

The MSK Pathology & Laboratory Medicine *Review*



Mission:

AFRICA

Cancer is a major public health burden in low- and middle-income countries. Memorial Sloan Kettering's Global Cancer Disparities Initiative (GCDI) is working toward enhancement treatment and outcomes in these regions, including the improvement of pathology services.



Memorial Sloan Kettering
Cancer Center

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Dear Colleagues,

As the first signs of spring emerge around us and memories of the long bitter winter and the latest COVID-19 surge start to fade, I am writing to update you about an important and positive change. MSK leadership has decided to form a single department by integrating our Pathology and Laboratory Medicine Departments. Effective from January 17, 2022, we have established a single Department of Pathology and Laboratory Medicine. As you will appreciate, the work of our pathology and laboratory medicine teams is a critical component of the outstanding care we provide to our patients at MSK. We are confident that this merger will enhance the academic and educational programs of the two teams as well as improve efficiencies and streamline many of the clinical functions our laboratories perform every day.

First, I would like to acknowledge the outstanding leadership provided by our Department of Pathology Chair, Dr. David Klimstra, and Department of Laboratory Medicine Chair, Dr. Melissa Pessin for over 10 years. Without their unwavering commitment to excellence in clinical practice, research and education, and most importantly, to patient care, the merge would not have been possible. We will be forever grateful for their leadership.

Dr. Pessin’s tenure in Lab Medicine has been marked by historic achievements, including extending laboratory and transfusion services to each of the regional sites, standardizing and harmonizing laboratory test results across the MSK continuum, creating a virtually paperless environment in the laboratory, implementing multiple innovations in how we process and analyze specimens, and establishing many new tests and test methodologies to support the MSK mission. Under her leadership, the faculty has more than tripled with the recruitment of diverse and outstanding individuals to lead innovation in laboratory testing. Some examples include the unprecedented expansion of the cell therapy service, the development of mass spectrometry-based serum protein testing, and the establishment of the HLA laboratory. These accomplishments were certainly evident to all of us during the height of the COVID-19 pandemic when the Clinical Microbiology Service led the efforts in the management of the pandemic in our institution.

Dr. Klimstra was named Chair of the Department of Pathology in 2012. During his tenure, Dr. Klimstra doubled the number of pathology faculty to 105 and broadened the

department’s scope by recruiting a wider range of experts in bioinformatics, engineering, spectrometry, and mathematics. Under his leadership, the department developed many transformative molecular diagnostic tests, most notably *MSK-IMPACT*, which was the first genomic panel assay to achieve FDA clearance, and *MSK-ACCESS*, which enables the detection of genomic alterations in circulating cell-free DNA. Other significant accomplishments include the creation of MSK’s Hematopathology Service, which is now one of the country’s most advanced diagnostic units related to hematolymphoid neoplasia, the implementation of digital pathology for diagnosis and research, the enhancement of the institutional biobank through the creation of the Precision Pathology Biobanking Center (PPBC), the introduction of mass spectrometry proteomics for tissue diagnostics and research, and establishment of MSK’s spatial immune profiling effort.

I take this opportunity to thank both Melissa and David for their dedication and service to MSK and our departments and wish both all the best in their future endeavors.

The newly combined department has 9 clinical services, an experimental pathology program, and several groundbreaking initiatives including translational efforts in genomics, protein-based diagnosis, and digital and computational pathology. The department brings together 130 faculty members with diverse skill sets and 1,100 allied and administrative staff in 27 laboratories and 16 sites throughout New York and New Jersey. The broad spectrum of activities of the department are highlighted in this issue including the histocompatibility laboratory, the Head and Neck pathology team, the Inclusion, Diversity, Equity, and Advocacy (IDEA) initiative, our efforts with the Global Cancer Disparities Initiative, and research profiles of Drs. Borge, D’Alfonso, Sen, Buonocore and Ramanathan.

I have the honor and privilege of serving in the interim as the acting Chair of the new department while the search to identify a permanent chair for the new Department of Pathology and Laboratory Medicine is in its final phases. We hope that the new Chair will be in place when the next issue of the Review, now named *The MSK Pathology and Laboratory Medicine Review* is published.

We wish you all the best for the spring and look forward to seeing you in person, hopefully at the Alumni Meeting in autumn.

Ahmet Dogan, MD, PhD
Acting Chair, Department of Pathology and
Laboratory Medicine

Lakshmi V. RAMANATHAN, PHD



Lakshmi V. Ramanathan, PhD, is Still Fascinated by Clinical Chemistry

By Kayt Sukel

Sometimes, Lakshmi V. Ramanathan, PhD, wonders if she should have gone to medical school. In the 1970s, she received her doctorate from the Massachusetts Institute of Technology, in a now-defunct program called Nutritional Biochemistry and Metabolism. She almost applied to medical school, but ultimately decided to pursue a fellowship in clinical chemistry at Mount Sinai instead.

“At the time, women were not well represented in medicine or science. I wasn’t sure if I could have a family and be a doctor,” she said. “My fellowship was a wonderful compromise—I’d have the clinical part and I’d have the biochemistry.”

Her choice turned out to be prescient; the field of clinical chemistry taking off right when she entered it. She found

herself at the forefront of new chemistry, new tests, and new technology.

“Today, it’s the molecular techniques are exploding,” she said. “But during my fellowship, the new technology that was coming in was just unbelievable to us. It was when computers first came into the chemistry lab. We had an old Radio Shack computer that we used to generate our lab reports. But these computers ushered in this whole business of informatics. I was just fascinated. I’m still fascinated.”

Dr. Ramanathan arrived at Memorial Sloan Kettering (MSK) Cancer Center in 2013, after 30 years at Mount Sinai Hospital. She was then, and remains now, in awe of the many advances that are furthering the field in the service of cancer patients. As the Chief of the Clinical Chemistry service, now home to

“Unfortunately, most women with ovarian cancer are diagnosed very late. Detection is very hard. But if we can monitor the biomarkers, we could theoretically identify the cancer early. And, after diagnosis, we can look at the progression of disease and response to therapy.”

six attending faculty, she is excited about what’s to come.

INNOVATIVE TECHNOLOGIES FOR DETECTION

In addition to riding the wave of advances in clinical chemistry, Dr. Ramanathan is also collaborating with Daniel Heller, PhD, Head of Cancer Nanomedicine Laboratory, on even more cutting-edge tests. Dr. Heller’s group is looking at nanosensor technology to detect biomarkers for ovarian cancer.

“Unfortunately, most women with ovarian cancer are diagnosed very late,” Ramanathan said. “Detection is very hard. But if we can monitor the biomarkers, we could theoretically identify the cancer early. And, after diagnosis, we can look at the progression of disease and response to therapy.”

Ovarian cancer cells produce and release unique protein molecules, only a fraction of which (if any) end up in the bloodstream and thus detectable. But when their carbon nanotube based sensors are placed in the uterus, perhaps as part of an intrauterine device (IUD) commonly used for birth control, it can measure the levels of different proteins in the uterine environment. Each carbon nanotube is only about one nanometer thick, orders of magnitude smaller than the width of a human hair. They are bound to specific antibodies that recognize particular proteins of interest that may indicate the

development of ovarian cancer.

“The traditional biomarkers we use in ovarian cancer are, to be honest, not the best,” said Dr. Ramanathan. “New technologies like the nanotube sensors are very exciting, but we need to work to identify which biomarkers are most important and how to measure them using these innovations.”

APPLYING CLINICAL CHEMISTRY TO MYRIAD PROBLEMS

Clinical chemistry is also part of many other research projects beyond nanotubes. In recent years, Dr. Ramanathan and her colleagues in the clinical chemistry service investigated ways to identify biomarkers to identify sepsis in cancer patients. They’ve looked at monoclonal antibodies and monoclonal immunoglobulins and their effect on multiple myeloma. They engage in therapeutic drug monitoring in bone marrow transplant patients. And they are always, always on the lookout for chemistry tests that can help MSK clinicians better treat patients.

“If someone at MSK finds a particular test or marker that they think has good potential to diagnose or monitor a certain type of cancer, they come to us,” she said. “We are happy to offer new testing, but it’s a very big process for our team. We do all of the validation ourselves. We need to approach New York State because they provide the oversight for all testing. And

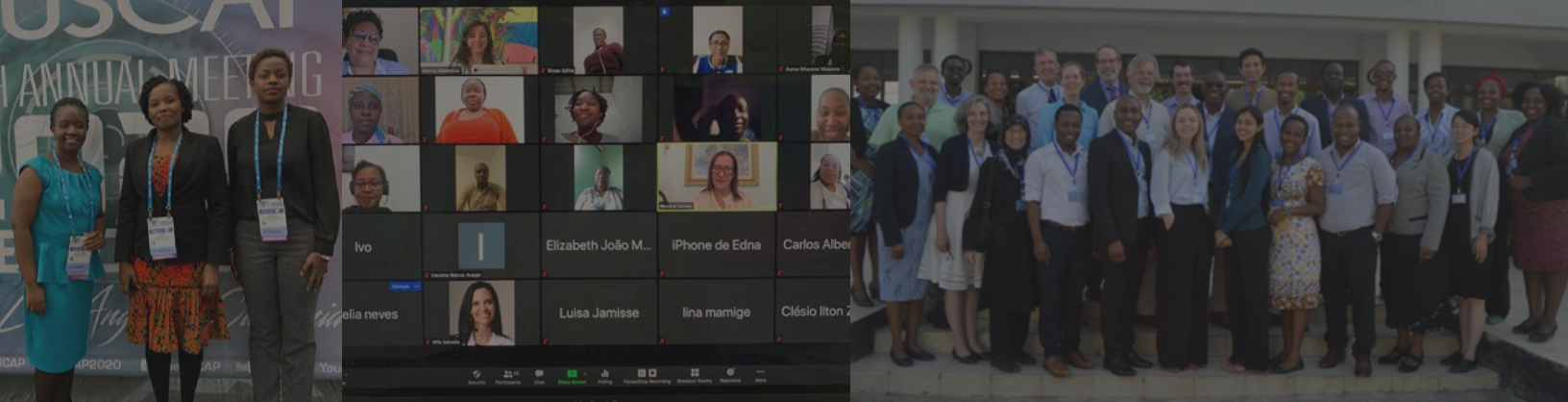
then, once they say the test is ready for prime time, we can finally use it clinically.”

It is probably no surprise that Dr. Ramanathan and her team played a pivotal role in developing tests during the COVID-19 pandemic.

“Microbiology, of course, developed a test to detect the virus using molecular techniques,” she said. “But we had to develop the antibody testing. It took a tremendous amount of effort but by collaborating with our employee health service and infectious diseases, we were able to get the right samples to validate our testing. It was incredibly challenging, but it taught us a lot about how to develop a test when procuring reagents was extremely challenging and difficult.

As rightly pleased as she is with an incredible body of research work and collaborations, Dr. Ramanathan said she is most proud of her work as a teacher and mentor at MSK. She enjoys working with residents and fellows who are pursuing a career in clinical pathology—and knows they will continue to bring about new innovations to further advances in cancer care.

“Wherever you look here, there is excitement. We need to develop new skills, of course, but there’s so much room for improvement and discovery,” she said. “We are ready to do that work to make a difference, knowing our patients will benefit at the end of it.”

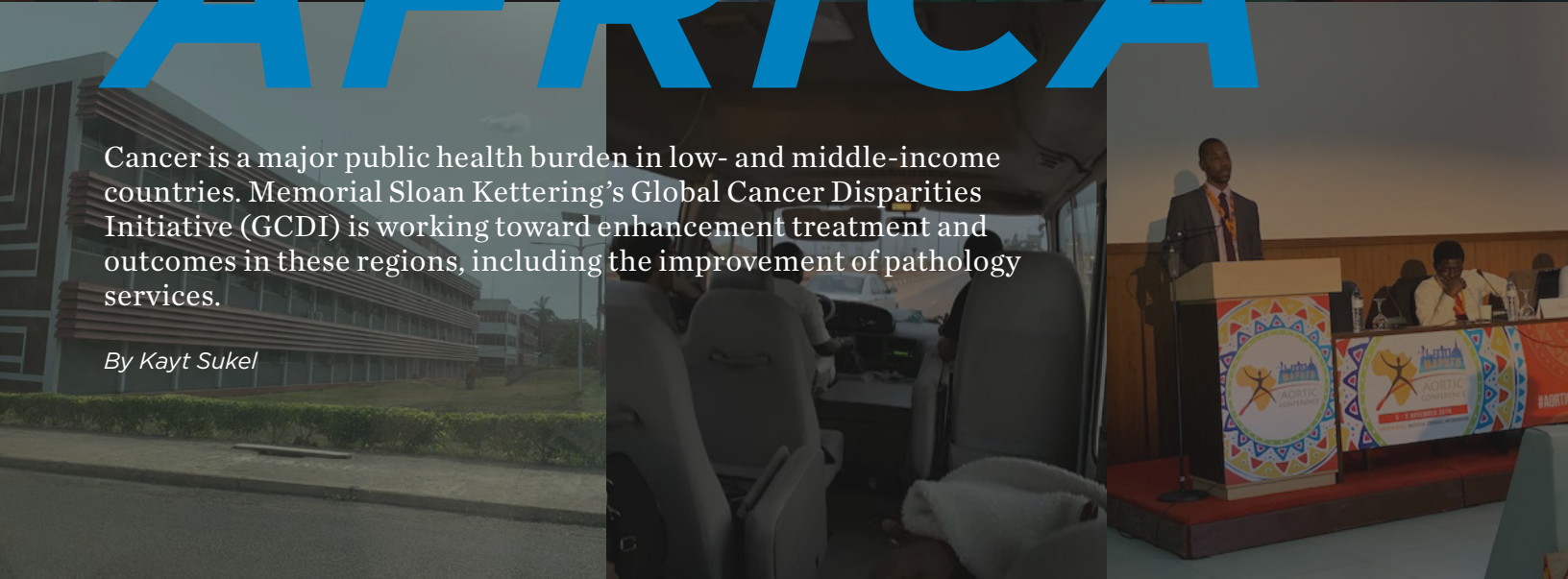


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By Kayt Sukel



Each year, tens of millions of patients across the globe will be diagnosed with cancer, and more than half of those cases will affect people in low- and middle-income countries (LMIC). Unfortunately, where you are diagnosed is often as important as when you are diagnosed in terms of mortality. Many cancer patients in LMIC will not survive their disease, in large part because of a lack of proper healthcare infrastructure, a glaring example of global healthcare inequity.

To help address these inequities, T. Peter Kingham, MD, a surgeon at Memorial Sloan Kettering (MSK) Cancer Center, founded the Global Cancer Disparities Initiatives (GCDI). For the past decade, he and his colleagues, both at MSK and abroad, have worked to improve outcomes for cancer patients in Africa through collaborative research and training efforts.

"We have developed long-term relationships with different hospitals and institutions to help build capacity," said Dianna Ng, MD, a cytopathologist at MSK. While the GCDI is focused on helping patients today by revamping and upgrading different processes and interventions, they also hope to one day run clinical trials in underserved areas.

The GCDI group started with Dr. Kingham's partnership with the Obafemi Awolowo University Hospital in Ile-Ife, Nigeria. Soon after, MSK received one of the first pilot grants from the National Cancer Institute's (NCI) Center for Global Health to address cancer care and treatment disparities. Over time, what began as one doctor's collaboration with a single hospital has grown into the African Research Group for Oncology (ARGO), an NCI-recognized consortium of 25 Nigerian hospitals looking to improve their cancer diagnosis and treatment capabilities, particularly in terms of improved care for colorectal and breast cancer.

BUILDING A STRONG PATHOLOGY TEAM

Such improvements require a focused investment in pathology. If clinicians cannot accurately diagnose the type of cancer a patient has, it becomes harder to determine the best course of treatment.

“Many cancer patients in LMIC will not survive their disease, in large part because of a lack of proper healthcare infrastructure, a glaring example of global healthcare inequity.”

That's why, in 2013, Dr. Kingham reached out to Peter Ntiamoah, PhD, the manager of MSK's Surgical Pathology Laboratory. A pathologist working with Nigerian tissue samples was having trouble staining them for mismatch repair (MMR) proteins. None of the samples were showing any reactivity and the pathologist was not sure of the cause. Dr. Kingham hoped Dr. Ntiamoah could help.

"I looked at the stained slides and, unfortunately, had to tell the pathologist that the tissues appeared to be processed sub-optimally," said Dr. Ntiamoah. "As such, their antigenicity couldn't be determined with immunohistochemistry."

While Dr. Ntiamoah could not help in this instance, it became clear that his expertise could help improve pathology services across ARGO. Since then, Dr. Ntiamoah has trained a set of Nigerian histotechnologists on best practices in tissue handling and processing, as well as actively collaborated on research projects. In 2018, Dr. Ntiamoah conducted a capacity and needs assessment of the available pathology laboratory services in Nigeria to better understand the local context. Using a structured pathology survey instrument, he and the GCDI group were able to identify critical issues with tissue handling and processing, as well as critical gaps in diagnostic services. They also noted challenges in pathology training programs.

That same year, the GCDI expanded to include breast cancer projects, bringing Marcia Edelweiss, MD, a breast pathologist at MSK, onboard as the pathology champion for these new endeavors.





“When I first started interacting with the Nigerian pathologists, they were extremely welcoming, and it became clear that we had to develop collaborative academic and mentoring relationships to be able to achieve and sustain high quality pathology services,” she explained.

Dr. Ng, meanwhile, had already been working on collaborative projects with Muhimbili University of Health and Allied Sciences in Dar es Salaam, Tanzania when she joined MSK and the GCDI group in 2020. “Peter and Marcia have pushed me to be a better global pathology researcher. It’s been great working with a team that shares the same values. We all strongly believe that partnering capacity building, mentorship, and research can lead to long-lasting changes in cancer diagnosis in sub-Saharan Africa,” she said. “GCDI really is on the vanguard by using systematic methods to enable and empower our counterparts in LMIC to be agents of their own care.”

Dr. Ng is particularly interested in leveraging novel technologies and implementation science to bridge gaps in cancer diagnosis. Currently, she is overseeing several projects exploring the development of different point-of-care technologies for breast cancer diagnosis and biomarker testing. One project assesses whether fine needle aspiration biopsy can be used for immediate diagnosis or same-day triage in Tanzania. Another is exploring the impact and use of whole slide imaging on the diagnosis of brain tumors.

These three individuals, with quite diverse backgrounds, have now come together to form the MSK Global Pathology group to unify their efforts. By working closely together, they can not

only advance projects with their partners in Africa but also help each other tackle any issues they may encounter. Their mission statement is “To improve cancer diagnosis through education, research, and collaboration.”

“Our mission statement may seem deceptively simple,” said Dr. Ng. “But it accurately captures the key pillars of our initiative.”

BUILDING STRONG PARTNERSHIPS

Addressing global health inequities is not volunteer work. To make locally driven and sustainable changes, the MSK Global Pathology Group has worked hard to develop strong research partnerships with local institutions. But it is important to understand exactly which efforts in education, research, and collaboration can make the biggest impact. To that end, Dr. Ng was recently awarded a K08 Mentored Clinical Scientist Research Career Development Award from the NCI. She is using that award to gain greater expertise in implementation science, a relatively new field that uses theories, models, and frameworks to systematically bridge evidence to practice gaps.

“Global health, traditionally, has not gotten the respect it deserves in the academic field,” she said. “However, there is a lot of science behind how to make truly sustainable improvements. Implementation science brings much needed rigor and reproducibility to global health interventions, which have traditionally been unstructured and ad hoc.”

Beyond these projects, Dr. Ng is also mentoring several young Tanzanian physicians, some of whom have published their research in peer-reviewed journals for the first time. Others

Efforts in Education

The MSK Global Pathology group has established 4 new Project ECHO programs since 2020 and participates in 2 additional clinical management programs established by the GCDI.

Dr. Ntiamoah gives lectures regarding how to handle specific tissues, improve on immunohistochemistry, and even do pipetting. “Sometimes, these are things that people take for granted,” he explained. “But training the lab technicians on validated processes leads to more accurate results, which in turn produces more accurate diagnoses.”

Participating hospitals receive the latest education on top-notch techniques and workflows, even learning how to troubleshoot common issues that can interfere with a diagnosis. And the benefits are clear: the laboratory, in adopting these improvements, have significantly reduced turnaround time for diagnoses. “Even a simple biopsy used to take 10 to 15 days,” said Dr. Ntiamoah. “Now, the average time is three to five days,” a remarkable improvement.

Dr. Edelweiss said the team is leveraging the experience they’ve gained from Project ECHO to develop an online breast pathology fellowship with a comprehensive curriculum of video lectures, conferences, reading materials, and other resources organized by learning modules.

“The idea is to have a program tailored to the types of specimens received in LMIC by supporting regular, frequent



one-on-one interactions between students and faculty,” she said. The pilot program will mirror the kind of breast pathology fellowship offered in higher income countries. Utilizing MSK’s online educational portal, it will present digital pathology slides from real-life cases provided by our faculty, and by the fellowship participants. “This will allow the faculty to teach and provide feedback on breast pathology diagnosis in real time and also establish mentoring relationships to help inspire students to discover their own research interests.”

Ongoing Efforts in Education

3 Pathology Project “ECHO” programs implemented in Nigeria (General Oncology Pathology, Histology processes and Breast Radiology-pathology correlation)

Marcia Edelweiss, Peter Ntiamoah, Dianna Ng – in collaboration with MSK Radiology and selected Nigerian anchors

Pathology Participation in 2 clinical management Project ECHO (Breast and Colorectal Cancer)

Marcia Edelweiss, Dianna Ng, Peter Ntiamoah and Laura Tang

Online breast pathology fellowship for LMIC – In development

Global Oncology Pathology Fellowship for US trained pathologists – In development

What is Project ECHO®

Project ECHO (Extension for Community Healthcare Outcomes) is a guided-practice model designed to increase workforce capacity by sharing and disseminating knowledge. Specialists/experts at the “hub” site meet regularly with community providers at “spoke” sites via video conferencing to discuss cases, present lectures and build local capacity to support the delivery of specialty care services.

The ECHO® Model™, developed at the University of New Mexico Health Sciences Center, connects specialists with front line providers. This capacity building model can dramatically increase access to high quality, specialty treatment, particularly in rural and underserved areas.

have received career development fellowships sponsored by the National Institutes of Health.

“Oftentimes we try to extrapolate data coming from the United States or Europe to practice in Africa, but the best interventions are informed by local context,” said Dr. Ng. “That’s why I’m so excited to be part of a consortium of dedicated doctors and scientists who are passionate about bridging the gap of global cancer care disparities.”

The success of the MSK Global Pathology Group’s projects not only rely heavily on partnerships on the ground in Africa but also with collaborations with broader-reaching organizations including the American Society of Clinical Pathology (ASCP) and the World Health Organization (WHO). But, Dr. Edelweiss explained, the group members also rely on each other to make progress. They are a cohesive team that is inspired to work together to foment sustainable change.

“One of the first collaborative projects in Nigeria that I participated in involved mentoring a pathologist to help establish reliable estrogen receptor, progesterone receptor, and HER2 immunohistochemistry performed in breast cancer specimens, while Peter guided the histotechnologists,” Dr. Edelweiss said. “We were able to establish a new protocol of rapid transport of mastectomies from the operating room to the pathology department with adequate control of ischemic and formalin fixation time and compared the immunohistochemistry results to the patient’s prior biopsy results.”

With this improvement, Drs Edelweiss and Ntiamoah’s team was able to achieve reliable immunohistochemistry results with high concordance between biopsy and mastectomy specimens. The project also created an opportunity for Dr. Edelweiss’ mentee to give a platform presentation at the African Organization for Research and Training in Cancer (AORTIC) meeting in



Mozambique in 2019.

“This meeting is the African equivalent of the American Society of Clinical Oncology (ASCO),” Edelweiss added proudly. “And now this effective workflow has been implemented in that hospital for all mastectomy specimens.”

BUILDING A RESEARCH INSTITUTE IN GHANA

Michael H. A. Roehrl, MD, PhD, Director of the Precision Pathology Biobanking Center at MSK, said he wanted to get involved with the GCDI team—he has been working with a research institute in Ghana—because “it takes a village” to address healthcare disparities. “Our partnership is focused on the latest cancer research technology as well as applications that can focus on the types of cancer that are most prevalent in Ghana,” he said. “For example, liver cancer is highly common in Ghana, but the



Pathology Projects

- Infrastructure and education interventions done with a scientific approach
- Focus on projects that potentially impact patient care



Healthcare Infrastructure



Research



Education

etiology of these tumors is quite different than what we see in the U.S. Patients there often develop cancers because of toxins found in food contaminated by certain fungi.”

When it comes to capacity building efforts in Ghana, Dr. Roehrl said the issue isn’t just a lack of technology or research but also a lack of pathologists and laboratory technicians. “They really don’t have enough physicians trained in diagnostics,” he said. “You can’t just start treating people if you don’t know what kind of cancer they have. And yet, without growing the ability to provide those diagnostics, that’s what is often happening.”

Much like his colleagues who have embarked on projects in other countries, Dr. Roehrl has been working on education, training, and capacity building. But he is also looking for ways to evolve the existing healthcare infrastructure to better support pathology initiatives.

“Here in the U.S., you have a biopsy, and the sample goes to pathology for analysis before you even wake up from surgery,” he said. “But in Ghana, it is the duty of the patient to take their biopsy to a pathology laboratory, and to pay for testing. It creates a huge burden, which means that many people are not getting timely or even any diagnosis.”

Helping to educate healthcare stakeholders and policymakers about the importance of logistics is a key part of efforts to expand pathology capacity. But Dr. Roehrl also views his work in Africa as a means to further MSK’s overall mission of better understanding different types of cancers.

“We want to find ways to treat patients with cancer better, to improve outcomes,” he said. “As we engage in different research projects and expand clinical trials in Africa, we are learning as much as they are learning about cancer and how to better treat it in certain types of patients. Having joint research and joint grants helps us to do that.”

CONTINUING THE MISSION DESPITE COVID-19

The COVID-19 pandemic has not stopped the team’s efforts. While Dr. Ng admits that the pandemic has made some projects more challenging, the MSK Global Pathology group has found innovative ways to overcome those issues.

“Thanks to the GCDI and the International Center we were able to purchase two Motic slide scanners for two of our partner sites in Nigeria. This purchase and installation were facilitated by

an important partnership with the American Society of Clinical Pathologists (ASCP),” said Dr. Edelweiss. “We are currently using the scanners to review whole slide images (WSI) of breast core needle biopsies sampled in 2021 for a radiology-pathology concordance project. The scanners provide an opportunity for us to continue our collaborations.”

Given the difficulties involved with traveling to Nigeria and Tanzania at this time, identifying technologies to support collaborative work is paramount. This allows the team to continue to do cutting-edge research to better understand the differences between the pathology of tumors seen in the United States and those seen in Nigeria, or in Africa overall.

“The differences we see may have implications for the way patients are treated both in Africa and here in the United States,” said Dr. Ntiamoah. “There is a lot to learn for me, personally, and I find this work very fulfilling.”

LOOKING TOWARD THE FUTURE

With the GCDI program growing, Dr. Kingham is excited to see what aspects of the knowledge and infrastructure cultivated at MSK can help these other cancer centers expand to better care for their own patients.

“It’s clear you can’t understand cancer just by studying the disease here in New York City, or even in the U.S. We are only just starting to understand some of the many genetic and environmental differences [in other parts of the world] that may help explain some of the ways that tumors behave,” he said.

He is grateful that so many talented MSK doctors and scientists have signed on to the project, the foundation of which is pathology. And he added there are ample opportunities for members of the departments of pathology and laboratory medicine to collaborate with the GCDI and MSK Global Pathology group, whether it’s participating in educational programs to collaborating in research projects.

“We still have a lot to learn,” he said. “And there’s a lot we can take from better understanding how cancer care is delivered in lower-income environments. It also helps us to understand the different barriers that patients may face when trying to get that care. But at the end of it all, successful care comes back to the diagnosis. You can’t do any sort of cancer capacity building or training without pathology.”

HEAD AND NECK TEAM



Ronald A. Ghossein, MD
Director, Head and Neck Pathology
Attending Pathologist



Snjezana Dogan, MD
Associate Attending Pathologist



Nora Katabi, MD
Associate Attending



Bin Xu, MD, PhD
Associate Attending Molecular Pathologist

Ahead of the Curve

The Head and Neck Pathology Team at MSK has a big impact on the understanding of and treatment for a rare set of cancers.

By Kayt Sukel

Head and neck cancers—those that affect the oral cavity, salivary glands, thyroid, larynx, pharynx, nasal cavity, and paranasal sinuses—account for just four percent of all cancers in the United States, according to National Cancer Institute statistics. Only squamous cell carcinomas stand out among head and neck cancers as relatively common among what is otherwise a rare group of cancers in this area of the body. One common misconception when one hears “head and neck” is that it would encompass brain cancers, but that’s not the case, said Ronald Ghossein, MD, Director for the MSK’s Head

and Neck Pathology team. “If you want to put it in laymen’s terms, we deal with the mouth, the nasal cavity, and the windpipe. Many of these cancers are caused by alcohol use and smoking. But what we see now is that many of them are also linked to the human papillomavirus (HPV).”

The very scarcity of head and neck cancers is the reason it’s important for an institution like Memorial Sloan Kettering (MSK) Cancer Center to have a team of pathologists who specialize in them, and who can work with surgical and oncological colleagues to adequately diagnose, stratify, and treat these patients, said Dr. Ghossein.

The Head and Neck team’s case volume may seem small in comparison to other pathology services—a little over 4,000 per year before the COVID-19 pandemic—it receives some of the rarest and most interesting cases from across the globe. Dr. Ghossein said it was one of the reasons he was eager to head the fledgling team when it was created in 2010.

“At MSK, we have a unique mission because other hospitals do not have the case volume required to do comprehensive research on these kinds of tumors,” he explained. “We are the place where you will find the rarest cases, and we work hard, both from a clinical and a research perspective, to help find ways to better diagnose and treat patients with these tumors.”

CUTTING EDGE RESEARCH

Three other pathologists work with Dr. Ghossein on the Head and Neck pathology team: Snjezana Dogan, MD, Nora Katabi, MD, and Bin Xu, MD. Together their expertise covers a wide range of head and neck tumors; and Dr. Dogan—a molecular pathologist—allows the group to look at a wide range of molecular and cellular biomarkers to help them better stratify patients for treatment.

“When you have a cancer in the head or neck, it can be quite painful and, sometimes, disfiguring,” said Dr. Ghossein, explaining why zeroing in on the appropriate treatment

for each individual patient helps avoid unnecessary or avoidable reductions in quality of life. “Think about it. If you have colon cancer, you may have some scars that people might see when you are at the beach. But treatment for some of the aggressive head and neck cancers can be quite traumatic and leave a lot of damage.”

In 2016, research conducted by Dr. Ghossein revealed that a variant of papillary thyroid carcinoma called the encapsulated follicular variant should not be considered cancer at all—and as such should not be treated like other thyroid tumors. Thousands of patients each year were receiving unnecessary treatments until he demonstrated the differences in the tumor’s pathology and suggested changing the name to noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

“When you get chemotherapy or radiation to the mucosa, it can be very uncomfortable for patients. We want to make sure we are only recommending treatments that are necessary,” he said. “So much of the research from our service involves basic science research to understand the tumors so we can not only develop new therapies but also better identify which patients actually need aggressive therapy and which ones we can just keep watch on over time.”

Some of the most promising work in that vein spans both traditional morphological and newer molecular approaches, said Dr. Ghossein, such as Dr. Dogan’s soon-to-be-published work in developing molecular tools to better classify sino-nasal tract tumors that defy histological methods. Another project that fits that description is Dr. Xu’s genotyping work on anaplastic thyroid carcinoma, an aggressive form of thyroid cancer, to help better direct treatments for diagnosed patients.

“We are seeing a lot of progress with our molecular efforts,” said Dr. Ghossein. “Our goal with any head and neck tumor is to assess the value of different markers, including molecular markers. But we are making sure that we do that thoroughly.” Though the Head and Neck team is determined to provide surgeons and oncologists with salient information to help them determine treatment, they need to balance that against offering so much information that things

become more confusing, which has the potential to result in worse outcomes than might occur via traditional techniques. “We are working hard to be sure we are bringing true additive value to traditional pathology information both in diagnosis and in how we select treatment.”

CONTINUING TO EVOLVE

The rarity of many head and neck tumors means not many pathologists are able to work on them. The volume of cases handled by MSK, however, makes important research possible. Dr. Katabi, for example, is currently working on classifying salivary gland tumors; without the number and range of MSK cases, that work would be nearly impossible. “You need to have that many cases if you want to really group patients in meaningful ways” that help narrow and zero in on appropriate treatment, he said.

Technology is also helping the pathologists on the Head and Neck team continue to contribute to the field. Beyond molecular and genetic techniques, the team is also looking to digital pathology to aid their efforts. They recently found a way to use a CT scan machine to scan a small paraffin-embedded block of tissue.

“We can examine a whole thyroid tumor this way,” said Dr. Ghossein. “Usually, the piece of tissue is about 3mm, but the slide is only 6 microns,” he said. “You would need hundreds of slides to examine the entire tumor. Using the CT, we can go through the entire piece of tissue without cutting it, which allows us to review all the slides and see if there’s something we might have missed doing things the usual way. It’s something that can help us be more accurate and efficient in the future.”

When you put the pieces together the service’s goal really is simple: To help provide the highest quality care to patients, those being treated at MSK as well as at other institutions.

“We do this research to make sure the field can continue to move forward,” he said. “We do it to make sure that we can make a big difference for patients. We do it to make sure that the tumor we find is actually cancer and not something that doesn’t need an aggressive treatment. We do it to make sure the patient gets the best treatment for the condition they have. It’s our responsibility and we are happy to do it.”

4,000 +
cases per year

The Head and Neck team receives some of the rarest and most interesting cases from across the globe.

Timothy
D'ALFONSO, MD



Timothy D'Alfonso, MD, is Up to the Challenge

By Kayt Sukel

He may not have gotten into pathology to be a detective, but for Timothy D'Alfonso, MD, a pathologist specializing in breast pathology at Memorial Sloan Kettering (MSK) Cancer, unraveling mysteries is one of the things that he likes best about pathology.

"The whole process just suits me," he said. "The way you establish a diagnosis and thinking about multiple aspects of it and what it might mean for a patient's treatment are really interesting. There's something about trying to get to the bottom of a diagnosis or some mystery in a specific case."

He soon learned there are plenty of mysteries left to solve in the field of breast pathology. As a resident, Dr.

D'Alfonso trained with Paul Rosen, MD. Formerly MSK faculty, at the time Dr. Rosen was at Weill Cornell. Every Tuesday, he would hold a conference to discuss complex cases.

"He would get consults from pretty much everywhere," Dr. D'Alfonso said. "It was a great experience to sit down at the microscope with Dr. Rosen and observe his approach to diagnosing the variety of different lesions you can find in the breast. That's when I realized that's what I wanted to do. Breast pathology is incredibly challenging and involves taking a multi-disciplinary approach to accurately diagnose different lesions and then direct the treatment."

At MSK for three years, Dr. D'Alfonso has worked on a variety of research

“Understanding the nuances of this sophisticated ecosystem is key to effectively treating certain tumors, or perhaps preventing them altogether.”

projects — he's more attracted to doing interesting pathology work with the promise of advancing patient care than he is at staying within any specific niche.

UNDERSTANDING THE MICROENVIRONMENT

Decades of cancer research has been focused on the biological nature tumors, offering insights that guide much of cancer treatment today. Tomorrow's treatments, said Dr. D'Alfonso, are more likely to be based on current research into the tumor microenvironment, or the molecular environment that surrounds the tumor. Picking apart the ways in which the elements of the tumor microenvironment—which includes which includes blood vessels, immune cells, fibroblasts, and a variety of signaling molecules, plus the extracellular matrix — interact with each other will help us “do a better job of understanding metastatic risk for different breast cancer patients.”

Any tumor and its microenvironment are closely interconnected, explained Dr. D'Alfonso. Together, the tumor and the microenvironment providing a unique ecosystem that can spur metastasis in certain people or certain types of breast cancer. Understanding the nuances of this sophisticated ecosystem is key to effectively treating certain tumors, or perhaps preventing them altogether.

Dr. D'Alfonso and his colleagues have studied a unique microanatomical structure called a tumor microenvironment of metastasis (TMEM). TMEM is the spot where an endothelial cell, a perivascular macrophage, and a Mena-expressing tumor cell meet. At that point, they provide a molecular doorway that allows tumor cells to enter the blood vessel, boosting the cancer cell's ability to spread throughout the body.

"This finding was based on a photon-based imaging model of breast cancer in live mice," Dr. D'Alfonso said. "You could actually see the cancer cells go into the blood vessels at TMEMs. We study these structures by immunohistochemistry and immunofluorescence and can look at different expression of proteins associated with different cancer cells, as well as other markers and inflammatory cells. We even helped develop an algorithm that can identify them in paraffin fixed samples."

Dr. D'Alfonso is currently a co-investigator on a National Cancer Institute RO1 grant to study TMEMs and Mena, a protein that helps cancer cells proliferate, as prognostic biomarkers for metastasis. He and his collaborators are also investigating whether the tumor microenvironment may be different between patients of different racial backgrounds, as women of color tend to have much lower survival rates than white women.

"We know that patients with higher numbers of these TMEMs in their primary breast tumors do worse in terms of survival," he said. "And other work has shown that when TMEMs are high, chemotherapy can actually lead to a microenvironment that is more inflammatory. These things all have implications for future treatments. TMEMs could be just a prognostic marker. But another question is whether we can block these doorways; can we somehow make the tumor microenvironment less suitable to metastasis? These are important questions to answer."

As Dr. D'Alfonso works on these projects, as well as contributes to blossoming digital pathology efforts in the department, he has one overarching goal: to further the field's understanding of the nature of metastatic breast tumors — and work closely with clinical colleagues to provide the highest quality of patient care for those diagnosed with them.

"My interests are kind of all over the place. But my career, so far, has been fairly well-rounded," he said. "I like that there are clinical, educational, and research aspects to it, and I hope to continue contributing to different interesting projects in the future."

Away from work when he's not practicing pathology, Dr. D'Alfonso is either solving or constructing crossword puzzles and has recently published in the *Los Angeles Times* and *Washington Post*.

Building on a Great IDEA

MSK works hard to develop a culture that values diversity and inclusion. The new Inclusion, Diversity, Equity & Advocacy (IDEA) group takes these efforts a step further.

By Kayt Sukel



Tejus A. Bale, MD, PhD
Assistant Attending Pathologist

As an institution, Memorial Sloan Kettering (MSK) Cancer Center has worked hard to foster a community of diversity and inclusion across its campus. In 2020, the cancer center established the MSK Equality, Diversity & Inclusion Council. Through workshops, learning programs, and other tools, they began important work to break down some of the systemic barriers preventing women, persons of color, and LGBTQ+ employees from feeling fully respected, supported, and welcomed as they evolve into their careers.

The Department of Pathology, meanwhile, launched its own initiative: Inclusion, Diversity, Equity, & Advocacy (IDEA) in Pathology with the goal of understanding and combating racial, social and any form of discrimination and injustice. The mission of IDEA is to encourage departmental dialogue around these important issues, and to proactively design and implement strategies to increase departmental diversity and ensure greater equity among faculty and staff members.

Tejus A. Bale, MD, PhD, Assistant Attending Pathologist in

Diagnostic Molecular Pathology and Neuropathology, was tapped as IDEA's inaugural director. "Creating this group is really about moving the ideas of inclusion, diversity, equity, and advocacy from a place that many people may consider extracurricular, into one where these values are really at the core of what we do in the department," said Dr. Bale.

A NATURAL ADVOCATE

Very soon after becoming a pathology faculty member, Dr. Bale joined the Junior Faculty Council, a group that works with MSK's Office of Faculty Development to develop programs addressing issues that impact new faculty members. "I was originally particularly focused on promoting mentorship and career development opportunities for junior faculty, particularly women," she said.

One of Dr. Bale's early initiatives was organizing an informal seminar series designed to connect rising and established female scientists at MSK with junior faculty members, which required changing to a virtual format at the start of the pandemic. But, she said, "While the pandemic affected us all, the last few years have shown us that stark inequity has persisted in our society, and that vulnerable groups have had to bear greater burden and suffering...I suppose I was engaging in conversations about these issues with people in the department, because they are so important to me," she said. "When the leadership started discussing the director position for IDEA, my name came up."

BEYOND LIP SERVICE

Still, when first approached about taking on the IDEA directorship, Dr. Bale admits she felt a bit of trepidation. "Too often, organizations and businesses create positions like this to say they are doing something, but those positions have little power to affect change," she said. "But I was able to convey my vision for some very specific initiatives and actionable goals, and I quickly saw that I was going to be able to rely on real support from the department."

A great deal of the work has been promoting, supporting, and integrating institutional and departmental efforts that are already underway. To that end, an IDEA Steering Committee composed of dedicated, and passionate representatives from Pathology and Laboratory Medicine, has been assembled to keep the momentum

“Creating this group is really about moving the ideas of inclusion, diversity, equity, and advocacy from a place that many people may consider extracurricular, into one where these values are really at the core of what we do in the department.”

underway and brainstorm new approaches to addressing complex issues.

Some of those goals include assessing the current landscape around diversity and inclusion, and working with various stakeholders, both within Pathology and Laboratory Medicine, and across MSK as a whole, to develop metrics that will encourage progress and accountability. Dr. Bale is especially interested in addressing the so-called pipeline problem, helping to bring more people from underrepresented groups into the department and the field of pathology.

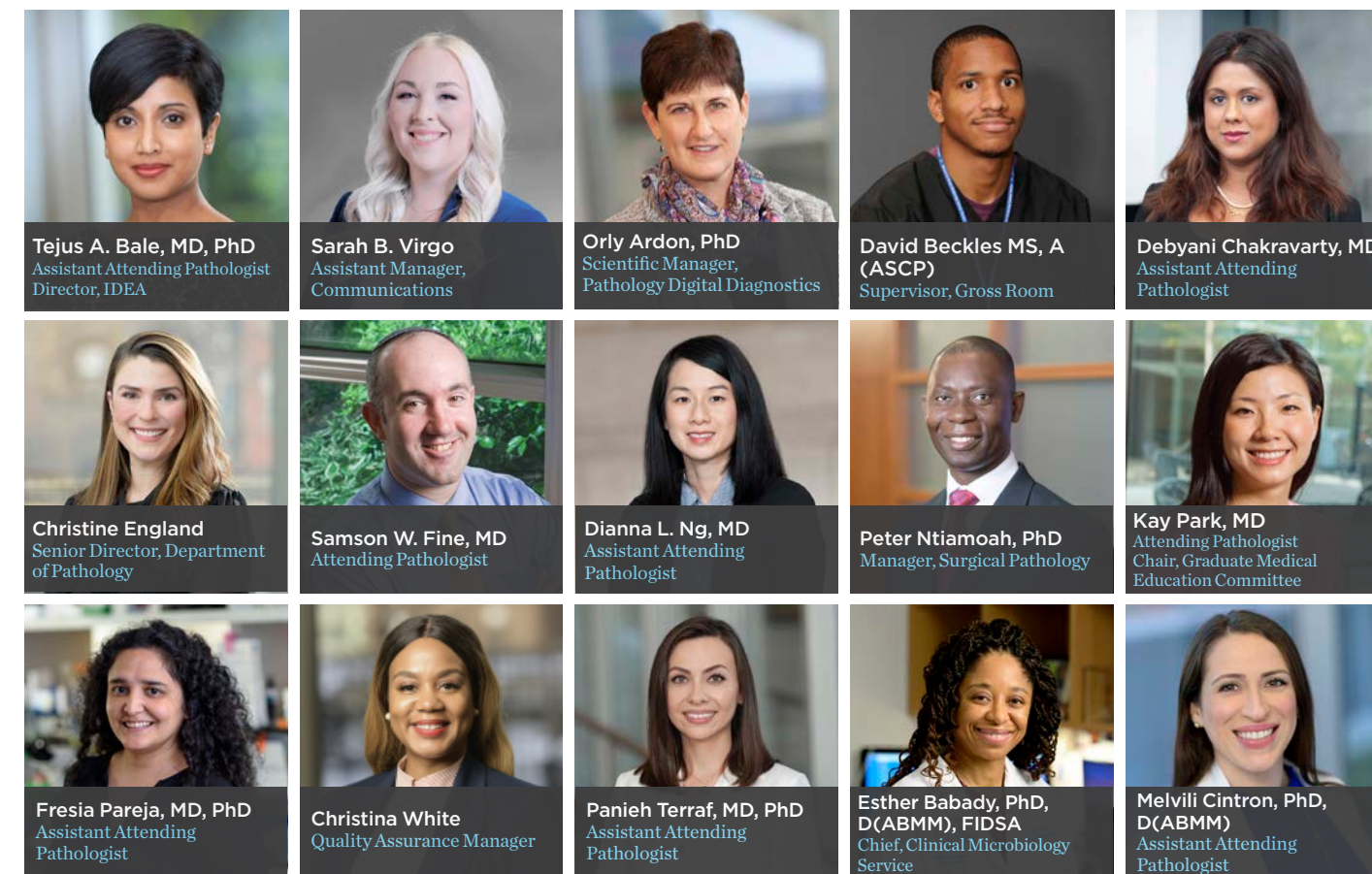
"With the mSCOPE program, spearheaded by Christina White and Sarah Virgo, we are taking an out-of-the-box approach to promoting pathology careers to young people who might perhaps have never even considered them before," Dr. Bale said.

"Unlike many other institutions, we don't have direct access to a medical school. So, as a sub-specialized cancer institution, in addition to creating rotation opportunities for under-represented

minority medical students and pathology residents, for which Dr. Kay Park has been leading the charge, we want to reach more high school and undergraduate students, and expose them to the range of scientific opportunities in our field, and its critical importance to patient care."

In the future, Dr. Bale plans to structure a component of IDEA as the IDEALab, which will function as a hub for pathology-driven global health and health disparities-related research. With help from Drs. Fresia Pareja, Dianna Ng, Marcia Edelweiss, and Peter Ntiamoah, the IDEALab will dovetail with the research support efforts to be offered under the new Experimental Pathology division to assist with the design and execution of research projects, as well as to support and expand ongoing global health initiatives, with increased involvement across the department.

The 'I' in IDEA stands for inclusion. In that spirit, Dr. Bale says, "We are looking into ways to improve mentorship and career development for trainees and pathology faculty, but also our department as a whole. While our incredible informatics and digital pathology infrastructure allowed many pathologists to keep functioning through the peak of the pandemic, we have to recognize that behind that is the labor-intensive, hands-on work of scientists, technicians and staff who came into the hospital, at times at risk to themselves and their families, while most of the world was locked down. We have to ensure that all voices are being heard and that we as a department are directing efforts and resources to grow and support careers from within, to which end



the involvement of Orly Ardon, David Beckles, Peter Ntiamoah, and Christina White on the committee is absolutely essential.”

Dr. Bale is under no illusions that this work will be easy, but she’s excited to lead the department in a previously overlooked area. True diversity and inclusion, she said, remains a “moving target,” but she is encouraged by the interest and support of her fellow faculty and staff members. The IDEA Special Seminars have sparked numerous discussions and an ongoing buzz of energy that Dr. Bale hopes to continue to tap into. “This is clearly really important to so many of us, and we now have a forum in which we can have fruitful conversations and help people get involved, hopefully so our efforts won’t remain siloed, and we can reach our goals regarding diversity and equity,” she said. “We have a lot more power when we work collectively. And we are in a good position to make real progress.”

ONGOING IDEA INITIATIVES:

- Enhanced awareness across MSK
- mScope re-launch
- IDEALab
- Global health disparities expansion
- Establishment of career pathways for staff



IDEA SPECIAL SEMINAR SPEAKERS:

Carla L. Ellis, MD, MS

Associate Professor, Pathology and Laboratory Medicine
Director, Wellness, Diversity and Inclusion
Associate Director, Renal Pathology Service
Northwestern University Feinberg School of Medicine

Marissa White, MD

Assistant Professor
Deputy Director for Diversity, Equity and Inclusion
Department of Pathology
Johns Hopkins School of Medicine

Narjust Duma, MD

Associate Director, Cancer Care Equity Program
Associate Professor of Medicine, Harvard Medical School

INTERESTED IN PARTICIPATING?

Please email Sarah Virgo (cooks@mskcc.org) or Dr. Tejus Bale (balet@mskcc.org) for additional information.

Inclusion, Diversity, Equity and Advocacy (IDEA) and Activism in Action



Sir Paul McCartney, Kay Park, MD and daughter Phoebe attending the Stop AAPI Hate March in New York City



Errol Virgo, Sarah Virgo and children Veda and Jack attending the swearing-in ceremony for newly elected Commissioner Virgo for the Board of Education in New Jersey



Non-profit organization “Rise Up”, founded by Christina White, highlights STEM opportunities, laboratory careers and professional development pathways for persons of color

Expanding CONVERSACIONES About Pathology

Victor E. Reuter, MD, brings his expertise to Latin America.

By Kayt Sukel



After nearly 40 years in the field of pathology, what most energizes Victor Reuter, MD, is teaching others. Lately he’s getting lots of energizing moments as he contributes to a unique educational platform called *Conversaciones en Patología*, or Conversations in Pathology, an educational portal designed to help expand learning options for trainees and residents in Latin America, South America, and the Caribbean.

Dr. Reuter, Vice Chair of the Department of Pathology, Director of the Genitourinary Pathology team, and founder of the Genitourinary Pathology Fellowship at Memorial Sloan Kettering (MSK) Cancer Center, a native Spanish speaker, was born and raised in Puerto Rico and educated in the Dominican Republic. “I have always looked for every opportunity to teach and mentor in Latin America because their resources pale in comparison to what you can find in the United States, Europe, and Asia.”

Dr. Reuter has lectured at different universities and hospitals in the region for decades. However, when a Venezuelan pathologist named Sandra Romero, MD, reached out to ask him to participate in other opportunities to work with pathology residents in these Spanish-speaking countries during the pandemic, he was intrigued by the possibilities.

“A group of pathologists in the Dominican Republic, the Esteva Laboratory, had already set up *Conversaciones en Patología* to reach more people,” he said, explaining the structure: Every

Tuesday at 7:00pm, a Zoom lecture was made available to trainees and new pathologists in the Dominican Republic and Venezuela. “As it became better known, more people wanted to take part,” said Dr. Reuter. “Soon, people were accessing it in Colombia, Bolivia, and other countries.”

Dr. Reuter delivered a suite of lectures on his area of expertise, bladder cancer, and was thrilled by the positive response from attendees. He decided to look for other ways to deepen his involvement, and get MSK involved, too.

“We offer a yearly course in pathology each May,” he said. “I reached out to the organizers to see if they would allow us, in a virtual manner, to let some of these trainees take advantage of our conferences. I wanted to create a system by which documented residents from countries in Latin America, the Caribbean, Central America, and South America could get access to our educational portal and courses.”

The request has been approved, and now Dr. Reuter is working with Dr. Romero, as well as Maria Marino, MD, a world-renowned pathologist at the National Institutes of Health, to reach out to Latin American societies, institutions, and hospitals to spread the word.

“There are very few courses and training opportunities in these areas,” he said. “It’s important that pathologists and trainees have access to the kind of educational material we can provide here at MSK. We can help open their minds to what is possible while also educating them to effectively practice medicine in their own environment, giving them the tools they need to serve their patient populations now.”

Dr. Reuter believes he can serve a purpose in helping to elevate pathology training in under-served areas. And he is excited to see how he and his collaborators can help expand their efforts in furthering learning opportunities in the future.

“I’ve been practicing pathology at MSK for over 38 years,” he said. “I love working with my colleagues. I love serving my patient populations here and doing my best to mentor, teach, and offer good clinical services. But I must tell you, at this stage of the game, there is nothing better than trying to find new ways to level the playing field in healthcare – and expanding the knowledge and training of tomorrow’s leaders in under-served and developing countries. That’s what motivates me the most.”

“It’s important that pathologists and trainees have access to the kind of educational material we can provide here at MSK. We can help open their minds to what is possible while also educating them to effectively practice medicine in their own environment, giving them the tools they need to serve their patient populations now.”

Darren BUONOCORE, MD



Darren Buonocore, MD, is Changing the Standard

By Kayt Sukel

Some might call Darren Buonocore, MD, a “jack of all trades”. While he specializes in thoracic pathology at Memorial Sloan Kettering (MSK) Cancer Center, the fact that he reviews cytology cases means that he ends up working with everything from ovarian tumors to head and neck tumors. He said it’s one of the reasons he enjoys his job so much.

“In medical school, you gain so much knowledge in so many organ systems, and then you go and specialize in colorectal surgery or cardiology surgery and basically never use 90 percent of what you learned because you now only work in this one area,” said Dr. Buonocore. “One of the best things about pathology is that you retain so much of that knowledge about different systems.

Especially when you do cytology, a specialty where you get to see and work with the full spectrum of organs and diseases.”

Dr. Buonocore has worked on a broad range of research projects, ranging from a phase II basket trial testing adotrastuzumab emtansine for patients with HER2-Mutant lung cancers, to the histopathological analysis of fatal COVID-19 pneumonia. Yet the research he’s most proud of is a project that looks at the cytologic evaluation of head and neck squamous cell carcinoma to test for human papillomavirus (HPV) status.

MAKING BIOPSIES LESS INVASIVE

You hear the word biopsy and, if you’re like most people, you brace

yourself for a surgical procedure. But in some cases, a biopsy can be taken using fine needle aspiration (FNA), a less-invasive procedure where a thin needle is inserted into a nodule or lymph node located right under the skin. It’s not an inferior form of information-gathering on potential malignancy, said Dr. Buonocore; a surprising amount of data can be gleaned when an FNA sample is sent for cytological analysis. In fact, he and his colleagues recently demonstrated that this type of sample is sufficient to determine a head and neck cancer’s HPV status, which can help direct treatment.

“Traditionally, doctors have used a surgical core biopsy. But core biopsy involves a much bigger needle,” Buonocore. “It is a much more painful procedure than the FNA, particularly in the head and neck area. It’s always good when we can spare patients that.”

HPV related squamous cell carcinoma is unlike traditional smoking related squamous carcinoma that develop in the mucosal membranes of the mouth. It arises in tonsillar tissue and typically goes unnoticed until it spreads to a neck lymph node.

“Many of these patients first present with an enlarged lymph node,” said Dr. Buonocore. “The cytology FNA team can perform the aspiration the same day they are evaluated by the head and neck surgeon, make a determination of whether it’s squamous cell carcinoma versus lymphoma versus some other metastasis, and collect the material needed to determine HPV status within two to three days.”

Having that status is essential to helping oncologists make the right treatment recommendations. Dr. Buonocore said HPV status dependent squamous cell carcinomas are much more radio-sensitive, so giving head and neck surgeons the ability to get a diagnosis and a status that quickly, using a minimally invasive procedure,

allows them to get patients on the right treatment immediately.

“It’s a pretty big deal,” said Dr. Buonocore. “These cancers are actually fairly common and we’re seeing more of them in recent years. The interesting thing about the HPV-related cancers is normally the presenting symptom is this node metastasis. You want to get on a treatment as soon as you can.”

MOVING FORWARD

Dr. Buonocore hopes to follow this success by working on a research project to determine HPV status just using the fluid the material is collected in, something that’s already done with cervical cancer.

Additionally, Dr. Buonocore is working closely with the thoracic surgery and pulmonology groups at MSK in evaluating the effectiveness of a new robotic endoscope. This new system allows peripheral lung lesions to be located endoscopically and perform an FNA through the endoscope. “We have already shown that performing FNA through an endoscopy in centrally located lung lesion acquires sufficient material to provide a diagnosis and perform all the molecular testing patients need to begin treatment. This new technology appears to allow us to evaluate peripheral lung lesions saving patients core biopsies and the risk of pneumothorax” says Dr. Buonocore.

As Dr. Buonocore contemplates future projects, he said he is grateful to work at an institution that sees such a great volume of interesting cases.

“Some hospitals may only see a few cases of certain types of cancer each year. MSK probably sees more than double that each week,” he said. “I’m also surrounded by wonderful colleagues, in pathology and in surgery and oncology, and they have amazing resources available for you to study just about anything. That’s what makes MSK such a great place to work.”

“Traditionally, doctors have used a surgical core biopsy. But core biopsy involves a much bigger needle. It is a much more painful procedure than the FNA, particularly in the head and neck area. It’s always good when we can spare patients that.”

In Memoriam: DR. STEPHEN STERNBERG

By David Klimstra, MD

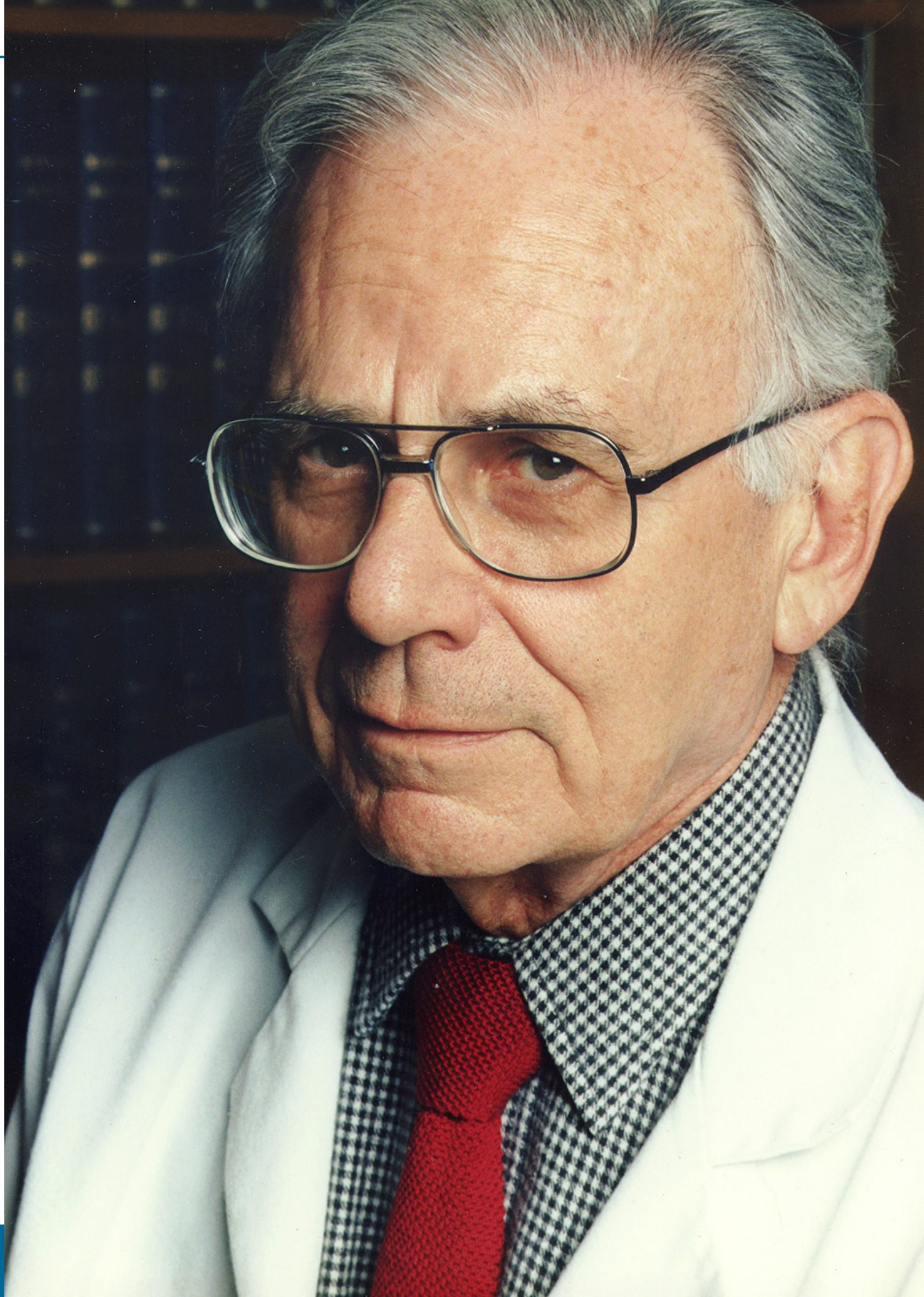
Dr. Sternberg passed away on May 12th at the age of 100. Dr. Sternberg was one of the best known surgical pathologists to have worked at MSK, and his editorial contributions alone made him a household name in pathology around the world.

A native of Queens, Dr. Sternberg was educated at Colby College and NYU School of Medicine. After his residency in pathology at Charity Hospital (Tulane University) in New Orleans, he was a fellow at MSK and then joined the faculty in 1951. He was a general surgical pathologist – as were all of the faculty at that time – but he developed expertise in gastrointestinal pathology and was the MSK reference pathologist in GI for many years. His research was focused on the toxicity of antineoplastic agents and the carcinogenic potential of various compounds, which he studied in animal models. Because of his research on these topics, he was appointed Professor of Pharmacology and Experimental Therapeutics at Cornell University and was widely consulted by government agencies and the WHO. He also conducted pioneering work on the pathology of colorectal polyps. At MSK he served as Chief of the Autopsy Service for 18 years and he was also the elected President of the Medical Board and General Staff.

In 1977, Dr. Sternberg became the founding Editor-in-Chief of the *American Journal of Surgical Pathology*, a position he held for 24 years. *Am J Surg Pathol*, for the first time, pulled together research publications on surgical pathology, which had previously been dispersed among a range of more broadly focused journals. Under his leadership, “the journal” became the foremost publication dedicated to surgical pathology, and many new entities were born and characterized within its pages. Dr. Sternberg engaged many of the MSK faculty members on the editorial board, so for many years the journal had the imprimatur of our department. He was a remarkably fair-handed editor, relying heavily on his reviewers’ opinions to avoid introducing personal bias. The success of the journal led to a second important work, which Dr. Sternberg conceived based on a series of review articles published initially in *Am J Surg Pathol* describing variations of normal histology and minor alterations in organs. He felt it would help surgical pathologists to better recognize the range of incidental findings, and the collection was ultimately updated and expanded as the text *Histology for Pathologists*, first published in 1992 and now in its 5th edition. He also edited Sternberg’s *Diagnostic Surgical Pathology*, another widely read and authoritative text with numerous authors, some of whom were also MSK faculty members.

Over his decades of practice and research, Dr. Sternberg influenced our field tremendously. He was generous, thoughtful, and witty, and his extramural interests were as broad as his professional impact. In 2000, Dr. Sternberg retired from MSK, and in 2001 he was awarded the Fred W. Stewart Award by the faculty. To quote from Dr. Marc Rosenblum’s tribute published upon this occasion, fittingly in *Am J Surg Pathol*, “Colleagues and friends of Stephen Sternberg know him as a man of irrepressible humor, as an acute observer of the human condition, as a mordant satirist of all that is affected, as a martini lover (Tanqueray, straight up with a twist), dog fancier, and gardener. The practice of pathology is much the better for his contributions, as are those of us privileged to have worked with him.”

Dr. Sternberg was predeceased by his wife, Dr. Norma Wollner, who also had a decades-long career at MSK as a beloved pediatric oncologist.



“Colleagues and friends of Stephen Sternberg know him as a man of irrepressible humor, as an acute observer of the human condition, as a mordant satirist of all that is affected, as a martini lover (Tanqueray, straight up with a twist), dog fancier, and gardener. The practice of pathology is much the better for his contributions, as are those of us privileged to have worked with him.”

HISTOCOMPATIBILITY LAB



Meeting Their Match

The Histocompatibility Lab at MSK is zeroing in on tests to produce better, safer, more effective donor matches for bone marrow transplants.

By Kayt Sukel

Each year, tens of thousands of patients in the United States will be diagnosed with leukemia, lymphoma, or multiple myeloma. For many, successful treatment will involve a bone marrow or stem cell transplant (BMT), the replacement of the cancerous blood-forming cells with new, healthy blood-forming cells. But this intervention can only occur if doctors can find a suitable donor match.

Amanda Blouin, MD, PhD, Medical and Scientific Director of the newly formed Histocompatibility Laboratory at Memorial Sloan Kettering (MSK) Cancer Center, said the primary mission of the service is to do human leukocyte antigen (HLA) typing for patients and donors to

determine the best possible match for each patient. This kind of typing is essential to find the appropriate donor for transplant patients.

“We do about 50 to 60 HLA typing tests each week,” she said. “We type the patient as well as any relatives that may be a suitable donor match. The BMT service performs a search through the National Marrow Donor Program Registry to look for unrelated donors, which we also test for a potential match.”

Before July 2021, MSK sent all its HLA typing out to a reference laboratory. When Dr. Blouin joined the MSK faculty in 2015, she suggested the creation of an in-house histocompatibility lab to better support the BMT service and its patients—as well as to provide the appropriate testing for different clinical research projects being done on site. Today, the lab is home to Dr. Blouin and six technologists, a supervisor, a general manager, and assistant director. She only sees it growing in the future.

“There are a number of benefits to having the lab onsite, such as utilizing next generation sequencing, a newer technology which allows us to characterize the full gene for most of the HLA molecules,” she said. “That results in fewer ambiguities in the results we report.” Additional benefits include a faster turnaround time, and in-house clinical consultation service, where members of Dr. Blouin’s team can help physicians interpret results as they consider potential donors.

A MORE COMPREHENSIVE PICTURE

What makes HLA typing such a critical step in selecting a suitable donor match is that every individual has a variety of HLA markers. Current guidelines for donor selection state that the optimal donor is fully matched at the HLA genes. Mismatching between donors and recipients can lead to BMT complications including rejection of the graft or the development of graft-versus-host disease. Graft-versus-host disease, in which the transplanted cells attack the patient’s body,

“We will be offering chimerism testing by next generation sequencing,” said Dr. Blouin. “This kind of testing is how we monitor the effectiveness of the transplant and lets us look for a graft failure or a potential relapse.”

while rare, can be fatal.

In addition to HLA typing, the Histocompatibility Lab runs assays for anti-HLA antibodies, which can be associated with graft failure or rejection of the newly transplanted cells.

“When a patient has previously been exposed to HLA molecules, either through pregnancy or transfusion, they may develop antibodies against these HLA antigens, some may be directed against the donor,” Dr. Blouin explained. “The presence of those antibodies indicates that the patient may reject a graft from that potential donor. For example, if you have a mother who needs a bone marrow transplant and her child is a haplo-identical donor, she may have developed antibodies against the child’s HLA antigens. We can test to determine that.”

While these two tests are the clinical standard for donor matching, the Histocompatibility Lab is also looking to expand the types of tests it offers to give a more comprehensive picture into whether a potential donor would be a good match, as well as adding new assays to help determine the prognosis of a patient after undergoing transplantation.

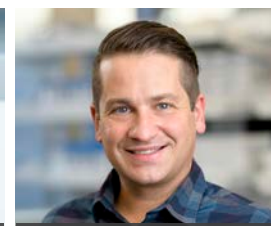
“We will be offering chimerism testing by next generation sequencing,” said Dr. Blouin. “This kind of testing is how we monitor the effectiveness of the transplant and lets us look for a graft



Amanda B. Blouin, MD, PhD
Director, Histocompatibility Laboratory
Associate Attending Physician



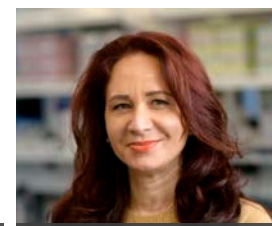
Fei Ye, PhD
Assistant Director, Histocompatibility Laboratory



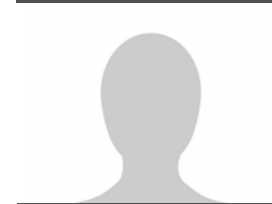
Jonathan Barone
Manager



Christina Savchik
Supervisor, Laboratory Medicine



Dorina Hura
Technologist II



Eunsil Kim
Technologist II



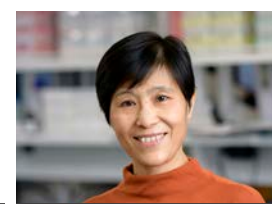
Byoungkyu Kim
Technologist II



Peter McManus
Technologist III



Ariel Molina
Medical Lab Assistant



Xiuwei Tang
Technologist II

failure or a potential relapse. The new methodology we are bringing in house can detect microchimerism, which means the recipient’s DNA is at less than one percent. There’s research that demonstrates this is associated with an early sign of relapse.”

The lab will also soon be offering Killer Cell Immunoglobulin-like Receptor (KIR) typing as well. This provides yet another diagnostic result to help determine the best bone marrow match for a particular patient with AML.

“There are some fairly new assays out there that can help us. We want to work with BMT to see if these tests have clinical utility for bone marrow transplant patients,” she said. “If we can develop additional assays that can detect relapse or other issues, that would be helpful so we can determine the best next steps for our patients.”

NO SUCH THING AS A PERFECT MATCH

The Histocompatibility Lab will also be supporting new BMT research that seeks to expand the guidelines for currently considered an appropriate HLA match. Given that half of a patient’s HLA markers are inherited from each parent as a haplotype, transplant doctors have traditionally hoped to find a sibling or close family member to donate the necessary bone marrow.

Unfortunately, the vast majority of transplant patients do not have a fully matched donor in their family.

“Data from recent large national studies show that it is feasible to use a less than perfectly matched donor in some cases,” Dr. Blouin said. “That’s important because not everyone has a sibling that will be an identical HLA match. And, when you are looking for an unrelated donor in the national and even international registries, the genetic diversity seen across the globe means that people of non-European descent will have even more trouble finding an unrelated match.”

Because of these challenges, the Histocompatibility Lab is participating in research studies to determine where, when, and how a mismatched donor might lead to a successful bone marrow or stem cell graft. It’s a process that requires a lot of consideration and consultation, she said, based on the existing studies in the literature, to help the BMT physicians select the optimal donor for a patient. Dr. Blouin is especially excited to collaborate on new studies to determine which markers are most important to finding a suitable or permissive “mismatch” – and help expand the pool from which patients can find an optimal donor.

The Histocompatibility Lab is relatively new—and has spent much of its first months developing

and validating its methodology obtaining New York State approval and accreditation from the American Society for Histocompatibility and Immunogenetics (ASHI). Dr. Blouin said everyone involved is “excited and motivated” to start showing the BMT service, as well as MSK as a whole, what having this kind of in-house lab can offer to both research programs and the successful treatment of patients.

“Histocompatibility testing is more than just molecular testing—it’s not just a sequencing of genes,” she said. “The HLA loci are the most polymorphic genes in the human genome. We do more than just direct matching; we provide information to help interpret permissible mismatches in these alleles. It takes a considerable amount of technical and analytical skill. And it’s something that will help a lot of our transplant patients.”

50-60

About 50 to 60 HLA typing tests performed each week



For the LOVE of LAB WEEK

Though the perennially popular Lab Week events are remote again this year, MSK is determined to make its lab techs feel the appreciation.

By Kayt Sukel

Flip to the methods section of any prominent Memorial Sloan Kettering (MSK) Cancer Center publication and you'll see evidence of the pioneering work of the institution's unsung heroes: the laboratory technologists and professionals. In both the pathology and laboratory medicine departments, these individuals are responsible for much of the groundbreaking work that undergirds MSK's ongoing clinical and research missions. And every year, the entire hospital is invited to celebrate their contributions during Laboratory Professionals Week.

While most laboratory personnel do not meet face-to-face with patients, they offer a vital contribution to diagnosis and overall care, said Joann Rittersbach, Education Manager for MSK's Department of Laboratory Medicine. "Patients see their laboratory results on a screen or a slip of paper and may never think about all the work that went into generating them, she said. "Unfortunately, sometimes doctors don't either." Lab Week is the institution's opportunity to shine a light on all the important work

the laboratory staff do. "We want to let them know how much they are appreciated by the management, administration, and faculty of MSK."

In 1975, the American Society for Medical Technology, now known as the American Society for Clinical Laboratory Science (ASCLS), organized the first Lab Week event to help educate the greater healthcare community about the role laboratory professionals play in patient care. Given the importance of the lab to enhanced cancer care, Sarah Virgo, Communications Manager for the Department of Pathology, said the planning committee works hard to go all out for these often underrecognized team members. "This is a national event, but you'll see a lot of variety in how different organizations celebrate it," she said. While a basic luncheon would check the recognition box, "we really wanted to evolve the event into something that everyone can enjoy and appropriately celebrate our laboratory professionals."

Pictured: Denise Frosina, Immuno Histology Technologist II

Lab Week programming at MSK has included everything from faculty lectures highlighting laboratory contributions to research and patient care to a laboratory-themed "escape room" activity, trivia challenges and "painting parties".

"My goal for all of our events is that they are either educational or an opportunity for team building but that everyone is excited to attend," said Virgo. "We have a keynote speaker and other lectures featuring prominent MSK faculty but we also host scavenger hunts, photography contests, career panels with neighborhood outreach, and a very popular "Family Feud" style game show. The main goal of Lab Week programming: "Celebration! We want people to learn and spend time with different kinds of colleagues, but we also want everyone to have a good time."

For the last two years, Lab Week has been conducted in a solely virtual format. This year, Lab Week is scheduled for April 24-30, with the theme "Back to the Lab: Celebrating Our Past as we Look Into the Future". Despite the vaccine mandates at MSK, the event will stay online - but Virgo, Rittersbach, and their colleagues are making sure that the MSK community can still get the most out of it. They are making plans to distribute favors and food vouchers so they can nosh on their meal of choice while watching the keynote lecture online. Anyone who signs up for the highly anticipated painting event will get canvases and supplies delivered in advance by mail.

"Our primary goal will always be the safety of our staff and patients," Virgo said. "In 2020, we had a training-wheels situation where we had to quickly pivot to an online format and hope that things would just work out the way they needed to. We learned a lot from that. In 2021, we perfected the



Jennifer Castillo
Lab Aide



Yaqiong Huang
Histotechnologist III



Vikas Rai
Molecular Genetics Technologist II



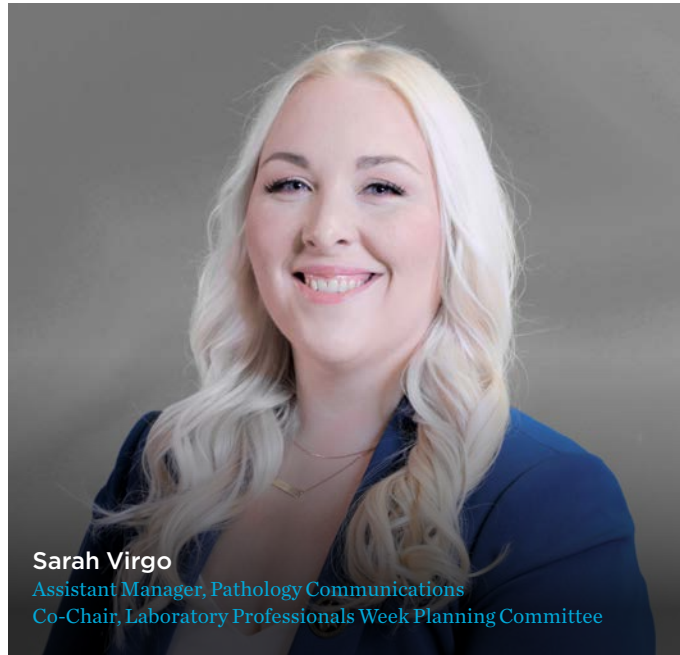
Munazza Owais
Pathologist Assistant



Lina Larrahondo-Bauer
Supervisor, Histology



Liliana Villafania
NGS Laboratory Technologist II



Sarah Virgo
Assistant Manager, Pathology Communications
Co-Chair, Laboratory Professionals Week Planning Committee



Joann Rittersbach
Education Manager, Laboratory Medicine
Co-Chair, Laboratory Professionals Week Planning Committee

virtual platform further and for 2022, we're ready to make it even better than last year! This year we're working very hard behind the scenes to make sure that we deliver a fun experience that really recognizes all the great work that our laboratory professionals do."

In light of the amazing response laboratory professionals had to the COVID-19 pandemic, including developing new tests for the virus, Rittersbach said she feels it's even more important to recognize and thank them.

"The contributions these professionals make, day in and day out, is just incredible," she said. "Our labs are open 24/7, 365 days

a year. We operate under any circumstances. Lab technologists are the backbone of so many clinical improvements. It's crucial that we let them know how important their work is."

"I have worked at MSK for 15 years, been a patient and had family treated here. In every role, I have benefited from the talent and dedication of our laboratory professionals. We are going to do whatever it takes to make sure this event is worthy of such an outstanding group of people," said Virgo. "We may have to get creative, and do some things we haven't considered before, but we are going to make it the best it can be. Nothing less than they deserve."



2021 Laboratory Professionals Week Winners

SOCIAL MEDIA CAPTION CONTEST

Sital Doddi

LOGO CREATION CONTEST

1st Place - Chemistry
2nd Place - Monmouth
3rd Place - Nassau

PHOTOGRAPHY CONTEST

1st Place - Koch Lab
2nd Place - Chemistry
3rd Place - Kerry Mullaney

DECORATE YOUR DOOR CONTEST

1st Place - Koch Lab
2nd Place - Cytogetnetics
3rd Place - Commack

LAB WEEK SCAVENGER HUNT

Alexandra Grala
Dory Londono
Sarina Sherpa
Hui Mei Wang
Tanzeer Chowdhury

"QUARANTINE QUIZ SHOW"

Juan Aponte, Jr.

FAMILY FEUD

1st Place

Tanzeer Chowdhury
Geeta Ambati
Sarina Sherpa
Pedro Flores
Jeffrey Breshin
Winsome White

2nd Place

Christopher Randazzo
Corine Judah
Erica Schornstadt
Monica Bonga
Bryan Lu

P. Dayand
BORGE, MD



P. Dayand Borge, MD's Serendipitous Path to Transfusion Medicine

By Kayt Sukel

P. Dayand Borge, MD, will be the first to tell you that his path into transfusion medicine was guided by fate. The new Chief of Transfusion Medicine, recruited to Memorial Sloan Kettering (MSK) Cancer Center in July 2021 from the American Red Cross, said he didn't even know what transfusion was until his graduate training.

"When I earned my doctorate in biochemistry I was doing, of all things, some diabetes research—it had nothing to do with blood whatsoever," he said. "I started talking to my PhD advisor, who was also the director of the residency program at the University of Pennsylvania, about what I wanted to focus on for the clinical side of my training. He suggested I do a rotation in pathology and laboratory medicine and then suggested that I take a look at blood

banking. I said, "That sounds interesting. But what is it?"

Soon enough, Dr. Borge got a crash course in transfusion medicine. The mix of laboratory research and patient interactions quickly made clear this was the winning specialty for him.

"I am very much a laboratory-oriented person," said Dr. Borge. "There were so many great laboratory investigations around understanding why people might be having reactions to transfused blood but there was also a lot of direct patient care activity, ranging from doing therapeutic plasma exchanges or patient red cell exchanges," he said. "For someone like me, training to get an MD and a PhD, it all appealed. Within three days of starting that rotation, I knew transfusion medicine was what I was going to do."

“At the end of the day, our overarching goal is to optimize patient care. And there are a lot of different ways to do that, especially if we can innovate and have new blood products available where they are needed.”

NEW INNOVATIONS IN BLOOD PRODUCTS

While at the American Red Cross, Dr. Borge's research involved investigating new blood products to improve the treatment of bleeding patients. "Much of that type of work has been driven by both the military and trauma surgeons," he said. "But the big question is what kind of blood products can we transfuse that will lead to the best outcomes?"

In the past few years, surgeons have tended toward treating trauma patients with whole blood transfusions rather than using component therapy, which is the transfusion of only red blood cells, plasma, platelets, or other blood components. But while whole blood is effective in countering many of the more common immediate bleeding issues, transfusing it can cause other medical issues. For example, a patient may have an immune system reaction to antibodies present in the transfused blood. The development of low titer whole blood, or type O blood with low levels of antibodies, helps prevent those issues.

"Given that what we're really trying to do is, in essence, reconstruct whole blood within the patient, it makes sense to give the patient whole blood from the start," he said. "It has everything together, all in one package. But not all blood is universal

and even type O blood can have plasma or antibodies that are not universally compatible."

Dr. Borge also has his eye on innovations in transfusion medicine, including researching a new product called cold-store platelets.

"These are platelets that are collected from a donor and then placed at refrigerated temperatures," he said. "The data out there demonstrates these cold-store platelets have superior hemostatic qualities when measured by in-vitro assays – and they maintain those parameters for up to 14 days." By contrast, the current shelf life of platelets is only about five days. And if researchers can come up with the right processes to develop cold-store platelets, they could not only give patients a higher-quality blood product, but also reduce the risk of bacterial contamination.

APPLYING TRANSFUSION MEDICINE IN CANCER CARE

While the bulk of Dr. Borge's work has been outside the cancer-care arena, several applications for innovative blood products are useful in cancer treatment. Many cancer patients, for example, become cytopenic—they have lower than the normal number of healthy red blood cells—after chemotherapy.

"We transfuse a lot of platelets here at

MSK," he said. Cancer patients can become allo-immunized to either antibodies that are specific to the platelets themselves, or to human leukocyte antigens (HLAs) that are ubiquitously expressed throughout the body, Dr. Borge explained, which can impact their ability to be transplanted. "We are working on ways to advance the level of testing we do on both patients and potential platelet donors to make sure we're finding adequate matches."

For this work, Dr. Borge and his team are collaborating with the hospital's blood center and clinical testing facilities to develop a patient-centered algorithm to determine the best products for each individual patient.

"We are taking a holistic approach, looking at a patient's current needs as well as potential future needs—and matching patients and donors accordingly," he said. "At the end of the day, our overarching goal is to optimize patient care. And there are a lot of different ways to do that, especially if we can innovate and have new blood products available where they are needed."

Pampee P. Young, P. Dayand Borge Jr. Making whole blood for trauma available (again): the American Red Cross experience. *Transfusion*. 2019;59:1439-1445.

Inside the NGS lab

Next generation sequencing (NGS) is changing the way that cancers are diagnosed and treated.

By Kayt Sukel

The NGS lab at Memorial Sloan Kettering (MSK) Cancer Center started as a small lab in the early 1990s, performing only a few hundred assays per year. Today, helmed by Ryma Benayed, PhD,¹ the laboratory tests tens of thousands of samples in that same time span. These innovative DNA sequencing technologies offer clinicians a new way to quickly and accurately assess the

genetic variation associated with different tumors. These assays can also help oncologists make more informed decisions about each patient's best course of treatment. While NGS testing has historically been viewed as an add-on, applicable only for a small subset of patients, new studies show it has remarkable clinical value, helping doctors quickly zero in on the right diagnosis;



Anna Razumova



Cong Shen



Tessera Baldi



Brian Murphy

allowing the care team to outline more targeted and effective interventions; and helping doctors better understand each individual patient's risk of recurrence.

MSK's NGS lab runs two major tests: the groundbreaking MSK-IMPACT™ and MSK-ACCESS® assays. The former, which looks at 505 different cancer-associated genes, can detect mutations and other changes in DNA that are common to certain types of cancer, helping pathologists and oncologists choose the most targeted and effective treatments. MSK-ACCESS®, by contrast, is a so-called "liquid biopsy" test, which looks at circulating DNA in the blood plasma to determine the likelihood of metastasis.

"This all takes place on the NovaSeq 6000 using S1 flow cells," said Dr. Benayed. "For MSK-IMPACT™, we can sequence 56 patient-matched tumor-normal pairs per run and we do up to six

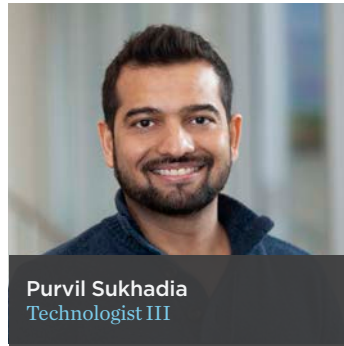
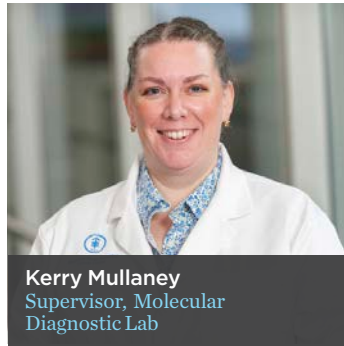
runs per week. For MSK-ACCESS®, each NovaSeq run can handle 25 patient-matched tumor-normal pairs, and we do two to three runs per week."

Certainly, both MSK-IMPACT™ and MSK-ACCESS® are game changers for MSK patients, improving the quality and efficacy of care. But having an expanded NGS lab will also allow the team to continue developing advances in cancer diagnostic and prognostic measures, said Marc Ladanyi, MD, Chief of the Molecular Diagnostics Service.

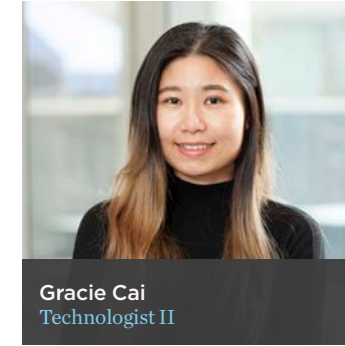
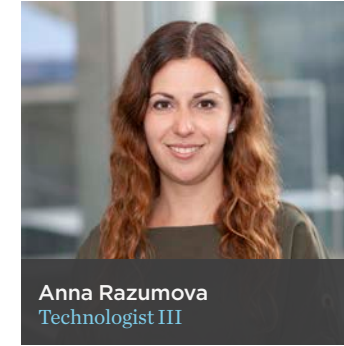
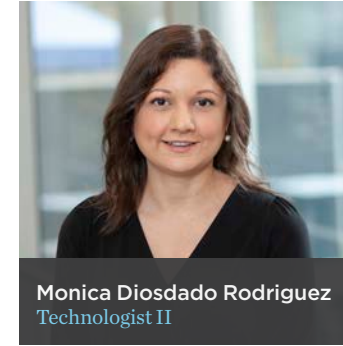
"We can potentially make progress on several important fronts, including updated and expanded NGS assays for lymphomas and leukemias, whole exome sequencing for very specific germline and somatic applications, and beginning to implement whole genome sequencing," he said. "It's very exciting."

¹ Dr. Benayed now serves as the Executive Director for Precision Medicine at AstraZeneca

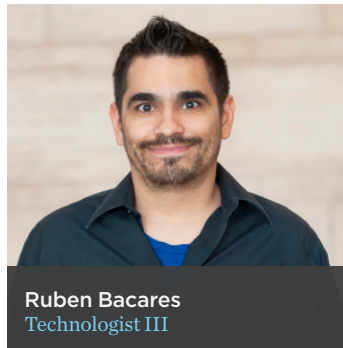
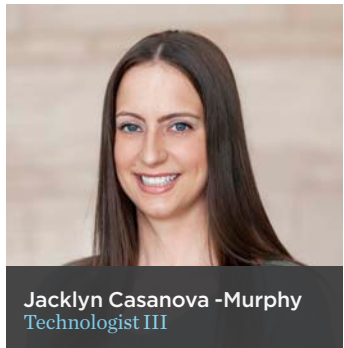
MSK-Fusion team



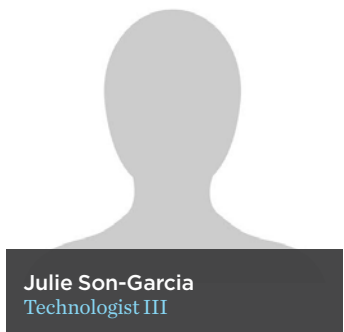
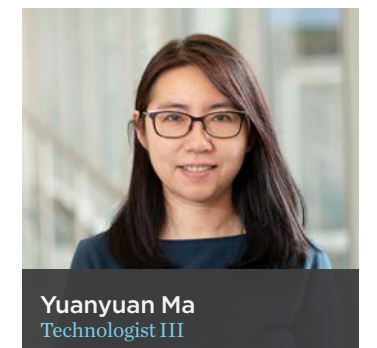
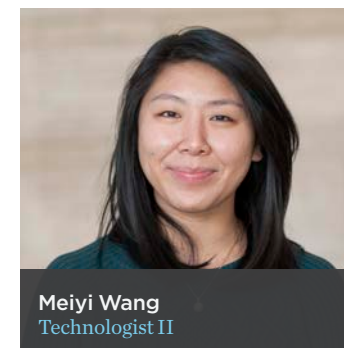
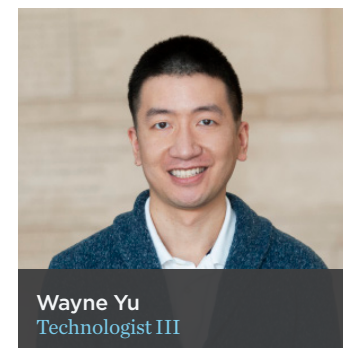
MSK-ACCESS team



MSK-IMPACT team



Lymphotrack team



Purvil Sukhadia

Filiz SEN, MD



Filiz Sen, MD, Follows Her Passion

By Kayt Sukel

Ask Filiz Sen, MD, what inspired her to specialize in pathology and she will tell you it's all about the microscope. She was only a grade schooler when she coveted her first scientific instrument.

"I grew up in the Eastern part of Turkey and, for as long as I can remember, I've had an interest in microscopes – I wanted to own my own microscope," she said. "There was one little shop in my town that had a microscope in the window. This was a big deal – at the time, my town was not very large. The fact the store had the microscope was surprising. I was just obsessed with it."

That obsession with observing objects at the cellular level followed her throughout her academic career and then on to medical school in Istanbul. During a rotation in hematology, during her fourth year of medical training, Dr. Sen developed a keen

interest in bone marrow aspiration smears.

"In Turkey, the hematologist does the bone marrow aspiration and reviews those smears to make a diagnosis," she said. "It was just fascinating for me. I loved it. I was following this hematology professor around like a puppy, trying to learn everything I could. I started to do peripheral blood smears on my own, reviewing them, counting them – I even built a collection of smears for myself."

Once she graduated from her medical program, Dr. Sen decided to specialize in histology and embryology, largely because it allowed her to continue working in microscopy anatomy. When she came to the United States to continue her training, moving to pathology was a natural extension of her interests.

SUPPORTING CLINICAL AIMS

Since landing at Memorial Sloan Kettering (MSK) Cancer Center in 2013, Dr. Sen has worked hard to provide pathology support to her clinical colleagues who are investigating a variety of questions regarding the cause and treatment of hematopoietic neoplasms. In 2020 alone, her name has appeared on a range of publications examining the cell of origin in leukemia initiation and how it influences therapeutic sensitivity, probing how the discordant extramedullary plasmablastic transformation of multiple myeloma leads to aggressive disease, and evaluating the drug Selinexor to treat myelodysplastic syndromes or oligoblastic acute myeloid leukemia. Dr. Sen is the first to admit it is an eclectic body of work – but there are still so many things to learn about hematopoietic cancers and how to effectively treat them.

"I don't have a research lab. I am not a primary investigator," she said. "But I try to be involved and collaborate with my clinical colleagues when they need pathology support. Too often, we don't pay enough attention to how important pathology is to answer some of the questions we need to answer in different research studies."

Because of her renowned hematopathology skills, Dr. Sen is often called in to collaborate on different cases and research studies. She said she works to build a bridge between the clinical and pathology worlds, providing strategic hematopathological work, including morphological and immunophenotypic evaluations.

"Sometimes it's the unique presentation of a disease," she said. "Certain diseases behave in certain ways but then you have a case that doesn't quite fit and surprises the clinical team. I will then make the diagnosis, try to explain why it is such an interesting presentation, and sometimes that becomes a paper."

In other cases, like the recent Selinexor

single-arm phase II trial, Dr. Sen is there to monitor how the drug is affecting the tumor. "I evaluate the samples before treatment in the bone marrow samples and then evaluate the response to the drug or treatment, using predefined criteria, over time," she said. "Having the pathology reports and the pathologic images helps the clinical team to make sense of the overall findings – you work together to gather the right information and see what it tells you."

TRAINING THE NEXT GENERATION

Dr. Sen is no stranger to large cancer centers. She did her fellowship training at M.D. Anderson Cancer Center and, when it came time to look for a faculty position, hoped to find a place where she would have access to a large volume of fascinating cases.

"When I came here, the pathology department was establishing a new hematopathology service," she said. "That really appealed to me. Especially since it's such a big cancer hospital – all of the most interesting and unusual cases usually come through here."

She said that her clinical work is the most rewarding part of her career – and that she remains passionate about helping to care for patients who are at one of the most vulnerable times in their lives. That is why she is happy to contribute to ongoing clinical research projects. But it's also important to her to emphasize her work as the head of the hematopathology fellowship at MSK, which helps to train the next generation of microscope enthusiasts.

"As part of that work, I established a hematopathology foundation course, which is intensive, focused education in lymphoma, leukemia, and flow cytometry, to just name a few, without any clinical responsibilities," she said. "This helps prepare the fellows for the work that they will do at MSK – and whatever comes next for them. I'm very proud of that."

“I grew up in the Eastern part of Turkey and, for as long as I can remember, I've had an interest in microscopes – I wanted to own my own microscope. There was one little shop in my town that had a microscope in the window. This was a big deal – at the time, my town was not very large.”

Q&A with David Beckles, MS, A (ASCP), Supervisor, Gross Room

By Kayt Suke

Q What are the contours of your job, day to day?

A I supervise a team of pathology assistants, dieners, and biopsy technicians in the Gross Room. We are the first stop for tumor specimens. Basically, we triage the specimens that come from surgeries or consults. We have everything set up so we can get all those specimens “grossed.” We look them over to obtain important diagnostic information. We also process the specimens, inking the tissue with a variety of different colors so the pathologists can do their more in-depth microscopic examination. We coordinate with attending physicians and other people in pathology to make sure we get the best possible specimen out of a biopsy. The goal is helping our pathologists get the results out as quickly and safely as possible.

Let’s say for example we process a specimen from a mastectomy or lumpectomy, we’ll examine the tissue after we resect it to do a margin assessment. If we still see cancer at the edge of the tissue that was removed, it’s likely the tissue will continue to proliferate and grow. Margin assessment is important to diagnosis and prognosis. Also, the size and shape of the tumor helps determine how the cancer will be staged. Then we slice, dissect, and edit so we can put the specimens into cassettes. After we do that, we prepare the report for the pathologist, describing what we saw in our gross examination of the tumor, so they can read it as they look at the slides and go on to make their microscopic report.

Q What inspired you to pursue a career as a pathology assistant?

A I knew I wanted to do something in cancer care because I wanted to help people. When I was in high school, a friend’s mother worked in a hospital. She got me a summer job in the pathology lab there and it was just a good fit. So, when I went off to university, I decided to pursue this as a career.

Q What are some of the biggest challenges that you face?

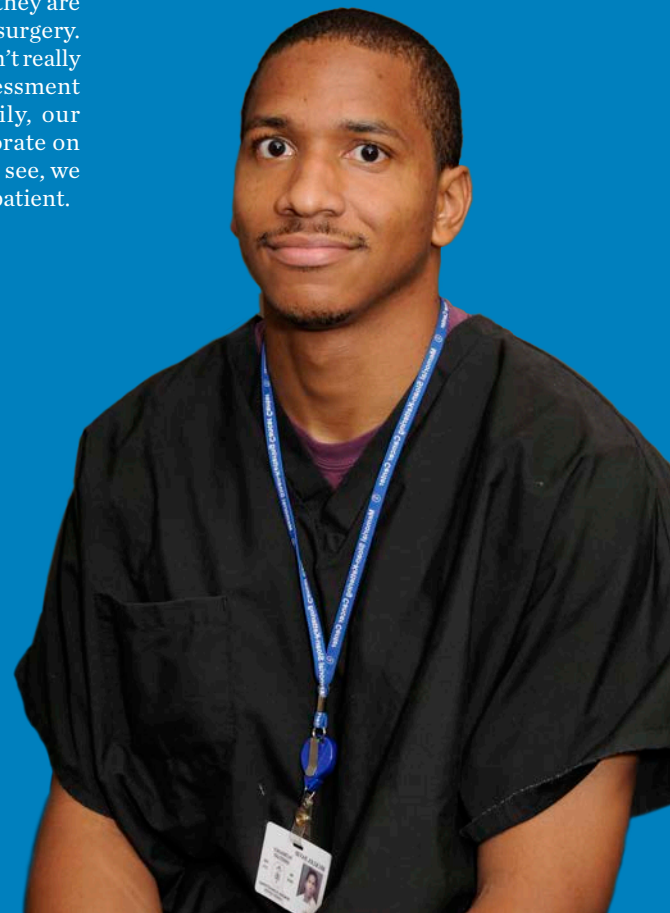
A We see a remarkable volume in specimens, to start. Our doctors do surgeries right here, of course, and we also have samples sent to us from other hospitals for our consult. We stay really busy with that.

That said, the biggest challenge is that there’s a level of complexity to some of the specimens we see here that you wouldn’t see at 99 percent of the hospitals around the country. The surgeons here do some very complex resections — sometimes they are doing once-in-a-lifetime kinds of surgery. We may get specimens that we haven’t really seen before, which makes our assessment that much more difficult. Luckily, our attendings come help and collaborate on those cases, so no matter what we see, we know we are doing our best for the patient.

Q What is your favorite thing about your job?

A I’ve been at Memorial Sloan Kettering Cancer Center (MSK) for nearly 10 years. It was my first job out of school and I’ve never felt the urge to leave because I love it so much here. If I had to pick one thing as a favorite it would probably be the people I work with. The people here just have such a passion for pathology and helping patients. It’s infectious. The attendings and pathologists know so much — yet they respect everyone in my lab. Most of the doctors we work with know all of us by name, which I don’t think happens at a lot of institutions.

There’s also a strong collaborative aspect to our work. If we have questions, the surgeons will come down and tell us, “This is what I saw in the surgery,” or “This is what we are looking for in this sample.” They always take such amazing care of their patients. Those kinds of interactions just set MSK apart from other places.



New Pathology Faculty



Marina Baine, MD, PhD
Instructor



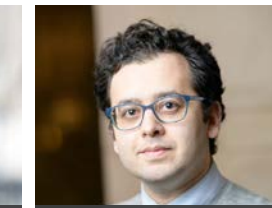
Umesh Bhanot, MD, PhD
Assistant Attending
Laboratorian



Jessica Chapman-Lim, PhD
Assistant Attending Mass
Spectrometrist



Konstantinos Linos, MD
Associate Attending



Amir Momeni-Boroujeni, MD
Assistant Attending Pathologist



Romel Somwar, PhD
Assistant Attending
Molecular Biologist



Amitabh Srivastava, MD, PhD
Attending Pathologist



Soo Ryum Yang, MD
Assistant Attending Pathologist

Faculty Promotions



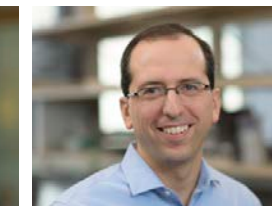
Narasimhan Agaram, MBBS
Attending Pathologist



Umut Aypar, PhD
Associate Attending
Cytogeneticist



Jamal Benhamida, MD
Assistant Attending Pathologist



Michael Berger, PhD
Attending Geneticist



Amanda Blouin, MD, PhD
Associate Attending Physician



Jason C. Chang, MD
Assistant Attending Pathologist



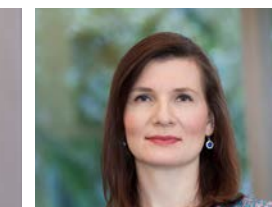
Matthew Hanna, MD
Assistant Attending Pathologist



M. Gabriela Kuba, MD
Assistant Attending Pathologist



Diana Mandelker, MD, PhD
Associate Attending Pathologist



Kseniya Petrova-Drus, MD
Assistant Attending Pathologist



Fresia Pareja, MD, PhD
Assistant Attending Pathologist



Filiz Sen, MD
Attending Pathologist



Bin Xu, MD, PhD
Associate Attending Molecular
Pathologist

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MSK Department of Pathology & Laboratory Medicine
@MSKPathology

We are pleased to announce the merger of our Departments of Pathology and Laboratory Medicine under the leadership of Acting Chair, Dr. Ahmet Dogan as a single department now named MSKCC Department of Pathology and Laboratory Medicine.

The new department will have 130 faculty, over 1,100 allied health and administrative staff and in 2022, is expected to perform over 5 million tests, etc.

Our combined efforts are a critical component of the exceptional care we provide to our patients @sloan_kettering. The new department will enhance our academic and educational programs, improve efficiencies, and streamline many of the functions we perform every day.



MSK Department of Pathology & Laboratory Medicine
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Welcoming the 2021-22 cohort of Oncologic Surgical Pathology & Subspecialty #pathology Fellows @MSKPathology - looking forward to working with you!



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@MSKPathology Grand Rounds with @DSolit "Defining the Actionable Genome" #MSKPathology #PathologyGrandRounds

The Department of Pathology Grand Rounds



Defining the Actionable Genome

Presented By
David Solit, MD
Attending Physician, Genitourinary Oncology Service
Director, Marie-Josée and Henry R. Krawis Center for Molecular Oncology
Member, Human Oncology and Pathogenesis Program
Geoffrey Beene Chair
Memorial Sloan Kettering Cancer Center


Tuesday, Dec 7, 2021 | 11:30am
An invite to a virtual meeting will be sent separately.

Moderator
Hikmat Al-Ahmadie, MD
Department of Pathology Grand Rounds Organizers
Natasha Rekhtman, MD, PhD and Hikmat Al-Ahmadie, MD




MSK Department of Pathology & Laboratory Medicine
@MSKPathology

Do you have a passion for lab medicine or pathology? Do you want to play a key role in redefining the future of cancer care? Join us on 11/10 @5pm for an interactive panel discussion with LM & @MSKPathology to explore how you can make a difference @MSK <http://bit.ly/3000U8D>




Exciting Job Opportunities Available in Lab Medicine & Pathology



MSK Department of Pathology & Laboratory Medicine
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IDEA (Inclusion, Diversity, Equity & Advocacy) Special Seminar with @NarjustDumaMD under the direction of Dr. Tejus Bale "Two Tales, One Goal: Equity" #IDEA #MSKPathologyLabMed

MSK Department of Pathology & Laboratory Medicine Special Seminar




Two Tales, One Goal: Equity

Presented By
Narjust Duma, MD
Physician, Medical Oncology
Associate Director, Cancer Care Equity Program
Dana-Farber Cancer Institute

Moderator: Tejus Bale, MD, PhD

IDEA
INCLUSION
DIVERSITY
EQUITY & ADVOCACY

Tuesday, Feb 1 | 11:30am
An invite to a virtual meeting will be sent separately.



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Congrats to the 10 most prolific @sloan_kettering authors from the past year! @DrMiguelPerales @alexdrilo @sgiralbtmdoc @aburustummd @EileenMOReilly @MarkRobsonMD @motzerm @MLadanyi

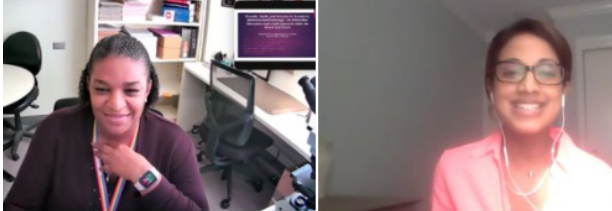

Top Authors

The top 10 prolific authors of 2020 (based on total # of 2020 publications), include:

 Jorge S. Reis-Filho, MD, PhD, FRCPath Pathologist, Chief, Experimental Pathology Service 83 publications	 Nadeem R. Abu-Rustum, MD, FACOG, FACS Surgeon, Chief, Gynecology Service; Vice Chair for Technology Development, Department of Surgery; Avron Chair in Gynecologic Oncology 72 publications
 Miguel-Angel Perales, MD Medical Oncologist, Chief, Adult Bone Marrow Transplant Service 82 publications	 Eileen O'Reilly, MD Medical Oncologist, Winthrop Rockefeller Endowed Chair in Medical Oncology; Co-Director, Medical Initiatives, David M. Rubenstein Center for Pancreatic Cancer Research; Section Head, Hepatopancreatobiliary & Neuroendocrine Cancers 69 publications
 Alexander Drilon, MD Medical Oncologist, Chief, Early Drug Development 80 publications	 Mark E. Robson, MD Medical Oncologist, Chief, Breast Medicine Service 65 publications
 Britta Weigelt, PhD Research Scientist, Director, Gynecology DMT Research Laboratory 76 publications	 Robert J. Motzer, MD Medical Oncologist, Kidney Cancer Section Head, Genitourinary Oncology Service; Jack and Dorothy Byrne Chair in Clinical Oncology 64 publications
 Sergio A. Giralt, MD Hematologic Oncologist, Deputy Division Head, Division of Hematologic Malignancies; Melvin Berlin Family Chair in Multiple Myeloma 75 publications	 Marc Ladanyi, MD Pathologist, Chief, Molecular Diagnostics Service; William J. Rouse Chair in Molecular Oncology 63 publications

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Privileged to be hearing from Dr. Carla Ellis @theglasspushe at @MSKPathology sharing her perspective on Diversity Equity & Inclusion #pathology - hosted by Dr. Tejus Bale, our inaugural Director of #IDEA (Inclusion, Diversity, Equity, Advocacy)

MSK Department of Pathology & Laboratory Medicine
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Today's @MSKPathology #GrandRounds lecture "Beyond Hashtags: Leveraging Social Media for Academics" with @Sara_Jiang (Moderator: @rovingatuscap) #MSKPathology #PathologyGrandRounds

The Department of Pathology Grand Rounds



Beyond Hashtags: Leveraging Social Media for Academics

Presented By
Xiaoyin Jiang, MD
Associate Professor of Pathology
Chief, Head and Neck Service
Director, Duke Pathology Communications Group
Duke University Medical Center

Tuesday, Oct 12, 2021 | 11:30am
An invite to a virtual meeting will be sent separately.

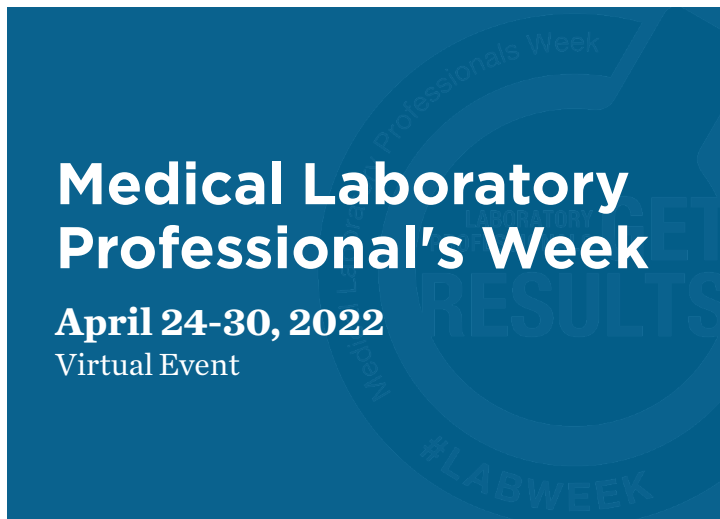
Moderator
Samson Fine, MD
Department of Pathology Grand Rounds Organizers
Natasha Rekhtman, MD, PhD and Hikmat Al-Ahmadie, MD





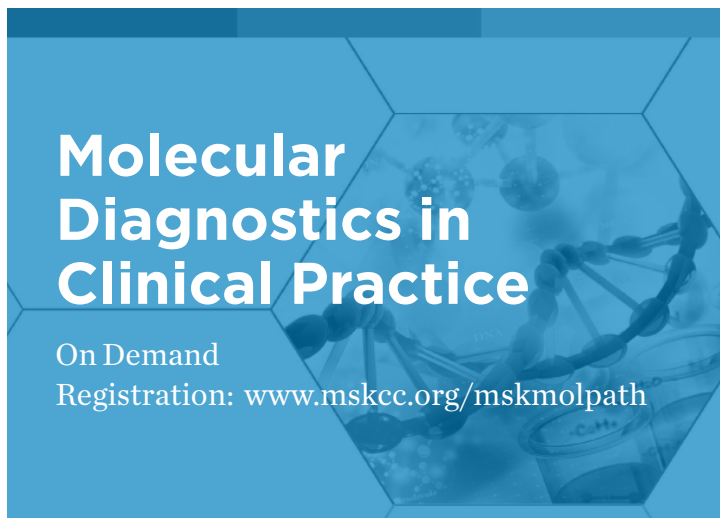
The Pathology of Neoplastic Diseases

May 2-6, 2022
Virtual Event
www.mskcc.org/neoplasticdiseases2022



Medical Laboratory Professionals' Week

April 24-30, 2022
Virtual Event



Molecular Diagnostics in Clinical Practice

On Demand
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Inquiries about *The MSK Pathology & Laboratory Medicine Review* should be addressed to:
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Attn: Sarah Virgo
1275 York Avenue
Department of Pathology, H-504
New York, NY 10065

212.639.5696
cooks@mskcc.org
www.mskcc.org/departments/pathology

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