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PATHWAYS TO EXCELLENCE

URMC DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE

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NEW PROCESS MAKES ROOM FOR GROWING CONSULT SERVICE

Providing second opinions through consultation is one way URMC pathologists are improving diagnoses and care of patients across the service region.

The rapidly growing volume of anatomic pathology consult cases in recent years, however, became overwhelming for staff whose job it is to prepare these cases for the pathologist to review.

Starting in 2015, a team of Surgical Pathology staff made it their mission to streamline workflow and reduce total turnaround time for AP consult cases. Their Lean project set the ambitious goal of having all consult cases signed out to a pathologist within two hours of being received.

Before this effort was implemented, the reception desk in Surgical Pathology was piled high with envelopes and packages filled with consult slides. They could go days before being examined while clients and their patients waited on results.

"At the outset of our project, zero cases met the (2-hour) goal," said Chris Taillie, chief supervisor of Surgical Pathology. "But we recognized that to meet the needs of clinicians waiting for results, and to both maintain our current clients and attract new business we needed to be aggressive with a fix."

After much time and effort, the team has succeeded in having 90 percent of consult cases signed out to a pathologist within two hours. About 80 percent of cases are turned around within 24 hours of being received, according to an April 2017 report. With support from faculty and leadership, the team created a centralized operation for receiving and triage of consult cases. They also implemented a standardized system for processing specimens.

Christa Whitney-Miller, MD, associate director of Surgical Pathology, says the new centralized process has improved turnaround time and alleviated some of the burden for pathologists.

She noted that AP has seen a significant uptick in the number of both in-house consults and outside affiliates. As the institution grows and hires more surgeons, there is more material for surgical pathologists to review to confirm patient diagnoses.

Now that workflow has been better streamlined, subspecialists are better positioned to devote the right amount of time and expertise to each case as consult volume grows.

90 percent of consult cases are delivered to a pathologist within two hours

"Having a core group of people to deal with these cases is making a difference already," said Whitney-Miller. "Moving forward, I think it's going to continue to be very helpful because I see this work increasing."

To gauge their efforts, the Lean team solicited five outside institutions for data to compare consult case volume, staffing, centralization, and total turnaround time. They found that, though helpful, productivity was not necessarily linked to having more full-time staff assigned to the work. *(continued on page 3)*

CHAIR'S COLUMN

Dr. Bruce Smoller

I am pleased to have the opportunity to share the latest developments in our rapidly evolving world here at URMC's Department of Pathology and Laboratory Medicine. We continue to work hard with our affiliated hospitals to develop a centralized reference laboratory that will ultimately be housed at our Bailey Road facility. We are working to establish appropriate test menus for the essential services laboratories that would remain on site within the affiliated hospitals and tests that would be triaged to a centralized laboratory, resulting in standardized test reporting, efficiencies and potential savings across the enterprise. Across the department, our test volume continues to grow at a rapid rate.

I am sad to report the loss of Dr. Marilyn Menegus, one of our longest standing faculty members, who passed away after a short illness on March 20. She will be missed by members of our department, throughout the institution and by all of her national and international colleagues. The department honored her many years of dedicated service on May 12 with a celebratory event. On a lighter note, Dr. Ping Tang will be leaving our department after nearly 20 years in order to serve as the Director of Anatomic Pathology at Loyola Medical Center in Chicago. While we are all sad to see her go, we wish her the very best and congratulate her on her promotion. Dr. Yawen Tiegerman will also be leaving us as she is returning to Texas for family reasons after a relatively short stay in our department. We have already begun the replacement recruiting process and have multiple excellent applicants scheduled to interview in the coming weeks.

We had several faculty members who were recently promoted to the rank of Professor. Drs. Scott Kirkley, Xi Wang and Richard Burack have attained this designation through many years of dedicated service, their successful research programs and educational activities. They are to be congratulated for this impressive achievement.

Congratulations to Melissa Allen, who has been promoted to Director of Operations, and Dr. Nicole Pecora, who has been named Associate Director of Clinical Microbiology and Director of the Microbiology Fellowship. Well done!

Dr. Nicole Pecora

Melissa Allen

We are thrilled to have six new residents joining our program this year (we filled all of our spots through the match). They appear to be a talented and friendly group of young trainees and add a new level of enthusiasm to our program. We also have a full slate of new fellows. By the time that this newsletter is published, our first class of Medical Technologist trainees will have started the program here in our department. We are excited about this new program and hope that it will provide URMC, as well as our affiliated hospital network with a pipeline of laboratory employees moving forward. It promises to be an exciting year for our educational program.

As we near the end of the academic year, the department celebrated another successful Research Day, a full day program at which residents and graduate students present their research. A visiting speaker helps to preside over the event that also includes a formal judging of the work. The festivities are concluded with a banquet for the faculty and trainees and a slate of prizes is given to trainees whose research is deemed to be superior. Other awards are given to faculty for teaching and service to the department. It is a day that makes allows us to reflect upon the good work that has been done by all over the past year.

This year, the department is sponsoring an employee appreciation night at the ballpark. On July 22, employees and their families are invited to attend the Rochester Red Wings game. For the past couple of years, we have had a department Night at the Zoo, so this year we are trying something new. It is important to acknowledge all of the hard work that our hundreds of staff members contribute to patient care, research and teaching throughout the year!

FOND FAREWELL

Judy Miller, supervisor of the Flow Cytometry Laboratory, retired June 9 after 41 years in the department. She started in the Hematology Lab in 1976 and spent much of her career working primarily in the Bone Marrow Lab. Her going away party included flow cytometry themed cupcakes made by resident, Nisha Patel. Congratulations, from all of us!

(Continued from pg. 1) Rather, the process itself needed a complete overhaul to improve efficiency and response time. Vicki Vandewalle, process improvement manager for the department, said the impact of this Lean project had immediate benefits not only for the pathologists, but gave extra bandwidth to administrative support staff that had previously handled consults.

"It has truly improved the service that we had," said VanDeWalle. "We were unable to meet the expectations of our clients and pathologists and by taking a step back and looking at the whole process we were able to significantly reduce the turnaround time by days."

The team will continue to measure turnaround time and other metrics as the project continues.

DISCOVERY SHOWS BACTERIAL PHENOMENON IN BONE IMPLANT INFECTIONS

Karen de Mesy Bentley (formerly Jensen), M.S., director of the Electron Microscopy Shared Resource Laboratory and faculty associate, has discovered something new about the behavior of Staphylococcus aureus bacteria that may explain why it sometimes recurs in patients who have had a hip or joint implant.

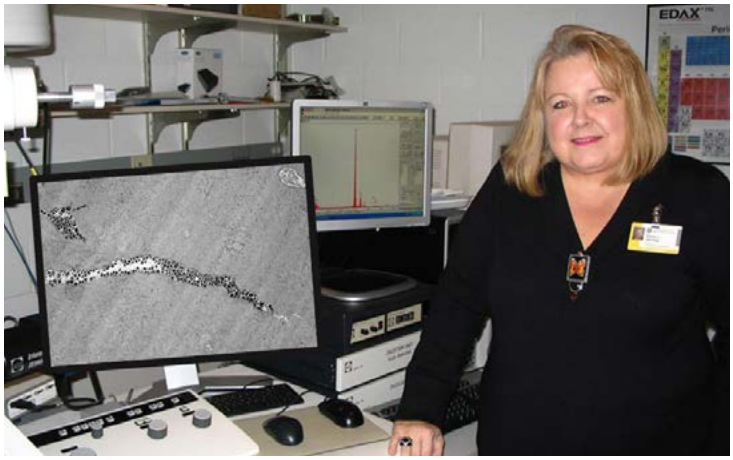
Bentley is the lead author in an NIH funded study published in the *Journal of Bone and Mineral Research (May 2017)* where she utilized transmission electron microscopy (TEM) to examine the bones of mice with implant associated S. aureus chronic osteomyelitis.

While examining sections of bone under TEM high magnification, Bentley discovered that some bacteria were able to change shape and squeeze into submicron spaces called canaliculi. Her study describes round bacteria becoming rod-shaped to accommodate the submicron diameter space of canaliculi. The bacteria are then protected from treatment with traditional antibiotics delivered via blood vessels.

"When I saw this, I was shocked," said Bentley. "Staph has never been described as being able to deform. It's always been described as round, one micron in diameter, growing in clusters like grapes on a vine."

Soon after documenting this bizarre shape shifting behavior in a mouse model, Bentley initiated studies on human S. aureus infected bone specimens and, in December of 2016, discovered the same bacterial phenomenon also occurs in human bone.

The initial findings explain, among other things, why a staph infection in humans may return despite weeks or months of



antibiotic treatments and bone debridement when replacing an infected implant. It also explains why infections can recur in patients years – or even decades – after going undetected. Bentley will soon be a co-investigator in a P50 NIH-funded grant working with the principal investigator, Edward Schwarz, Ph.D., the director of the Center for Musculoskeletal Research and his team to continue studies on human S. aureus chronic osteomyelitis specimens.

"If we can identify a gene that allows S. aureus to shift into rod shaped bacteria, then maybe we can develop a drug to prevent invasion of osteocyte canaliculi and also recurrence," she said.

LAB WEEK 2017

The department celebrated a successful Medical Laboratory Professionals Week in April. The week's events included a staff luncheon, bake sale to support the United Way, and a coat of arms decorating contest.

MEET THE RESIDENTS

Chelsea Milito
Hometown: Buffalo
Medical School: University of Pittsburgh School of Medicine
Undergraduate School: University of Pittsburgh
Interests in Pathology: Not sure yet
Hobbies: Reading, paper craft, cross-stitch, music

Numbereye Numbere
Hometown: I have two hometowns, Buguma City and Port Harcourt, both in Rivers State, Nigeria
Medical School: College of Medicine, University of Ibadan, Nigeria
Interests in Pathology: Urologic pathology, gastrointestinal pathology, molecular pathology
Hobbies: Reading, reading and even more reading (mostly non-fiction), chilling with my family, ice skating, and practicing the guitar. Playing, watching, and commenting on football (soccer).

Anna-Karoline Israel
Hometown: Pokrent, Germany
Medical School: Friedrich-Schiller Universität Jena
Interests in Pathology: Surgical pathology
Hobbies: Walking and hiking, bike rides with my daughter and husband, exploring Western NY, and traveling. I used to compete in equestrian vaulting, but these days I focus on following the major tournaments.

Bennett Wilson
Hometown: Mapleton, Utah
Medical School: Kansas City University of Medicine and Biosciences
Undergraduate School: Brigham Young University
Interests in Pathology: Cytology, hematopathology
Hobbies: Rock climbing, running, mountain biking, camping, hiking

Xin Zhang
Hometown: Tianjin, China
Medical School: Zhongshan School of Medicine
Undergraduate School: Sun Yat-Sen University
Interests in Pathology: Molecular pathology and hematology
Hobbies: Aerobic exercise, music, gardening and traveling

Phoenix Bell
Hometown: Conway, New Hampshire
Medical School: St. George's University
Undergraduate School: St. Lawrence University
Interests in Pathology: GI pathology
Hobbies: Snowboarding, waterskiing, baseball, charcoal drawing, reading

WHERE THEY'RE HEADED

Outgoing Residents

Sachica Cheris – Cytopathology (Duke)
Shana Straub – Forensics (NYC ME office)
Sapna Patel – Hematopathology (U. Pennsylvania)

Incoming Fellows

GI – Diana Agostini-Vulaj (UR)
GU – Meenal Sharma (URMC)
Breast – Jason Shen (Peking U.)
Hematopathology – Meenakshi Bansal (UR)
Hematopathology Research – Chad Hudson (UR)
Year-Out Research Fellow – Hani Katerji

Departing Fellow

Michael Maggiulli – Forensics (Cuyahoga County, OH, ME office)

IN MEMORIAM: MARILYN MENEGUS, PH.D. (1943-2017)

This spring, friends, former colleagues and family members gathered at URMC to celebrate the life of Dr. Marilyn Menegus, who passed away in March.

She was the longtime Associate Director of Clinical Microbiology at Strong Memorial Hospital and professor of Microbiology and Immunology and Pathology and Laboratory Medicine at URMC.

Just about everyone who knew or worked with her has a "Marilyn story."

There was the time she brought a Cheesy Eddie's carrot cake to work when she got tired of hearing that her staff had never tried it before. The way she could cut through complex scientific concepts to make them easy for anyone to grasp. And her coworkers can remember how she'd warmly greet them with, "Hey kid," no matter their age.

Since her sudden passing, the response from those who knew her has been sincere. Chief among her many accomplishments was training more than 40 clinical microbiology fellows and five infectious disease fellows during her 41 years at URMC, dubbing her the "mother of the post-doc program." Many of her trainees went on to work in prestigious laboratories across the U.S. Her impact on their careers remains strong.

"In that sense, her professional impact was huge," said former Pathology resident Vanesa Bijol, M.D. "Very few of us who devote life to academia can achieve that level of success. But she never thought of it that way. She just simply enjoyed her work, science, and teaching, and was very humble about her achievements."

In what became one of her final professional contributions, Marilyn worked closely with the Finger Lakes Donor Recovery Network to establish a nucleic acid testing lab at Strong Memorial Hospital to expedite the organ transplant process for recipients. This launched just weeks before her passing. Rob Kochik, executive director of FLDRN, said he was heartbroken to hear the news.

"She was always such a joy to work with," he wrote. "She was committed to helping establish the NAT testing facility because she truly understood how vitally important it was to help the donation process."

Despite her expertise and accomplishments, many remember Marilyn as an extremely approachable and down to earth person; a lover of gardening, food, wine, and a good laugh.

Friends and former colleagues of Marilyn gathered at URMC for an informal celebration on May 12.

Whether you knew her for 20 years or 20 minutes, she made a warm and lasting impression on those she came into contact with. Debra Jesien, chief supervisor of Clinical Microbiology at URMC, worked closely with Marilyn for many years.

"She could bond with people very quickly," said Jesien. "She was the type of person you could talk to once and you felt like you knew her."

FOCUS ON FACULTY (CONT.)

Zhang believes it is fundamentally important not to just recognize a complex karyotype or genomic pattern, but how and why it occurs in the first place. This pursuit of the unknown is what inspires him to make breakthroughs in molecular genetics. His next round of research will explore chromosomal biology – most notably, how to create cell models for chromosomal aberrations and using genome editing technology to correct them. Zhang sees this as the next step in making progress into treatment for patients with genomic disorders. "In the future, we need to see how these types of cells can be generated and be therapeutic," he said, "We have a long way to go, but the initial goal is finding out how we can easily correct chromosomal aberrations in petri dishes."

The future of cytogenetic testing is already changing, as evidenced by growing use of next generation sequencing (NGS) technology. Zhang expects NGS to change the nature of many clinical tests within the next decade. Educational training programs have already shown more overlap of cytogenetics and molecular genetics on a greater scale.

Dr. Zhang lives in Pittsford with his wife, April Du, their daughter Angelina, 13, and son Alexander, 8. In his free time he enjoys hiking and being outdoors with his family.

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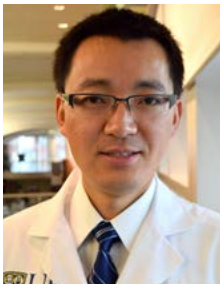
FOCUS ON FACULTY: BIN ZHANG, PH.D.



Bin Zhang isn't afraid to ask the big questions when it comes to solving the mysteries of the human genome. Zhang, who was named director of the Cytogenetics Laboratory in January of this year, initially began his career in basic research. After earning his PhD from Washington University in St. Louis, he worked at Cold Spring Harbor Laboratory in Long Island investigating the role of long noncoding RNAs (lncRNAs). Prior to coming to the University in 2015, his data from this project had not been published.

That changed when Zhang came to UR. The findings recently published in *Cell Reports* shed light on the largely unknown roles of lncRNAs present in genomic "dark matter." The data show that these elements play a role in tissue development, cancer progression, and even speciation. Some may wonder, why go back to a years-old project? For Zhang, it came down to making an impact on research and patient care.

"I am a scientist, and have a responsibility to conclude and publish what I spent years studying, otherwise no one will see that discovery," he said, "Hopefully it can be further tested and will help establish a working model for a big community."

As a molecular geneticist, he feels compelled to help others by naming and characterizing the genetic mechanisms responsible for certain disorders. His interest in genetics began early in his education, as he learned how scientists map out genes to see how disorders are expressed in humans. Genetics, he notes, is somewhat quantitative; mathematical modeling is critical for Mendelian genetics, complex/quantitative genetics, and, his favorite subjects, population and evolutionary genetics. "Even when it comes to clinical cases, it helps to have a mathematical mind," he said, "We do see patterns over time which become generalized, and I believe they hold potential research discoveries for the future." *(continued on pg. 5)*

THANK YOU FOR YOUR SUPPORT!

We have been fortunate to receive philanthropic support from many individuals, allowing us to maintain and accelerate vital clinical, educational, and research initiatives. If you are interested in making a tax-deductible gift today, or as part of your estate plans, please visit www.pathology.rochester.edu and look for the "Make a Gift" button, or contact Jon Sussman, Associate Director of Advancement at 585-276-4976 or jon.sussman@rochester.edu. Thank you!