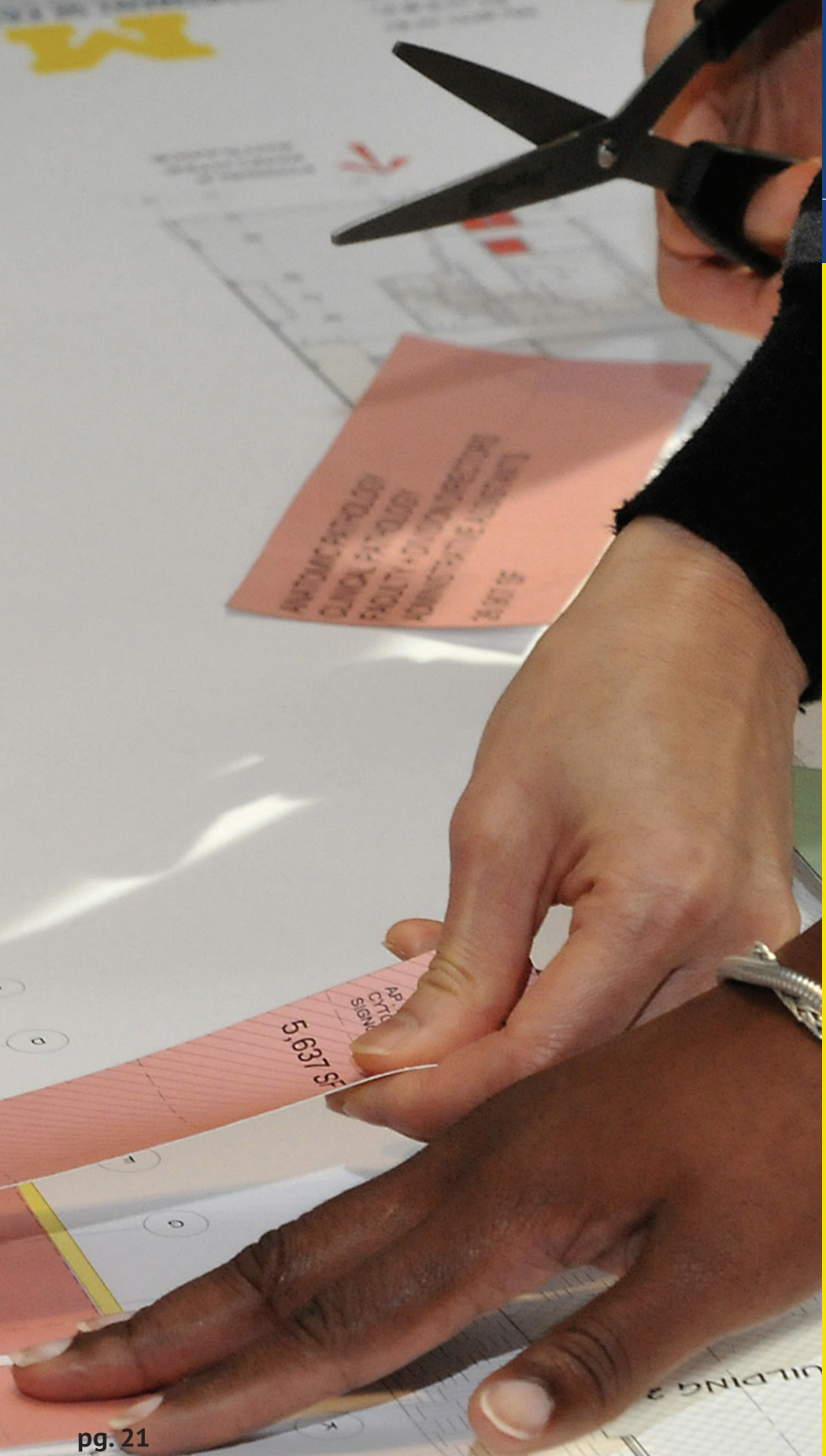
INSIDE PATHOLOGY

DEPARTMENT OF PATHOLOGY
UNIVERSITY OF MICHIGAN

SPRING 2016



M INSIDE PATHOLOGY

SPRING 2016

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www.pathology.med.umich.edu/**news**

On the Cover

Autopsy Technician draws blood while working in the Wayne County morgue.
Photography by Kelly Root

Photo/**Elizabeth Walker**

It has been an eventful first year as Chair. Our faculty continue to thrive with new leadership roles. Dr. Kathleen Cho was appointed Vice Chair for Academic Affairs and Dr. Jeffrey Myers became the new Vice Chair for Clinical Affairs and Quality. Dr. David Lucas was recently appointed Director of Anatomic Pathology, allowing Dr. Myers to focus on his new appointment.

Multiple new Divisions within Pathology were created. Dr. Asma Nusrat leads the new Division of Experimental Pathology and will work to provide collaborative and mentoring opportunities for faculty members. Dr. Thomas Giordano is the Director of the new Division of Molecular and Genomic Pathology. He will seek to create a broad vision across all of the molecular pathology labs, setting departmental strategies for future test development and leveraging our research efforts for broader use by pathology faculty. The team in the new Division of Quality and Health Improvement (DQHI), led by Dr. Scott Owens, will tackle both quality improvement projects focused on daily processes and broad, value-creation projects that will span the interests of UMHS and beyond.

The department continues to be well recognized at national and international levels. Over the past year, our faculty have received numerous exceptional awards, and I do want to highlight the following three. Dr. Kathleen Cho was inducted into the National Academy of Medicine (formerly known as the Institute of Medicine), recognizing her outstanding contribution to national service, diagnostic expertise and laboratory research in gynecological cancer. Clinical Pathology continues to thrive under the leadership of Dr. David Keren, Professor and Director of the Division of Clinical Pathology, who was the recipient of the American Board of Pathology's Life Trustee Award. Dr. Peter Ward received the Society of Leukocyte Biology's Honorary Lifetime Award for Excellence. In this issue, he provides a personal perspective on the evolution of the Department of Pathology and changes at the U-M's Medical School and Health System. Having served as interim Dean of the Medical School and as 25 years as Chair of the Department of Pathology, you will no doubt agree his leadership and wisdom has been an essential part of the growth of this Department.

In October 2014, shortly after I became Chair, the Department received approval from the Wayne County Board of Commissioners to manage all activities of the Wayne County Medical Examiner's Office. In this issue, we look at Forensics in Wayne County and at the University of Michigan, and the steps that led to this very important partnership. You will also read about the career of Dr. Jeffrey Jentzen, Professor and Director of our Autopsy and Forensic Services. With Dr. Jentzen's leadership at U-M and Dr. Carl Schmidt's leadership as Chief Medical Examiner in Wayne County, I have no doubt we have one of the best forensics teams in the nation.

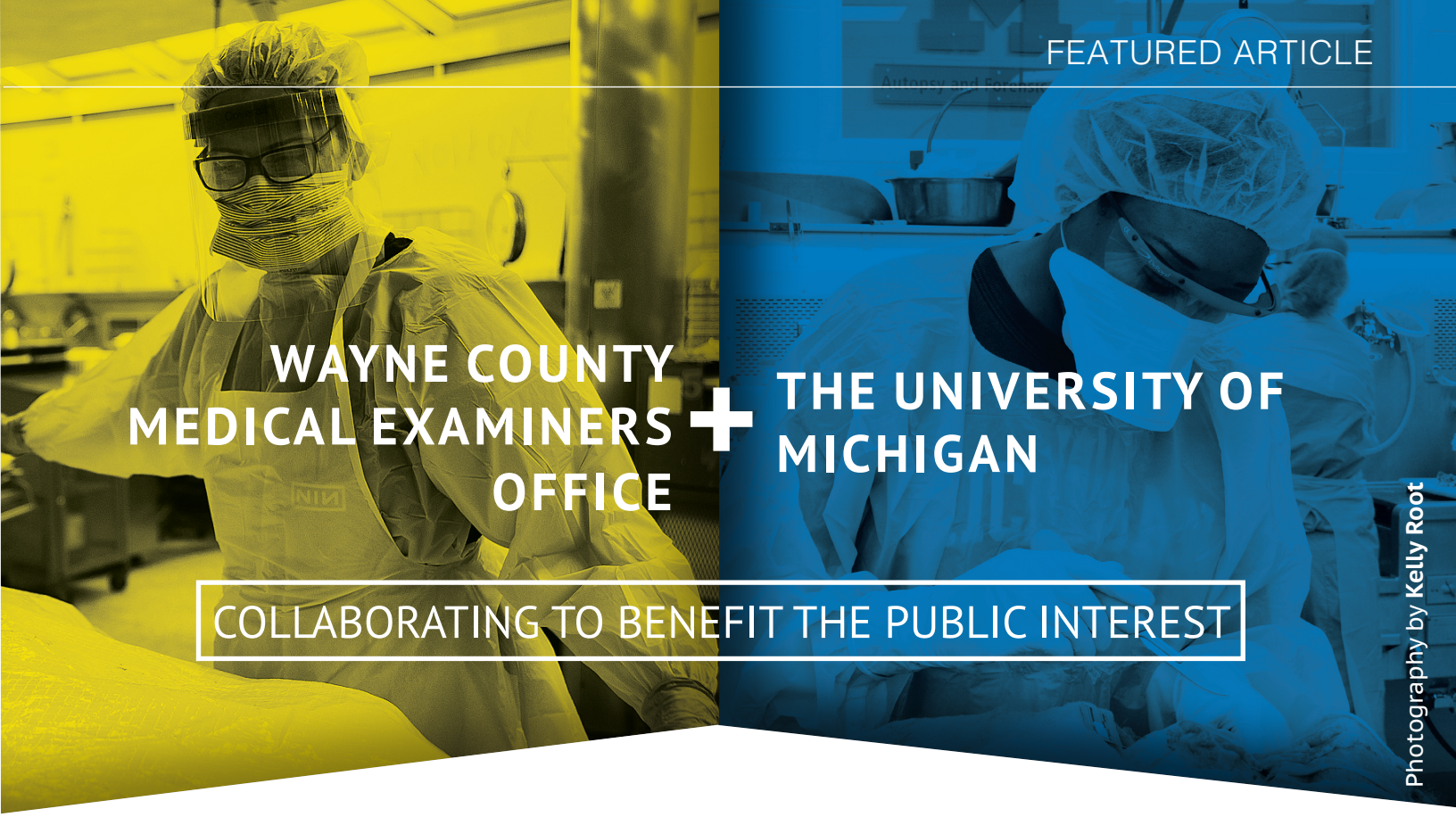
You will read about Pathology's talented imaging staff, with a historical perspective of imaging services over the years. They are the "eyes" of the department, as their work can be seen everywhere, on the website, this publication and many others. They are also the caretakers of a treasure trove of historical images, which provides a fascinating look into the past of our Department and institution. Alums of our Department will recognize many of the images from this invaluable core facility, and hopefully they will provide fond memories of how the staff in "Photography", (as it was once known) were always quick to provide assistance.

The Lab Ambassador Program was created in 2006 as a way to improve communication between the Pathology labs and the nursing staff. In this issue you will read about volunteers for this program and some of the initiatives our staff have taken to improve patient safety and communication on patient floors.

I am excited to announce that plans are moving rapidly forward to prepare the new administrative, clinical and lab spaces for Pathology's move to North Campus Research Campus (NCRC) in 2018! The former Pfizer site, which was obtained by the U-M in 2009, will provide an exceptional new space for our department. Two very important milestones were reached this past year with the Regents' approval of the $160M renovation and relocation project in May 2015 and the Regents' approval of the schematic design in December 2015. In this issue, Christine Baker, Project Manager for the relocation project, provides an explanation of the some of the virtual and Lean tools used for designing new state-of-the-art space for Pathology.

These are truly exciting times for Pathology at Michigan. I hope you enjoy reading this issue as much as I did. Please send us feedback. We would be delighted to hear from you!

Charles A. Parkos, M.D., Ph.D.
Carl V. Weller Professor and Chair
Department of Pathology
University of Michigan Medical School



WAYNE COUNTY MEDICAL EXAMINERS OFFICE + THE UNIVERSITY OF MICHIGAN

COLLABORATING TO BENEFIT THE PUBLIC INTEREST

Photography by **Kelly Root**

Written By
Elizabeth Walker

Death doesn't stop for holidays or budget cuts, explains Albert Samuels, office administrator for the Wayne County Medical Examiner's Office (WCMEO) in Detroit. Yet in 2007, funding for WCMEO plummeted in the wake of county-mandated budgetary cuts. The office was forced to eliminate 4 of its 8 forensic pathologists and cut back on support staff. Remaining employees soon became overworked, fatigued, and unable to keep pace. Turnaround time for autopsy reports increased, and WCMEO struggled to maintain its high standards of service. But the bodies kept coming: 14,000 death calls a year, leading to 2,500-3,000 autopsies or inspections. That's roughly 7 bodies a day, 365 days of the year.

Medical examiner's offices, and the forensic pathologists who work for them, perform an essential public service. The word "forensic" derives from the Latin forum, meaning "public," and forensic pathologists determine the cause of any deaths that may affect the public interest, including deaths from unnatural causes such as gunshot wounds, car accidents, and suicide. Today's medical examiner system originated in New York City in the 1900s. Medical examiner's offices are government bodies with close ties to the legal system. Because of this, becoming a forensic pathologist requires training not only in medicine, but also in courtroom testimony and criminalistics.

Despite their importance to society, there is a critical shortage of forensic pathologists. In 2009, a major federal study entitled *Strengthening Forensic Science in the United States: A Path Forward*, recommended that forensic pathology ultimately be centered in academic institutions. This would allow individual counties to take advantage of a university's research and educational offerings while raising the status and standard of forensic medicine. Yet support of forensic medicine has not been typical of academic medical centers, which focus on teaching and basic science, and are not used to coordinating with the government and the legal system.

As WCMEO was struggling with budget cuts, the Department of Pathology was interested in starting a forensic pathology fellowship program within the U-M Health System. Department administrators, including then Director of Anatomic Pathology, Jeffrey Myers, M.D., the A. James French Professor of Pulmonary Pathology; Department Chair, Jay Hess, M.D., Ph.D., M.H.S.A.; and Director of

Despite their importance to society, there is a critical shortage of forensic pathologists.

the Division of Finance and Administration, Marty Lawlor, collaborated with the Washtenaw County Board of Health, developing a plan to more fully integrate the UMHS autopsy and forensic service with the activities of the Washtenaw County Medical Examiner's Office. Jeffrey Jentzen, M.D., Ph.D. (*profile featured on page 18*), was recruited to serve as both director of UMHS Autopsy and Forensic Services and chief medical examiner for Washtenaw County. Yet, a challenge remained. Unlike Wayne County, Washtenaw County does not receive a predictable number of bodies in need of forensic autopsies. Explains Jentzen, "It's much harder to plan what kind of experience [students

Top:
(left to right) Autopsy room at the WCMEO; Carl Schmidt reviewing pre-autopsy report;

will] have. It depends on that day, or that year."

Jentzen and Carl Schmidt, M.D., the chief medical examiner for Wayne County, envisioned a collaboration that would incorporate WCMEO into the Department of Pathology. This would allow U-M to join a handful of other medical schools currently partnering with a medical

Evidence package of bullets found at a crime scene.

examiner's office. The Wayne County pathologists would become Medical School faculty, and U-M's forensic pathology fellowship (which would become one of only about 40 in the nation) would offer training at sites in both Wayne and Washtenaw Counties. Further, WCMEO would have access to UMHS services, such as histology, resulting in significant savings for the budget-strapped office. With the support of UMHS administrators and their counterparts in the Wayne County Health Department, this partnership was launched in 2011.

Over time, the U-M's role expanded to provide salary support for WCMEO's remaining administrative and support staff, autopsy technicians, and death investigators, as well as a staff photographer to document autopsies and offer on-site IT support. Wayne County does retain oversight of its primary facility, but all other services are provided by the U-M, including administrative support from the finance team and expanded IT support from the Pathology Informatics Division in Ann Arbor.

The benefits of this partnership became evident immediately. The U-M has admitted a succession of high-quality applicants to its fellowship program and attracted motivated faculty. Additionally, "We've increased the reach of our bench, so to speak," says Jentzen. "We have staff who are mobile and can assist in a specialty role or for general coverage in Washtenaw County when they're needed."

Similarly, WCMEO has seen a dramatic increase in the number of applications received for once hard-to-fill positions. Now applicants from across the continental United States vie for employment. "We hired an investigator from Virginia less than a year ago. We get applicants from Oregon, Washington State, California. We had over 120 applicants for just two autopsy technician spots," says Samuels. "We're getting the cream of the crop."

Easing the Emotional Toll

Even with sufficient funding, working at a medical examiner's office isn't easy. Leigh Hlavaty, M.D., deputy medical examiner for Wayne County, states, "We see the worst that men can do to themselves and to others. It takes a toll on us in ways we can't grasp and understand."

Each year in the United States, between 35 and 40 new forensic pathologists are board certified. However, "about a third of them don't end up practicing the specialty because they had difficulty with the violence they were exposed to or found going to court stressful," explains Schmidt. Now that the office's staffing needs are met, the U-M can provide additional services to help employees, and the families they serve, manage the grief that comes with death.

Looking for ways to improve patient care, Pathology's Division of Quality and Health Improvement reached out to the U-M School of Social Work. The two units are now collaborating to launch a pilot program, based upon a model observed by WCMEO forensic pathologist, Francisco Diaz, M.D., during his residency in Philadelphia, in which social work students are embedded at the medical examiner's office. A similar collaboration is also in place

Right: (*clock-wise*) (left to right) WCMEO faculty Lok Man Sung, fellow James Lozano, and PA student Rachael Pineau; faculty and staff from both Detroit and Ann Arbor campuses; (left to right) Mouhanad Hammami, Tom Kochis, Jeffrey Jentzen, Charles Parkos, Carl Schmidt; Albert Samuels.

between the Cook County Medical Examiner's Office and the University of Illinois – Chicago's Jane Addams College of Social Work. U-M School of Social Work's Susan Sefansky, LMSW, ACSW will provide faculty mentorship to two interns who will provide support and training to both staff and patient families, working at the WCMEO office two days a week for the entire calendar year.

Hlavaty, the pathology faculty lead for the pilot, explains, "Many times we are dealing with violence or drugs and the aftermath it leaves in these families. Even with natural findings, there can be ramifications." For instance, identifying an underlying natural disease in someone who has died young can increase anxiety in survivors, who may be grieving the death of a spouse and worrying about the effect the disease could have on their children. School of Social Work students will assist with training to guide the decedent's next of kin in sharing the news of their loved one's death with others. The student interns can also provide crisis intervention and management, as well as support for families working their way through a number of difficult and often unfamiliar tasks, everything from viewing the body to filling out paperwork.

Social work students can connect families with community resources that assist with funeral expenses and provide ongoing grief support. The students also check in later with families, a task that has traditionally fallen on WCMEO's clerical staff and death investigators, many of whom have not received formal training. With the arrival of Sefansky and the social work interns, WCMEO staff will have the opportunity to receive additional training in how to assist families in need. "We bring a tremendous amount of social work experience to the table," says Sefansky. She hopes this new service will also be incorporated into pathology residents' rotations, enabling residents, faculty, and staff to debrief after their experiences working with unnatural deaths.

> Now that the office's staffing needs are met, the U-M can provide additional services to help employees, and the families they serve, manage the grief that comes with death.

The partnership between WCMEO and the U-M is not a traditional way to provide forensic pathology service to a large metropolitan city. "There were a lot of skeptics," says Jentzen "but I think overall it's become a successful model for other cities and universities to follow." This kind of partnership ensures that the public has access to forensic pathologists. It also opens up new opportunities for research and discovery.

One example is a project initiated by Schmidt in 2014, which has come to be known as the Human Postmortem Microbiome project. It was recently described in *The Living Dead*, a New York Times Magazine article by Peter Andrey Smith*. By studying swabs taken from the thousands of bodies autopsied at WCMEO each year, Schmidt and researchers from two other universities have identified differences in the bacteria on male versus female bodies, as well as on the bodies of those who have committed suicide versus those who are victims of homicide. Observations from this study have also been used to better estimate time of death. Discoveries like these provide knowledge to families and could profoundly affect how forensic science is applied within the judicial system. At the end of the day, when it comes to forensic pathology, public health, public safety, and personal justice are all at stake.

* *New York Times Magazine*; January 24, 2016

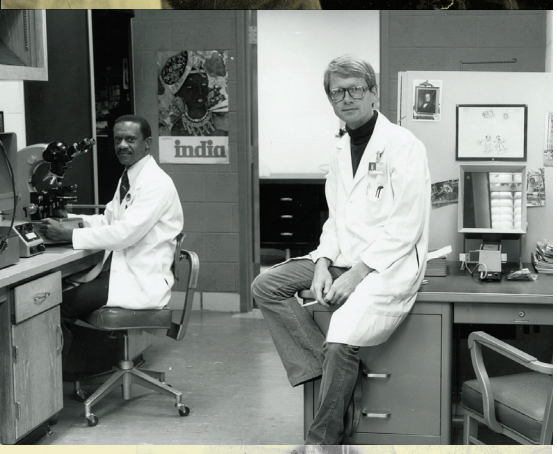
History of PATH IMAGING

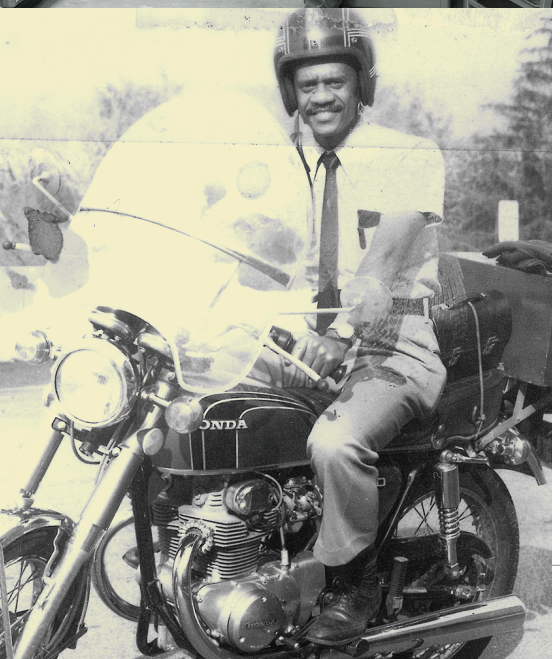
Written By
Brent Temple

Standing inside the thoroughly modern Pathology Imaging Facility, one glimpses a rich history in a series of photographs preserved behind a glass frame. Most of the images are black and white, some stained and sepia toned with curled edges, evoking an old family album. In one picture, A. James French, M.D., former department chair, shakes hands with President Lyndon Johnson. In another, Bruce Friedman, M.D., now a professor emeritus, sits in a military jeep in Korea, where he was assigned during the Korean War. One image captures Pathology residents streaking across the Diag. Another shows Kathy Heidelberger Davenport, M.D., now a professor emerita, advising actor Robert Young for the 1970s television series Marcus Welby, M.D. There's also an image of Paul Gikas, MD, who died peacefully last year after retiring in 1994. In this picture, he's carving a turkey for a departmental Thanksgiving party.

Based in the Medical Science 1 Building, Pathology Imaging provides image- and video-making services to the Department. Full-time image specialists assist with everything from photographing autopsies to documenting departmental events. The end products are used for clinical, research, teaching, and promotional purposes. Following the addition of the Wayne County Medical Examiner's Office

Clockwise from Top-Left:
Eddie Burks duplicates materials at a copy stand (1970s); Mark Deming posing inside the imaging lab (1980s); Matt Hardeen and Dr. James French enjoying a reception(1950s); Burks and J. Craig Biddle inside the photo lab (1970s); Eddie Burks on his motorcycle (1970s); Matt Hardeen working at the PAKO print dryer; portrait of a young Craig Biddle (1960s); Elizabeth Walker at her first House Officer's Farewell dinner (2000).





Matt Hardeen

J. "Craig" Biddle

Eddie Burks

(WCMEO) to the Department (*read more on pg. 5*), Pathology Imaging also employs an imaging specialist at WCMEO to document autopsies and process photo requests for local police departments and the prosecutor's office.

History

The Department hired its first full-time photographer, Matt Hardeen, in 1958, at a time when pathology, like radiology, was becoming highly image-driven. There was a growing need for photographs to provide clinical documentation and showcase research results. Before Hardeen's retirement, J. "Craig" Biddle was hired in 1968, and Eddie Burks joined as a full-time photographer in 1971. Today, there are three full-time image specialists: Mark Deming and Elizabeth Walker at the Pathology Imaging Facility in Ann Arbor, and Kelly Root at WCMEO.

Working for Pathology imaging since 1987, Mark Deming initially served as an assistant for Biddle and Burks. He says the lab was less crowded then, and the darkroom's photographic print-washing tub was always filled with floating photos. Space was available to hang backdrops for portraits, but as new faculty joined the Department, the lab filled with microscopes and other scientific equipment. Increasingly, faculty members needed clinical images that could provide accurate diagnoses and feedback about courses of treatment.

With a degree in photography and experience working in the hospital histology lab, Deming was eventually promoted from assistant to full-time photographer. He recalls how there were always two photographers, one taking the pictures, and the other back in the darkroom, developing and printing. "One week you would be taking pictures," he says, "and the next week you'd be in the darkroom all day with the water running, very zen-like."

When Elizabeth Walker joined the team in 2000, the majority of the photographers' time was spent in the darkroom, creating Kodachrome slides of specimens, books, articles, and important events. As new technologies became available, large and bulky photo enlargers were replaced with computers, software, and digital printers. Walker anticipates the addition of more glass slide scanners in the future. She also believes the x-ray processor will be replaced by a piece of digital equipment, and that video production will grow as multimedia is increasingly included on the department website (*www.pathology.med.umich.edu*).

Problem Solving

Now that so many people have smartphones with cameras and video recorders, the perceived need for photo expertise could diminish. Indeed, some UMHS departments have downsized or eliminated their photography units entirely. This has the potential to be an incredible loss, given the unique training, experience, and intuition that in-house professionals offer.

Photography is not merely a point-and-shoot kind of job, explains Walker. In fact, she says, "The most important aspect of being a pathology imaging specialist is problem solving"—keeping in mind the subject, environment, and desired outcome when choosing the best tools to meet a client's needs. Whether documenting a medical examiner autopsy in the morgue, shooting a training video, or producing a figure for a grant, many variables must be considered when making a professional-grade image.

Mark Deming

Elizabeth Walker

Kelly Root

"the most important aspect of being a pathology imaging specialist is PROBLEM SOLVING"

-- Elizabeth Walker

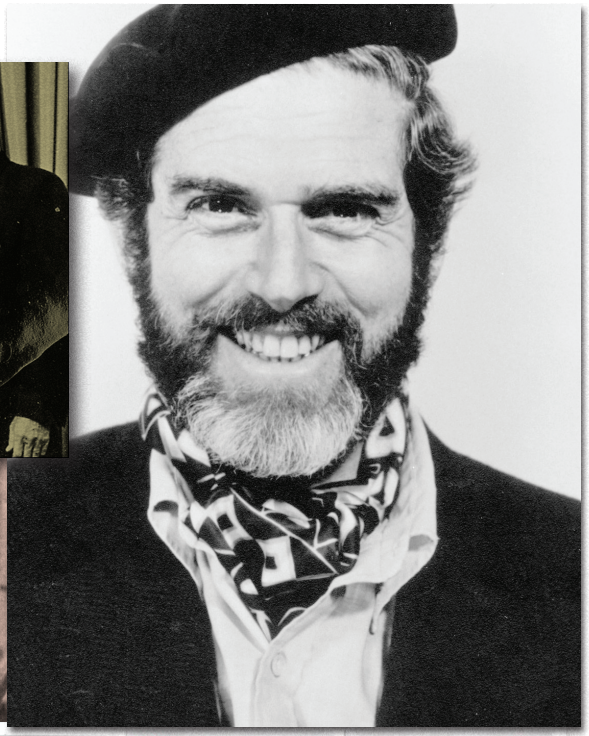
Pathology Imaging also provides support for faculty who wish to produce their own images using a variety of microscopes in the core facility. Staff can guide a faculty member through the process, demonstrating how to set up and use the equipment. Deming and Walker have both received awards for their excellent services, verifying that their expertise continues to be an outstanding asset to the Department.

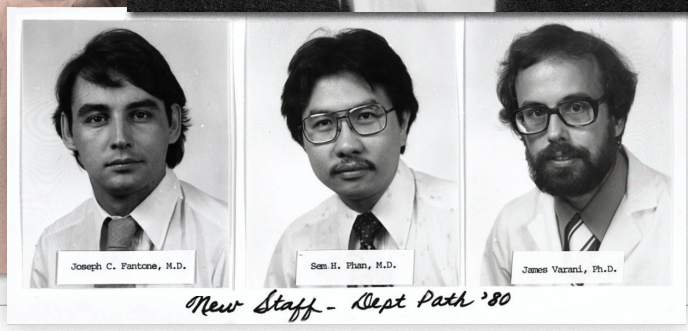
Wayne County Medical Examiner's Office

Since the University of Michigan acquired contracts with Washtenaw County and WCMEO a few years ago, the Ann Arbor imaging specialists have produced fewer figures for grants and journals, instead assisting with a large increase in daily forensic work. Wayne County has a high homicide rate relative to Washtenaw County, explains Kelly Root, who has worked at WCMEO since 2000 and currently serves as its onsite pathology imaging specialist and information technologist.

Over the years, Root has acquired a broad knowledge of fatal injury and artifacts of death that are distinct to the medicolegal death investigation field. She speaks yearly at the University of Detroit Mercy Forensic Odontology Seminar, and at the U-M-WCMEO Medicolegal Death Investigation Seminar (www.pathology.med.umich.edu/wcmeo). Root admits that because of the high workload, she often forgets that the photographs she's producing are helping take murderers off the streets. She is reminded of the significance of forensic photography when she receives a sincere thank you in the form of an email from a Detroit homicide detective.

With the passing of six decades, and the incorporation of WCMEO, Pathology Imaging would like to acquire a digital asset management system to share images with clients and help organize the archives. Thousands of photos of myriad subjects have accumulated over the years—the framed pictures in the Pathology Imaging Facility are just the tip of the iceberg. Pathology Imaging documents everything from social events, to scientific meetings, to homicide investigations. Indeed, the archives pay tribute to the Department's important work and rich history.





Bottom(clock-wise):
Department chair A. James French shaking hands with President Lyndon Johnson; a young Dr. Gerald Abrams, sporting a french beret and beard; new Faculty of 1980 including Joseph Fantone, Sem Phan, and James Varani; pathologist Kathy Hidelburger-Davenport from the university advising actor Robert Young for the television series *Marcus Welby, M.D.*

Lab Ambassador Program

Bridging the Gap Between Patients and the Laboratory

Left: (*left to right*) Saira Ramirez shares information about the program at the Laboratories Communications Committee meeting, after being introduced by Kristina Martin and Chris Rigney.

Right: Med tech, Michele McGee shows nursing staff the incubators in Microbiology.

Written By
Elizabeth Walker

For the past decade, the Lab Ambassador Program has been linking Pathology laboratories with University Hospital nursing units. "The program streamlines communication," explains Clinical Pathology Operations Manager Kristina Martin. Better communication ultimately improves patient safety by allowing nurses and laboratory staff to coordinate efforts to enhance and preserve specimen integrity.

As part of the program, medical technologists from the laboratories serve as lab ambassadors, liaisons to the nursing staff in the clinical care units. "It's amazing because they can see who we are," says lab ambassador Amy Drouillard, a technician in the Microbiology Laboratory. "We're always behind a closed door," but thanks to the program, nurses have a point person to contact when problems arise. Saira Ramirez, who also works in the Microbiology Laboratory, explains: "If a nurse needed help with a certain issue, then they would contact the liaison from that particular lab to try to find a solution." This allows questions to be answered quickly and efficiently.

Kristina Martin hopes more people will volunteer to serve as ambassadors in the coming months. "Ideally we would have someone from every lab. That's the goal."

One of the first tools that the Lab Ambassadors Program distributed was the Order of Draw card, a quick, visual reference for the order in which blood should be drawn. Ambassadors also arrange educational opportunities with the nursing staff, helping them understand the minimum volumes needed for various tests, the difference between urgent and routine testing, and how to properly label and transport specimens.

As part of Medical Laboratory Professionals Week, held each year in April, ambassadors organize lab tours, which are recorded for those unable to attend in person. Nursing staff, and all other interested parties, are invited to "see the different labs, ask questions, just get a better feel for the institution that they work in and the people that are down here," says Ramirez. Feedback from those who have attended tours has been very positive, with suggestions that every nurse should be required to tour the laboratories.

In addition to improving communication between the nursing units on the patient floors and the laboratories, the Lab Ambassador program increases morale. Says Ramirez, "It can be empowering and make staff feel like they are part of something bigger. It gives them ownership."

Drouillard appreciates that working as a lab ambassador has given her a voice and allowed her to better connect with her colleagues. "When you're more involved, you're more engaged. Your world opens up to this amazing hospital!"

Funding Great Causes

Our Missions

The Department of Pathology is advancing the future of health care through our interrelated patient care, education, and research missions. In all of our clinical service areas, we are committed to achieving the highest standard of service excellence to ensure an ideal experience for our patients and their families. We provide comprehensive training to our residents and clinical fellows, to ensure that our trainees have a strong foundation for their clinical practice. We are also endeavoring to train the next generation of research scientists through our Molecular and Cellular Pathology Ph.D. program. Our research programs are extremely robust and making significant advances in the basic science, translational pathology, drug discovery, and informatics arenas. The department consistently ranks amongst the top ten Pathology departments in total funding from the National Institutes of Health. Many of our faculty members are recognized as international leaders in diagnostic pathology, education, and research.

Support Leaders & Best

In the pursuit of continued excellence in our educational training, clinical care and scientific discovery, the Department of Pathology has always been grateful for private support. Gifts from individuals, foundations, corporations and associations play a key role in medicine at Michigan.

Available Funds

Pathology Faculty Research Fund
Established to support the research programs of faculty in the Department of Pathology

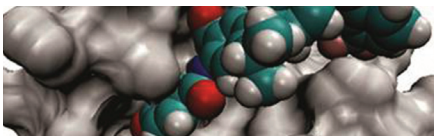
Pathology Resident Research Fund
Established to support research by Residents in our Anatomic and/or Clinical Pathology training programs

Pathology Fellowship Fund
Established to support Fellows in our clinical subspecialty fellowship programs

To learn how to help, contact Susan Foley UMHS Development at 734-763-1005 or *shfoley@umich.edu*

Research Highlights

Myeloid Cell Leukemia-1

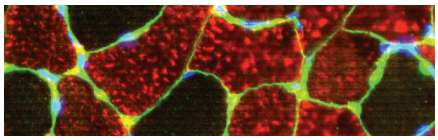


Dr. Zaneta Nikolovska-Coleska's research focuses on chemical genomics, discovery and application of active compounds for the interrogation of biological systems and improvement of human health. Recently, Dr. Nikolovska-Coleska's team has successfully developed several classes of small-molecule inhibitors targeting Myeloid cell leukemia-1 (Mcl-1) protein, involved in controlling the programmed cell death. Preclinical studies demonstrate that these selective Mcl-1 inhibitors potently inhibit in vitro and in vivo pancreatic cancer growth, and they can act as radiosensitizers. These studies provide evidence for future clinical development of Mcl-1 inhibitors as novel targeted drugs against pancreatic and other human cancers.

Therapeutic Allergy Strategy

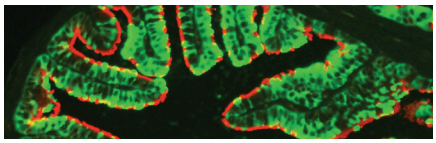
It is estimated that ~15 million Americans have severe food allergies with 1 in every 13 children under 18 afflicted with this disease. That is 2 in every classroom. The economic cost is approximately $25 billion/year, with no effective therapy available. Dr. Nicholas Lukacs is the Scientific Director for The University of Michigan's recently established Mary H. Weiser Food Allergy Center. This Center was anchored by the philanthropic commitment of Ron and Eileen Weiser, along with other significant donors. The Food Allergy Center is committed to paradigm-shifting research by supporting basic and clinical researchers to identify new targets for developing novel therapeutic strategies to effectively treat this life threatening condition.

Muscular Atrophy



The Andrew Lieberman laboratory studies protien aggregation neurodegenerative disorders. Specifically, the work concentrates on inherited forms of neurodegeneration, with the goal of understanding disease mechnisms so as to identify therapeutic targets. Of particular interest is spinal and bulbar muscular atrophy, an inherited degenerative disorder of the neuromuscular system caused by a CAG/glutamine expansion in the androgen receptor gene. Using a gene targeted mouse model, they uncovered a critical role for skeletal muscle in disease pathogenesis, suggesting that expression of the mutant protein in peripheral tissues contributes to lower motor neuron degeneration. The lab is now partnering with a pharmaceutical company to complete preclinical efficacy studies in mice to knockdown expression of the mutant gene only in the periphery as a lead up to proof-of-concept trials in patients to test this therapeutic approach.

Ovarian Cancer



The Kathleen Cho lab studies gynecological malignancies, with a primary focus on ovarian cancer. Early studies used comprehensive molecular profiling to show that ovarian cancer is actually a group of several distinct cancer subtypes. More recently, the group has engineered powerful, subtype-specific mouse models that are being used to study the biology of ovarian cancer and to test novel approaches for prevention, early detection, and treatment of this disease.

Annual Events

Anatomic, Molecular and Hematopathology Research Day
February 13, 2016

One-day event showcasing scientific presentations by Department faculty and trainees with open discussions for applying lessons learned to attendee areas of interest.

Advances in Forensic Medicine and Pathology
May 11-12, 2016

Two-day symposium, held yearly, designed to meet the needs of practicing pathologists, medical examiners, law enforcement personnel, coroners, health care professionals and district attorneys. A distinguished and diverse group of forensic pathology specialists serve as faculty.

Current Topics in Blood Banking
May 14, 2016

Educational program for medical lab scientists, residents, fellows and faculty, designed to discuss topics related to blood banking, hemostasis, quality and management. CE credits offered for medical lab scientists.

Clinical Pathology Symposium
October 3 & 4, 2016

Two-day educational event for Pathology medical laboratory scientists and staff geared towards a variety of lab topics. CE credits are applied to the Certification of Maintenance Program (CMP).

New Frontiers in Pathology
October 13-15, 2016

Annual two and a half day state-of-the-art conference, designed to meet the educational needs of pathologists, residents and fellows. AMA PRA Category 1 CME and SAMs credits offered. U-M Pathologists lead lectures and breakouts with several acclaimed speakers giving plenary and keynote presentations. Attendees are encouraged to bring cases for consultation.

15th Annual Pathology Research Symposium
November 1-2, 2016

This Molecular and Cellular Pathology graduate student event showcases research within the department by faculty, postdoctoral fellows and Ph.D. students. The 2015 Symposium featured Dr. Samie Jeffrey of Cornell University as the keynote speaker. Multiple oral and poster presentations, held at Palmer Commons, completed the day. The 15th anniversary of this symposium promises both exceptional science and special festivities.

Find More Events
Visit our website to find more upcoming events and symposiums:
pathology.med.umich.edu/calendar

Recently Endowed *Professorships*

In honoring these professors, we show our appreciation to the many donors whose generosity and dedication to improving the human condition through support for education and research have made these endowments possible.

Thomas J. Giordano, M.D., Ph.D.

Henry Clay Bryant Professor of Pathology

Effective Sept 1, 2015-Aug 31, 2020.

Dr. Giordano was appointed Director of Molecular and Genomic Pathology on July 1, 2015. His research interests include the molecular biology of endocrine neoplasia. He maintains an active translational research program, using contemporary molecular and genomic profiling techniques to address problems in endocrine and other types of oncologic pathology.

David R. Lucas, M.D.

A. James French Professor of Anatomic Pathology

Effective February 1, 2016-August 31, 2020

Dr. Lucas was appointed Director of Anatomic Pathology, effective December 1, 2015. His research focuses on the areas of soft tissue and bone pathology, including studies that identify clonality in desmoid fibromatosis, variants of dedifferentiated liposarcoma, and clinicopathological features of undifferentiated small cell sarcoma with CIC-DUX4 fusion for which there is now a diagnostic FISH assay.

Asma Nusrat, M.D.

Aldred S. Warthin Professor of Experimental Pathology

Effective May 1, 2015-Aug 31, 2019

Dr. Nusrat was appointed Professor with tenure and Director of Experimental Pathology on March, 1, 2015. She comes to the Department from Emory University, and is recognized nationally and internationally as a leader in the area of epithelial pathobiology, most notably for her research on molecular mechanisms of barrier function and wound repair.

Charles A. Parkos, M.D., Ph.D.

Carl Vernon Weller Professor of Pathology

Effective September 14, 2015-August 31, 2019

Dr. Parkos was appointed Chair of Pathology and Professor with tenure on September 14, 2015. He comes to the department from Emory University and is recognized nationally and internationally for his research on leukocyte interactions with mucosal epithelia as it relates to pathologic conditions such as inflammatory bowel disease.

MALDI-TOF

A New Paradigm for Diagnostic Microbiology

Information by
Duane W. Newton, Ph.D.

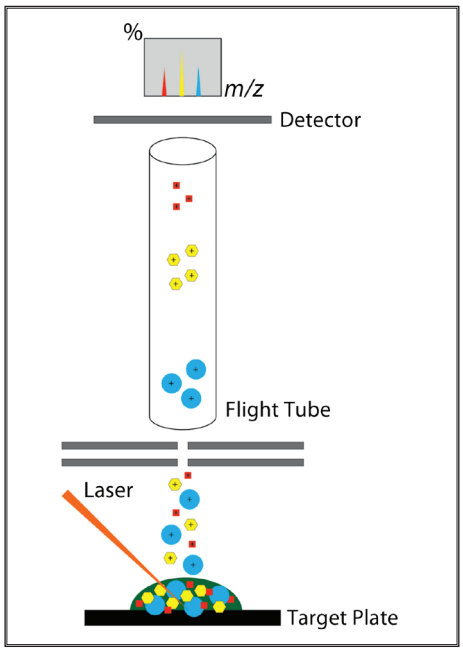
Medical Technologist, Katie Lew, placing a specimen in the MALDI-TOF.

Technological advances have contributed significantly to improved detection rates of important microbial pathogens. Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry, historically used only in clinical chemistry laboratories, is now improving diagnostic speed and accuracy in clinical microbiology laboratories.

The primary goal of the Clinical Microbiology Laboratory is to identify causative agents of infectious diseases in patient specimens. Traditionally, this is achieved by first isolating an organism in culture and using a variety of different physical and chemical features of the organism to identify it. However, the identification procedures can be time-consuming and cumbersome, often requiring days before the final result is available. MALDI-TOF mass spectrometry has recently emerged as an important, rapid and accurate tool for organism identification, providing results in just a few minutes.

Once an organism is isolated from a clinical specimen, a small amount is spotted on a stainless steel target plate, mixed with a chemical matrix and allowed to dry. When placed into the MALDI-TOF instrument, the spot on the target plate is subjected to laser pulses. The now desorbed ionized molecules from the isolate are accelerated through a flight tube by an electromagnetic field. The TOF of the analytes to the detector is then measured and produces a characteristic spectrum from which an organism can be identified. This is accomplished by comparing the resultant spectrum to a database containing spectral patterns of various clinically-relevant organisms. The software then matches the spectrum in question, providing an identification.

MALDI-TOF mass spectrometry is suitable for the microbiology laboratories because samples require minimal preparation and identifications are made in less than one minute. MALDI-TOF also provides excellent specificity, low operating costs, and requires minimal maintenance. The identification database is continuously updated with clinically-relevant organisms to improve the diagnostic capacity of the system.



Although this technology is powerful, there are a few limitations. The database is not entirely complete, so not all organisms are able to be identified (<5% unidentified). In addition, the acquisition costs of the instrument are high; but because of the extremely low operating costs, and the high volume of samples that can be tested on the system, the return on investment can be relatively quick.

In collaboration with our institutional Antimicrobial Stewardship Team (AST), we have recently published a study* demonstrating that rapid identification of isolates using MALDI-TOF yields clinically-significant benefits to our patients and health system overall when coupled with active AST interventions. Not only were microbiology reporting times reduced, but patients whose cultures were identified using MALDI-TOF had significantly shorter times to placement on optimal antimicrobial therapy, reduced length-of-stay, and reduced mortality compared to patients whose cultures were identified using conventional methods.

This recent implementation of MALDI-TOF in the Clinical Microbiology Laboratory has clearly demonstrated positive clinical and operational impacts, and is serving as a template for the continued incorporation of the latest technology in our clinical microbiology laboratory.

*Huang AM, Newton DW, Kunapuli A, Gandhi TN, Washer LL, Isip J, Collins CD, Nagel JL. 2013. Rapid Organism Identification via Matrix-Assisted Laser Desorption Ionization Time-of-Flight Combined with Antimicrobial Stewardship Team Intervention Decreases Mortality and Improves Time to Clinical Response in Adult Patients with Bacteremia and Candidemia. *Clinical Infectious Diseases*. 57:1237-45.

Photography by Elizabeth Walker

REFLECTIONS

by Peter A. Ward, M.D.

The field of pathology has changed dramatically in the 55 years since Peter Ward, M.D., graduated from the University of Michigan Medical School. Here, he reflects on those changes, and on his tenure at U-M as chair of the Department of Pathology, interim dean of the Medical School, and the Godfrey D. Stobbe Professor of Pathology, Immunology/Inflammation.

In the summer of 1980, I returned to the University of Michigan as chair of the Department of Pathology, where I had trained as a resident. At that time, the Department had over 50 full-time faculty members, with strong clinical programs representing all the subspecialties. The Department was also known for its excellent teaching programs. As chair, I wanted to build our research capabilities. As a first step, several teaching laboratories were relocated to the adjacent School of Nursing in order to free up departmental space for 5 modern research laboratories.

The 1980s were an exciting time for pathology research. My own work was in the field of complement and immunopathology with an emphasis on inflammation: Why and under what conditions was it involved in lung disease? Complement is a series of plasma proteins that are involved in immune defenses against infectious agents. Several of my younger colleagues moved with me from the University of Connecticut Health Center, where I had previously served as department chair, to research these questions at UMHS. As immunology became more sophisticated, it became clear that many diseases were triggered by an immune response. The development of tools such as ELISA assays provided

Clock-Wise:
(left to right) Peter Ward with regent Sarah Power at the groundbreaking for the current U-M Hospital which opened in 1986; at a holiday party in the Towsley lobby; oil painting of Dr. Ward; Dr. Ward with Janani Krishnaswami, recipient of the Ward Pathology Medical Education Scholarship, and Dean Lichter.

fast, larger-scale methods for measuring immune responses in individual patients. Suddenly, my U-M colleagues and I had access to a wealth of new detection systems.

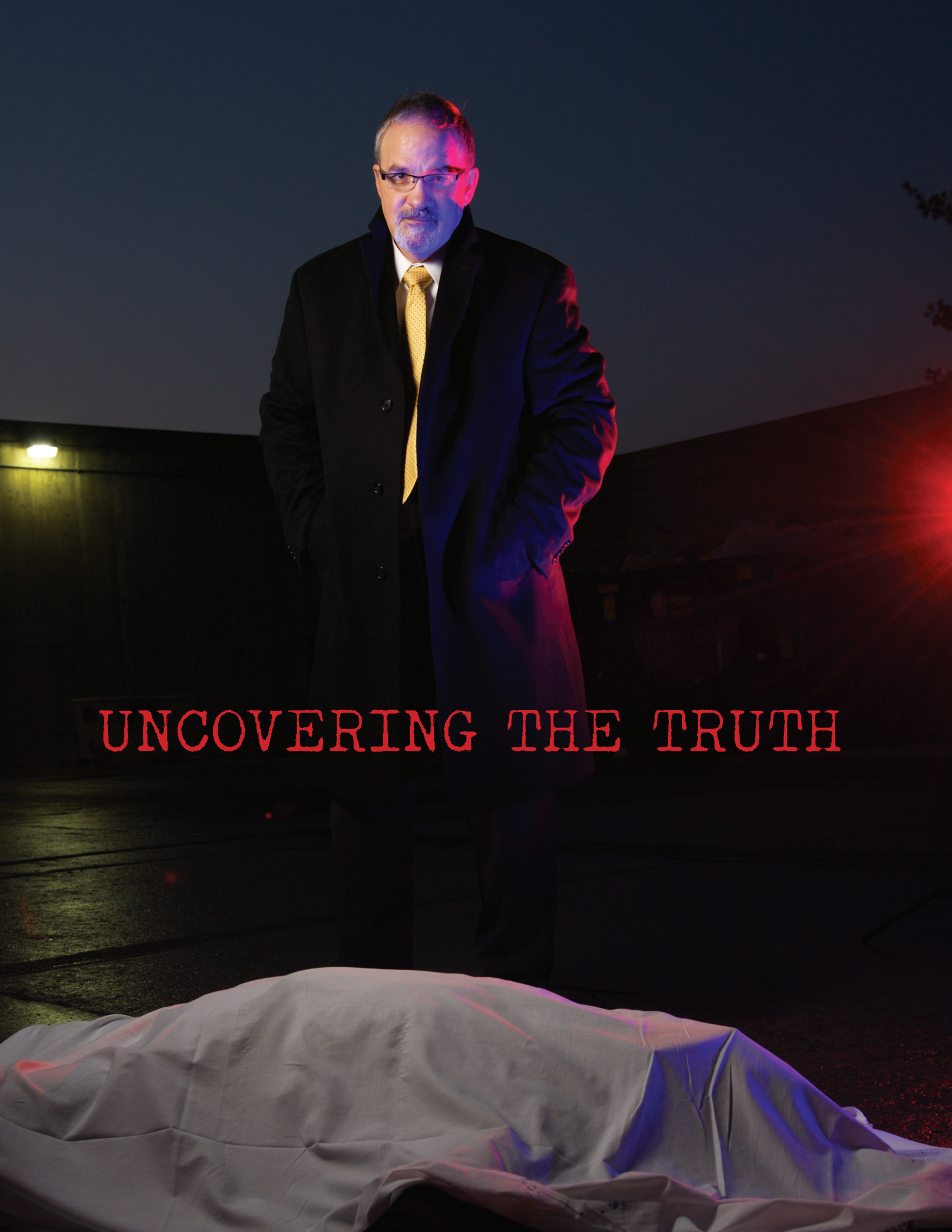
Two years into my tenure as chair, I assumed duties as interim dean of the Medical School (1982-1985). One of my roles was to help the basic science departments increase their research funding through R01 grants. I supported enhancing collaborations between the basic sciences and the various clinical departments. The National Institutes of Health (NIH) encouraged clinically-related research because the results helped justify congressional funding of the NIH. In fact, between the end of World War II and up until just ten years ago, Congress expanded the NIH budget from 7-12% per year. This was possible because legislators appreciated how NIH-supported research allowed clinicians to provide better treatments. For example, between the mid-1950s and the 1980s, the incidence of cardiac deaths from heart attacks plummeted and lifespans increased because of better treatment of cardiovascular diseases.

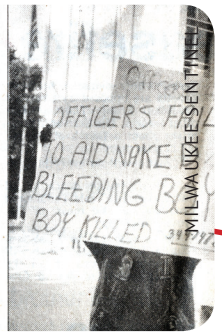
Here in the Department of Pathology we collaborate with a number of clinical programs. For example, for the past 15 years, Pathology has partnered with the Department of Urology using genomic sequencing to identify specific types of prostate tumors and predict how they will respond to various therapies. As a result of this kind of cancer research, there has been a tremendous evolution in the specialty areas of pathology. Surgical pathologists can now relay much more information about a particular tumor. The patient's physician can then use this information to determine whether and how to treat it. We're seeing things we never dreamed of even ten years ago. It's a fascinating time.

In 2005, then-Dean of the Medical School Allen Lichter and I agreed that after 25 years of my being chair of the Department of Pathology, it was a time for change. Jay Hess, M.D., Ph.D., M.H.S.A., was recruited as my replacement. Hess had trained as a diagnostic surgical pathologist and was working as a hematopathologist at the University of Pennsylvania. He had expertise in defining molecular mechanisms in cancer, especially in hematologic cancers. With his arrival at UMHS, Dr. Hess played a key role in expanding an epigenetics research program in Pathology, recruiting new faculty with expertise in leukemia, transcriptional activation, histone modifications, genome deep sequencing, and use of mouse leukemia models. The epigenetics and leukemia group has published several important papers, which have made meaningful contributions to the translation of basic science research into clinical practice. Dr. Hess also recruited Jeff Myers, M.D., A. James French Professor of Diagnostic Pathology, to lead the Division of Surgical Pathology. Currently he serves as the Vice Chair of Clinical Affairs and Quality. Kojo Elenitoba-Johnson, M.D., was also recruited and helped develop the new Molecular Diagnostics Laboratory, which is now under the leadership of Dr. Noah Brown.

Soon thereafter, the Medical School created the Strategic Research Initiative, which aligns the Medical School and UMHS around a common research vision. Among other projects, the program supports the Protein Folding Diseases Initiative, which provides funding for the study of protein folding diseases. This research is currently led by Pathology researchers, working in collaboration with other U-M scientists. By the time Hess left UMHS in 2014, he and his colleagues had developed a state-of-the-art, sophisticated proteomics core laboratory that would have very positive impacts on research programs in Pathology and beyond.

In the fall of 2015, Charles Parkos, M.D., Ph.D., from Emory University, became chair of Pathology and the Carl Vernon Weller Professor Pathology. Parkos is well-known for his research into the role of junctional proteins that regulate the epithelial barrier in the small bowel. The Department of Pathology appears to be in excellent hands for the coming years.


UNCOVERING THE TRUTH



Jeffrey Jentzen, M.D., Ph.D., is a professor of forensic pathology and the Director of the Autopsy and Forensic Services for the Department of Pathology. He also serves as chief medical examiner for Washtenaw County. Here, he reflects on his decades of experience in the field of forensic pathology with Sara Talpos.

Top-Right:
Jeffrey Jentzen, M.D., Ph.D. with Police Chief Philip Arreola (left) making an announcement involving the Jeffrey Dahmer case (1991); Jentzen taking measurements for a case in Chicago involving a 16-year-old fatally shot (1993).

Photography by **Elizabeth Walker**

In the summer of 2007, a UMHS Survival Flight plane, carrying 2 pilots and a 4-member transplant team, crashed into Lake Michigan. The team had procured a set of lungs from a donor in Milwaukee and was headed back to Ann Arbor when the plane went down. At the time, Jeffrey Jentzen had not yet joined the UMHS Department of Pathology. Instead, he was working in Wisconsin as the medical examiner for Milwaukee County. His office was responsible for identifying the Survival Flight bodies. He recalls standing on the beach, the bodies a mile out, and his office without a boat. "We were at the mercy of other agencies to recover the bodies," says Jentzen, who was accustomed to having his own investigators make the recovery. This time he had to wait, an experience he describes as "humbling."

Eventually, the Medical Examiner's Office was able to procure and identify the bodies, which were subsequently released back to their families. Jentzen traveled to UMHS, where he met with those families. "Bodies are an important aspect of the grieving process," he explains. "Having them back is important to the family. The military has a practice where they do not leave bodies on foreign soil. In non-military cases, families also really want their loved ones back."

In his thirty-plus years as a forensic pathologist, Jentzen has handled dozens of high-profile and emotionally difficult cases. During that time, he has also sought to raise the standards of the field of forensic pathology through his work in outreach and education.

Early Training

When Jentzen began his anatomic and clinical pathology residency at the Hennepin County Medical Center in Minneapolis, Minnesota, he knew little about the work of forensic pathologists. "That was in the era before *CSI* and all the crime shows," he says. "The Quincy TV show was out, but that was about everybody's limited experience with the field." Typically, medical students and pathology residents have little exposure to the field unless their program is connected--as UMHS' is--with a medical examiner's office (*Read more on pg. 5*). As it happened, the chair of Jentzen's department, Dr. John Coe, was also the county's medical examiner. Coe had even been part of the congressional select committee that answered questions about the deaths of President John F. Kennedy and Reverend Martin Luther King, Jr. In his earliest years as a pathologist, Jentzen learned from one of the leaders in the field.

During training, Jentzen attended

numerous death scenes. This is not typical of forensic pathology fellows, but it was a requirement in Minneapolis. Though Jentzen has sharp memories of being outside in negative 45-degree Minnesota weather, he grew to appreciate the unique experience. "'Autopsy' means 'to see for oneself,'" Jentzen says, "and that's what going to a crime scene is, too." The scene provides a perspective that might not otherwise be available. For example, viewing the position of the body at the scene of the crime, can help a pathologist better understand how an injury occurred.

During his residency and fellowship, Jentzen was also able to assist his mentor Dr. Coe with early investigations of vitreous fluid, and he learned about post-mortem drug redistribution. ("It's important to recover blood specimens in the peripheral blood vessels rather than around the heart," says Jentzen.)

Raising the Standards

At the age of 33, Jentzen became Milwaukee County's medical examiner. This was 1987, and he was one of the youngest medical examiners of a major American city. He would eventually go on to handle high-profile cases, such as the Jeffrey Dahmer serial killing in 1991, and the Milwaukee heatwave in 1995, when 100 people died suddenly in a single night. But his most lasting contributions to the field include his efforts to raise national standards.

In 1995, while vacationing with a childhood friend who has a Ph.D. in curriculum design, Jentzen expressed frustration that there were no formal measures of investigator performance and training. Death investigators need a combination of skills in the areas of medicine and law in order to investigate bodies at the scene. Working together, the two men went on to create a training manual and test, which eventually developed into the American Board of Medico-Legal Death Investigation. Jentzen also worked with the National Association of Medical Examiners to develop national forensic autopsy standards. Until 2006, there was no official standard. A forensic autopsy could be anything from opening a skull and looking at the brain, to a complete full-body autopsy.

While working as medical examiner for Milwaukee County, Jentzen obtained a Ph.D. in the history of science from the University of Wisconsin. His most recent publication, *Death Investigation in America: Coroners, Medical Examiners, and the Search for Reasonable Medical Certainty* is a history of forensic pathology in America published by Harvard University Press (2009). He is currently completing another book, *Instruments of Empire: A Global History of Colonial Legal Medicine* also by Harvard Press.

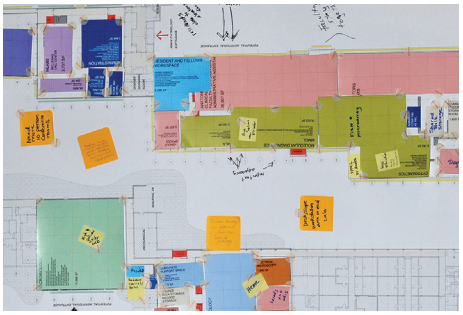
UMHS

Since joining the U-M in 2008, Jentzen has continued his innovative work. He and his team have worked with Gift-of-Life, an organ- and tissue-recovery program, developing an automated reporting system that allows the Health System to make timely notifications about donor availability. As a result, Washtenaw County has the highest number of cases for organ and tissue recovery in the nation. Hospitals around the country have used this program as a model.

Jentzen also collaborates with his U-M colleagues. He is currently working with the U-M International Center for Automotive Medicine on a program to understand injuries involved in pedestrian fatalities, which have gone up 40% over the last 10 years. During the H1N1 outbreak, he partnered with intensive care specialists, conducting autopsies to understand why some people died of the illness while others survived. Working at University Hospital, his group of pathology residents identified a marker in the blood associated with death. Subsequent studies identified a related genetic mutation, suggesting that some individuals may be predisposed to die from that particular flu strain.

Over the years, Jentzen has greatly influenced his field, and he continues to bring positive change to the Department of Pathology.

Bottom (Left to Right):
Jeffrey L. Dahmer; Drew Peterson; Plane down in Lake Michigan resulting in the death of six people.



Top (left to right):
Kick-off planning session at NCRC; paper dolls, an element of Lean Design process.

Moving Forward
Relocation of Pathology

Written By
Christine Baker

The Department of Pathology will soon have a new address! Work is well underway toward the goal of moving a major portion of the Department in 2018 to the North Campus Research Complex (NCRC).

Over the past 5 years, the Department's clinical needs have grown at a rate of 7.8% annually. This, along with the general growth of UMHS, has created demand for a larger and more efficient departmental space. In response, UMHS initiated the Pathology Relocation and Renovation Project (PRR), which will move much of the Department to the NCRC, a facility formerly belonging to the Pfizer Corporation, and located just 4 miles northeast of University Hospital.

The move will allow laboratories currently scattered across the Hospital to consolidate, reducing operational inefficiencies and expenses, while lowering the risk of lost specimens. Additionally, the new location will provide more laboratory space to address current constraints and meet growth demands of UMHS testing. Administrative and faculty offices will be relocated, along with the department's divisions of Education and Pathology Informatics. The Department's most urgent and immediate functions will remain at University Hospital, where all of the spaces will be renovated, realigned, and enlarged, allowing for creation of an automated core laboratory.

Pathology faculty and staff have actively contributed to the design of the new NCRC space by working with designers to review current facilities and explore ways to improve upon them. For example, the PRR Project Team recently met with members of 3 separate laboratories that will share space at NCRC. A mock-up was created so the lab teams could experiment with different spatial arrangements, considering details such as how to create sightlines and where to place sinks and equipment. As the NCRC design effort comes to a close, teams staying within University Hospital will begin designing their spaces, too, including the future core laboratory, blood bank, and apheresis laboratories.

The effort to design and activate the new space for Pathology has been a collaborative and innovative effort across the entire department--involving faculty, staff, and management. It's an exciting time for the Department of Pathology.

North Campus Research Complex

The Groups Relocating

- *All Molecular laboratories, designed with an innovative approach towards integrating similar technology*
- *Microbiology, except for stat functions remaining with the Core Laboratory*
- *All Anatomic Pathology labs, except for stat functions near the Operating Rooms*
- *Pathology Administration and Informatics*
- *Pathology Faculty spaces*
- *The Education program*

2015 Pathology Resident, Fellow and PhD Graduates

We are proud of all our trainees and look forward to future interactions with them. Listed here are their areas of accreditation and where they are presently located.

Residents

Theodore Brown, M.D.
Anatomic and Clinical Pathology
Miami-Dade County, FL

Stephanie Chen, M.D.
Anatomic and Clinical Pathology
University of Iowa

Charles Harmon, M.D.
Anatomic and Clinical Pathology
University of Michigan

Carolyn Haus, M.D.
Anatomic and Clinical Pathology
University of Michigan

Martin Ishikawa, M.D.
Anatomic and Clinical Pathology
University of Michigan

David Seward, M.D., Ph.D.
Anatomic Pathology
University of Michigan

Aaron Udager, M.D., Ph.D.
Anatomic Pathology
University of Michigan

Nilam Virani, M.D.
Anatomic and Clinical Pathology
University of Michigan

Fellows

Megan Alderman, M.D.
Cytopathology Fellow
Indiana University

Ghassan Allo, M.D.
Pathologist
Henry Ford Hospital, Detroit, MI

David Arps, M.D.
Dermatopathology & Surclinical Lecturer
University of Michigan

Katherine Brick, M.D.
Dermatologist
HealthPartners, St. Paul, MN

Karen Choi, M.D.
Gastrointestinal Pathology Fellow
University of Michigan

Mary Dhesi, M.D.
Medical Director of the Hematology Lab
Madigan Army Medical Center, Lakewood, WA

Julie Dueber, M.D.
Surgical & Cyto Pathology
University of Kentucky

Juan Gomez-Gelvez, M.D.
Molecular Pathology Fellow
Memorial Sloan-Kettering, New York, NY

Hunter Johnson, M.D.
Pathologist
Pathology Associates, Greenville, SC

Mark Kiel, M.D., Ph.D.
Chief Executive Officer
GENOMENON, Ann Arbor, MI

Kristine Konopka, M.D.
Thoracic Pathologist
University of Michigan

Sean Li, M.D., Ph.D.
Chemical Pathology Fellow
University of Michigan

Andrew McDaniel, M.D., Ph.D.
Molecular Genetic Pathology Fellow
University of Michigan

David Moons, M.D., Ph.D.
Forensic Pathology Fellow
University of Michigan

Maria Pletneva, M.D., Ph.D.
Pathologist
Henry Ford, Detroit, MI

Leonardo Roquero, M.D.
Clinical Lecturer
University of Michigan

Rashi Singhal, M.D., M.P.H.
Pathologist
Sparrow Pathology, Lansing, MI

Jiaqi Shi, M.D., Ph.D.
Gastrointerinal Pathology
University of Michigan

Laura Walters, M.D., Ph.D.
Pathology
Oakland University, Rochester, MI

Molecular & Cellular Pathology - PhD

Chan Chung, Ph.D. (2015)
Postdoctoral Fellow
University of Michigan

Cailin Collins, M.D., Ph.D. (2015)
Internal Medicine Residency and
Heme/Onc Fellowship
University of California, San Francisco

Garrett Gibbons, Ph.D. (2014)
Postdoctoral Fellow
University of Pennsylvania

George Lund, Ph.D. (2015)
Menlo Innovations, LLC

Ania Owczarczyk, Ph.D. (2015)
Medical Student - Lukacs Lab
University of Michigan Medical School

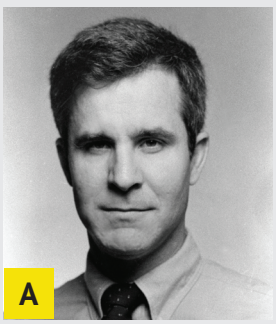
Anirban Sahu, Ph.D. (2015)
Medical Student - Chinnaiyan Lab
University of Michigan Medical School

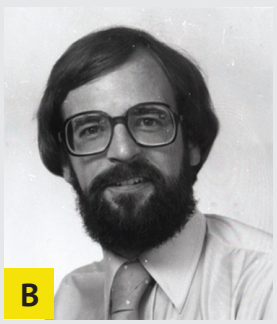
Sunita Shankar, Ph.D. (2015)
Postdoctoral Fellow
University of Michigan

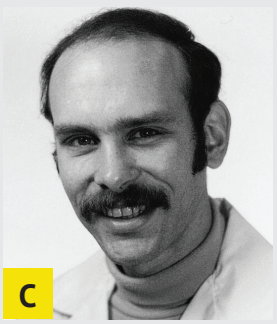
Bernadette Zwaans, Ph.D. (2014)
Postdoctoral Fellow
William Beaumont Hospital, Royal Oak, MI

FLASH FROM THE PAST

Can you guess who these individuals are? They are all currently working in the Department of Pathology, here at the University of Michigan. Two of them are endowed professors and one a division director*...if that helps.



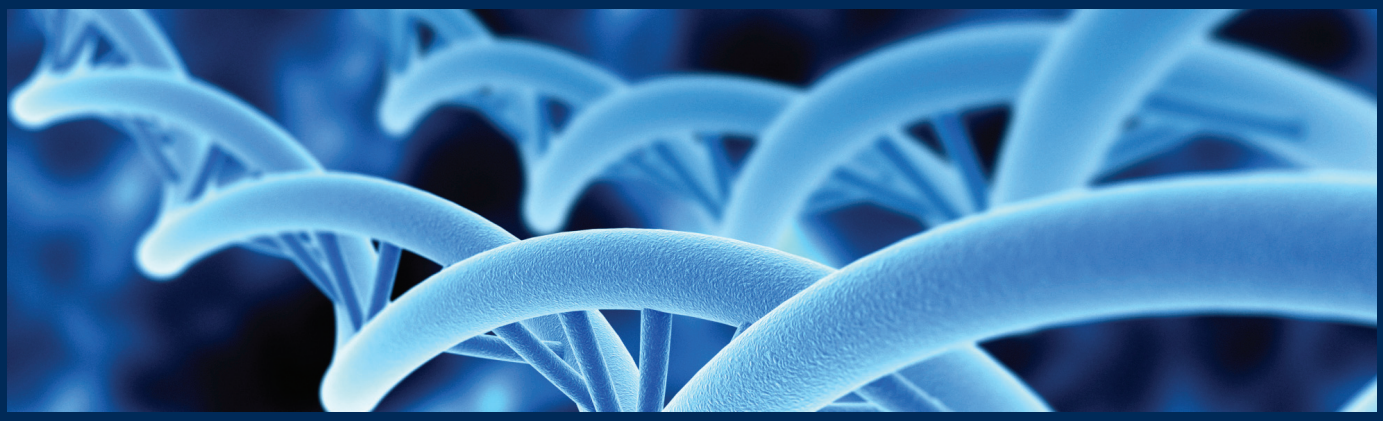




*A. Jeffrey Warren; B. Steve Kunkel; C. David Keren

DEPARTMENT OF PATHOLOGY
UNIVERSITY OF MICHIGAN

5240 Medical Science I, SPC 5602
1301 Catherine St.
Ann Arbor, MI 48109-5602



Expertise in Reference Laboratory Services.

MLabs, established in 1985, functions as a portal to provide pathologists, hospitals, and other reference laboratories access to the faculty, staff and laboratories of the University of Michigan Health System's Department of Pathology. MLabs is a recognized leader for advanced molecular diagnostic testing, helpful consultations and exceptional customer service. To learn more, call us at **800.862.7284** or visit us at **mlabs.umich.edu**.

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