

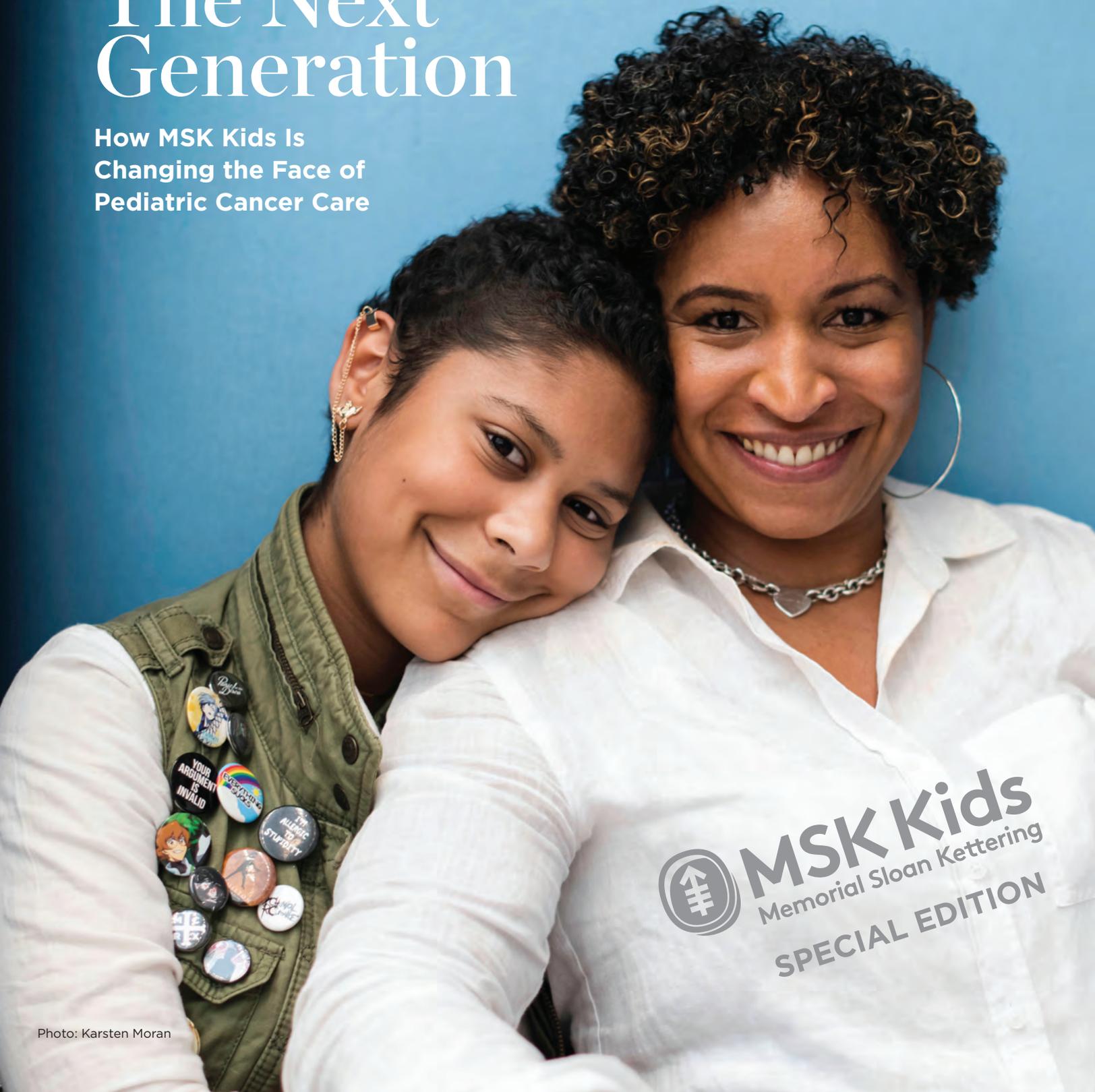
MSKNews

FALL 2019

MEMORIAL SLOAN KETTERING CANCER CENTER

The Next Generation

How MSK Kids Is Changing the Face of Pediatric Cancer Care



 **MSK Kids**
Memorial Sloan Kettering
SPECIAL EDITION



The graduates celebrate. Photo: Rick DeWitt

Grads Seize the Day at Pediatric Convocation

By Meredith Begley and Ann Marie Sanchez

MSK's Class of 2019 was feted on June 6 at the 13th annual Pediatric Convocation, which recognizes current and former MSK Kids patients who are graduating from high school. The event is a happy reunion for families and care teams, and a time to look ahead to all that awaits MSK's graduating class.

This year's convocation was attended by 37 graduates and their families. Paul Meyers, Vice Chair for Clinical Affairs and Chief of the Sarcoma Service, emceed.

Mary Maher, principal of the New York City Department of Education's Hospital Schools Program, was on hand to present an award to each student for their dedication to academics, sports, service, and other interests.

In his keynote address, MSK President and Chief Executive Officer Craig B. Thompson encouraged graduates to take risks and not fear failure in their years ahead.

Finally, Nina Pickett, Senior Director of Pediatrics, recognized the teachers who instruct children of all ages at MSK Kids. She thanked them for their devotion to their students and their flexibility in teaching under unique circumstances.

After processing out of the auditorium to "Pomp and Circumstance," the graduates celebrated with a luncheon and spent time catching up with familiar faces. •

New York Yankees Partnership Is a Home Run

By Meredith Begley and Ann Marie Sanchez

Talk about a winning combo: Since 2006, the New York Yankees and MSK Kids have teamed up to strike out childhood cancer — and have some fun too. MSK Kids patients and their families have been treated to a personalized Bronx Bombers experience at every home game this season. Fans can buy T-shirts and make direct donations year-round through the Yankees Universe Fund, which raises money to provide MSK Kids with critical funding for the development of treatment advances in childhood cancer care. •



From left: MSK fans at Yankee Stadium; Yankee star Aaron Judge (left) with a supporter. Photos: Courtesy of the New York Yankees



MSK Kids Chair Andrew Kung speaks at the festivities as children take center stage during the day's events. Photos: Rick DeWitt

Kids Walk for MSK Kids: Raising Funds for Pediatric Cancer Research

By Meredith Begley and Ann Marie Sanchez

In 2001, Sophie and her classmates founded Kids Walk for MSK Kids to raise money for neuroblastoma research at Memorial Sloan Kettering, where her younger brother, Simon, was undergoing treatment for the disease. Today, Simon is cancer free and pursuing a PhD, and the event created in his honor is still going strong. On May 4, more than 3,000 patients, families, students, and other supporters participated in the 19th Kids Walk in Central Park.

Only 4 percent of federal cancer funding goes to pediatric cancer research. To address this gap, 100 percent of every dollar raised from Kids Walk directly supports pediatric cancer research at MSK Kids. In 2019, the 1.5-mile walk raised more than \$1 million, bringing the total raised by Kids Walk to \$7 million since 2001, with more than \$4 million raised in the last four years. These funds provide MSK Kids researchers and doctors with the resources they need to improve the lives of children with cancer and make life-changing discoveries.

Andrew Kung, Chair of MSK Kids, says, "Kids Walk is a special event in that it features kids raising money to support other young people with cancer. With these donations, MSK Kids has uncovered new treatments, giving hope to children and their families."

Thanks in part to donations from Kids Walk over the years, MSK Kids has developed treatment strategies that have changed outcomes for advanced neuroblastoma. Children with this cancer once had a survival rate below 5 percent. It is now nearly 50 percent.

As the largest pediatric oncology program in the nation, MSK Kids treats more children and young adults with cancer than any other hospital in the United States. For over a century, MSK has led the crusade in research and patient care for children with all types of the disease, from the most common to the rarest. Kids Walk has also supported two clinical trials for leukemia. Without the funding that participants and donors provide through Kids Walk, these initiatives might not be possible. •



DEAR READERS,

Like every child, teen, and young adult in the MSK Kids community, this issue of *MSK News*, dedicated to our youngest patients, is unique.

This special edition is a testament to the resilience of our patients and their families, the tenacity and dogged focus of our researchers, and the unwavering commitment of our dedicated doctors, nurses, and staff.

These are the stories of the people behind MSK Kids, the nation's largest pediatric oncology program.

We hope you come away feeling as inspired by what you read here as we were while putting the issue together. Please let us know what you think at publicaffairs@mskcc.org.

—The MSK News Editorial Team

ON THE COVER

By Meredith Begley

When 12-year-old Bryana's knee started hurting last year, her family doctor thought it was just growing pains. But an MRI revealed something far worse: osteosarcoma, a rare bone cancer that tends to affect children, teens, and young adults. After meeting a specialist near their home in Florida, Bryana's mother decided to take her to New York City, where they used to live.

"I knew MSK," says Bryana's mom, Myrna. "There was no question."

At MSK, Bryana and Myrna met orthopedic surgeon Daniel Prince, who specializes in bone regeneration in children. "After we met Dr. Prince, I immediately said, 'Mommy, I want to get treated here,'" Bryana recalls. "This didn't feel like a hospital, and I didn't feel scared."

Bryana underwent 29 rounds of chemotherapy under the care of pediatric oncologists Paul Meyers and Leonard Wexler, who are specialists in sarcoma.

She has had two surgeries, during which Dr. Prince was able to successfully remove the remaining tumor. Despite numerous hospitalizations, she maintained a positive attitude throughout, relying on a personal mantra to get her through. "My blood counts might be low, but my spirits are high," she says. Following a summer vacation to Japan, Bryana is back at school and in her normal routine. She has no evidence of disease. •



Bryana and her mom at MSK, and (bottom left) with surgeon Daniel Prince. Photos: Karsten Moran

“Rather than normal cells becoming cancerous because of random mutations, *PGBD5* itself produces the mutations and turns cells malignant. It suggested a whole new category of human cancers that result from the process.”

—Alex Kentsis



Alex Kentsis has shed important light on the process by which an abnormally active gene can trigger the development of pediatric cancers. Photos: Rick DeWitt

CRACKING THE CODE OF CHILDHOOD CANCERS

By Jim Stallard

When cancer strikes a child, the fates seem especially cruel. After all, cancer is typically seen as a disease of aging. A person's risk rises through the years as genetic mutations pile up due to DNA copying mistakes when cells divide or exposure to environmental factors. Researchers have long been confounded by why tumors develop in children, who presumably haven't lived long enough to accumulate these mutations.

Memorial Sloan Kettering cancer biologist and pediatric oncologist Alex Kentsis has spent most of his career looking for an answer to why children get cancer. In the past few years, his Sloan Kettering Institute laboratory has begun to unravel the mystery.

In 2017, Dr. Kentsis's team made a major discovery: A gene called *PGBD5* can become abnormally activated in children, unleashing mayhem in various cell types. The protein made by *PGBD5* snips DNA segments and flips them to a different location, which can drastically alter normal gene function and trigger cancer.

"This discovery explained a long-standing conundrum as to how pediatric cancers develop," Dr. Kentsis says. "Rather than normal cells becoming cancerous because of random mutations, *PGBD5* itself produces the mutations and turns cells malignant. It suggested a whole new category of human cancers that result from the process."



Research by Alex Kentsis and Michael Ortiz (right) could help pave the way for treatments of such childhood cancers as rhabdoid tumor and Wilms' tumor. Photo: Kreg Holt

Jumping Genes

The PGBD5 protein is a DNA transposase, a type of enzyme that organisms use to rearrange segments of DNA. Called transposons or "jumping genes," these pieces of mobile DNA move from one site on a chromosome to another. (For an example, look at corn. When transposons alter pigment-controlling genes, varying colors of kernels appear on a single ear. The discovery of transposons was recognized with a Nobel Prize.)

For decades, researchers thought that transposons did not play much of a role in how human cells function; they were considered remnants of evolution. But beginning in 2015, Dr. Kentsis's team led research revealing that PGBD5 could cut and paste DNA in human cells. These genetic rearrangements were especially prominent in human rhabdoid tumors, a rare, aggressive childhood cancer that

affects soft tissue in the kidneys, liver, and brain.

"Despite years of intense laboratory studies of childhood tumors, this was a new cause of mutations that the scientific world had missed," says Andrew Kung, Chair of MSK Kids. "It represented a major advance in understanding human cancer in general and pediatric tumors in particular."

An Inviting Drug Target

PGBD5's means of creating genomic havoc suggests a therapeutic strategy for targeting the cancer cells it creates. For a cell to survive, it must use special proteins to fix breaks in the DNA. In a cancer cell, a transposase, such as PGBD5, creates so many DNA breaks that the cell is especially dependent on these proteins.

Dr. Kentsis's team reported that recently developed drugs could kill PGBD5-producing tumor cells by interfering with the cells' DNA repair system. As a result, the cancer cells become overwhelmed by DNA damage and self-destruct.

In the future, children with cancer could potentially have their tumors analyzed to see whether they make the PGBD5 protein and, if so, receive these targeted inhibitors. This treatment strategy has already emerged as a promising way to treat other cancers. Drugs called PARP inhibitors appear to be effective in women with breast or ovarian cancers that have mutations in BRCA genes, which also regulate DNA repair.

"This has implications for people with a wide range of cancers that make PGBD5," Dr. Kentsis says.

A Reliable Biomarker for Wilms' Tumors

The discovery of PGBD5's role in childhood cancers occurred somewhat by chance. A decade ago, Dr. Kentsis began a collaboration with Elizabeth Mullen of the Dana-Farber Cancer Institute and

Hanno Steen of Boston Children's Hospital. The researchers were looking for a molecular indicator, or biomarker, that would make it possible to identify children whose cancers would resist treatment. They collected urine from children with various kidney tumors and from healthy children.

The team analyzed thousands of proteins and looked for ones in the urine associated with certain tumors. Early in the project, the PGBD5 protein stood out as a biomarker for kidney rhabdoid tumors, which led to the jumping genes discovery.

Researchers then realized that a protein called prohibitin was linked to treatment resistance in Wilms' tumor, the most common type of kidney cancer in children. Almost 90 percent of children with this cancer can be cured with a combination of surgery, chemotherapy, and radiation. The team found that prohibitin was present at high levels in children whose Wilms' tumor returned after surgery and chemotherapy.

Michael Ortiz, an MSK Kids clinical investigator and pediatric oncologist, confirmed through laboratory experiments that prohibitin is high in Wilms' tumor cells. It is even higher in children with advanced disease. "Prohibitin is required for the survival and growth of cancer cells in response to chemotherapy," Dr. Kentsis says. "Normally, chemotherapy kills the tumor cells, but high levels of prohibitin enable them to survive."

Prohibitin is also found in high levels in a variety of other solid tumors, including neuroblastoma. Based on these findings, Dr. Kentsis thinks drugs that target prohibitin are expected to help people with Wilms' tumor, neuroblastoma, and other cancers that persist despite treatment.

"Research like this will allow us to devise new therapeutic strategies to eliminate toxic chemotherapy for children who won't benefit and to overcome treatment resistance in children for whom current therapy is not sufficient to cure," Dr. Kentsis says. •

"Despite years of intense laboratory studies of childhood tumors, [PGBD5] was a new cause of mutations that the scientific world had missed. It represented a major advance in understanding human cancer in general and pediatric tumors in particular."

—Andrew Kung



In 2016, then 3-year-old Caroline was diagnosed with stage IV Wilms' tumors in both kidneys. She was treated by a team of MSK Kids specialists, and today, the cancer is in remission. She and her family — including big brother Andy, mom Debbie, and dad Kevin — have raised more than \$200,000 to support the work of MSK Kids oncologist Michael Ortiz, who is working to develop better ways to diagnose and treat Wilms' tumor. •

Photo: Karsten Moran

Inside MSK Kids: Jonathan's Journal

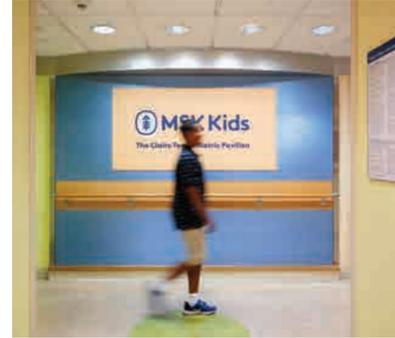
By Jonathan, Age 13

Hi! My name's Jonathan. I'm from New York, and I'm in eighth grade. I love traveling with my family, snorkeling, and building Lego cars.

When I was 9, I found out I had leukemia. When my parents took me to MSK Kids, I was scared. Treatment was really hard, but everyone I met made me feel like they had my back.

For two years, I spent a lot of time on the ninth floor in the Pediatric Ambulatory Care Center, getting chemotherapy and other kinds of treatments. Sometimes I got really sick and I had to stay in the hospital overnight.

Now, I come back to MSK Kids every few months for checkups. A photographer tagged along during my most recent visit so you could meet some of the awesome people who take care of me.



▲ This is my nurse practitioner, Joe. He was one of the first people I met when I came to MSK Kids. He always helped me during my treatment days and made sure I was getting what I needed. Now, I see him for regular checkups, when he takes my blood pressure, listens to my heart, and tells me about my test results. After that, we like to swap traveling stories.



▲ The first person I see when I get to the ninth floor is Matt. He greets everyone and helps me get my appointment started.



▲ This is the MSK Kids fish tank. You can't miss it! There are lots of cool things on the ninth floor for kids to see and do while they're here.



▲ This is Robin. He's a mind body therapist. He taught me martial arts, tai chi, and meditation to help keep me calm during treatment. My favorite meditation was when we took a "trip" to the beach.



▲ People like Caitlin and the rest of the IV room staff were there for me when I was getting chemo, so I stop by for a high five.



▲ Dr. Steinherz was in charge of my treatment and made sure I got what I needed to get rid of my leukemia.

◀ At MSK Kids, you see the same nurses the whole time you're here, so you can get to know one another. I've known Paige for four years now. I have to give her a hug. She's awesome!



▲ Say cheese!

◀ This is my friend Jess. Playing Legos with her helped me get through my chemo treatments. She even brought me my favorite Lego sets to help cheer me up when I was sick in the hospital. Jess is a child life specialist. Her job is to help kids get used to being in the hospital. She also gets to plan fun stuff for kids and families to do.



Photos: Karsten Moran

A TO Z

Check out some of the many offerings available to young patients and their families at MSK Kids.

By Meredith Begley

A IS FOR ARRAY OF EXPERTS

MSK Kids has specialists in a variety of fields — including radiation oncology, physical and occupational therapy, and radiology — working alongside primary teams to provide the most expert care.



B IS FOR BINGO NIGHT

Every Monday and Wednesday, youngsters and their siblings can get together for an evening of play and prizes.



C IS FOR CHILD LIFE

Our specialists help young patients and their families develop strategies for coping with and adjusting to treatment.



D IS FOR DIAGNOSTICS

MSK uses the most-advanced techniques and tools to ensure that patients receive accurate and up-to-date information about their disease.



E IS FOR EDUCATION

As part of the New York City Department of Education's Hospital Schools Program, full-time teachers are available in the Pediatric Ambulatory Care Center or at the bedside for students in pre-K through high school.



F IS FOR FRIDAY NIGHT CANDY CART

A beloved tradition since 1989, the cart brings joy to children staying overnight in the hospital.



G IS FOR GIANT FISH TANK

Step off the ninth floor into MSK Kids and one of the first things you'll see is the 162-gallon fish tank, where residents Nemo and Dory are often seen swimming around.



H IS FOR HOLIDAY PARTIES

With support from The Society of MSK and other generous donors, MSK Kids celebrates special days of the year, including Valentine's Day, Mardi Gras, the Fourth of July, Halloween, and more.



I IS FOR INTEGRATIVE MEDICINE

Our unique Integrative Medicine Service offers kid-friendly yoga, creative movement, music therapy, karate, and more to complement traditional medical care.



J IS FOR JUGGLERS

Members of Healthy Humor visit MSK Kids three times a week to clown around with the children.



K IS FOR KIDS BEING KIDS

The abundance of programming at MSK Kids allows young people to retain a sense of normalcy during their time in the hospital.



L IS FOR LONG-TERM FOLLOW-UP

A team of dedicated experts in survivorship is committed to helping pediatric cancer survivors maintain the highest possible level of health and manage any needs.



M IS FOR MEDICAL PLAY

A miniature operating room, lifelike puppets, and doll-size medical equipment help younger kids become familiar with the hospital environment.



N IS FOR NURSES

At MSK Kids, our award-winning nurses know the little details that make each child an individual: their favorite flavor of juice, for example, or the artists on their latest playlist.



O IS FOR OUTPATIENT CARE

More than 90 percent of the care delivered at MSK Kids is done on an outpatient basis, so kids can spend more time out of the hospital.



P IS FOR PSYCHOSOCIAL CARE

Our robust psychosocial care team includes psychologists, psychiatrists, social workers, chaplains, physical and occupational therapists, child life specialists, and teachers.



Q IS FOR QUICK SCHEDULING

A cancer diagnosis can turn a parent's world upside down. Our experts aim to schedule an initial appointment within 24 hours of a family's first call to MSK Kids.



R IS FOR RESEARCH

The collaboration between our doctors and researchers means that young patients can benefit from the latest advances in cancer care, many of which were developed across the street in our research labs.



S IS FOR SUPPORTIVE CARE

Our pain and palliative care program staff works hard to make children, teens, and young adults as comfortable as possible while they're under our care.



T IS FOR TYA@MSK

The diagnosis and treatment experience of teens and young adults is unique. Our Teen and Young Adult Program (TYA@MSK) offers services to decrease isolation, improve connections among peers, and address psychological and social needs.



U IS FOR UNPARALLELED EXPERTISE

Our team of experts, made up of people across a variety of specialties, is world-renowned in treating all pediatric cancers, from the most common to the most complex.



V IS FOR VOLUNTEERS

More than 100 volunteers come through MSK Kids each week, offering respite for caregivers and assistance with group activities.

W IS FOR WHOLE-GENOME SEQUENCING

It's one of the ways that MSK Kids understands and targets tumors with more-effective treatments.



X IS FOR X-TRA SPECIAL SIBLING PROGRAMS

The Specially Important Brothers and Sisters program ensures that the siblings of young patients are recognized, valued, and cared for.



Y IS FOR YEARLY CELEBRATIONS

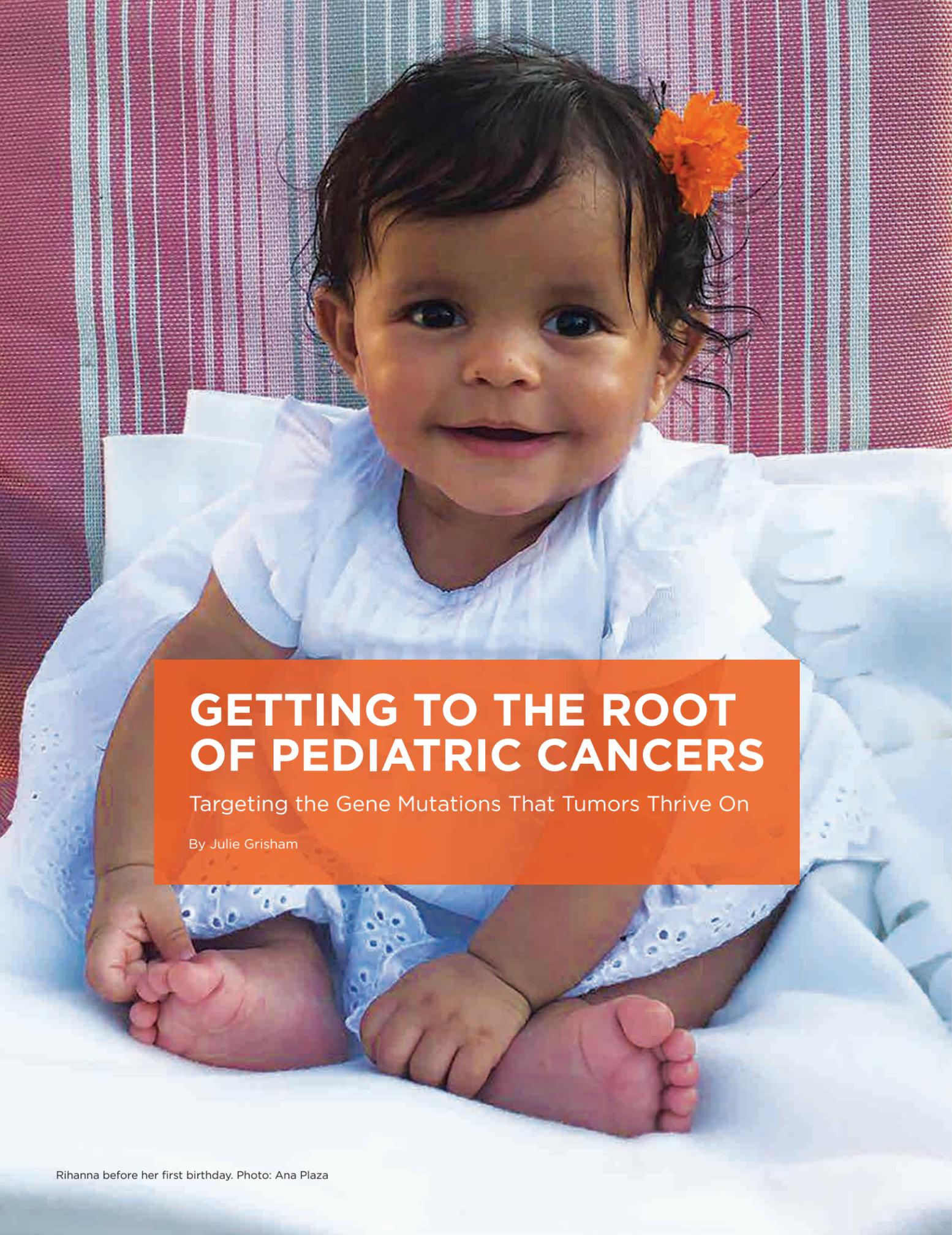
During MSK's annual talent show, children and staffers wow the crowd. At Pediatric Prom, kids of all ages don their finest for a fancy party.



Z IS FOR ZOOM

Little ones about to have surgery can ride into the operating room in style on remote-control cars.





GETTING TO THE ROOT OF PEDIATRIC CANCERS

Targeting the Gene Mutations That Tumors Thrive On

By Julie Grisham

Rihanna before her first birthday. Photo: Ana Plaza

Rihanna was born with a tumor on her upper right arm almost as large as her head. After chemotherapy failed to shrink it, her parents brought her to Memorial Sloan Kettering, hoping for a different outcome. “MSK’s doctors gave me a sense of confidence that they knew what they were doing,” says Rihanna’s mother, Ana.

And the MSK team delivered: They determined that Rihanna’s cancer was caused by a mutation in a gene called *NTRK* and focused her care plan on attacking the cancer-driving effects of that mutation.

At the time, MSK Kids pediatric oncologist Neerav “Neal” Shukla was leading a clinical trial for larotrectinib (Vitrakvi®), a drug that specifically targets *NTRK*. Within days of starting Rihanna on larotrectinib, the tumor began to shrink. Five months later, the remaining tumor was removed, allowing Rihanna to have full function of her arm. Now 2, she has shown no sign of the disease. “She is a happy, healthy toddler,” Ana says.

Rihanna’s story illustrates the power of precision medicine. This practice is grounded in uncovering the genetic changes that drive a tumor’s growth and then finding the best drugs to stop them. Over the past two decades, precision medicine has helped many adults with cancer, leading to dozens of more effective, less toxic drugs for cancers of the lung, colon, breast, and more.

But the progress has been slower for children. MSK Kids is changing that:



Above: Neerav “Neal” Shukla is Director of the Pediatric Translational Medicine Program. Photo: Karsten Moran. Right: Dr. Shukla with Rihanna and her mother, Ana. Photo: Ana Plaza

A major effort is underway to fully deliver on the promise of precision medicine for our youngest patients.

Successfully treating one child, like Rihanna, can do a lot to accelerate drug development to help many more kids. The trial she participated in resulted in the simultaneous approval of larotrectinib for both children and adults with *NTRK*-driven tumors. In the past, children often had to wait until after a drug was approved in adults before pediatric trials were launched.



Above: MSK Kids Chair Andrew Kung. Photo: Rick DeWitt

“As the largest pediatric oncology program in the world, we are well-positioned to deliver on the promise of precision medicine and to learn from every child who we have the privilege of caring for.”

—Andrew Kung



Pediatric oncologist Julia Glade Bender is part of the Pediatric Translational Medicine Program. Photo: Karsten Moran

Making Progress in the Lab

These efforts are guided by MSK's Pediatric Translational Medicine Program (PTMP), which is led by Dr. Shukla. The PTMP is involved in genomically characterizing patients' tumors as well as developing new therapies. Through this



Nancy Bouvier, a research project manager, with pediatric oncologist Filemon Dela Cruz, a member of the Pediatric Translational Medicine Program. Photo: Karsten Moran

program, all children cared for at MSK are offered comprehensive tumor testing.

Being able to deliver therapies to the right target requires identifying the root cause of each tumor. This interdisciplinary approach is being spearheaded by geneticist Elli Papaemmanuil and her team of data scientists.

"We want to understand the genomic drivers of cancer in children, identify the key targets, and understand which patients will respond to targeted therapies. In this way, we can develop a treatment approach that is patient tailored and data driven," Dr. Papaemmanuil explains.

Her lab has performed in-depth analyses on tumors from more than 120 children treated at MSK. "Our preliminary data have opened our eyes to the diversity and complexity of pediatric cancers," she says.

"We have developed and optimized the processes required to deliver tumor analyses quickly enough to benefit patients," she adds. "We have shown that this is possible."

How Research Translates to Treatment

Part two of precision medicine is developing drugs that can potentially target the changes driving children's tumors. Once a tumor has been characterized, members of the PTMP's clinical research team take over and start working on treatments matched to changes in the cancer genome.



Geneticist and data scientist Elli Papaemmanuil. Photo: Michael Prince

"Our preliminary data have opened our eyes to the diversity and complexity of pediatric cancers."

—Elli Papaemmanuil

Doctors, molecular pathologists, and data and laboratory scientists work together to make treatment decisions based on what they've already learned about the underpinnings of pediatric tumors.

If a child appears to be a good candidate for a treatment matched to a genetic change in their tumor, the next challenge is gaining access to the drug. The best option is to enroll the child in an ongoing clinical trial. This is what happened with Rihanna.

"We aim to have a clinical trial available for every patient, but even common mutations are present in only 1 or 2 percent of pediatric cancers," says Julia Glade Bender, a pediatric oncologist who is part of the PTMP. "Doing a clinical trial for every genomic abnormality that we find is just not feasible."

For rarer mutations, a more specialized approach may be needed. "This is when we develop a single-patient use [SPU] treatment plan," Dr. Glade Bender says. These compassionate-use plans require tremendous



Pediatric oncologist Kim Kramer (left) with researcher Nai-Kong Cheung. Photo: Rick DeWitt

Addressing an Urgent Need with Science

When MSK researcher Nai-Kong Cheung developed a drug called omburtamab in his laboratory, his work filled a need for better therapies to treat neuroblastoma when it spreads to the brain, previously an incurable disease.

Omburtamab, an antibody linked to a radioactive isotope that seeks out cancer cells, delivers a big dose of radiation while sparing healthy cells. MSK pediatric oncologist Kim Kramer is excited about what this drug could mean for her young patients. "It has the potential to have tremendous impact not only on neuroblastoma but on other cancers that express the protein that omburtamab targets," she says.

Dr. Kramer has enrolled dozens of patients in her ongoing international clinical trial for omburtamab, which was given a Breakthrough Therapy Designation from the US Food and Drug Administration in June 2017.

"We understand how urgently these new drugs are needed," Dr. Kramer says.

Dr. Cheung is also working on another drug for neuroblastoma called naxitamab, which received the FDA's Breakthrough Therapy Designation in 2018. Of his team's commitment to developing new drugs for pediatric cancers, he asks, "If we don't take on this challenge, who will?"

In another area, MSK medical oncologist Renier Brentjens is collaborating with MSK Kids Chair Andrew Kung to develop engineered chimeric antigen receptor T cell therapies for osteosarcoma, a type of bone cancer. "We are optimistic that this approach will address the tremendous challenges these patients face," Dr. Kung says. •

resources, including finding a company willing to supply a drug and getting permission from the US Food and Drug Administration to administer it. It can be a lengthy and labor-intensive process.

"We anticipate that many of the drugs we test in individual patients can eventually benefit a greater number of children with cancer," says Dr. Glade Bender. So far, at least five drugs first given as SPUs at MSK Kids have progressed into pediatric clinical trials.

MSK's efforts to develop drugs for kids go beyond the doctors and

scientists who specialize in pediatrics. For example, clinical trials developed by MSK's Early Drug Development Service can now include children as young as 12. (Previously, the age requirement was 18, as it is for most clinical trials.)

"As the largest pediatric oncology program in the world, we are well-positioned to deliver on the promise of precision medicine and to learn from every child who we have the privilege of caring for," says MSK Kids Chair Andrew Kung. •

THE SOCIETY WELCOMES A NEW PRESIDENT



Kate Allen was named the 37th Society President in May. Born and raised in Austin and a graduate of the University of Virginia, Mrs. Allen has lived in New York City for 24 years. Her involvement with The Society of MSK began on the Associates Committee. During eight years of service, she co-chaired the Bunny Hop, the Antique Show (now known as TEFAF), and The Society Campaign, finally serving as Vice Chair of Membership. Upon moving to the Administrative Board, she co-chaired the Spring Ball and served on the Executive Committee as Secretary from 2017 to 2019. Mrs. Allen is active on the board of her summer church in Maine, Christ Church Dark Harbor, and regularly volunteers at her children's schools. She and her husband, Chris, have two children, Katie, 14, and Dillon, 11. •



Medical oncologist Santosh Vardhana, one of the 2019 Scholars Prize recipients, with his family

SUPPORTING TALENTED RESEARCHERS WHO ARE NEW PARENTS

Established in 2016 and first awarded in 2017, The Society Scholars Prize honors postdocs performing at the highest levels who are also managing familial obligations and adjusting to being new parents. The merit-based prize is awarded annually to at least ten full-time postdoc researchers. It provides a cash award of up to \$1,250 per year for up to four years. •



MSK Kids Chair Andrew Kung and 2019 Society Prize winner Kevin Shannon. Photo: Rick DeWitt

PRIZE RECOGNIZES CONTRIBUTIONS TO THE FIELD OF PEDIATRIC ONCOLOGY

The Society of Memorial Sloan Kettering Prize is given annually to recognize an individual who has made significant or groundbreaking contributions to the field of pediatric oncology. The 2019 award was given to Kevin Shannon, a professor in the department of pediatrics at the University of California, San Francisco. His research into RASopathies, a group of rare genetic conditions, has advanced the understanding of the causes of and treatments for various childhood and adult cancers. Dr. Shannon has also played a key role in training several leaders in the field. He currently serves on the External Advisory Board of MSK's Human Oncology and Pathogenesis Program. He has served on the National Cancer Institute's Board of Scientific Advisors, the Pediatric Cancer Working Group for the NCI's Cancer Moonshot Initiative, and the American Cancer Society's Council for Extramural Grants. •

The Society of Memorial Sloan Kettering, founded in 1946, is a volunteer-led organization within MSK dedicated to promoting the well-being of patients, supporting cancer research, and providing public education on the early prevention, detection, and treatment of cancer.

MSKInterview



8 Questions with J. J. Boelens

By Meredith Begley

Photo: Rick DeWitt

Jaap-Jan "J. J." Boelens joined MSK Kids in 2018 as Chief of the Stem Cell Transplantation and Cell Therapy Service. For this very special edition of *MSK News*, some of our MSK Kids patients asked him the questions they were most curious about.

JAMES, AGE 4: You're a new doctor here at MSK Kids. Where did you come from?

I moved from the Netherlands last August with my wife and my three girls, ages 17, 14, and 7, plus our two cats and our horse. It was not easy to move the whole family, but they were all excited to take this step. The Netherlands is pretty small, and we were looking for some adventure.

JULIA, AGE 13: Why did you come to MSK Kids?

Coming here was an opportunity for me to give kids treatments that could give them a second life — a very long second life, like six or seven decades. It's giving them their whole life back after they have been so sick. It is very gratifying.

EMILY, AGE 11: Your shirts are really cool! How do you pick them?

That's a very important question, Emily! They need to be a little bit colorful, and they need to be a certain motif or theme. They are usually by a couple of designers who have shops on the Internet. My

favorite depends on the day, my mood, the weather, the season, deadlines, how busy I am — it all factors in!

NAOMI, AGE 18: What are you studying?

That's a big question with a long answer, Naomi. I have been studying bone marrow transplants (BMTs) for the past 15 years. I noticed that in general, the process wasn't standard from start to finish. So I started to analyze how the chemotherapy and immunotherapy we gave before a transplant affected how the immune system rebuilt itself afterward. We looked at everything — the drugs and the dose, and how much of the drugs were in the blood — and then asked how all of that related to survival outcomes in each patient. The blood levels of the drug in the body after we administer the medication — what we call drug exposure — is a really good way to predict a child's response to treatment. After we adjusted the dose based on weight and other variables, and started measuring the actual drug levels in the body, we figured out how to get to a consistent drug exposure for everyone. The result was that

we could better predict the rebuilding of the immune system after transplant. Plus, it increased survival chances and there were fewer dangerous side effects for the child.

LUCY, AGE 12: What is different about getting a transplant at MSK?

Over the past ten years we have made major progress in making BMTs safer and more effective for children. At MSK Kids, half of the BMTs we do are for diseases that aren't cancer, so gene therapy is going to be a big game changer.

Here's how it works, Lucy: We take a child's own stem cells, modify them outside the body, and then give the child their gene-corrected cells back after chemotherapy. Because we are using a kid's own cells, there is no risk of graft-versus-host disease, which is when the new cells attack the body. I predict that gene therapy will be available for most noncancerous blood diseases in five to ten years. We already have access to gene therapy for some diseases in clinical trials here at MSK Kids. We also have chimeric antigen receptor T cell and other immunotherapy treatments, which rev up the body's own immune system to fight cancer. It is such an exciting time!

MATTHEW, AGE 8: What do you like to do when you're not working?

Definitely travel, Matthew. And I like to be active. I like hiking and scuba diving.

HECTOR, AGE 9: What do you like best about New York?

So many things, Hector! The city is really diverse, and the food is great. You can get everything here, and it's super easy.

OMAR, AGE 15: What has surprised you the most about MSK Kids?

Lots of things, Omar, but probably the large number of patients we get to see here. I really want more people to know about MSK Kids, especially about BMTs and cellular therapy. We have so many more resources than other centers do, and we want to be able to share what we learn here in a way that makes it easier for other doctors around the world to help more kids. •

ENDOWED CHAIRS



Dana Pe'er was appointed to the Alan and Sandra Gerry Endowed Chair.



Martin Tallman was appointed to the Cassidy Family Endowed Faculty Chair.



Christopher Lima was appointed Chair of the Structural Biology Program at SKI. Dr. Lima is a fellow of the American Academy of Arts and Sciences and a Howard Hughes Medical Institute Investigator.

MSK KUDOS

Kathryn Anderson, Maria Jasin, and Dana Pe'er were named to *Crain's* 2019 list of Notable Women in Health Care.

Piro Lito was selected to join the 2019 class of Pew-Stewart Scholars for Cancer Research by the Pew Charitable Trusts and the Alexander and Margaret Stewart Trust.

John Maciejowski was named a Pew Biomedical Scholar by the Pew Charitable Trusts.

Blima Marcus was honored by *The Jewish Week* in its annual 36 under 36 special section.

Maria Rubinstein received the fourth annual Young Investigators Award from Gateway for Cancer Research.

Charles Rudin received the Paul A. Bunn, Jr. Scientific Award from the

International Association for the Study of Lung Cancer.

Michel Sadelain was awarded the Jacob Heskel Gabbay Award in Biotechnology and Medicine from the Rosenstiel Basic Medical Sciences Research Center at Brandeis University.

Craig B. Thompson was recognized in *Becker's Hospital Review's* list of 105 Physician Leaders to Know.

Santosh Vardhana received a Burroughs Wellcome Fund Career Award for Medical Scientists.

Anas Younes received the 2019 Distinguished Leadership Award from the Lymphoma Research Foundation.



Andrea Schietinger was named an inaugural member of the Cancer Research Institute's Lloyd J. Old Scientists Taking Risks Program and awarded a research grant.

APPOINTMENTS AND PROMOTIONS



Prasad Adusumilli
Surgeon
Promoted to Member; Department of Surgery, Thoracic Service



Michalis Aristophanous
Medical Physicist
Appointed as Associate Clinical Member; Department of Medical Physics, Radiotherapy Physics Service



Lisa Carter-Harris
Behavioral Scientist
Appointed as Associate Member, Memorial Hospital; Department of Psychiatry and Behavioral Sciences, Behavioral Sciences Service



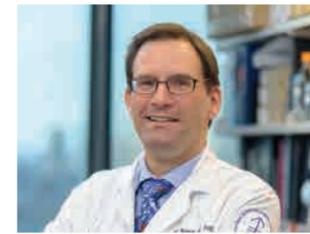
Irene Cheung
Clinical Immunologist
Promoted to Laboratory Member; Pediatric General Oncology Service



Ian Ganly
Surgeon
Promoted to Member, Memorial Hospital; Department of Surgery, Head and Neck Service



Daniel Gomez
Radiation Oncologist
Appointed as Member, Memorial Hospital; Department of Radiation Oncology, External Beam Radiotherapy Service, Manhattan



Jan Grimm
Radiologist
Promoted to Member; Molecular Pharmacology Program, Sloan Kettering Institute; Department of Radiology, Molecular Imaging and Therapy Service



Chris Kotsen
Clinical Psychologist
Appointed as Associate Clinical Member; Department of Psychiatry and Behavioral Sciences, Behavioral Sciences Service, Tobacco Treatment Program



Galina Levin
Diagnostic Radiologist
Appointed as Associate Clinical Member; Department of Radiology, Body Imaging Service



Rosna Mirtcheva-Trocheva
Radiologist
Appointed as Associate Clinical Member; Department of Radiology, Molecular Imaging and Therapy Service



Michael Morris
Medical Oncologist
Promoted to Member; Department of Medicine, Genitourinary Oncology Service



Milind Rajadhyaksha
Optical Imaging Specialist
Promoted to Member; Department of Medicine, Dermatology Service

MSKNews

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SOMEWHERE OVER THE RAINBOW

By Andrew Roth

In January, nearly 50 children and teens with cancer and their siblings lent color to their experiences at MSK, with help from fashion designer Tanya Taylor and her team, in a color therapy painting class.

The class took place in the Pediatric Ambulatory Care Center's Recreation Center. Color therapy is about associating color to help people express emotions. In this class, Ms. Taylor used prompts to help participants paint, including "What do you feel when you're happy?"

The class was part of an ongoing partnership between MSK Kids and Ms. Taylor, who previously redesigned the exam room curtains at MSK Kids and produced head scarves for adults and children undergoing chemotherapy, with profits going to MSK. In the summer of 2018, her team painted the Art Shack at Sunrise Day Camp, a free summer camp for children with cancer and their siblings.

An art installation was created with 42 of the student paintings from the color therapy class; it's currently on display in the entry lobby of the Pediatric Ambulatory Care Center. ●

