Chair’s Corner

Transitions...

Three decades ago, I was asked by Dean Rosenberg to assume the Chair of Pathology at Yale and was given just a weekend to decide. It was not an easy decision. I was still an early career physician scientist, my research program was booming, and I harbored aspirations of advancing computational pathology given the recent development of CoPath® (a software package that had spread from Yale to become the nation’s leading anatomic pathology laboratory information system). I had a one-year-old son at home (Alexander) and was planning a second addition (soon to become Anna). Choosing to lead Pathology would be a new burden. My first thought was that it would be an unwise decision, one that would certainly require a redirection of my career goals. But the Dean was persuasive, and I took the job.

In 1990, the Department was facing many challenges (as it does today and has during every era). It was not a large Department. There was a core of about thirteen outstanding faculty, approximately evenly divided between our clinical and research missions. Everyone was involved in teaching. And everyone was overburdened. The Department was just too small to meet the growing clinical demands, the burgeoning research opportunities, and our many-faceted teaching responsibilities. Laboratory space was constrained. Our clinical teams aspired to be more impactful in the specialty areas of their interest but were held back by a generalist-oriented practice. So, we began to grow. A large NCI grant secured new research space and allowed for the construction of the Brady addition. The clinical practice became subspecialized, greatly improving the quality of care delivered and opening opportunities for faculty as national leaders. Research programs and collaborations were built or expanded in cancer biology, vascular biology, computational pathology, molecular virology, and others. Expansion of grant support, increased endowment, and the initiation of an expansive clinical outreach program established a firm fiscal foundation supporting the Department’s growth. Now, in 2020, the Department hosts an outstanding and more diverse primary faculty of nearly one hundred, in addition to faculty contributing as secondary appointees. We enjoy robust investigational and clinical programs, a strong partnership with the Yale New Haven Health System, and an enviable national reputation. This progress and our successes have truly been a team effort by many talented faculty, staff, and students.

On March 1, 2020, I will hand the reins of Departmental leadership to Chen Liu, MD, PhD, my worthy successor. I am confident that Chen’s energy, vision, and enthusiasm will assure the continued success and exceptionalism of our Department. Many old challenges remain, and there will of course be new ones. As for myself, I am looking forward to returning to long-delayed academic pursuits, to building collaborations both within and outside the Department that will advance pathology’s role in precision medicine, and to not having to answer my phone so religiously. I am blessed to be surrounded by such an incredible group of colleagues, and am sincerely thankful to have enjoyed your trust and support over so many years. It has been an exciting and rewarding journey.

Jon S. Morrow MD, PhD
February 2020

Digital Pathology and AI in Prostate Cancer Prognosis

By Nathan Paulson
Artificial intelligence (AI) and digital pathology will have a significant impact on the practice of pathology. According to Dr. Peter Humphrey, Professor of Pathology and Director of the Genitourinary pathology service, “Pathologists should lead in development and application of these exciting technologies, and model how we will incorporate these tools into daily practice. A critical element that will drive progress in this field is collaboration.” Through weekly multidisciplinary clinical working conferences such as the Prostate Cancer/MRI-US fusion tumor board and monthly research meetings with the Yale Interdisciplinary Prostate Program (YIPP), “We are fortunate to have an excellent working relationship with our clinical and research colleagues who share a common interest around the diagnosis and management of prostate cancer in the MRI-US fusion biopsy era. Dedicated time and space to prioritize information sharing is the key to integration,” adds Dr. Angelique Levi, Associate Professor of Pathology and senior author of this recent study submitted to the American Urologic Association’s annual meeting to be held in Washington, D.C. this Spring. The investigation highlighted in this article is an excellent example of collaboration between departments and disciplines.

Digital pathology and machine learning/AI are buzzwords that have infiltrated the narrative of almost every aspect of pathology in recent years. Companies ranging from Google to startups with significant funding (PaigeAI, PathAI, etc.) have entered into the world of anatomic pathology and contributed to the hype. A number of factors have contributed to the somewhat abrupt push into these technologies: FDA approval of a whole-slide imaging system for primary diagnosis, creation of large-scale whole-slide image databases, and significant advances in machine learning including deep neural networks. The combination of these factors has led to numerous proof-of-concept papers which have am-

(article continued on page 7)
By Rachel Lyke

Q: Where did you grow up?
A: I was born in Shanghai, China and immigrated when I was seven. I grew up mostly in Los Angeles and a suburb of Southern California called Torrance.

Q: What brought you to the field of medicine?
A: I knew that I wanted to be a scientist in high school when I worked in a neurology lab at UCLA with a National Science Foundation trainee award. From that experience, I learned how hard it is to put together a manuscript and how exhilarating it is to present your findings in front of a group of people pursuing knowledge. When I went to college at Harvard, I realized that the context of the work—application to human health—was paramount to me. That’s why I decided to go to medical school, which was a disappointment to my father, who is a physicist (he has a rather purist idea of science). But I’ve never looked back on that decision. I believe now, more than ever, that there are critical discoveries to be made in translational and clinical medicine by those who are in the trenches taking care of our patients.

Q: What were some of your areas of research while at Harvard and Brigham Women’s Hospital? How did this work affect your career?
A: Between my third and fourth years of medical school at UCSF, I took a gap year and worked in Jon Aster’s lab at Brigham & Women’s Hospital with an American Society of Hematology trainee scholarship. I was connected to him through my career mentor Abul Abbas. Incidentally, Jon had been in Jeff Sklar’s lab when Jeff was at the Brigham, and that is how he caught the Notch bug. It was a remarkable year because we got two papers out describing how different types of Notch1 mutations function in T lymphoblastic leukemia (the discoveries got a mention in the Heme WHO that followed). That was also the year I decided to be a hematopathologist, to follow in Jon’s footsteps. He is an outstanding morphologist, so his appreciation of the traditional pathology of our tumors directly fed into his questions and experiments.

Q: Lymphoma has been a strong area of interest for you professionally. What brought you to the field and how has the treatment of it evolved?
A: My first patient during internal medicine clerkship was diagnosed with an aggressive lymphoma upon admission to the hospital and died after we took care of him for the whole 8 weeks of my rotation. We were so busy doing all the things on the floor necessary for his care that I understood very little about the tumor itself and its biology. His death was crushing; it made me feel helpless. But it also made me want to design a job where I could get a better grasp on how these cancers worked, see and predict their evolution and still be able to help individual patients with the disease.

Treatment has come a long way very quickly. When I was in medical school, pretty much everyone received standard chemotherapy, and some received quite a lot of radiation. Now, we have a huge range of targeted therapies. Many of these are directed against cell surface markers that pathologists interpret using traditional phenotyping methods or molecular signatures that can be detected in our laboratories. In hematologic malignancies, of course, stem cell transplant continues to be curative for many. But even there, novel agents can help increase the chance of lasting remission, depending on the biology of the tumor.

Q: What has been your primary focus as the director of the Hematopathology service?
A: The most important part of our service is the extraordinary talent of faculty members that compose this group. My administrative focus is to equip them to do their work as efficiently as possible, and facilitate their growth in scholarship, clinical expertise, and education. The AP hemopath team is very diverse and includes our brilliant physician scientists Demetrios Braddock and Sam Katz. Zenggang Pan is the newest to join our group and is a renowned educator. Sudhir Perincheri and Alexa Siddon were both stars in our own fellowship program; Sudhir is good at everything he picks up, so he’s also become a renal expert, while Alexa has a focus in the lab medicine aspect of hemopath and manages the fellowship program. We’ve been blessed with great fellows, some of whom now work as hematopathologists at the West Haven VA: Jocelyn Chandler and Raisa Balbuena. David Hudnall has transitioned to the autopsy service this past year but he still visits us to see interesting cases. We all get together for consensus conference, which makes for a large and rowdy group.

Q: Do you have any current publications and/or presentations that you are working on?
A: I have a substantial collaboration with Jordan Pober in Immunology. One project I’ve started involves looking at the aggressive lymphoma microenvironment using techniques he has perfected in the vascular space. Our resident Nathan Paulson has learned to do these experiments and will be presenting preliminary findings at USCAP this year.

Another project, which has been presented already and is now in the writing stage, is a study of how we can harness deep learning methods to achieve greater accuracy at predicting when indolent lymphomas transform. This project has been driven by our resident Lina Irshaid and done with the help of many individuals working in Yuval Kluger’s lab and alongside Sam Katz.

Of course, being a clinical educator, there are many other projects that are large collaborations with Yale oncologists (i.e. clinical trials) as well as path/oncology groups outside of Yale. These are exciting as well because they tend to involve larger sets of data and can be clinically impactful in an immediate way.

Q: Do you serve on any committees within or outside of Yale? If so, which one(s)?
A: Internal: Pathology Executive Team, YSM medical student curriculum (malignant heme course), several search committees for Pathology Dept and Hematology Division

External: USCAP Abstract Review committee, RISE/FISHE question bank, ALLIANCE (CALGB) for clinical trials in oncology

Q: Who have your mentors been throughout your academic and profes-

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2019 Yale Pathology Labs GYN Outreach Conference

By Stephanie Weirman and Angelique Levi

On October 3, 2019, Yale Pathology held its first ever Pathology Outreach Conference. “A Practical Approach for GYN Clinicians and Staff.” The event was held at The Blake Hotel in New Haven and was well attended by outreach clients and interested physicians from across New Haven and Fairfield Counties. The symposium highlighted lab operations, clinical guidelines surrounding The Pap Test, Cervical Cancer Screening, including a presentation regarding our GYN Colposcopy Correlation Conference, GYN Surgical Pathology, medical coding and reimbursement, as well as Information Technology.

The inaugural YPL GYN Outreach conference attracted a variety of staff from across the practices: physicians, nurses, medical assistants, practice and billing managers. The day began with lunch and networking, opening remarks were provided by Jon Morrow, MD, PhD, Founder, Yale Pathology Outreach, Chair and Professor of Pathology.

The distinguished panel of speakers included:

- Adebawale Adeniran, MD, Director, Cytopathology; Associate Professor of Pathology
- Aileen Baldwin CPC, CPPM, Clinical Revenue and Compliance Manager
- Martina Burn, MD, Chief Resident of Obstetrics, Gynecology & Reproductive Sciences
- Natalia Buza, MD, Associate Director of GYN Pathology; Associate Professor of Pathology
- Peter Gershkovich, MD, MHA, Research Scientist, Director Pathology Informatics
- Angelique W. Levi, MD, Director, Pathology Outreach; Associate Professor of Pathology
- Shefali Pathy, MD, MPH, Medical Director, YNH Women’s Center; Assistant Professor of Obstetrics, Gynecology & Reproductive Sciences
- Kevin Schofield, BS, CT(ASCP), Associate Director, Outreach Clinical Operations.

The day ended with an engaging and thoughtful Q&A session.

As Director of Pathology Outreach, Dr. Angelique Levi believes “a successful Outreach program promotes excellent clinical service, effective communication, client education, and practice engagement.” In this inaugural conference, the Pathology Outreach team set out to showcase Yale Pathology Lab’s GYN Cytopathology and Surgical Pathology services, educate our GYN clients on YPL’s clinical and operational standards that go above and beyond, and engage GYN practice clinicians and administrative staff, and open lines of communication with meaningful dialogue, and compassionate listening for the sake of optimizing women’s health.

The conference space was an intimate setting which invited comfortable interactions and professional dialogue among pathology leaders, clinical caregivers and support staff. Each presenter spent time introducing themselves, describing her/his specific roles and how best to make contact for specific questions, or general issues. The personal introductions set the tone for developing a positive rapport with multidisciplinary colleagues with whom many pathology department leaders have not previously had the opportunity to meet. The presentations were informative, engaging, and interactive, emphasizing the approachable nature of the symposium speakers. Spirited discussions ensued during the Q&A session and included a variety of topics from ICD 10 coding, and patient insurance coverage, to formatting of pathology reports and YPL test results across the EPIC interface.

The impact of the event was multi-dimensional. It brought together a multidisciplinary group of people from the Yale community and beyond with a common interest in women’s health to share meaningful information, exchange new ideas, and find opportunities to optimize patient care. It also served as a platform to set the standard for the culture of YPL’s Outreach Program and to promote the 4 pillars that support and inspire the YPLO mission:

1. Excellent Service
2. Effective Communication
3. Client Education
4. Practice Engagement

#YPLOStandsOut@yalepathology

Clinical Immunohistochemistry Laboratory

By Mary Helie and Dr. Manju Prasad

Immunohistochemistry (IHC) started as a research technique. Through the years it has become indispensable for patient care. The Clinical Immunohistochemistry laboratory, staffed by Mary Helie, Laura Fuller-Weston, Kasia Nasuta, Samantha St Clair, Erik Wandelcar and Liping Zhao, has a repertoire of immunofluorescence tests to evaluate renal and mucosal biopsies. Such tests are needed in order to assess immune mediated injuries, and transplant rejection in kidney, heart and liver transplants. Immunohistochemistry uses antibodies to detect antigens. Currently, the laboratory offers approximately 180 antibodies for testing.

These tests can be used in several ways. For example, tumors detected in routine H&E staining can be further characterized by the use of a panel of antibodies and the diff-

Digital Pathology Trial

By Rom Celii

On August 27, 2019, our department went live with a 90 day trial for a Digital Pathology system in collaboration with Leica Biosystems. Two scanners have been lent to us from Leica: one 400 slide scanner (the AT2) residing in EP2, and one low-throughput live-microscope and scanner (the LVI) residing at the Bridgeport lab. The goal of the trial is to identify potential use cases of digital pathology in our clinical environment, and to test them for suitability in our overall workflow.

Early results of the trial are promising. So far, we have scanned...
New Residents 2019-2020

Thomas (Chad) Binns, MD — CP
Medical School: University of Arkansas
Undergraduate: Hendrix College
Hobbies/Interests: Photography, hiking, board games, and films

Soumar Bouza, MD — AP/CP
Medical School: Pennsylvania State University
Undergraduate: University of California, Irvine
Hobbies/Interests: Cross stitching, journaling, paper crafts, and medical anthropology

Savanah Gisriel, MD, MPH — AP/CP
Medical School: University of Arizona, Phoenix
Undergraduate: Arizona State University
Hobbies/Interests: Singing, acting, hiking, and gardening

Krishna Iyer, MD, PhD — AP/CP
Medical School: University of Iowa
Undergraduate:
Hobbies/Interests: Sports, cooking, and classical violin

Gabriel Lerner, MS, MD — AP/CP
Medical School: Boston University
Undergraduate: Colby College
Hobbies/Interests: Amateur photography and outdoors sports

Austin McHenry, MD — AP/CP
Medical School: Loyola University, Chicago
Undergraduate: University of Michigan
Hobbies/Interests: Volleyball, indoor dodgeball, architecture, and urban planning

Donald Turbiville, MD — AP/CP
Medical School: University of Texas, Galveston
Undergraduate: St. John’s University
Hobbies/Interests: Classical guitar, reading, and cooking

Leon Zheng, MB, PhD — AP/CP
Medical School: University of Colorado
Undergraduate: Carnegie Mellon University
Hobbies/Interests: Running, hiking, and visiting Colorado National Parks

Pathology Soccer Team Wins Fall Intramural Championship

By Wang Min
Our soccer team, the Yale Evergreen, has won the 2019 Fall intramural soccer league championship! The team, which was coached and captained by Professor Wang Min of Pathology and made up of several faculties and fellows in the Department of Pathology (Professor Qin Yan, Drs. Yonghao Li, Dong Wang, Dong Chen) competed with nine other teams from across the university. Yale Evergreen beat all nine teams in the regular season and defeated the traditionally strongest team from the School of Management in the final on November 3rd.

Closer to Free Ride
According to Dr. David Rimm, this year’s Closer to Free event, which took place on September 7, 2019, was the best one yet. Even with an accident on I-95 causing delays before the race, the great weather and team camaraderie led to a successful race.
Thanks to all the contributors, the Cyclopath team raised $17,621, smashing previous year records by nearly 50%! The Cyclopaths fast group (the Eastside Ringers) did 103 miles including 4,035 vertical feet at an 18.1 mph average, or 18.5 before arriving in New Haven and slowing and stopping for all the traffic lights before the finish.
Thanks to all of the supporters and riders. See you next year on Sept. 5th, 2020.
New Fellows 2019-2020

Hisham Assem, MD
GYN Pathology Fellow (AP)
AP/CP Residency: University of Calgary, Canada
Medical School: University of Calgary, Alberta, Canada
Hobbies/Interests: Hiking, watching movies, reading, and spending time with friends

Hongjie Li, MD, PhD
GI Pathology Fellow (AP)
AP/CP Residency: SUNY Downstate Medical Center, Brooklyn, NY
Medical School: China Medical University, Shenyang, Liaoning, China
PhD: Medical Science, Jichi Medical University, Japan
Hobbies/Interests: Yoga, gardening, traveling, and listening to music

Hana Banizs, MD, PhD
Molecular/Genetic Pathology Fellow (AP)
AP/CP Residency: The Warren Alpert Medical School of Brown University, Providence, RI
Medical School: Seth G.S. Medical College, Mumbai, India
Hobbies/Interests: Travel, basketball, painting, flute, social events, spending time with family and friends, astronomy and physics

Pallavi Patil, MD
GI Pathology Fellow (AP)
AP/CP Residency: Yale University School of Medicine/Yale New Haven Hospital, CT
Medical School: University of Massachusetts Medical Center, Worcester, MA
Hobbies/Interests: Trail running, hiking, cooking, golfing and beer brewing

Kevin Pelland, MD
Renal GU Pathology Fellow (AP)
AP/CP Residency: LAC and USC Medical Center, Los Angeles, CA
Medical School: Shahid Beheshti University, Tehran, Iran
Hobbies/Interests: Watching movies, reading history books, and painting

Aram Vosoughi, MD
Cytopathology Fellow (AP)
GU/Precision Medicine Research Fellow: NY Presbyterian University of Colorado, Denver
AP/CP Residency: Jackson Memorial Hospital/University of Miami, Florida
Medical School: Shahid Beheshti University, Tehran, Iran
Hobbies/Interests: Watching movies, reading history books, and painting

Clinical IHC Laboratory (continued)

Differential diagnosis narrowed to pinpoint the precise nature of tumors. This is most used in the classification of hematological malignancies, but also to parse lung, bone and soft tissue tumors.

The IHC Lab routinely stains sentinel nodes in breast cancer and melanomas to detect micrometastases and determine the stage of cancer.

Biomarkers predict tumor behavior and predict outcome and the selection of the most appropriate therapy. They are absolutely essential to treatment of breast, head and neck, gastrointestinal, lung, gynecological and many other cancers.

The laboratory offers tests to aid in targeted therapy of cancer cells, such as PD-L1, ALK, HER2/neu. Tests like IDH1, MMR, HER2, ALK, FH, detect genetic abnormalities, i.e. mutations, translocations and gene amplifications or loss. As patients are surviving longer, some develop second malignancies. IHC can help determine if this is a new primary tumor or metastasis from the old cancer as the therapy will be different.

In addition, the laboratory tests for infectious agents such as viruses like Herpes, Epstein Barr virus, and bacteria like H. pylori, Treponema and parasites like Toxoplasma. Immunohistochemistry is also used to study senile plaques in Alzheimer’s disease.

Digital Pathology Trial (continued)

more than 2000 slides and have established integration of the images into our clinical ‘hub’, the PathPortal, via a link to the Leica webviewer. The quality of the whole slide images generated has been very good, with an overall low scan failure rate. We have 232 consult slides (X19) scanned, and four tumor boards which have been presented at least partially with the digital images in lieu of the live microscope in Smilow.

The clinicians are particularly enthusiastic about the idea that slide images may be available when the physical slides have been sent to the referring institutions.

Future tests include ‘digital consensus conference’ with Bridgeport hospital, and generating primary diagnoses on biopsy specimens using the viewer software. We hope the results of this trial will underscore the importance, as well as viability of a local digital pathology architecture. We also hope and expect that this experience will encourage the hospital system to seriously consider a long-term investment in this important technology.
Department Holiday Party at the Peabody Museum

On December 6th, the Pathology Department held its annual Holiday Party at the Yale Peabody Museum of Natural History. As one of the last groups to hold an event at the Peabody before it closes for a three-year renovation, our staff, faculty, residents, fellows, and their families got to observe all of the first floor exhibits, including the exceptional Hall of Dinosaurs. Guests took part in guided tours of the third floor exhibits, practiced their best smiles in the photo booth, and enjoyed both the delicious food catered by La Cuisine and the music of Benny Mikula. Thank you to the party planning committee for your hard work!
Simplified interest in combining machine learning with digital pathology. Most recently, the team behind PaigeAI (through the power of ~45,000 whole-slide images from MSK) published their results of screening for prostatic adenocarcinoma and basal cell carcinoma, which showed 100% sensitivity for detecting cancer. Indeed, the vast majority of papers thus far have focused on diagnosis alone.

Inspired by these trends in pathology and hoping to piggy-back on a fruitful database recently generated for a separate multidisciplinary prostate project, we sought to leverage the expertise of our Yale colleagues in the departments of Urology, and Radiology & Biomedical Imaging who have experience applying machine learning to digital image analysis. We generated whole-slide images using the pathology department’s Aperio ScanScope slide scanner on all prostate biopsy cases from YNHH (from 2015-2018) which had corresponding radical prostatectomy, Grade Group 2 or 3 disease in at least one core, and no biopsies with higher than Grade Group 3 disease. Using these whole-slide images, features were extracted using a pre-trained convolutional neural network and an aggregated feature representation for each patient was calculated. An XGBoost classifier was then trained to correlate aggregated image features and adverse outcome at radical prostatectomy. Figure 1 is a schematic of the AI processing pipeline of high resolution biopsy images for predicting adverse outcomes at radical prostatectomy (RP). Our final data-set included 357 whole-slide images from 107 patients (57 with adverse outcome at RP). Figure 2 illustrates the Receiver Operating Characteristic (ROC) and area under the curve (AUC). Thirty runs of 10-fold cross-validation yielded a mean AUC of 0.70 for predicting adverse outcomes in our preliminary analysis.

Gleason Grade Group (GG) continues to be the most powerful predictor of prostate cancer prognosis. Being able to fine-tune this prediction in the MRI-US fusion prostate biopsy era is novel and provides significantly more clinical guidance than trying to weight or determine an overall risk from multiple positive prostate biopsy cores. Further investigation in this area will allow for even more personalization of risk prediction. We asked Dr. Preston Sprenkle, Associate Professor of Urology; Chief, Division of Urology at VA Connecticut Healthcare System and founding member of YIPP, “How could you foresee this technology impacting your clinical management of GG2 and GG3 prostate cancer patients in the active surveillance population?”

“We have seen patients with low volume GG2 and GG3 prostate cancers [on biopsy] that ultimately have lower grade cancer on final pathology. These [data] provide further clarification and insight into which of these intermediate risk patients on biopsy may be at lower risk for adverse pathology and could hence be considered for inclusion in active surveillance monitoring. Further characterization of this population is an immediate need for future research.”

This study is an early step utilizing a very powerful technology to enhance an already powerful multidisciplinary collaboration. Continued work in this area will revolutionize Yale’s internal clinical care pathways and improve prognostication and patient care. Beyond the results and potential clinical applications, our pilot study attempts to explore the usefulness of digital pathology and machine learning within our own department, particularly in conjunction with pathologic outcome data. In addition, it highlights the power of collaboration with our colleagues, particularly those in Radiology who now have years of experience with digital image analysis. Dr. Lawrence Staib, a Professor of Radiology and one of the senior collaborators in this project, sees great potential in the future of digital image analysis and machine learning:

“The potential of digital pathology is tremendous. Radiology went through the transition to fully digital many years ago… [which] enabled the development of quantitative radiologic image analysis methods. Now, as we move into the era of machine learning, radiology is well positioned to exploit these new capabilities. And pathology can too. The benefits of digital pathology, especially in conjunction with machine learning, are particularly promising in the integration of pathology with other information sources from radiology, genetics, blood tests, etc.”

Through continued collaborations such as this one, and creation of pathology databases which include whole-slide images, there is potential to be on the forefront of an exciting new wave entering anatomic pathology.
Spotlight on Staff

Department Welcomes New Staff

Kaitlin Fish, Autopsy PA • Manager: Amanda Masters
Kaitlin is responsible for teaching Pathology residents various autopsy techniques. This involves clinical chart review, external and internal exam, organ evisceration and dissection, taking sections, ancillary tests (cultures, electron microscopy, etc.), and preparing the autopsy report. She will also help with miscellaneous tasks in the department such as assisting with labs, helping to orient and teach new interns and PA students, and supervising Autopsy Technicians in their technical duties related to autopsy.

Valerie O’Connor, Clinical Technologist II • Manager: Lori Charette
Valerie came to the Department of Pathology from Yale Dermpath. She currently works in the Tissue Microarray Facility as a Clinical Technologist. She is a well-rounded histologist and utilizes her years of experience in her current role. She performs tissue processing, embedding, cutting, special staining, IHC staining, cutting tissue microarray slides, and builds tissue microarrays.

Julio Badillo, Clinical Technologist I • Manager: Lorraine Savoca
Julio was previously the Slide Room Senior Administrative Assistant with the Department of Pathology at Yale. In his current role, he accesses patient samples from Yale-New Haven Hospital, as well as other locations for the cytology non-gyn group. Julio prepares stained slides as well as cell blocks for the cytotechns and pathologists to screen. He is also in charge of maintaining QC logs for his group on a daily basis. Outside of work, Julio enjoys running, doing karaoke, watching movies, and salsa dancing.

Keith Rentfro, Clinical Administrative Supervisor • Manager: Robin Pinsker
Before coming to Pathology Keith worked in the Nephrology Program of Applied Translational Research (PATR) as the Biorepository Manager/Clinical Coordinator. In his current role as the Clinical Administrative Supervisor in Report Generation, Keith oversees and supervises the staff and manages report corrections regarding surgical path submissions. Keith is originally from Vandalia, Missouri.

Nicole DeJesus, Clinical Case Management Liaison • Managers: Robin Pinsker & Dr. Mina Xu
Nicole has taken on a new role in the Department of Pathology. As the Clinical Case Management Liaison supporting the Hematopathology service, Nicole will act as a liaison for the Hematopathology service and will serve as the primary contact for obtaining materials necessary for diagnosing/consultations, sending out materials for testing, and other clinical support tasks. Prior to coming to Yale, Nicole worked as a medical biller/administrative assistant for a Dermatopathology Laboratory. Nicole is geared towards being helpful in any way she can, and is looking forward to being an asset to her team.

VIP: Dr. Mina Xu (continued)

(article continued from page 2)

Q: Why did you decide to attend Yale for your residency?
A: My husband was recruited to Yale School of Management as faculty the year before I entered the residency match. We had planned for me to match after his finishing grad school so that we had a better chance of being in the same city, after dealing with 5 years of a long-distance relationship.

Q: Outside of work, what are hobbies you enjoy?
A: Watercolor painting, hiking and traveling with family and friends.