory of Connie Griffin in support of the Constance A. Griffin Fellowship in Molecular Pathology, please visit **http://pathology.jhu.edu/department/giving.cfm**

JHU DIVERSITY COMMITTEE 2019 HAPPENINGS

Alisha Ware received the 2019 APC Inspiration Award

Annika Windon, Tricia Murdock, Alisha Ware, and Kevan Salimian

In July 2019, **Dr. Alisha Ware** presented her research at the Association of Pathology Chairs (APC) Annual Meeting in Boston. Dr. Ware won the 2019 APC Inspiration Award for her work, "The 'Race' Towards Diversity, Inclusion, and Equity in Pathology: The Johns Hopkins Experience," which was published in *Academic Pathology*. In August 2019, **Dr. Tricia Murdock** attended the Association of American Indian Physicians Annual Meeting and Health Conference and had the opportunity to speak at the Association of Native American Medical Students Meeting. This presentation encouraged Native American students to gain exposure to pathology as a career through the Johns Hopkins Pathology Elective for Underrepresented Minorities. Outreach efforts in the Native American population are crucial, given the exceedingly low number of Native American physicians, with only 0.56% of the 727,398 active physicians and 0.48% of the 174,570 full-time faculty members at U.S. medical schools and teaching hospitals.

FROM 2012 TO 2016, OF THE NEARLY 55,000 MEDICAL SCHOOL GRADUATES IN THE U.S., ONLY 101 WERE NATIVE AMERICAN — ACCORDING TO THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

THE FIFTH ANNUAL FRED AND JANET SANFILIPPO VISITING PROFESSOR LECTURE

Fred Sanfilippo, Jeffrey A. Golden, and Ralph Hruban

Daniel Miller, Meaghan Morris, Fred Sanfilippo, Tatianna Larman, and Nicolas Giraldo-Castillo

Jeffrey Alan Golden, M.D., the chair of the Department of Pathology at Brigham and Women's Hospital and the Ramzi S. Cotran Professor of Pathology of the Harvard Medical School, gave the fifth annual **Fred and Janet Sanfilippo** Lecture on Monday, April 8, 2019. In his talk entitled "A Path from Computational Pathology to Precision Medicine," Dr. Golden presented an inspiring picture of what it could mean to be a pathologist in the future. As stewards of large amounts of data generated by their laboratories, pathologists are uniquely positioned to develop novel ways to combine and process data to make discoveries about how a disease is likely to manifest in an individual patient. Using the analogy of how different types of information are stacked in layers on Google Maps, Dr. Golden described a database that the Brigham has built that combines data from several traditional sources, as well as data from a novel CLIA-compliant tissue-based immunoprofiling assay illustrating how integation of these large data sets can provide new insights into disease. Following the lecture, resident **Nicolas A. Giraldo-Castillo, M.D., Ph.D.** was recognized as the 2019 recipient of the Fred and Janet Sanfilippo Research Award.

THE PATHOLOGY HOUSESTAFF 2019-2020

Gabrielle Bailey, M.D., was born and raised in Springfield, Missouri. She attended Rhodes College in Memphis, Tennessee and received a B.S. in chemistry, as well as a minor in religious studies. She spent time during her undergraduate years cultivating her interest in medicine by volunteering at St. Jude Children's Research Hospital. Gabrielle attended the University of Kansas School of Medicine. During medical school, Gabrielle completed an internship at Children's Mercy Hospital in the Bioethics Department. She pursued her love of engaging younger students through Students in Schools, a medical student group that taught human anatomy and physiology concepts to middle school students. In her free time, Gabrielle enjoys exploring the culinary scene of new cities, playing tennis, reading, and planning her next travel adventure. Gabrielle is pursuing AP/CP training.

Caroline Early, M.D., was born and raised in Greensboro, North Carolina. She attended the University of Georgia in Athens, Georgia, where she received her undergraduate degree in biology and psychology. After college, she worked as a medical scribe, and rotated through several emergency departments in North Carolina, before starting medical school at the Brody School of Medicine at East Carolina University in Greenville, North Carolina. She discovered the practice of pathology through her M1 histology course, and ultimately decided to spend the summer after her first year immersed in autopsy research. From this experience, she knew she had found her passion in pathology. She went on to do longitudinal research with hospital autopsies through her medical school's Research Distinction Track. She tutored peers in microbiology and immunology and led a pathology interest group at her medical school. Caroline enjoys trying new restaurants, tasting and brewing beer, true crime, and playing with (getting scratched by) her cat Claire. Caroline is pursuing AP/CP training.

Matthew Gabrielson, M.D., was born in Baltimore, Maryland, and grew up on a small farm just outside of the city. He received his B.S. in biochemistry from Susquehanna University in Selinsgrove, Pennsylvania. Matt earned his medical degree from Albert Einstein College of Medicine in the Bronx, New York. As a medical student, he studied the role of various immune cells in the tumor microenvironment of pancreatic ductal adenocarcinoma at Montefiore Medical Center. Matt is a huge Ravens fan and has a passion for sports, history, computers, and the outdoors. Matt is pursuing AP/CP training.

Ashleigh Graham, M.D., was born in Kingston, Jamaica and moved to Tallahassee, Florida as a child. At Florida State University she double majored in biochemistry and chemistry, and obtained her B.S. degree with honors. Her participation in two research labs involved testing antidepressant properties of ketamine and quantification of ribosomal binding strength. At the University of South Florida she finished her M.S. in medical sciences before earning her M.D. at New York Medical College. In medical school she received the Victor Tchertkoff, M.D. Memorial Award for exhibiting exceptional interest and ability in the field of pathology. Global humanitarianism is an important and avid interest of Ashleigh's. Not only has she designed a research project focused on aiding refugee children traumatized by war, but she also helped to provide health services during a mission trip to the underserved population of St. Elizabeth, Jamaica. One day she hopes to integrate her interest into career initiatives. She enjoys making vegetarian meals, acrylic painting to classical music, and cheering for underdogs in basketball games. Ashleigh is pursuing AP/CP training.

Eitan Halper-Stromberg, M.D., Ph.D., is from Takoma Park, Maryland. He completed his undergraduate degree in mechanical engineering at University of Maryland, College Park. He then worked for LexisNexis as a software engineer before returning to graduate school. He received a Ph.D. in human genetics with a focus in bioinformatics at Johns Hopkins University. While in graduate school, he met his wife at a swing dancing lesson. Five years later, they moved to Denver where she completed her psychiatry residency. Eitan did a postdoctoral fellowship at the University of Colorado/National Jewish Health Hospital, and subsequently attended University of Colorado School of Medicine. While in Colorado, he contributed to the research of the COPDGene Study. Eitan enjoys spending time with his wife and two children, camping, running, and following current events. Eitan is pursuing AP/CP training.

Harsimar Kaur, M.B.B.S., was born and raised in Ambala Cantt, a cantonment in northern India. She received her M.D. from All India Institute of Medical Sciences. After graduation, she moved to the United States for a postdoctoral fellowship at Johns Hopkins in the Lotan Lab. Her work mainly focused on elucidating the correlation of tumor-infiltrating lymphocytes with different molecular mutations and their potential prognostic role in prostate cancer. She is interested in immuno-oncology and digital pathology. During her time at Johns Hopkins, she also served as the co-chair of International Committee of the Johns Hopkins Postdoctoral Association. Outside of medicine, she enjoys baking, visiting local cafes, dancing, and hiking. Harsimar is pursuing AP/CP training.

THE PATHOLOGY HOUSESTAFF 2019-2020

Efrain Antonio Ribeiro, M.D., Ph.D., was born just a few blocks from Johns Hopkins on East Baltimore Street and grew up in Ellicott City, Maryland. He attended Wesleyan University and majored in philosophy and neuroscience as an undergraduate. He then worked at Memorial Sloan Kettering Cancer Center as a research technician doing stem cell research. He completed the M.D./Ph.D. program at Icahn School of Medicine at Mount Sinai in New York and earned his Ph.D. in neuroscience with a focus on the use of next generation sequencing technologies to profile specific cell types in the brain. Outside of medicine, he likes to spend time outdoors with his wife and two dogs, Puff and Hela (who was named after the stem cell line). He and his wife love trying new food and wine and love to host friends and family. Efrain enjoys producing music and attending concerts with his dad, and he is an avid Ravens fan. Efrain is pursuing AP-only training.

Carla Saoud, M.D., was born and raised in Miniara, Lebanon. She received her B.S. in biology and her M.D. from the Lebanese American University. Early on during her medical studies, she was interested in histology and pathology. After medical school, she completed two years of residency in anatomic pathology at Lebanese American University, where she also studied the clinicopathologic features of lymphocytic esophagitis. She enjoys swimming, dancing, cooking, travelling, and shopping. Carla is pursuing AP training.

Andrew Sohn, M.D., was born and raised in Queens, New York. He attended Vassar College, where he graduated with a degree in chemistry, including a senior thesis on computational electrochemistry of carbon nanotubes grown on silicon wafers. Andrew received his M.D. from Sidney Kimmel Medical College at Thomas Jefferson University in Philadelphia, Pennsylvania. During medical school, he completed research fellowships in the Medical Research Scholars Program at the NIH, followed by the HHMI Medical Research Fellows Program at the University of Pennsylvania. For his research, Andrew focused on machine learning and computer vision for biomedical image analysis and epigenomics. In his spare time, he enjoys reading, pour over coffee, craft beer, sports, and programming. His current programming languages of choice are Python and Rust. Andrew is pursuing the Physician Scientist Training Program in AP-only training.

Julie Stein, M.D., was born in Washington, D.C., and raised in Potomac, Maryland. She received a B.A. in psychology from the University of Pennsylvania, and her M.D. from George Washington University where she was elected to Alpha Omega Alpha. Not entirely certain about what type of medical specialty she wanted to pursue, Julie decided to complete a preliminary internship in internal medicine in the Osler Residency Program at The Johns Hopkins Hospital where she fell in love with pathology while she conducted clinical and translational research as a postdoctoral research fellow under the mentorship of Dr. Janis Taube. Julie's research focuses on immunopathology, particularly investigating the tumor microenvironment and the histopathologic and immunohistochemical correlates of cancer immunotherapy treatment modalities. She had the opportunity to present her research at several conferences, including the annual meeting for the American Society of Dermatopathology where she was awarded the Best Resident/Fellow Oral Abstract Presentation. Julie enjoys spending time with her family and friends, cooking, and spending all disposable income on maintaining her foodie identity at new restaurants. Julie is pursuing AP training.

Seena Tabibi, M.D., was born in Tehran, Iran, and moved to the United States in 2004. Seena attended the University of California, Berkeley, and graduated with a double major in integrative biology and marine science. He went on to attend Southern Illinois University School of Medicine. During the summer between first and second years of medical school, Seena participated in a research project that evaluated the risk of developing squamous cell carcinoma of skin from potential wound healing reagents (LCN2 and MMP9) at Baylor College of Medicine in Texas. At SIU, he participated in a psoriasis research project and a few other projects, including a case report on cutaneous meningioma of the scalp that he presented at 2018 CAP Annual Meeting in Chicago. In addition to traveling, Seena is passionate about sports including running, biking, and swimming. He has been a member of Academy Bullets Swim Club throughout medical school and competed as a member of the U.S. Aquathlon Team in Spain in the men's 25-29 year old age group category. Seena loves nature photography and is an avid weather enthusiast, and uses his home weather station to record observations. He is fluent in Azeri, Turkish, and Farsi. Seena is pursuing AP/CP training.

continued on page 16

Taking a selfie standing on one leg isn't easy...

...but a gift of retirement assets is

an easy and efficient way to give back to the Johns Hopkins Department of Pathology. Plus, you and your family can benefit from significant tax advantages.

To learn more, contact Amy Helsel
Senior Director of Development
Department of Pathology
Phone: 443-287-7943
Email: ahelsel@jhmi.edu
Website: giving.jhu.edu/giftplanning

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JOHNS HOPKINS
UNIVERSITY & MEDICINE

Private philanthropy is critical to our educational and research missions. The smiling faces of the fellowship recipients below tell the story. In addition to these fellowships, we have several funds that support trainee and junior faculty research.

2019-2020 FELLOWSHIP RECIPIENTS

Walter and Jean Boek Autoimmune Research Fellow
Paula Chalan, Ph.D.

John K. Boitnott Fellow
Annika Windon, M.D.

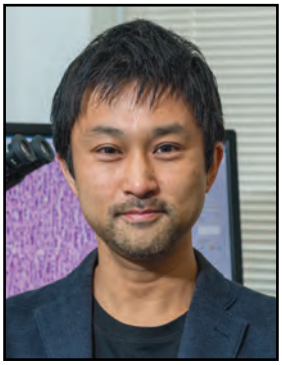
Michael J. Borowitz Fellow
Karin Miller, M.D.

Daniel W. Chan Fellow
Steven Conklin-Lopez, Ph.D.

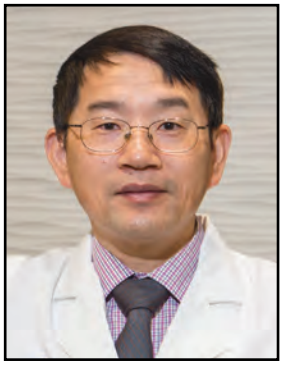
Patricia Charache Fellow
C. Paul Morris, M.D., Ph.D.

Jonathan I. Epstein Fellow
Daniel Grosser, M.D.

Yener S. Erozan Fellow
Daniel Miller, M.D., Ph.D.



Sol Goldman Fellow in Pancreatic Cancer
Kohei Fujikura, M.D., Ph.D.



Constance A. Griffin Fellow
Jialing Huang, M.D.

Robert H. Heptinstall Fellow
Giovanni Rossi, M.D.

Paul M. Ness Fellow
Alexander J. Fenwick, M.D.

Virginia O'Leary & John C. Wilson Autoimmune Disease Research Fellow
Elena Sabini, M.D.

Dorothy L. Rosenthal Fellow
Robert Jones, M.D.

John H. Yardley Fellow
Danielle Hutchings, M.D.

Please consider supporting one or more of our funds or fellowships. If you have any questions, please contact **Dr. Ralph Hruban** (rhruban@jhmi.edu or 410-955-9791). If you would like to donate to one of these funds online, please visit our secure site at http://pathology.jhu.edu/department/giving.cfm, or please send your tax-deductible contributions payable to Johns Hopkins University to:

Department of Pathology
Attn: Rob Kahl
The Johns Hopkins Hospital
600 North Wolfe Street, Carnegie 424
Baltimore, MD 21287-6417

DR. BARBARA DETRICK RETIRES

The Department of Pathology hosted a retirement reception on November 7, 2018 for **Dr. Barbara Detrick**, professor of pathology and medicine in the School of Medicine, and professor of molecular microbiology and immunology in the Bloomberg School of Public Health to celebrate and thank her for her 20 years of service as Immunology director, teacher, scientist, and valued collaborator. Now as emerita professor, Barbara continues some of her activities, including participating on NIH grants, serving as a member of the JHU Diversity Leadership Council, and pursuing professional activities with the Federation of Clinical Immunology Societies and the Association of Medical Laboratory Immunologists. We thank Barbara for her significant contributions to the Department of Pathology and wish her the best in her many future endeavors.

Barbara Detrick and Ralph Hruban

From left, Robert Hamilton, Karen Carroll, Jennifer Coughlin, Barbara Detrick, Ralph Hruban, Mario Caturegli, and Kevin Boyle

A FAREWELL RECEPTION FOR FRED ASKIN, M.D.

Fred Askin and artist Carol Bailey

On June 17, 2019, a farewell reception was held for **Fred Askin, M.D.**, at the Johns Hopkins Bayview Medical Center. Dr. Askin retired from his position as professor of pathology at Hopkins and has taken a faculty position at the University of North Carolina at Chapel Hill. A Virginia native, Dr. Askin first came to Hopkins in 1964 as an intern and resident in Medicine (1964-1966). He returned to Hopkins in 1991, and held a number of leadership roles, including director of surgical pathology (1991-2003) and chief of pathology at Bayview (2007-2017). The goodbyes included an amazing gift—a drawing of his Westie peering into a microscope while standing on books authored by him! Thank you, Dr. Askin, for all you have done for Hopkins, for the Department, for Bayview, for your students and residents, and most of all for your patients.

David Borzik, Mark Hopkins, Jacqueline Birkness, Alice Meiss, Fred Askin, Tricia Cottrell, Meaghan Morris, Cherub Kim, Danielle Hutchings, Ankit Rajgariah, and Monica Hill

Ralph Hruban, Fred Askin, Tim Amukele, and Richard Bennett

ALUMNUS HONORS HER HUSBAND BY SUPPORTING THE NEXT GENERATION OF RESEARCHERS

When **Ekaterina "Catherine" Limas** and her husband, **Constantinos J. Limas** left Greece in 1968 for the United States, they knew no one. Equipped with freshly minted medical degrees from the University of Athens Medical School, they were fortunate to meet Abou D. Pollack, M.D., a professor of pathology at the Johns Hopkins University School of Medicine. He helped them find a place to live and encouraged Catherine's ambition to become a researcher. "He took a paternal interest in us, supporting and encouraging us," she says. "I owe a lot to him."

Over the next several decades, Catherine and Constantinos dedicated their careers to research, service, and teaching. When her husband of 48 years passed away in 2014, Catherine wanted to create a research award in his memory at the Johns Hopkins Department of Pathology. **The Catherine and Constantinos J. Limas Research Award** provides seed research funding annually for a junior pathologist. "The Department of Pathology does impactful work in basic sciences, and more people are needed to work in research because they are passionate about it," says Catherine. "Providing seed money for young investigators is important because we need their new and exciting ideas."

CATHERINE LIMAS AND HER HUSBAND, CONSTANTINOS J. LIMAS

Catherine feels strongly about helping other researchers because she received financial support from the School of Medicine that helped launch her research career. After their first period in Baltimore—when Catherine attended the Pathology Residency Program at the Baltimore City Hospital (now the Johns Hopkins Bayview Medical Center), and Constantinos completed his residency in internal medicine at Mercy Medical Center—the couple moved to Washington, D.C. There, Constantinos completed a fellowship in cardiovascular diseases and clinical pharmacology at the Washington DC VA Medical Center and Catherine was a resident in anatomical and clinical pathology and an instructor for a year at Georgetown University. They returned to Baltimore in 1973 so Constantinos could become an assistant professor in cardiology at the School of Medicine and Catherine in pathology.

It was during this time that Catherine, then also assistant chief of pathology at Baltimore City Hospital, and director of the hospital's blood bank, received an institutional grant from the School of Medicine to study vascular changes in kidneys preserved for transplantation. This was the beginning of preserving kidneys from car accident victims for transplants at a time when 60 percent of those transplants were failing. Her research found that the majority of kidneys preserved using continuous pulsatile perfusion, or a pump with fluid circulating around the kidneys, developed lesions, while the kidneys preserved through hypothermia, or placed on ice, did not. Her findings were published in the *American Journal of Pathology* in 1977 and significantly improved the way kidneys were preserved during transportation.

In 1975, Catherine and Constantinos joined the faculty at the University of Minnesota School of Medicine, where they were both promoted to full professors in 1985. Throughout their research careers—in which they both had ample funding from institutions such as the NIH and the American Heart Association—Constantinos studied hypertension and the metabolism of the heart, while Catherine focused on the pathology of neoplasia, as well as cardiovascular pathology and biochemistry.

Catherine shares her husband was a man of high intelligence who spoke several languages and never complained or raised his voice. "Our thinking, our knowledge, and our skills were complementary to each other," she says. "We were both dedicated and committed to each other and our work."

M. Kathryn Grabowski, Ph.D., Sc.M., one of the Catherine and Constantinos J. Limas Research Award recipients, conducts research focused on the epidemiology and transmission of HIV as she leads the new field of "viral phylodynamics." She is grateful to Dr. Limas for her commitment to help launch the careers in academic medicine of junior faculty like her and shares, "It is inspiring that Dr. Limas is paying it forward and making it possible for future generations to succeed." ■

THE PATHOLOGY HOUSESTAFF 2019-2020

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Jason Van Roo, M.D., was born and raised in Port Washington, Wisconsin. He spent several years employed in a variety of jobs including manufacturing and construction before working his way through college as a line cook/sous chef. He attended the University of Wisconsin-Milwaukee and completed a degree in chemistry. He participated in a summer undergraduate research fellowship where he studied the interactions of nitrous oxide with cytochrome in bacteria. He also worked as a teaching assistant in multiple chemistry labs. Jason earned his medical degree from the University of Wisconsin School of Medicine and Public Health. While there he studied outcomes for renal oncocytic neoplasms and variability of Ki67 index and mitosis quantification. He was also a coleader in a mentoring group for new medical students and helped to pilot new curriculum. Jason enjoys trying new recipes, refining his soups, golfing, hiking, and hanging out with his cat. Jason is pursuing AP/CP training.

Bart White, M.D., is a native of Akron, Ohio who was raised on books, sports, and board games. He received a B.S. in biology at the Youngstown State University, and his M.D. through the Northeastern Ohio Medical University. Following medical school, he completed three years as an anatomic and clinical pathology resident at the Penn State Hershey Medical Center. Due to his interest in neuropathology, he took an opportunity to complete the Peter C. Burger Neuropathology Fellowship at Johns Hopkins. This fellowship was partially funded by an administrative supplement through the NIH National Institute on Aging, which served as a platform for his investigations into Pick's disease and Alzheimer's disease. Currently, he enjoys reading a variety of books, training for a half marathon, and learning to play the ukulele. Bart is completing his final year of AP/CP training.

GRADUATE TRAINING PROGRAM IN PATHOBIOLOGY 2019-2020

Ying-Yu (Ashley) Chen is from Taipei, Taiwan. With a B.S. in public health, Ying-Yu received her M.S. in microbiology and immunology from National Defense Medical Center in July 2018. In graduate school Ying-Yu dedicated herself to autoimmune disease research in the lab of Dr. Sytwu Huey-Kang to understand the regulatory role of Xbp1 in dendritic cells during the development of autoimmune diabetes in nonobese diabetic mice. She joined the Pathobiology Program because the diverse research fields in the Program will help her to gain more knowledge of diseases and hands-on research skills. In her leisure time, Ying-Yu loves to cook, read, watch TV, and hang out with friends. Ying-Yu is also our Margaret Lee Student this year.

Nathan Crilly is a veterinarian from Knoxville, Tennessee. As an undergraduate, he studied food science and technology at the University of Tennessee. He completed his DVM at the University of Tennessee, College of Veterinary Medicine. As a Merial Scholar at UT, Nathan planned and carried out a project to elucidate the distribution and seasonal activity of ticks in Tennessee. A second Merial scholarship led Nathan to the lab of Dr. Sabra Klein at Johns Hopkins, where he investigated the expression of putative viral cell entry receptors following Zika virus infection in mice. Nathan's research interests include the use of animal models to study human disease and the pathobiology of infectious disease, especially emerging and zoonotic pathogens. Nathan enjoys reading, visiting museums and Civil War battlefields, playing with his greyhound, and backpacking in the Appalachians.

Logan George is from Gloucester, Virginia and received his B.S. from the College of William & Mary, where he majored in biology and minored in biochemistry. His undergraduate research under Dr. Josh Puzey explored the evolutionary genetics behind pattern formation, where he used Mimulus luteus, or monkeyflowers, as a model organism for petal pattern formation. This project became the subject of his undergraduate honors thesis, where he developed a high-throughput protocol for quantifying visual traits for phenotypic segregation. Following graduation, Logan worked at the National Institute on Aging in Baltimore as a postdoc research fellow. In his free time, Logan enjoys sailing, soccer, tennis, traveling the world, and exploring Baltimore and DC with his friends.

Danielle Nicklas received a B.S. in microbiology and genomics and molecular genetics from Michigan State University. Danielle's translational work began at Stanford University, where she contributed to the School of Medicine's biotechnology efforts in viral pathology and implant rejection. More recently, Danielle worked at Extherid Biosciences where she specialized in developing molecular biology experiments for *ex vivo* testing of novel antimicrobials and medical devices. Danielle is originally from Jackson Hole, Wyoming and enjoys rock climbing, hiking, and reading in her limited free time.

GRADUATE TRAINING PROGRAM IN PATHOBIOLOGY 2019-2020

Pola Olczak obtained her bachelor's degree in chemistry from Morgan State University in 2011. She participated in the Diversity Summer Internship Program at the Johns Hopkins Bloomberg School of Public Health, Department of Environmental Health Sciences. At Bloomberg, she was involved in an international project at the Sligo Institute of Technology in Ireland. During the last summer of her undergraduate studies, she pursued an internship at the New York University School of Medicine. After completing her B.S., she accepted a position at the University of Maryland to study the effects of organophosphates on cognition in rodents. In 2018 Pola received an M.S. in biochemistry in molecular miology from the Johns Hopkins Bloomberg School of Public Health. After completing her degree, Pola joined PathoVax, a biotech company where she worked on the development of an HPV vaccine, which further sparked her interest in immunology and pathobiology. Besides science Pola enjoys playing tennis, outdoor activities, and traveling.

Andrew Wilson is from Sidney, Maine and received his B.S. in biology with a minor in chemistry from the University of Maine Orono in 2015. Following his undergraduate degree, he continued on with a master's degree in zoology at the University of Maine, studying the effect of different color combinations on human subjects' visual acuity using the program created during his undergraduate degree. After obtaining his master's degree in 2017, Andrew joined the lab of Dr. David Nauen at Johns Hopkins as a research technologist studying transcriptome changes in the dentate gyrus during and after the development of temporal lobe epilepsy. In his free time, Andrew enjoys fishing, hiking, playing and watching sports.

Zhuolun (Poppy) Wang is from Beijing, China and received her B.S. in systems neuroscience with a minor in theoretical computer science from Johns Hopkins University in the spring of 2019. Since her freshman year, she has been working in the Pasricha and the Kulkarni Labs to study enteric neurobiology and the gut-brain axis in animal models of health and disease. Her work has helped to identify markers for an entirely new developmental lineage of adult enteric neurons. Using her technique of isolating long segments of the myenteric plexus (which she acquired at the Habtezion Lab at Stanford in the summer of 2017), she has also contributed to creating a platform for structural mapping of the adult ENS in mice. She helped create a 3-D chip device that models the interaction of the vagal and DRG sensory neurons with the epidermal and immune cells of the gastrointestinal tract, opening up new research avenues for unraveling the pathophysiological mechanisms underpinning gut-originated neurological diseases. In her free time, Poppy enjoys going to the gym, swimming, traveling, and good food.

TWO TUBES SAVE LIVES

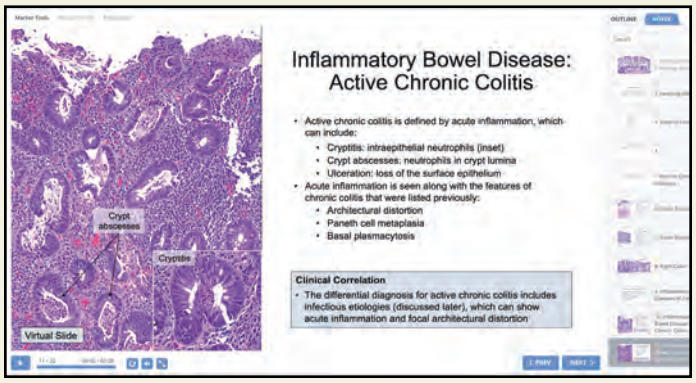
When ABO incompatible blood is transfused because of a patient identification error, the risk of mortality is believed to exceed 50%. Barcode-based collection systems, which are already used at Johns Hopkins, can prevent some types of specimen collection errors, but are not perfect. For example, these systems can be overridden at the time of specimen collection.

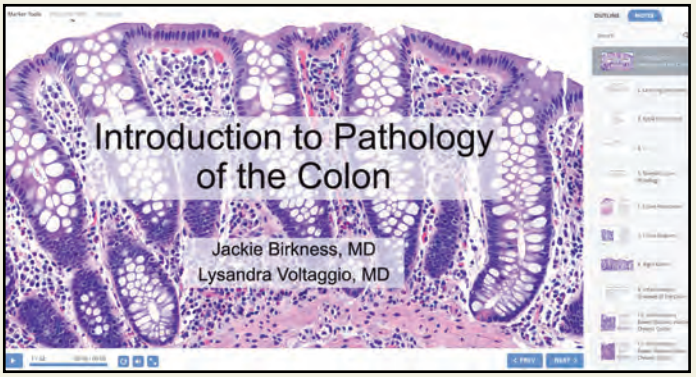
Eric Gehrie, M.D.

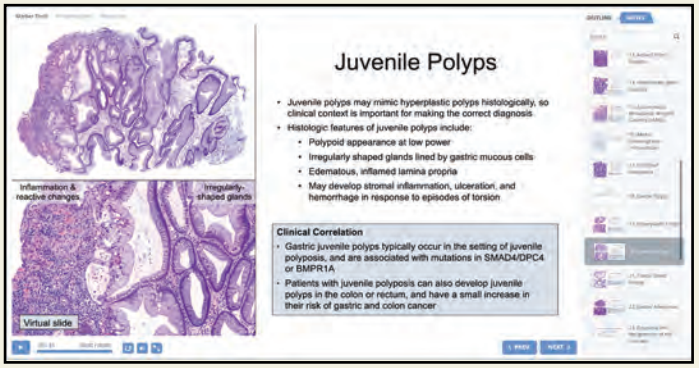
To diminish the risk of mislabeled specimens causing harm to patients, the Transfusion Medicine Division under the direction of Blood Bank director **Eric Gehrie, M.D.**, led a Health Systemwide initiative to confirm the blood type of patients without a previous blood bank history on file. The project led to the requirement of a second tube of blood for testing prior to transfusion of routine, crossmatched blood. This was a team effort across the Health System. On August 27, 2019, alerts began to display within Epic notifying providers when their patient would benefit from an ABO confirmation sample prior to routine transfusion. The alerts made it possible to order a confirmatory test, when needed, with just three mouse clicks, conforming to the broader institutional imperative to "make Hopkins easy." In the following month, the number of patients transfused with routine, crossmatched blood without a confirmatory specimen at Johns Hopkins was diminished by 65%. In addition, a mislabeled type and screen tube was detected – due to a confirmation sample sent within an hour of the index sample – prior to causing harm to an elderly patient with altered mental status and no previous blood bank history. In this case, the blood type from the first sample (group A) was ABO incompatible with the patient's actual blood type (group O), which was confirmed by subsequent testing. On October 1, 2019, the Health System policy officially changed to formally require a second sample for routine transfusions. Good work, Dr. Gehrie!

PATHOLOGY EDUCATIONAL ADVISORY COMMITTEE

Under the leadership of the deputy director of education, **Marc Halushka**, assistant professors **Marissa White** and **Laura Wake** co-established the Johns Hopkins Department of Pathology Educational Advisory Committee (EAC) to serve in an advisory and collaborative capacity for faculty, fellows and residents interested in education scholarship. The EAC hosts regular meetings to support our community of educators and foster creativity through discussions of ongoing education scholarship within Pathology and across the School of Medicine. These meetings have included guests such as **Dr. Jeffrey A. Golden**, the 2019 Fred and Janet Sanfilippo Visiting Professor, and **Dr. Pamela Johnson**, Vice Chair of Quality, Safety & Value in the Department of Radiology. Our residents have also presented their innovative educational projects to the EAC, including **Drs. Jackie Birkness** (PGY4) and **Caitlin Alexander** (PGY4). Dr. Birkness highlighted her new web-based introduction to gastrointestinal pathology learning modules (see images to the right), while Dr. Alexander shared her successful experience in submitting a peer-reviewed educational case for Pathology Competencies for Medical Education to the journal *Academic Pathology*. Upcoming EAC meetings will highlight the numerous education resources available to Pathology residents and faculty, including those available through the **Pathology Web Team** and **Pathology Photography**. As the EAC continues to grow, Drs. White and Wake hope to further strengthen and enhance the Pathology Department as a whole by generating enthusiasm for education scholarship, a cornerstone of the Johns Hopkins Medicine mission.







INTO THE WOODS WITH ED GABRIELSON

The Merriam-Webster online dictionary defines a pathologist as a specialist in pathology; specifically one who interprets and diagnoses the changes caused by disease in tissues and body fluids. If you were to ask Ed Gabrielson, M.D. the definition of a pathologist he might say, "one who makes paths in the woodlands for people to hike and explore nature." Making paths through the woods has become Ed's passion and pastime, especially in the summer months when the days are long and sunlight lasts until 9:00 p.m. It is not unusual to find Ed leaving work to escape to the woods to chisel out another path. Instead of looking into the microscope, he looks for patterns in the landscape.

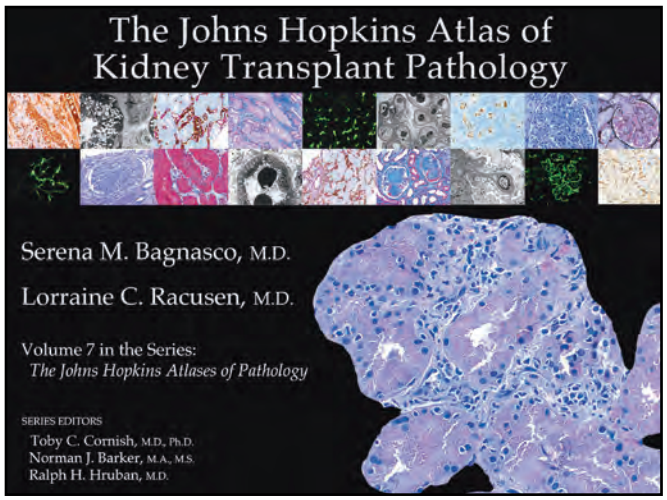
Dr. Ed Gabrielson creating a new path

NEW JOHNS HOPKINS PATHOLOGY IPAD APPS

We have created a new educational iPad app! **Drs. Serena Bagnasco and Lorraine Racusen** developed **The Johns Hopkins Atlas of Kidney Transplant Pathology.** This app, as well as our other iPad apps, is available through the iTunes Store.

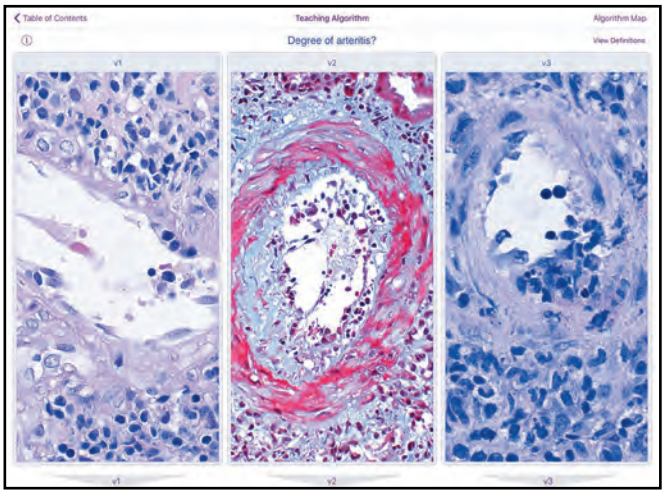
This profusely illustrated app contains hundreds of stunning images, an educational algorithm, a "Quiz Me" section, and comprehensive diagnoses albums.

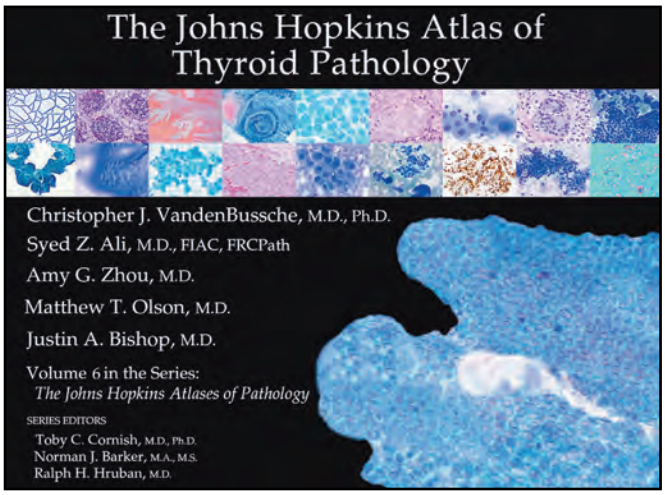
We hope you enjoy these teaching tools, and please watch for these topics to be covered in future JHU Atlases: **Anus, Appendix, Esophagus, Eye, Large Intestine, Stomach, and Small Intestine.**

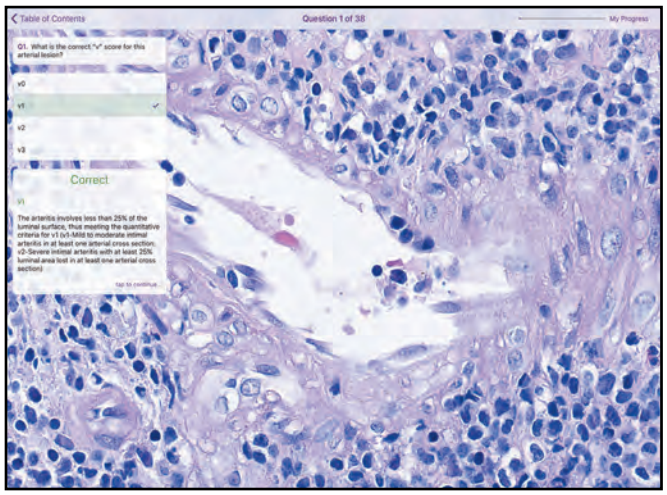


The Johns Hopkins Pathology Atlases currently available in the Apple App Store include:

- **The Johns Hopkins Atlas of Pancreatic Pathology**
- **The Johns Hopkins Atlas of Pancreatic Cytopathology**
- **The Johns Hopkins Atlas of Neuropathology**
- **The Johns Hopkins Atlas of Prostate Pathology**
- **The Johns Hopkins Atlas of Ovarian Pathology**
- **The Johns Hopkins Atlas of Thyroid Pathology**
- **The Johns Hopkins Atlas of Kidney Transplant Pathology**







NEW GRANTS AND CONTRACTS AWARDED TO PATHOLOGY FACULTY

10/13/18 - 9/26/19

Faculty Member	Award Type	Agency	Dates	Total
Amukele, Timothy	Contract	Makerere University	9/4/19 - 12/31/20	129,929
Anders, Robert	Contract	FLX Bio Inc	5/1/18 - 12/31/21	5,000
Anders, Robert	Contract	FLX Bio Inc	8/21/18 - 12/31/21	198,135
Asrani, Kaushal	Grant	Department of Defense	9/1/19 - 8/31/21	163,750
Baras, Alexander	Grant	AACR	11/21/18 - 10/31/19	50,000
Burns, Kathleen	R01 Grant	NIH/NIGMS	7/24/19 - 5/31/23	1,310,000
Carroll, Karen	Contract	Genmark Diagnostics	8/1/18 - 3/31/19	9,192
Carroll, Karen	Contract	Memed Diagnostics	11/21/18 - 11/20/19	2,794
Carroll, Karen	Contract	LBT Innovations	8/12/19 - 8/11/20	8,739
Chen, Liam	Grant	Association for Frontotemporal Degeneration	1/1/19 - 12/31/19	60,000
Cihakova, Daniela	Grant	Childrens Cardiomyopathy Foundation	2/1/19 - 1/31/20	50,000
Cihakova, Daniela	Grant	American Heart Association	7/1/19 - 6/30/22	300,000
Cihakova, Daniela	Grant	Saving Tiny Hearts Society	1/1/20 - 12/31/20	75,000
Clarke, William	Contract	Saladax Biomedical Inc.	11/1/18 - 10/31/19	103,522
Clarke, William	Contract	Roche Diagnostic Systems Inc.	5/10/19 - 5/10/20	130,331
DeMarzo, Angelo	Contract	Janssen Research & Development LLC	3/27/19 - 3/26/20	128,486
DeMarzo, Angelo	Grant	Schwab Charitable Fund	7/1/19 - 6/30/20	234,170
Eberhart, Charles	Grant	Childrens Cancer Foundation	11/1/19 - 10/31/20	75,000
Eshleman, James	Contract	Promega Corporation	7/23/19 - 7/22/20	94,830
Gehrie, Eric	Contract	Immucor Inc.	11/30/18 - 4/30/19	9,995
Halushka, Marc	R01 Grant	NIH/NIGMS	9/20/18 - 8/31/22	1,244,500
Hamad, Abdel	Grant	WM Keck Foundation	7/1/19 - 6/30/22	1,000,000
Hung, Chien-Fu	Contract	Papivax LLC	4/1/19-3/31/20	51,600
Hung, Chien-Fu	Contract	Papivax LLC	9/12/19 - 9/11/20	13,600
Hung, Chien-Fu and Roden, Richard	R01 Grant	NIH/NCI	12/1/18 - 11/30/23	2,976,701
James, Aaron	Grant	TEDCO	6/30/19 - 6/29/21	345,000
Lai, Shenghan	R21 Grant	NIDA	4/1/19 - 3/31/21	450,313
Larman, Harry	Grant	Cure JM Foundation	2/28/19 - 8/30/20	25,000
Larman, Harry	Grant	Crohns and Colitis Foundation	6/3/19 - 8/9/19	2,500
Larman, Harry	Contract	Flagship Pioneering	7/8/19 - 7/4/20	71,604
Larman, Harry	Contract	CDI Laboratories	9/12/19 - 9/11/21	15,540
Lotan, Tamara	Grant	Department of Defense	7/1/19 - 6/30/22	1,516,374
Nachman, Sharon	Contract	VIIV Healthcare	12/18/18 - 2/28/21	2,655,611
Nachman, Sharon	Contract	VIIV Healthcare	12/18-18 - 9/30/22	13,691,743
Rosario, Maxim	Grant	Academy of Clinical Laboratory Physicians	1/1/19 - 12/31/19	7,500
Schneck, Jonathan	R21 Grant	NIH/NIBIB	9/17/18 - 6/30/20	450,313
Schneck, Jonathan	Contract	Neximmune Inc.	2/8/19 - 2/7/21	225,000
Schneck, Jonathan	R33 Grant	NIH/NCI	5/1/19 - 4/30/22	1,217,475
Schneck, Jonathan	P41 Grant	NIH/NIBIB	9/15/19 - 5/31/24	6,381,838
Sfanos, Karen	Grant	Emerson Collective	8/19/19 - 8/18/21	205,556
Shih, Ie-Ming	Grant	The Honorable Tina Brozman Foundation	1/1/19 - 12/31/20	400,000
Simner, Trish	Contract	Hardy Diagnostics	1/1/19 - 12/31/19	23,254
Simner, Trish	Contract	Accelerate Diagnostic Inc	1/1/19 - 12/31/19	47,947
Simner, Trish	Contract	Affinity Biosensors	1/15/19 - 2/29/20	128,171
Simner, Trish	Contract	International Health Management Associates	8/1/19 - 12/31/19	6,000
Vang, Russell	Contract	Inovio Pharmaceuticals	3/30/19 - 3/29/22	41,000
Wong, Phil	UG3 Grant	NIH/NINDS	9/15/19 - 8/31/21	1,462,754
Wong, Phil	R56 Grant	NIH/NINDS	9/17/19 - 8/31/22	2,208,827
Wood, Laura	Grant	American Cancer Society	1/1/19 - 12/31/22	792,000
Wu, T.C.	Grant	UH Harrington Discovery Institute	1/1/19 - 12/31/21	136,000
Wu, T.C.	R01 Grant	NIH/NCI	4/1/19 - 3/31/24	2,929,067
Wu, T.C.	P50 Grant	NIH/NCI	9/1/19 - 8/31/24	8,477,386
Zhang, Sean	Contract	Vela Diagnostics Singapore	6/1/19 - 5/31/20	78,374
				52,084,356

Syed Ali, M.D., received the Maurice Goldblatt Award at the 20th International Congress of Cytology in Sydney, Australia in May 2019. The award was given for Dr. Ali's stewardship of the continuing educational activities of the International Academy with vigor and innovative ideas; for his successful efforts to develop, test and introduce novel techniques in the practice of clinical cytology; and for his dedication to the education of young cytopathologists from around the world.

Lois Arend, M.D., has been elected to serve as councilor of the Renal Pathology Society (RPS) for a three-year term, transitioning to vice president in 2022, and president of the RPS in 2023. The RPS is an international society of over 500 professionals with an interest in diseases of the kidney.

Barbara Detrick, Ph.D., was honored with the 2019 AMLI Distinguished Service Award at the Association of Medical Laboratory Immunologists (AMLI) Meeting held in Cleveland in August 2019. Dr. Detrick was acknowledged for her extraordinary contributions, dedication and leadership to the AMLI society and for her outstanding accomplishments in the field of clinical laboratory immunology.

Jonathan Epstein, M.D., was honored by Baltimore Magazine as a Top Doctor for 2019. The list is voted on by peers and represents about 5 percent of the roughly 12,000 physicians licensed to practice in the Baltimore area.

James Eshleman, M.D., Ph.D., became the inaugural recipient of the Ralph H. Hruban, M.D. Professorship in Pancreatic Cancer Research on July 1, 2019. Dr. Eshleman has proved to be an impactful scientist, a gifted teacher, and a talented clinician. This newly endowed professorship was funded by private donors. A reception will be held in the spring of 2020.

Eric A. Gehrie, M.D., accepted the 2019 RISE (Research Innovation in Scientific Excellence) Award at the AABB Annual Meeting in San Antonio, Texas in October 2019, on behalf of all co-authors who collaborated on the paper, "Blood utilization and mortality in victims of gun violence."

Ralph Hruban, M.D., was honored by Baltimore Magazine as a Top Doctor for 2019. The list is voted on by peers and represents about 5 percent of the roughly 12,000 physicians licensed to practice in the Baltimore area.

Aaron Tobian, M.D., Ph.D., was inducted into the American Society for Clinical Investigation (ASCI). ASCI is one of the nation's oldest and most respected medical honor societies. It is made up of more than 3,000 physician-scientists from all medical specialties who are elected for outstanding scholarly achievements in biomedical research.

T.C. Wu, M.D., Ph.D., became an elected fellow in the American Academy of Microbiology (AAM). The AAM is an honorific leadership group within the American Society for Microbiology (ASM), the world's oldest and largest life science organization. The AAM recognized Dr. Wu for his outstanding translational contributions in the fields of HPV biology and therapeutic HPV vaccine development. He received recognition during the annual ASM Microbe 2019 Conference in June, along with all newly elected fellows.

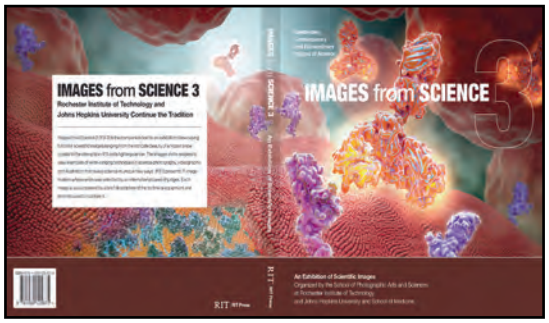
PATHOLOGY WEB TEAM NEWS

Suman Nagelia, RJ Malacus and Aidel Weisberg

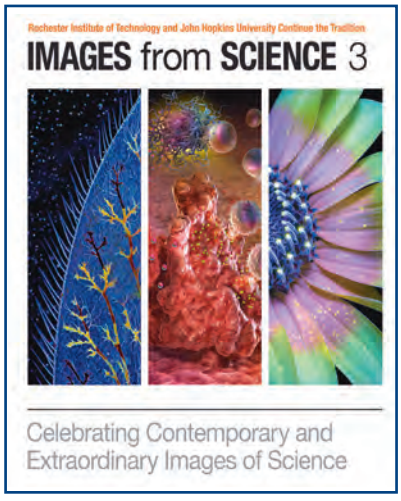
This year the Pathology Web Team focused its efforts on a new modern design for our Department homepage, just launched in the first week of December! This mobile-friendly design runs on CraftCMS, our new Content Management System. The videos that display at the top of the page, beautifully created by our in-house Path Photo group, do a great job of highlighting the mission of our Department and demonstrate the training, collaboration, research, clinical excellence, and diversity that our Department is so proud of. Visit our new home page: **https://pathology.jhu.edu.** In addition to our brand new homepage, we continued to move our disease-oriented sites to the new system and design with three new sites: **Autoimmune Disease (https://pathology.jhu.edu/autoimmune)**; **Brain Tumor (https://pathology.jhu.edu/brain-tumor)**; and **Type 1 Diabetes (https://pathology.jhu.edu/type1-diabetes)**. These sites provide up-to-date information for patients about their diseases, as well as related research findings in our Department.

Stay tuned as we continue to transition additional portions of our Pathology website to the new and improved design! A special thank you to **Dr. Marc Halushka** who has taken on an advisory role to our team this year and has offered us valuable counsel and direction. We welcome feedback on our recent web efforts, as well as suggestions for ideas that you would like to see on the website. Contact our team at **pathwebteam@jhmi.edu**.

IMAGES FROM SCIENCE 3: A TRAVELING EXHIBIT & BOOK



Images from Science 3 is a collaborative experiment that initially began in 2002 at Rochester Institute of Technology, and was organized to celebrate the production of extraordinary images featuring science. This year the exhibit and book was organized as a collaboration between Johns Hopkins University and the Rochester Institute of Technology by professors **Norman Barker and Michael Peres.**



At its core mission, the project seeks to explore the interface of science, technology, art, design, and communication. Since the first two versions of Images from Science in 2002 and 2008, much has changed. Coupled with new optical and other imaging software, nothing seems out of the realm of what is possible in the creation of images for science. The dynamic release of new imaging equipment, including the smartphone, coupled with the explosive use of social media has allowed for images to be shared worldwide synchronously.

The traveling exhibit will showcase 82 extraordinary images from 71 image makers from 15 countries around the world. This year, in addition to still images, the exhibition will incorporate moving images that use video, computer-generated images, animations, and illustrations. Several Hopkins faculty and students have had their work accepted into this prestigious exhibition. Judging and image selection was accomplished online, and the international panel of expert judges included photography editors, scientists, physicians, science photographers, and business owners who live in Europe, Australia, and North America. Our own **Dr. Jonathan Epstein** was on the panel of expert judges.

The traveling exhibition will be on view at RIT City Art Space November 1-24, 2019, then travel to Johns Hopkins University's Turner Auditorium in February 2020. The exhibition is available for travel to other venues, and is accompanied by a catalogue published by RIT Press.

THE SEVENTH ANNUAL PATHOLOGY EDUCATIONAL SYMPOSIUM

The Johns Hopkins Pathology Educational Symposium, held September 24-26, 2019, continues to be a very successful and highly regarded educational event. The yearly conference, chaired by **Lorraine Blagg** of Transfusion Medicine and **Morgan Grabowski** of Pathology Human Resources, features lectures ranging from diverse pathology topics to areas of general interest, and online poster sessions. The Symposium was attended by nearly 700 people and included a livestreamed presentation from Johns Hopkins All Children's Hospital in St. Petersburg, Florida. Presenters included keynote speaker **Dr. Charles Reuland**, executive vice president and chief operating officer of the Hospital; **Dr. Hruban**; Pathology clinical laboratory staff, faculty, residents, and leadership; and external speakers. Enthusiasm for the Symposium is far-reaching and an annual highlight for our Department.

BLAST FROM THE PAST (from page 18)

What is this?

These stairs were made for our first director, **William Henry Welch, M.D.** by the carpentry shop in the hospital. As Dr. Welch advanced in years, he needed these stairs to reach the podium. For several decades, these stairs resided in the Institute of the History of Medicine. They were then transferred to the Chesney Archives, and now reside in Dr. Hruban's office.

Have you moved or are in the process of moving? Have you changed your email address?

If so, please email **Kimberly Gill** at kgill@jhmi.edu, and let her know your new address and updated email address. We don't want you to miss an issue of PathWays.

We respect your privacy by never sharing your name with other organizations. If you prefer not to receive mail from us, please send us a note or email and we will promptly remove you from our mailing list.

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CALENDAR OF EVENTS

March 1, 2020
Fellowship Fair
United States and Canadian Academy of Pathology
109th Annual Meeting
Los Angeles Convention Center
Los Angeles, California

March 2, 2020, 5:30 – 7:30 p.m.
Pathology Alumni Reception
United States and Canadian Academy of Pathology
JW Marriott Hotel Los Angeles at L.A. Live
Los Angeles, California

March 18, 2020, Noon – 4:00 p.m.
2020 Pathology Young Investigators' Day
Turner Concourse
Johns Hopkins University School of Medicine
Baltimore, Maryland

April 22, 2020, 5:30 p.m.
Pathology Awards Presentation
Chevy Chase Auditorium and Arcade Room
The Johns Hopkins Hospital
Baltimore, Maryland

May 1, 2020, 7:00 p.m.
Pathology Awards Dinner
Royal Sonesta Harbor Court Hotel
550 Light Street
Baltimore, Maryland

2019 PATHOLOGY YOUNG INVESTIGATORS' DAY AWARDEES

Congratulations to the Top Award Recipients

Basic: Ahmed Rizwan, Ph.D. & Bo-Ran Choi, M.S., D.V.M.
Clinical: Stefani Thomas, Ph.D.
Translational: Nicolas Giraldo-Castillo, M.D., Ph.D.

For Excellence in Basic Research

Rizwan Ahmed, Ph.D.
Bo-Ran Choi, M.S., D.V.M.
Weiwei Cheng, M.D., Ph.D.
Janelle Montagne, M.S.
Zahra Omidian, D.V.M., Ph.D.
Tim Nieuwenhuis, B.S.
Mohanraj Sadasivam, Ph.D.
Srona Sengupta, B.S.

For Excellence in Clinical Research

Stefani Thomas, Ph.D.
J. David Peske, M.D., Ph.D.
Maria Adelita Vizcaino Villalobos, M.D.
Derek Allison, M.D.

For Excellence in Translational Research

Nicolas Giraldo-Castillo, M.D., Ph.D.
Tricia Cottrell, M.D., Ph.D.
Emily Maggioncalda, B.S.
Antje Arnold, Ph.D.
Eva Shrestha, B.A.
Regina Kwon, M.D., Ph.D.