Memorial Sloan Kettering Cancer Center

2024 ANNUAL REPORT

UNSTOPPABLE.

At MSK, we leave no stone unturned to provide compassionate care to our patients and to push the frontier of scientific discoveries. Every day, brilliant minds and dedicated people give their all to reimagine what is possible.

Cover: Thoracic surgeon Dr. Alexis Chidi
This page: Associate Laboratory Member Jason de la Cruz and Research Assistant Sagnik Sen look at images from a cryo-EM microscope, which gives scientists an unprecedented view inside cells.

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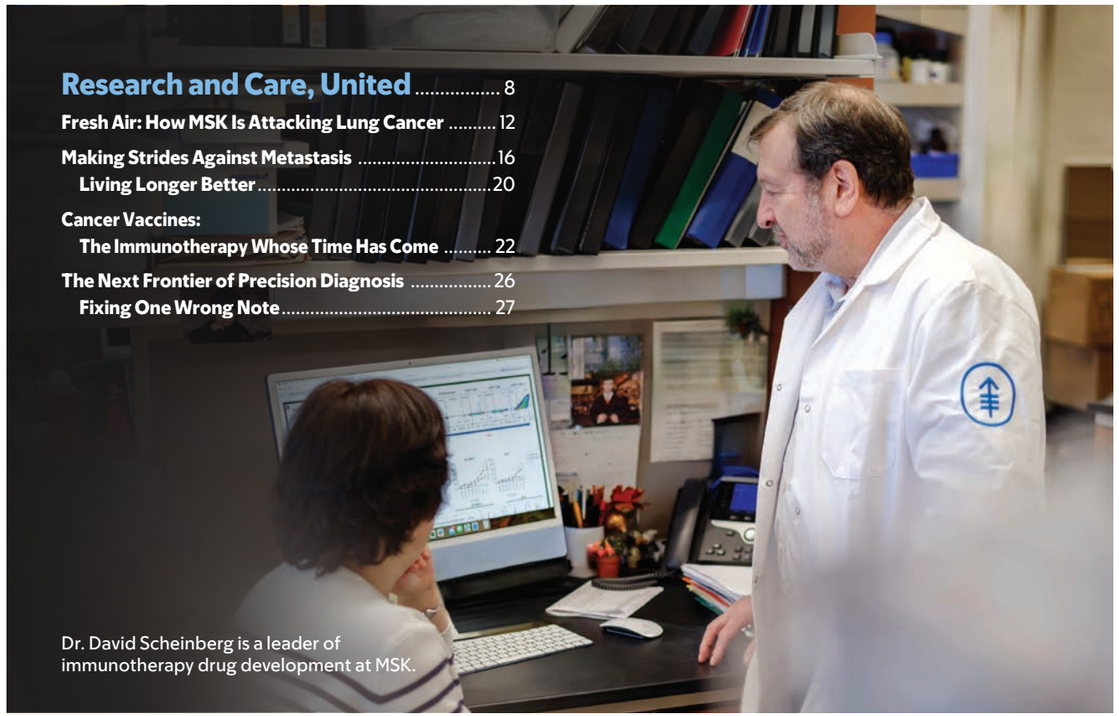


Dr. David Scheinberg is a leader of immunotherapy drug development at MSK.

Spine surgery patient Amy Speck hugs her niece.

Imam Yusuf Hasan has been an MSK chaplain for nearly 30 years.

Tom Scalera and Brett Ravage found a second chance at love through the MSK community.

A Message From the Chairman and the President

The year 2024 will be remembered for the bold and strategic course we set to fulfill our mission of ending cancer for life. The need to plan for the future is urgent, as the Centers for Disease Control and Prevention (CDC) predicts the number of people with cancer is expected to increase by 50% by 2050. At the same time, there is unprecedented hope and opportunity in the understanding and treatment of cancer.

To continue our global leadership in the field, we have prioritized six strategic initiatives:

- **Innovate Clinical Strategy** by expanding our capacity in many ways. We've achieved significant progress toward our goal to complete The Kenneth C. Griffin Pavilion at MSK in 2030. Our regional locations continue to create new ways to increase access and deliver an exceptional patient experience.
- **Drive Scientific Discovery** by answering fundamental questions of biology that lay the groundwork for the cancer treatments of tomorrow. Across MSK, there are teams of scientists driven to discover, using advanced technology and new tools in cancer engineering.
- **Harness the Immune System** to boost the body's innate power to fight cancer, a field that MSK pioneered, which has become among the most promising treatments in cancer therapy.
- **Expand Precision Oncology** to tailor a patient's cancer treatment to the molecular and genetic characteristics of their disease, an approach that MSK helped introduce to the world.
- **Transform Data Into Cures** through MSK's unique capability to analyze the vast amount of information gathered by treating hundreds of thousands of people and finding insights that continuously advance patient care.
- **Develop the Next Generation of Leaders** through innovative educational and training programs that create exceptionally skilled physicians, scientists, and other professionals who bring the MSK standard of excellence to the world.

To support these initiatives, 2024 marked the launch of **The MSK Campaign: Leading Science. Changing Lives**. The goal of this philanthropic campaign, perhaps the most important in MSK's 140-year history, is to ensure that MSK doctors and scientists will have the resources they need to develop new treatments and cures, turning a legacy of innovation into impact.

In this report, you'll see how this is happening every day at MSK, including:

- Advances in genetic testing, such as MSK-IMPACT®, that have helped patients like jazz pianist Michael Wolff overcome an extremely rare cancer.
- New insights into the secrets of metastatic cancer cells, which can change their identity to evade therapies.
- Accelerated development of vaccines to treat cancer with a patient's own immune system, with the help of the newly launched Olayan Center for Cancer Vaccines at MSK.
- Important advances in the treatment of lung cancer that have helped patients like Jen Cosgrove, who was diagnosed with stage 4 disease in her 30s.

At MSK, we focus on not only a patient's cancer diagnosis but also on what matters most to them.

- For Staten Island teenager Cody Bass, that meant helping him return to championship-winning form in bowling after becoming the first pediatric patient with a rare metastatic cancer to take a medication that targets a tumor's mutation.
- For Dana Vergara, that meant fulfilling her dream of giving birth following rectal cancer, thanks to leading-edge surgery at MSK.

Scott Stuart, MSK Board Chair, and Dr. Selwyn Vickers, MSK President and CEO

For us, it's personal. When MSK's Shakima Grant talks to people about the future Kenneth C. Griffin Pavilion at MSK, she remembers her grandmother's experience getting cancer care in New York. For Margaret Bediones, being a nurse at the MSK Ralph Lauren Center in Harlem fulfills a promise she made to herself to help people — at just 12 years old — when her father passed away from cancer.

The MSK community also includes the family and friends of our patients, who contribute to our mission through events like Cycle for Survival. This report shares the touching story of two people grieving the loss of their spouses, who found each other and are forging a new path forward.

As we create the future of cancer care, guided by our strategic initiatives and supported by the generosity of the MSK Giving Community, we thank you for your partnership. Because of you, the greatest minds and the most compassionate people are able to give their all to reimagine what is possible. Be assured, our determination is unstoppable.

Selwyn M. Vickers, MD, FACS
President and
Chief Executive Officer

Scott M. Stuart
Chair, Board of Trustees

The MSK Campaign is led by co-chairs Stanley F. Druckenmiller, Member of the MSK Board of Trustees; Marie-Josée Kravis, Vice Chair of the MSK Board of Trustees; and Scott M. Stuart, Chair of the MSK Board of Trustees.

RESEARCH AND CARE, UNITED

The dynamic connection between our research labs and our patient care makes MSK a world-class leader in cancer treatment. People who come to MSK benefit from new, investigational therapies that may not be available at other hospitals. As a result, our patients face cancer with confidence and hope.

Postdoctoral fellow Frank Arnold studies pancreatic cancer in the Mara Sherman Lab.

In 2024, the U.S. Food and Drug Administration (FDA) approved 11 drugs based on clinical trials in which MSK played a pivotal role.

A rare blood cancer called **mantle cell lymphoma**

Brain tumors called low-grade diffuse gliomas

Adult and pediatric patients with **advanced or metastatic thyroid cancers**

Adults with a rare soft tissue cancer called **synovial sarcoma**

Cancers anywhere in the body caused by gene changes called ***NTRK* fusions**

Children and adults with leukemia that has come back after treatment

Advanced and metastatic **bile duct cancer** (cholangiocarcinoma) and other biliary tract cancers with high levels of HER2

Advanced colorectal cancer caused by a gene mutation called *KRAS*-G12C

Breast cancers that are ER+, HER2-

Advanced **pancreatic cancer or non-small cell lung cancer** that has an alteration called an *NRG1* gene fusion

Metastatic non-small cell **lung cancer**

To learn more about these new therapies, scan here.

Fresh Air

How MSK Is Attacking Lung Cancer

MSK's expertise in treating lung cancer has helped Jen Cosgrove (center) enjoy precious milestones with her children, Aidan (top left), Andrew (bottom left), and Lauren.

Jen Cosgrove says her first appointment at Memorial Sloan Kettering Cancer Center (MSK) was unforgettable.

"When my family and I showed up at MSK, we felt totally defeated," she says. "We knew I had a type of lung cancer called adenocarcinoma — that was it."

As a wife and mother in her 30s, she was deeply frightened, not just for herself but for her three children, all under the age of 9.

"At my first appointment at MSK, the care team sat with us for three and a half hours and went through my entire history, soup to nuts," Jen says. "It was a hard conversation, because they were pretty sure I was stage 4, meaning the cancer had spread. That's a hard pill to swallow because it's not curable."

But one thing she heard that day stood out. "The MSK doctors told me, 'We have hope. Advances in research and treatment are happening right now that can help you.' I felt encouraged for the first time, which was awesome."

MSK quickly established her precise diagnosis and uncovered crucial information about the cancer. "MSK called to tell me the cancer was ALK positive, and my mother and sister started crying with joy," Jen recalls.

She and her family had done their research. Jen's tumor had a mutation in a gene called *ALK* that was helping fuel the cancer. However, this type of mutation can be susceptible to a targeted therapy called alectinib that can slow the cancer's growth.

Jen was prescribed alectinib by MSK thoracic medical oncologist **Alexander Drilon, MD**. He is a pioneering researcher of cancer-related mutations and Chief of the MSK Early Drug Development Service.

"When I started the drug, I couldn't stand up," Jen says. "Within four days I got off my couch and said, 'Let's take the kids to the arcade.' It was like a switch flipped, and I have never looked back."

The unparalleled combination of compassionate care, cutting-edge diagnostics, and world-class research is helping the experts at MSK rewrite the playbook for lung cancer.

For Jen, this has meant reaching milestones she feared were impossible when she learned she had metastatic lung cancer in 2017. "I've seen my kids enter high school and graduate middle school and move up in elementary school. I've been to their parties, and I run them all over for their sports and activities."

"I just feel really lucky," she says, "because with cancer your first shot is your best shot, and for me that came at MSK."

Discovering a New Type of Lung Cancer

Khaliq Sanda was a 19-year-old student at Duke University when he was diagnosed with small cell lung cancer, one of the two major types of lung cancer (the other is called non-small cell lung cancer). Like Jen, he was a never-smoker.

"That is very unusual," says physician-scientist **Charles Rudin, MD, PhD**, who was one of Khaliq's doctors. "This is a type of cancer that's almost always associated with heavy smoking. So that prompted us to begin looking for other, similar examples of never-smokers with small cell lung cancer. We identified a group of patients who fit this pattern."

The search for answers brought together 42 physicians and researchers across MSK — from the doctors who treat lung cancer to specialists in tumor genetics and computer analysis to pathologists, who evaluate cells and tissues to make a diagnosis.

Together, they found a rare, distinct subtype of lung cancer they dubbed "atypical small cell lung carcinoma." The people facing this diagnosis were younger than typical small cell lung cancer patients, who average around 70 years old. And they reported smoking very lightly or never.

This new subtype also displays a genetic signature — a "shattering" of one or more chromosomes in the cancer cells. This unusual genomic change may point toward treatment strategies.

Tragically, the cancer that Khaliq confronted was too far advanced to stop, and he passed away. His case underscores the

Khaliq Sanda was only 19 years old when he was diagnosed with lung cancer.

Thoracic medical oncologist Dr. Alexander Drilon, Chief of the Early Drug Development Service, cares for people with lung cancer and specializes in testing new medicines to treat cancer.

Thoracic surgeon Dr. Alexis Chidi, Co-Director of MSK's Lung Cancer Screening Program, cares for people with lung cancer and has a special interest in early cancer detection.

seriousness of lung cancer — which causes more deaths than any other type of cancer — as well as the need to constantly improve screening for the disease to catch it as early as possible.

"Screening is one of the best tools we have to identify lung cancer early," says thoracic surgeon **Alexis Chidi, MD, PhD, and Co-Director of the MSK Lung Cancer Screening Program**.

"Our research teams are working diligently to find effective strategies to identify lung cancer early for people at risk, including those people who don't meet current screening guidelines, which focus on people 50 to 80 years old who smoke or did in the past."

Promising New Techniques for Better Diagnosis

In 2024, MSK researchers made major strides in developing new methods that could one day transform lung cancer diagnosis.

MSK thoracic surgeon **Gaetano Rocco, MD**, conducted a clinical trial that showed promising results for a screening method called "E-nose." E-nose involves a person breathing into a collection device for three minutes to develop what's called a "breathprint." A highly sophisticated technology then "smells" the sample for chemicals called volatile organic compounds that are emitted by cancer cells.

"The E-nose was very accurate when compared with the long-established available imaging methods," such as X-rays and CT and PET scans, says Dr. Rocco.

He believes that if the E-nose is fully developed, it may encourage more people who should get screened for lung cancer to do so, because the method "is noninvasive and inexpensive and could eventually be small enough to fit in a doctor's pocket."

MSK researchers also published research on a new imaging technique they developed that uses a radioactive particle that binds to a molecule on cancer cells called DLL3 and makes the cancer cells more visible on PET scans.

The technique was developed in the labs of MSK radiochemist **Jason S. Lewis, PhD**, and Dr. Rudin. "About 70% to 80% of small cell lung cancers express DLL3 at various levels," Dr. Rudin says.

The technology could determine if a patient may be helped by drugs that target DLL3. And Dr. Rudin believes it may be possible to link the radioactive particle to other therapies "that could create an important new treatment option."

> "We investigate how tumor cells compete with healthy cells for resources."
>
> —Dr. Joo-Hyeon Lee, stem cell biologist

Unlocking the Secrets of Stem Cells at Lung Cancer's Beginning

At the Sloan Kettering Institute, the lab of **Joo-Hyeon Lee, PhD**, is exploring fundamental questions about the biology of the lung that can shed new light on lung cancer.

A major focus of her lab is stem cells. Stem cells keep lungs healthy by dividing to replace old or damaged lung cells. "We study how stem cells work to maintain and regenerate healthy tissue," says Dr. Lee. "But we also know that when stem cells get dysregulated — which means something goes awry — that can lead to cancer as cells grow out of control. We investigate how stem cells work to understand what happens when things go wrong."

One way her team does this is using patient-derived organoids — miniature lungs grown in the lab using samples of a patient's tissue. "They are like mini lungs, allowing us to study how cells communicate and work together to form and repair tissues or tumors," explains Dr. Lee. "We also investigate how tumor cells compete with healthy cells for resources and change their environment to better support their growth."

Thoracic surgeon Dr. Gaetano Rocco holds a component of the "E-nose," a non-invasive cancer test that has produced promising results in a clinical trial at MSK.

The lab's research spans the full cycle of lung health — from healthy tissue maintenance to tumor development and back to healing after treatment. "Understanding how stem cells work in each of these stages is crucial," says Dr. Lee. "This knowledge could help us develop better treatments for lung disease."

Lifesaving Confidence

This depth and breadth of research, stretching from the lab to the clinic, gives Jen Cosgrove enormous confidence in her MSK team. Since her own diagnosis seven years ago, she has become a passionate advocate for lung cancer issues and someone who is deeply knowledgeable about the latest scientific advances.

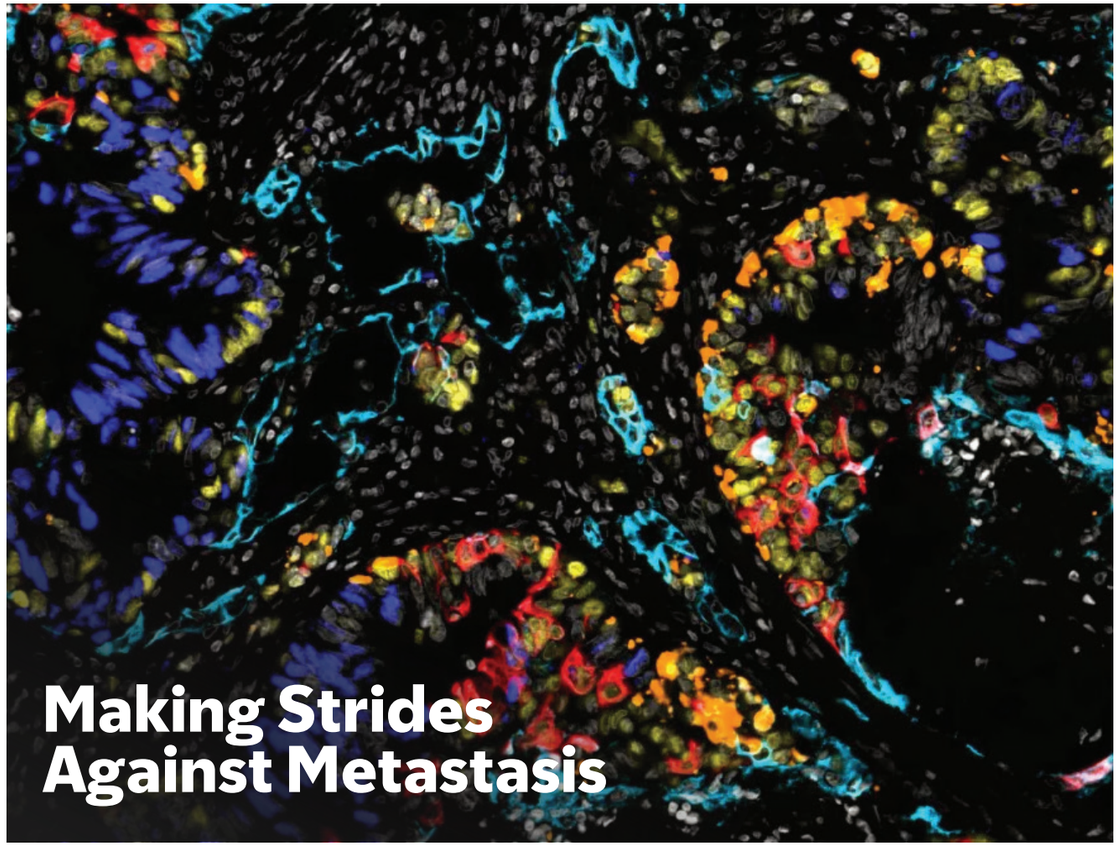
"I trust my MSK team with my life — literally," she says. "If the time comes that I need some other treatment, I know they'll help me. They're like my family now. And I so appreciate it." •

Dr. Drilon's research is supported by the MSK donor community, including **Keren Phillips and Deborah Kazis-Taylor for the Earle and Judy Kazis Foundation Fund** and **The Gibbons Scattone Family Foundation**.

Dr. Rudin's research is supported by the MSK donor community, including **Ge Li & Ning Zhao Family Foundation**, **Stand Up To Cancer**, **Goldberg Family Foundation, Inc.**, and **Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation**.

Dr. Lewis' research is supported by the MSK donor community, including **The Tow Foundation**.

Dr. Rudin holds the **Sylvia Hassenfeld Chair** in Lung Cancer Research.
Dr. Lewis holds the **Emily Tow Chair in Oncology**.



Making Strides Against Metastasis

This fluorescent image of a patient's colorectal cancer liver metastasis shows the diversity of cell states from normal intestinal states (dark blue) to atypical cell states (other colors).

Sometimes doctors say that people don't die from cancer, they die from metastasis — that is, from the spread of cancer from an initial "primary" tumor to other parts of the body.

Metastasis is responsible for about 9 of every 10 cancer deaths, and it remains one of the most daunting and least understood aspects of the disease.

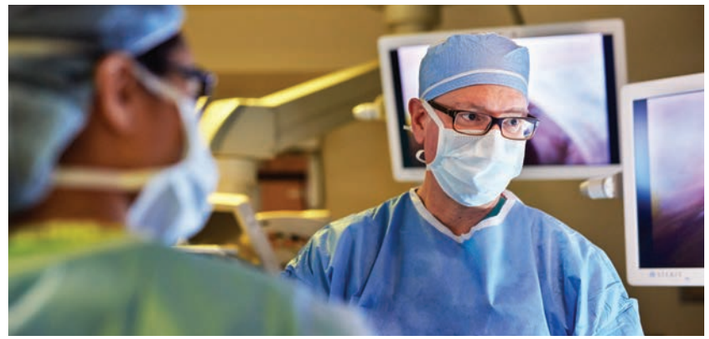
"We know how to control primary tumors — with surgery, chemotherapy, and radiation," says physician-scientist **Karuna Ganesh, MD, PhD**, whose lab at Memorial Sloan Kettering Cancer Center (MSK) is dedicated to understanding metastatic disease. "But the cancer cells that manage to survive treatment become more and more aggressive, until eventually we can't stop them."

That's why Dr. Ganesh and other researchers across MSK are working to illuminate the mysteries of metastasis and to identify opportunities to slow or even stop its relentless march. Some of their recent discoveries are providing crucial insights into metastasis and pointing toward new opportunities for potential treatments.

And there's reason for hope. Already, a growing number of people are living longer with metastatic cancer thanks to advances in treatments and supportive care, the National Cancer Institute reports. Deaths from breast cancer alone dropped 58% between 1975 and 2019 — with nearly a third of the drop due to advances in treating metastatic breast cancer — a recent multicenter study found.

> More people are living longer with metastatic cancer, thanks to advances in treatment and supportive care.
>
> Source: The National Cancer Institute

Dr. Karuna Ganesh reviews research results with MD-PhD student Elizabeth Benitez.



At MSK, clinicians such as Dr. David Jones and laboratory researchers are working together to study metastasis and find new treatments.

"At MSK, we are attacking the problem from all sides," says **Joan Massagué, PhD**, a world-renowned metastasis researcher and Chief Scientific Officer for MSK. "Our ultimate goal is to turn metastatic cancer into a manageable chronic condition and, perhaps one day, to be able to stop it for good."

Attacking Metastasis on Many Fronts

Researchers across MSK are approaching a wide variety of metastatic cancer types from many directions.

A team led by thoracic surgeon **David Jones, MD**, recently established the first living-organism model of patient-derived organoids (mini 3D tissue models made from a patient's cancer cells) to investigate lung cancer metastasis in individuals. The new model aims to help doctors understand tumor evolution, assess the effectiveness of different drugs against a tumor, reveal mechanisms of resistance to targeted therapies, and help personalize strategies for immunotherapy.

"Creating these models directly from our patient's lung cancer cells adds yet another important tool for us to better understand the biology of lung cancer and to identify ways to better predict its behavior and treat the cancer with specific therapies," says Dr. Jones, who co-directs MSK's Fiona and Stanley Druckenmiller Center for Lung Cancer Research.

Meanwhile, neuro-oncologist **Adrienne Boire, MD, PhD**, is leading a clinical trial that grew out of MSK research that targets cancer that has spread to the fluid and tissues of the spinal column and brain (leptomeningeal metastasis).

The team showed that cancer cells were able to survive in this challenging environment by reprogramming themselves to outcompete other cells for iron; this fuels their growth while also preventing immune defenders in the area from getting enough iron, which they need to function well.

Dr. Adrienne Boire is leading a clinical trial that targets metastatic cancer that has spread to the fluid and tissues of the spinal column and brain from elsewhere in the body.

"Commandeering the iron is an elegant solution on the part of the cancer cell," Dr. Boire says. "It's really unique biology that allows them to outcompete the body's defenders."

Based on that discovery, doctors at MSK are now determining whether a drug called deferoxamine could be an effective treatment for leptomeningeal metastases by helping to remove iron from the cerebrospinal fluid.

Finding Metastasis' Vulnerabilities

Another recent high-profile study by MSK researchers illuminated new and dramatic differences between metastatic cancer cells and cells in the primary tumors they break away from — suggesting opportunities for these differences to be harnessed to fight metastasis.

Metastatic cells have more "plasticity" than their primary tumor counterparts — meaning their cellular identities are more fluid, a collaboration between Dr. Ganesh and computational biologist **Dana Pe'er, PhD**, found.

When colorectal cancer cells metastasize, they found, they look less and less like the intestinal cells they started out as. In fact, they begin to resemble completely different types of cells — like skin cells or neuroendocrine cells. Essentially, they travel back in time to an early development phase, when the cell's identity wasn't yet decided.

"All this time traveling that cancer cells do is a survival mechanism," Dr. Ganesh says. "It's an adaptation to help them survive the assaults of cancer treatment. And we think this time traveling is actually a vulnerability that we could target."

Dr. Ganesh and her colleagues see two potential opportunities to interrupt metastasis as a result: finding a way to prevent cells from entering this early state, as well as targeting the state itself. Research into both approaches is ongoing at MSK.

The Challenges of Studying Metastasis

There are a number of factors that make metastasis difficult to study — and reasons why MSK is well-positioned to meet those challenges.

One challenge is that metastatic cells may seed themselves in a variety of locations throughout the body, each with a unique microenvironment that can influence the behavior of the cancer cells.

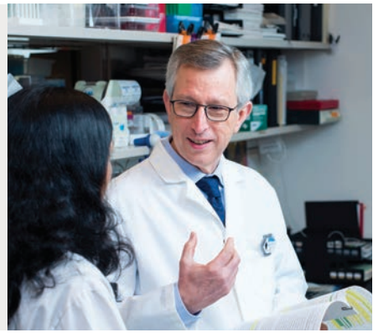
A recent collaboration between Dr. Pe'er and **Christine Iacobuzio-Donahue, MD, PhD,** who heads the David M. Rubenstein Center for Pancreatic Cancer Research at MSK, examined the differences in genes that are turned on in genetically identical cancer cells — called clones — that had spread to different locations in the body.

"What we see is that these clones are able to adapt to the pressures and metabolic demands of very different environments," Dr. Pe'er says. "And we see that they're able to access different gene programs that allow them to thrive in different places, different organs."

Moreover, even genetically different cancer cells tend to adapt to specific situations by accessing the same gene programs.

"The big question of a cancer cell is, 'Are you plastic or not?' And once you are, you can acquire all these different traits. The environment is what really determines what traits will be most advantageous," she says.

> "Our ultimate goal is to turn metastatic cancer into a manageable chronic condition and perhaps, one day, to stop it for good."
>
> —Dr. Joan Massagué, Chief Scientific Officer, MSK



Fueling the Future of Discovery

One of the critical supports for metastasis research at MSK comes from generous philanthropic gifts.

Dr. Boire was recently selected to be the new Scientific Director of the Alan and Sandra Gerry Metastasis and Tumor Ecosystems Center. The center brings together a diverse group of laboratory scientists and clinicians and provides additional resources to support projects focused specifically on metastasis.

"It would be hard to overstate the impact of this center in the progress we've made already and will continue to make in the coming years," Dr. Massagué says.

"The center creates synergies across MSK by improving access to clinical samples for research, developing and sharing new techniques and models, and encouraging new talent to join the endeavor," Dr. Boire says.

"MSK investigators are leading the way in illuminating the mechanisms of metastasis," she adds.

Additional support for metastasis research is also being provided by the Marie-Josée and Henry R. Kravis Cancer Ecosystems Project. Its goal is to fund ambitious laboratory research aimed at moving beyond the study of genetic mutations that drive cancer to understand how malignant cells get empowered or defeated by the greater ecosystem of the body and individual types of tissue. Funding these early-stage studies is critical for securing more substantial grants from the National Institutes of Health and elsewhere.

"MSK is uniquely positioned to make significant progress against metastasis in the coming years — thanks to this visionary philanthropic support, combined with our scientific talent, and the robust partnerships between our clinical and laboratory research communities," says Dr. Massagué, who oversees the Ecosystems Project. •

Dr. Massagué's research is supported by the MSK donor community, including **Marie-Josée and Henry Kravis**, and **Alan, Sandra, and Adam Gerry through their Gerry Foundation**.

Dr. Iacobuzio-Donahue's research is supported by the MSK donor community, including **David M. Rubenstein**.

Dr. Massagué holds the **Marie-Josée and Henry R. Kravis Foundation Chair**.

Dr. Jones holds the **Fiona and Stanley Druckenmiller Chair in Lung Cancer**.

Dr. Boire holds a **Geoffrey Beene Junior Faculty Chair**.

Dr. Pe'er holds the **Alan and Sandra Gerry Endowed Chair**.

Dr. Iacobuzio-Donahue holds the **David M. Rubenstein Chair**.

Dr. Ganesh was a **Josie Robertson Investigator** in 2024.

Living With Stage 4 Cancer

Dennis Flaherty
Kidney cancer

Four years ago, Dennis Flaherty was told to get his affairs in order when he was diagnosed with stage 4 kidney cancer at another hospital. Refusing to give up, he sought care at MSK, ranked by *U.S. News & World Report* as the top hospital in the country for urology care in 2024. After surgery, radiation, and checkpoint inhibitor immunotherapy, Dennis shows no evidence of disease. He's back to just being a dad to his teenage daughter, Julia.

"Growing up in New York City, I always heard that MSK was the best, but I didn't know how easy it would be to get treatment there," says Dennis. "Now whenever I hear that someone has been diagnosed with cancer, I urge them to just pick up the phone and call MSK for an appointment, like I did."

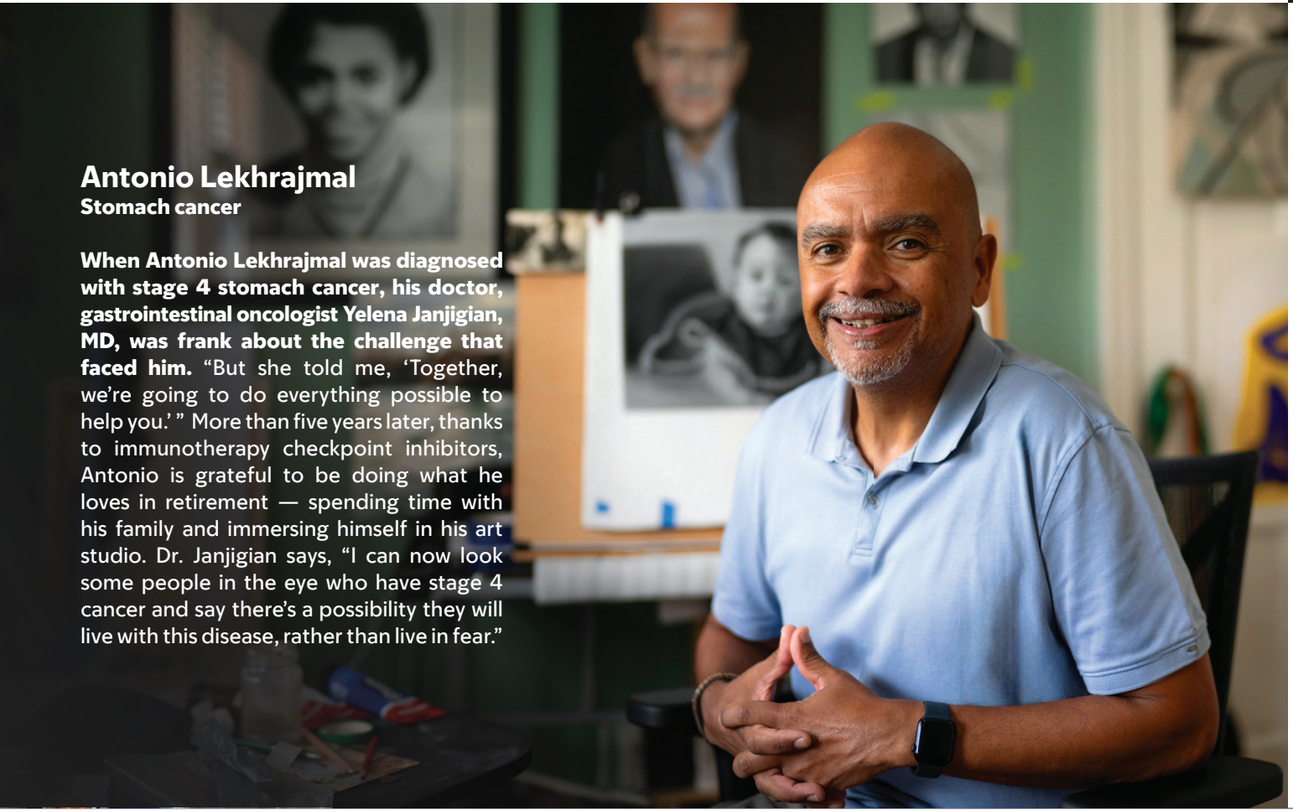
LaDawn Jefferson
Breast cancer

New York City Police administrator LaDawn Jefferson had always been an avid runner, and she hasn't let stage 4 breast cancer stop her. Three years ago, she was diagnosed with HER2+ metastatic breast cancer that had spread to the fluid around her brain and spinal cord, typically a grave prognosis.

"I found myself packing up my closet, getting ready to die," she says. "I thought everything was over."

But the 52-year-old grandmother from Brooklyn pushed through. She had surgery and chemotherapy, under the care of breast oncologist **Pedram Razavi, MD, PhD**. Incredibly, the day after her last treatment in February 2022, she ran a four-mile race. Now in complete remission for more than two years, she ran the NYC Marathon last fall.

Believe it or not, LaDawn says she doesn't like running. "It's a struggle," she says. "But I like the competition I have with myself when I get out there. I'm proving to myself that I can do anything, in spite of whatever is out there in front of me."



Antonio Lekhrajmal
Stomach cancer

When Antonio Lekhrajmal was diagnosed with stage 4 stomach cancer, his doctor, gastrointestinal oncologist Yelena Janjigian, MD, was frank about the challenge that faced him. "But she told me, 'Together, we're going to do everything possible to help you.' " More than five years later, thanks to immunotherapy checkpoint inhibitors, Antonio is grateful to be doing what he loves in retirement — spending time with his family and immersing himself in his art studio. Dr. Janjigian says, "I can now look some people in the eye who have stage 4 cancer and say there's a possibility they will live with this disease, rather than live in fear."

Jacqueline Hickey
Lung cancer

Jacqueline Hickey has been fighting lung cancer for 17 years. When it spread to her bones four years ago, intense pain kept her from enjoying the life she'd always treasured — working as a nurse and being a mother of four. But she found relief at MSK's special clinic for treating bone metastases, where doctors in five different specialties can see patients on the same day and coordinate treatments. Jacqueline was treated with a combination of a nerve block, stereotactic body radiotherapy, and cryoablation (which freezes and kills the bone metastases).

"It's unbelievable the difference it made," she says. "There's so many new things coming out to help manage pain. If one thing doesn't work, there's always something else they can try. I am here enjoying lots of good things in my life and am forever grateful for the care that MSK continues to give."

Cancer Vaccines: An Idea Whose Time Has Come

Dr. David Scheinberg, a leader of immunotherapy drug development at MSK, says an improved understanding of immune function combined with advances in clinical applications has created a new optimism about cancer vaccines.

Remarkably, the idea that a patient's own immune system could fight cancer is more than a century old.

Back in 1893, Memorial Sloan Kettering Cancer Center (MSK) bone surgeon and cancer researcher William Coley, MD, noticed that patients with bacterial infections sometimes saw their tumors shrink, which hinted that the body's own immune system could be a weapon against cancer. More than 130 years later, researchers at MSK have continued to build upon Dr. Coley's early ideas, breaking new ground and driving the field now known as "immunotherapy" forward.

Today, one specific type of immunotherapy — cancer vaccines — has taken center stage. Unlike traditional vaccines, which prevent disease, a cancer vaccine would actually treat the disease. The concept is audacious. It is challenging. And it is also achievable, thanks to new technology and more support for researchers in the lab and the clinic.

David Scheinberg, MD, PhD, has been soldiering in the field for more than 20 years as a leader of immunotherapy drug development at MSK.

"For a long time, cancer vaccines didn't show much promise, and people were skeptical," he says. "But the success of the COVID vaccine generated a lot of enthusiasm and has renewed interest in cancer vaccines — and that is great news for everyone working in this field."

The COVID vaccine demonstrated that it's possible to use mRNA technology to train the immune system to ward off virus invaders, known as pathogens. It's a preventive vaccine.

A cancer vaccine also engages the immune system, but in a slightly different way. It's a therapeutic vaccine, which works by exposing the immune system to the specific proteins produced by a patient's tumor, called antigens. Once the immune system sees those rogue proteins, it will attack them and keep the cancer at bay.

Fighting the Enemy From Within

Developing therapeutic cancer vaccines is a major challenge because cancer cells are the enemy within. A person's own cells are turning against them and growing out of control. Therefore, cancer vaccines must teach the immune system how cancer cells differ from the rest of the body.

If that goal can be achieved, Dr. Scheinberg says that therapeutic cancer vaccines offer important advantages over other cancer treatments:

- They can be given over a brief period and then are not needed again, as the immune system learns to fight on its own.
- Side effects are lower compared with more toxic treatments such as chemotherapy or radiation therapy.

In the past, Dr. Scheinberg explains, cancer vaccines fell short for several reasons:

- They were too narrowly focused, targeting just one antigen. "Tumors have different antigens from cell to cell," he says. "Some tumor cells are attacked, but others survive and grow."
- They were given to patients with too much cancer in the body; they didn't have enough power to conquer tumors, which can suppress immune attacks by masking their own antigens. Cancer cells can also send out signals to immune cells to reduce their efficiency.

"Therapeutic cancer vaccines usually cannot wipe out an existing tumor or make bulky amounts of cancer go away," Dr. Scheinberg says. "They work much better to prevent cancer from coming back after the tumor has been removed by a surgeon or put into remission by chemotherapy or radiation."

He points to the phenomenal success of the HPV vaccine in preventing the HPV virus from infecting cells and causing them to develop into cervical cancer.

"We know vaccines can stop cancer from forming — the same principle holds when the cancer is largely gone," Dr. Scheinberg says. "When people say cancer vaccines just will not work, they are wrong. They do work — if they are specific, potent, attack multiple antigens, and are given when there is not much cancer in the body."

That's now possible, thanks to new technology.

"The science has evolved, and the clinical applications have evolved, which are contributing to the new optimism," says Dr. Scheinberg.

A Visionary Vaccine Center

The momentum for cancer vaccines picked up speed in 2024 with a generous gift supporting The Olayan Center for Cancer Vaccines (OCCV) at MSK, now a critical part of MSK's broader efforts to develop immunotherapies. It will expedite development of vaccines that target a wide range of cancers.

"This center is a unique, visionary initiative that will enable our researchers and clinicians to develop breakthroughs for people with cancer," says MSK surgeon-scientist **Vinod P. Balachandran, MD, Director of the OCCV**.

Dr. Balachandran has played a key role in the development and testing of one of the most exciting

Dr. Vinod Balachandran is Director of The Olayan Center for Cancer Vaccines. He has played a key role in the development and testing of an mRNA-based vaccine for treating pancreatic cancer.

examples of this type of therapy: a vaccine for treating pancreatic cancer based on mRNA. It is personalized for every patient, based on their tumor's particular antigens.

Dr. Balachandran led a phase 1 clinical trial showing that the mRNA-based vaccine, given after surgery to remove pancreatic tumors, stimulated the production of immune cells that recognized the antigens in the pancreatic tumors.

The investigational vaccine, called autogene cevumeran, was developed through a collaboration between BioNTech and Genentech. In November 2024, updated results from the phase 1 trial showed that the immune cells targeting the tumor antigens had persisted for more than three years. There is an ongoing phase 2 study to determine whether that means the vaccinated patients live longer.

Barbara Brigham holds her newest grandchild, Florence Brigham, with (from left) her son, Harry Brigham, and her granddaughters, Lily and Mae Brigham, standing behind her.

One of Dr. Balachandran's patients in the phase 1 study, Barbara Brigham, is still doing well four years after being diagnosed with pancreatic cancer, beating the odds for this particularly deadly cancer. After surgery to remove her tumor, she received an immunotherapy drug and then two doses of the mRNA vaccine based on the molecular structure of her tumor, followed by chemotherapy.

"I'm so glad I decided to participate in this trial," she says. "I feel good and have been working part time at the library, playing mahjong with my friends, and spending more time with my grandchildren — enjoying things that at one point I never thought I'd have."

None of this research would be possible without the ability to track these activated T cells with the help of computational biologist **Benjamin Greenbaum, PhD, Co-Director, Neoantigen Discovery, OCCV**.

"The way that computational biologists and physician-scientists collaborate is especially strong at MSK," Dr. Greenbaum says. "I don't think this research confirming the vaccine's effects on the immune cells would happen at other places."

Off-the-Shelf Cancer Vaccines

The personalized vaccines represent remarkable feats of technology. But they take weeks or months to make and are expensive. So MSK researchers are working to develop off-the-shelf treatments, which could be given to patients as soon as they need them.

One key to off-the-shelf cancer vaccines: finding and targeting an antigen that is present in most cancer cells but not normal cells.

Again, MSK researchers are leading the way. Dr. Scheinberg has developed a vaccine targeting an antigen called WT1, found in the cancer cells of more than 95% of people with acute myeloid leukemia (AML), ovarian cancer, and mesothelioma. It is a complex "peptide" vaccine that triggers a targeted immune response by using synthetic peptides, which are strings of amino acids — the building blocks of proteins.

This WT1 peptide vaccine is now being tested in an international phase 3 clinical trial for AML, sponsored by Sellas Life Sciences Group Inc. Dr. Scheinberg is a Director of Sellas.

"These off-the-shelf vaccines in development could potentially be available to patients — they can be mass-produced and sit in a vial in a refrigerator, ready to be used," Dr. Scheinberg says. "This could make them possibly more accessible and more affordable, which can be critical in helping the most patients."

Computational biologist Dr. Benjamin Greenbaum is helping lead research efforts to track immune cells that have been activated by cancer vaccines, as well as clarify which antigens will serve as the best vaccine targets.

Another off-the-shelf, peptide-based vaccine is being tested for pancreatic and colorectal cancer in a clinical trial co-led by medical oncologist and pancreatic cancer specialist **Eileen O'Reilly, MD**. The phase 1 trial involved patients whose cancer had mutations in a gene called *KRAS* and were at high risk of the cancer returning after surgery. The results demonstrated this vaccine is safe and appears to stimulate the patient's immune system to create cancer-fighting cells.

"These findings show we have more than one way to activate immune cells to target pancreatic cancer," Dr. O'Reilly says.

Scientists are also excited about the possibility of using cancer vaccines to boost the effectiveness of other therapies.

The pace of progress since Dr. Coley's discovery more than a century ago has accelerated dramatically in the past few years. Once believed unattainable, cancer vaccines are now full of possibility.

"We have made tremendous leaps over the last two decades understanding how the immune system recognizes and kills tumors," Dr. Scheinberg says. "These insights are what will help make cancer vaccines — and other immune-based treatments — a reality for more patients." •

Dr. Scheinberg's research is supported by the MSK donor community, including **Commonwealth Foundation for Cancer Research**.

Dr. Balachandran's research is supported by the MSK donor community, including **Olayan Charitable Foundation**, **FORTH Foundation**, **Margaret M. Keane**, and **The Ben And Rose Cole Charitable PRIA Foundation**.

Dr. Greenbaum's research is supported by the MSK donor community, including **The Tow Foundation**, and **Stand Up To Cancer**.

Dr. Scheinberg holds the **Vincent Astor Chair**.

Dr. O'Reilly holds the **Winthrop Rockefeller Chair of Medical Oncology**.

The Next Frontier of Precision Diagnostics

It all starts with the right diagnosis.

Finding the right cancer treatment means figuring out the molecular changes that caused the cancer in the first place. It's the reason it matters so much where patients are treated first.

The precisely matched treatments available to patients today are the result of a big idea and a generous donation a decade ago, which launched the Marie-Josée and Henry R. Kravis Center for Molecular Oncology (CMO). The bold goal: to give every patient who needs drug treatment a personalized therapy, and to do so regardless of what type of cancer they have.

At the CMO's inception, scientists at Memorial Sloan Kettering Cancer Center (MSK) believed in the possibility of what it could do for future patients. But at the time, patients with only a handful of cancer types and a few gene mutations could benefit.

Today, the application of precision oncology has skyrocketed. People with cancer, especially those with metastatic disease, are routinely screened for hundreds of mutations in their tumors. And dozens of targeted therapies have received approval from the U.S. Food and Drug Administration (FDA).

This quantum leap can be attributed largely to the work of the CMO.

Physician-scientist Dr. David Solit has led MSK's Center for Molecular Oncology since its founding a decade ago.

"These approaches have benefited not only patients treated at MSK, but all over the world," says medical oncologist **David Solit, MD, Director of the CMO**. "And as the CMO enters its second decade, it's clear that testing tumors for gene mutations is only the beginning."

Moreover, data science and artificial intelligence are accelerating progress and guiding the treatments that cancer patients receive at MSK and beyond.

"Increasing the kinds of tests we do will enable us to get a better view of what's driving cancer and how to stop it," says pathologist **Kojo Elenitoba-Johnson, MD, Chair of the Department of Pathology and Laboratory Medicine**. "It's not at all farfetched to say that this will position us to see things we've never been able to see before."

Test the Tumor, Find the Target, Develop the Drug

The CMO's first big milestone was the 2017 FDA authorization of MSK-IMPACT®, a test that now detects mutations in more than 500 cancer-related genes. The test was developed in partnership with

Fixing One Wrong Note

You could consider renowned composer and jazz pianist Michael Wolff's story to be one of the greatest hits of precision diagnostics at MSK. Molecular testing saved his life by identifying the rare cancer that was causing his inexplicable high fevers, violent shaking, and severe weakness, even after he'd been treated for lymphoma at another hospital.

His wife insisted he get a second opinion at MSK. The initial test results were grim. MSK's pathologists determined lymphoma was not the cause of Michael's symptoms. He had histiocytic sarcoma, a blood cancer so rare it affects only 300 people in the United States every year. It had spread throughout his body.

But there was hope. It was 2017, and MSK-IMPACT® was being offered to all patients with advanced cancer treated at MSK. Michael's doctor, sarcoma medical oncologist and early drug development specialist **Mrinal Gounder, MD**, told Michael the results from the test just might point to a new therapy they could use.

The test revealed a mutation in a gene called *MAP2K1*. Recent studies had revealed the role of *MAP2K1* mutations in driving certain cancers. Even more fortunate, a drug called trametinib (Mekinist®) had been approved to treat melanomas with a vulnerability in a related gene.

Michael became the first person in the world to take trametinib for histiocytic sarcoma. "We were improvising on the fly," Dr. Gounder says. "His whole treatment was very much like jazz music."

And it worked. "After only two days, all my symptoms went away," Michael says.

At his next appointment, Michael told Dr. Gounder his symptoms had vanished, except for some skin problems caused by the trametinib. A PET scan performed 10 days after Michael started taking the drug confirmed what he was feeling: His tumors had already shrunk by 80%.

"I had chills when I saw the results," Dr. Gounder says. "It was clear we were on to something big."

Indeed they were. Three years later, after several scans had shown Michael was free of disease, Dr. Gounder said he could stop taking the drug. Michael's treatment response was later published as a case study in the *New England Journal of Medicine* to alert other physicians worldwide about this new treatment option. And after MSK research on other diseases related to histiocytic sarcoma, there are now effective treatments for a whole class of patients who previously had no good options.

Michael says he's proud to be a textbook example of how correcting just one wrong note in the genetic code can return a patient to good health. For Michael, his wife, and two sons, everything is now in tune.

Michael Wolff (far right) celebrates surviving a rare cancer with his family (from left) sons, Nat and Alex Wolff, and his wife, Polly Draper.

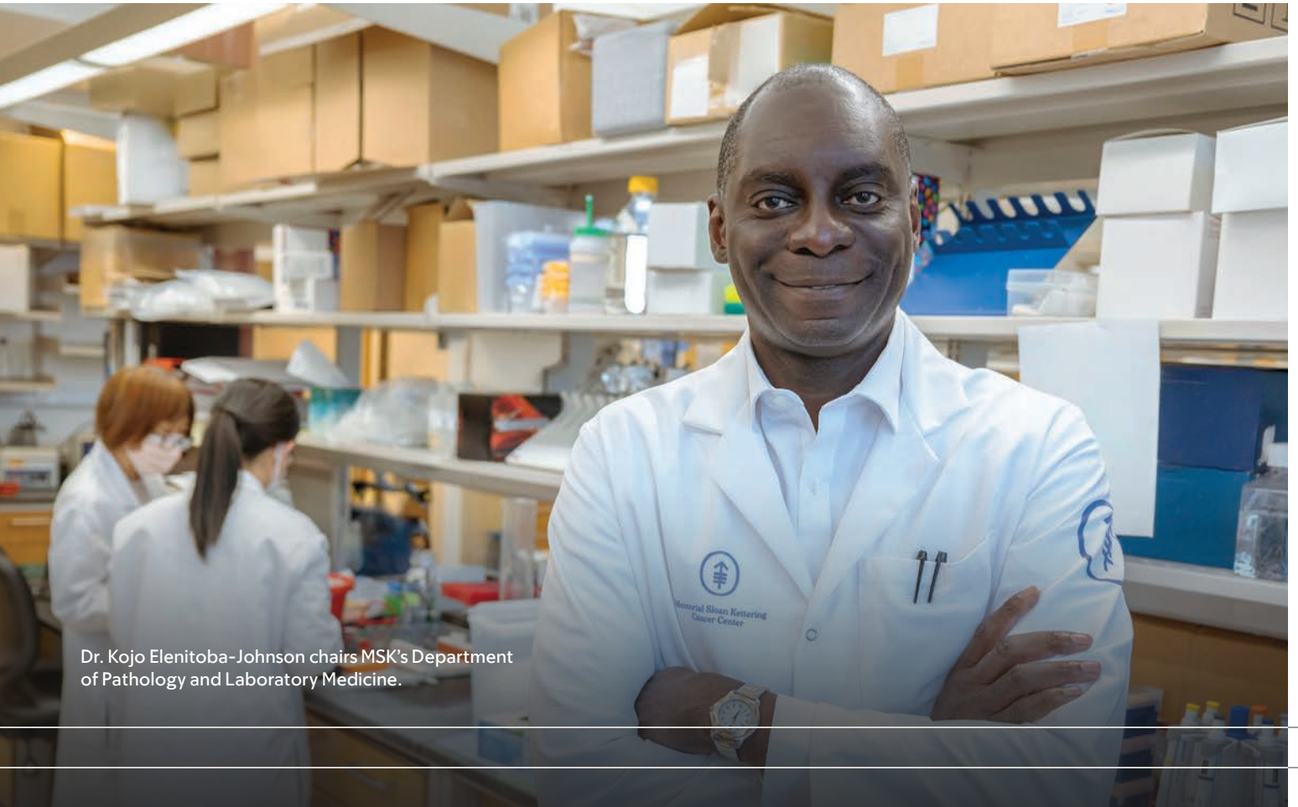
Michael has resumed composing and performing music.

MSK's Molecular Diagnostics Service, which is led by pathologist **Marc Ladanyi, MD**. It was the first test of its kind to be authorized by the FDA. Later tests developed by the CMO include MSK-ACCESS®, which allows doctors to examine DNA from solid tumors using a blood test called a liquid biopsy. This helps to noninvasively detect targetable mutations prior to the start of therapy as well as monitor a patient's progress without having to extract tissue.

A decade later, there are many drugs that block the activities of specific cancer-driving genes. Several are "tumor agnostic," meaning that they work regardless of where the cancer started in the body. This innovation has been important especially for patients with rare cancers, because it is often impossible to enroll enough patients in a clinical trial who share a specific tumor type.

Molecular testing can also guide the use of treatments that harness a patient's own immune system, by identifying certain kinds of genomic signatures that make patients more likely to respond to immunotherapy drugs called checkpoint inhibitors.

> "Increasing the kinds of tests we do will enable us to get a better view of what's driving cancer and how to stop it."
>
> —Dr. Kojo Elenitoba-Johnson, Chair, Pathology and Laboratory Medicine



Dr. Kojo Elenitoba-Johnson chairs MSK's Department of Pathology and Laboratory Medicine.

Going Beyond Tumor DNA

Unfortunately, despite all this progress, it's clear that new types of testing are needed. Not all patients are able to be matched with treatments using current molecular diagnostic tests.

"DNA sequencing only tells us so much," Dr. Solit says. "We need to be able to collect additional complementary information about the biology of an individual patient's tumors that cannot be obtained from our current tests. This includes looking at gene expression — which genes are actually being made into proteins — and what these proteins are doing." That's because changes in protein function are what ultimately affect how cells behave — and what causes them to become cancerous.

One exciting new advance is a test designed to measure RNA rather than DNA. This is called gene expression. (The difference between DNA and RNA is that DNA stores genetic information, while RNA converts that information into instructions for creating proteins.) RNA sequencing provides deeper insights into tumor cells. It can also reveal changes in a patient's immune system related to disease. This new diagnostic test, called MSK-TARGET™, will enter into clinical use in 2025.

Geneticist Dr. Michael Berger has co-led the development of many molecular diagnostic tests at MSK.

"Studying RNA will lead to the discovery of new kinds of changes that can't be detected with our current tests and enable the development of new drugs based on our understanding of those changes," says molecular geneticist **Michael Berger, PhD, Co-Director of the CMO**.

"This test will also allow us to learn more about the tumor microenvironment — the cells that surround the cancer," Dr. Solit adds. "This is important for finding ways to boost the effectiveness of novel immune and cellular therapies."

Another next-generation test is "whole-genome sequencing." It scales up the hunt for cancer-causing mutations far beyond the 505 genes currently analyzed by MSK-IMPACT. Whole-genome sequencing looks for mutations in any of the 23,000 genes found in the human genome. It's already used on a limited basis for patients treated at MSK Kids, the pediatric cancer program at MSK, because cancer drivers in children can be different from those found in adults.

A Deeper Dive Into Inherited Cancer Genes

One of the most revolutionary aspects of MSK-IMPACT is that, from the start, it was able to detect cancer-causing mutations not only in tumors, but also in a patient's normal DNA. Testing the normal DNA — called "germline testing" — reveals whether patients have mutations that are inherited. That knowledge may affect their treatment.

Germline testing has revealed a surprise: Inherited cancer mutations are much more common than previously thought.

One landmark study from MSK researchers found that nearly 18% of patients with advanced cancers were born with mutations in genes that increase the risk of developing specific cancer types. Depending on the cancer, that's double or triple the previously expected rate of patients with an inherited mutation.

Once a patient learns they have a germline change that predisposes them to developing cancer, MSK's genetic counselors work with them to test family members.

> Whole-genome sequencing looks for mutations in any of the **23,000 genes** found in the human genome.

MSK-IMPACT® is a test that detects mutations in more than **500 cancer-related genes.** As of 2024, it had analyzed tumors in more than 92,000 MSK patients to identify the best treatment for them.

Dr. Berger and a lab member review results in the genetic sequencing lab.

It's called "cascade testing" and is especially important for the patient's close relatives — parents, siblings, and children.

Testing for Prevention

"Genetic testing of at-risk family members allows us to move from our focus on cancer treatment to cancer prevention and interception," says gastrointestinal oncologist and clinical geneticist **Zsofia Stadler, MD**. "Through MSK-IMPACT, we have been able to help improve outcomes not just in cancer patients but in entire families."

The ultimate objective is to prevent cancers from ever developing in the first place.

Through MSK's specialty clinics and patient registries, scientists are amassing data on genetic warning signals that may be detectable before a cancer ever arises.

For example, MSK-IMPACT tests are being used to study precancerous conditions like Barrett's esophagus (a precursor to esophageal cancer), colon polyps, and cervical dysplasia (the irregular cells sometimes detected with a Pap smear). The hope is to find new details about the genetic changes that lead up to cells' transformation from normal into cancer.

"So far, targeted therapies have mostly been used to treat patients with late-stage disease, which we know is always going to be more difficult," says physician-scientist **Yonina Murciano-Goroff, MD, MSc, DPhil**, who works at the intersection of clinical genetics and early drug development. "We want to take what we've learned from patients with advanced disease and develop approaches to intercept processes inside abnormal cells before they ever become cancer."

Dr. Zsofia Stadler cares for patients and families who have an inherited cancer risk.

Philanthropic Support Is Crucial for Advancing New Diagnostics

In the early years of the CMO, molecular testing was considered experimental and was not covered by insurance. Philanthropy enabled MSK patients to have access to these tests and allowed researchers to learn from them. Today, MSK-IMPACT and MSK-ACCESS are usually covered by insurance.

Once again, the future of diagnosing cancer with greater speed and accuracy depends on philanthropy.

"New tests that use RNA sequencing and whole-genome analysis will be critical for developing a new generation of cancer therapies urgently needed for patients for whom current targeted and immune therapies are ineffective," Dr. Solit says. "I expect that the availability of this next generation of tests will be another key reason patients will come to Memorial Sloan Kettering for their cancer care." •

Dr. Solit's research is supported by the MSK donor community, including **Marie-Josée and Henry Kravis**. **Dr. Solit** holds a **Geoffrey Beene Chair**.

Dr. Berger holds the **Elizabeth and Felix Rohatyn Chair for Junior Faculty**.

Dr. Elenitoba-Johnson holds the **James Ewing Alumni Chair of Pathology**.

WHAT MATTERS MOST

At MSK, success is based on what matters most to each patient and their loved ones. We innovate relentlessly to develop the least-invasive therapies to protect our patients' quality of life during treatment and beyond.

LeDawn Jefferson is in complete remission from stage 4 breast cancer. Photo courtesy of Lenniell Atkinson

Living, Their Way

Cody Bass

Five months after being diagnosed with a rare and metastatic kidney cancer, Staten Island teenager Cody Bass was back to winning championships as the captain of his high school bowling team. In June 2022, when Cody was 17, scans revealed a cantaloupe-sized tumor that had spread to both lungs — his mother, Nicole, wasted no time in making an appointment at Memorial Sloan Kettering Cancer Center (MSK).

Pediatric hematologist-oncologist **Michael Ortiz, MD**, who leads the Rare Cancer Program at MSK Kids, discovered through molecular analysis using MSK-IMPACT® that Cody's cancer carried a mutation called an ALK fusion, which is highly unusual in kidney cancers and almost unheard of in children. Fewer than 20 cases have ever been reported. The team at MSK would have to create a treatment where none existed.

Following surgery to remove his right kidney and adrenal gland, lymph nodes in his pelvis, spots on both lungs, and his appendix, Cody enrolled in a clinical trial for alectinib, a medication originally developed to treat adults with lung cancers carrying ALK fusions. Now a sophomore at John Jay College of Criminal Justice, Cody continues to take alectinib and to lead the way — as the first pediatric patient in the United States to participate in the trial, he's helped forge a path for other young people facing rare cancers.

Additional support for the research collaborations was provided by the MSK donor community, including **Keren Phillips and Deborah Kazis-Taylor** for the **Earle and Judy Kazis Foundation Fund**, and **Cycle for Survival.**

Elizabeth Sosa

A cancer diagnosis has the power to upend every aspect of a person's life. Elizabeth Sosa, who was diagnosed with stage 3 breast cancer in 2022, says for her, "The impact was total — my emotions, my feelings, my physical life, my mental life."

With treatment came difficult side effects, including severe neuropathy and leg cramps that disrupted her sleep and brought her nearly to tears. At MSK's Ralph Lauren Center (RLC) in Harlem, Elizabeth was able to find treatment and pain relief closer to home.

For more than 35 years, Elizabeth has lived on the same block in Washington Heights, where she has dedicated her life to raising her two children and promoting literacy through the Head Start program.

She says that when she first met with RLC acupuncturist Charles Rico, she felt an immediate bond. The acupuncture brought her an 80% reduction in her symptoms, and Rico's empathy and compassion, says Elizabeth, improved her sense of well-being "100%" — making it easier to cope with breast cancer treatment.

RLC brings cancer care excellence as well as the latest pain management and integrative therapies to the Harlem community and surrounding neighborhoods, a fundamental part of MSK's commitment to addressing health disparities.

"You meet a person like Charles Rico — and many others at the Ralph Lauren Center," says Elizabeth, "and the way they treat you makes you feel safe. You know you're in good hands."

Additional support for the research collaborations was provided by the MSK donor community, including **Pat and Ian Cook**, and **The Ralph Lauren Corporate Foundation**.

Amy Speck

At 33, Amy Speck was all about being on the move — an avid runner and cyclist, she was training for the 2022 New York City Marathon when a sharp pain in her left thigh started keeping her up at night. An MRI revealed a clementine-size tumor wedged between the base of her spine and hip bone. Though noncancerous, the tumor would have to be removed — and traditional surgery would mean a lengthy and difficult recovery.

Amy's doctors suggested she see spine neurosurgeon **Ori Barzilai, MD**, at Memorial Sloan Kettering Cancer Center (MSK). For nearly two decades, MSK has been at the forefront of using robotic-assisted laparoscopic surgery, with some 35,000 operations performed since 2007 — not all for cancer. In 2023, Dr. Barzilai pioneered the use of the technology to remove noncancerous spinal tumors, including the exact type that Amy had.

Amy emerged from surgery with five tiny abdominal incisions and was able to leave the hospital the same day, to recover at her mother's house on Long Island. Within days, Amy could manage short walks to the beach, and within months, she was nearly back up to speed — playing soccer, snorkeling, and skiing.

"When I think back now to how I felt before my diagnosis, I realize how long my body was compensating for this tumor, which was probably there for a long time," Amy says. "I feel so much lighter and freer now. I feel like myself again."

Dana Vergara

Dana Vergara has the family she always wanted, thanks to a history-making surgical technique that preserved her ability to give birth, even after she was diagnosed with stage 3 rectal cancer. The standard of care for her cancer would include chemotherapy and radiation — radiation that would damage her uterus and end her dream of carrying another child.

But her doctors at MSK had another idea: a revolutionary procedure that would temporarily relocate her uterus and ovaries outside of the direct radiation field. MSK gynecologic surgeons **Mario Leitao, MD**, and **Jennifer Mueller, MD**, had performed the first such procedure — called a "uterine transposition" — in the United States in 2020. Dana was the third person in the U.S. to undergo the surgery.

Following treatment, Dana had a second operation to return her ovaries and uterus to their natural position. A few months later, to their astounding joy, Dana and her husband, Thomas, conceived naturally. They welcomed their son, Hudson, in the spring of 2024, making Dana the first person in the country to deliver a baby following this innovative surgery.

"There's a special place in my heart for the doctors who saved me and who are responsible for me being able to carry another baby," Dana says. "I'd do that surgery again in a heartbeat. And I'd recommend it to any woman in a similar situation."

Patients from over 70 countries traveled to MSK in 2024 to seek our physicians' expertise and treatment.

Argentina
Armenia
Australia
Austria
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Brazil
Bulgaria
Cambodia
Canada
Cayman Islands BWI
Chile
China
Colombia
Costa Rica
Cyprus
Dominican Republic
Ecuador
Egypt
El Salvador
France
Gambia
Georgia
Germany
Greece
Guyana
Haiti
Honduras
Hong Kong
India
Indonesia
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kuwait
Lebanon
Libya
Mexico
Morocco
Nepal
Netherlands
New Zealand
Nigeria
Norway
Pakistan
Panama
Peru
Philippines
Poland
Portugal
Qatar
Russia
Saudi Arabia
Serbia
Singapore
South Africa
South Korea
Spain
St. Vincent and the Grenadines
Switzerland
Taiwan
Trinidad and Tobago
Turkey
Turks and Caicos
Ukraine
United Arab Emirates
United Kingdom
Uruguay
Uzbekistan
Venezuela
Vietnam

Lifeline

Caring for the Growing Number of Early Onset and Young Adult Patients

When 26-year-old Jo Luzarraga was diagnosed with breast cancer in Manila, Philippines, her older sister Jan Claire swung into action.

"I told her, you're moving to Queens, New York, to live with me and my daughter and my partner," says Jan Claire, who is 40. "And you're going to be treated at Memorial Sloan Kettering Cancer Center."

Jan Claire supported her younger sister as she underwent chemotherapy, surgery, and radiation to treat triple negative breast cancer, which is a challenging subtype of the disease.

While being treated at MSK, Jo learned that she carries the *BRCA1* mutation, a genetic trait passed down through families that puts people at much greater risk for breast, ovarian, and other cancers.

Testing revealed that her older sister Jan Claire, also carries the *BRCA1* mutation.

In a heartbreaking blow, just as Jo was looking forward to finishing treatment, older sister Jan Claire learned she also had BRCA1-related triple negative breast cancer.

"I was in a state of shock," says Jan Claire. "But I had seen the amazing care everyone at MSK gave my younger sister. I knew I would be taken care of every step of the way."

Now both sisters say their bond is stronger than ever. "Jan Claire took care of me during my cancer journey," says Jo, "and I'm going to do the same for her."

Specialized Cancer Care for Younger Adults

Because both sisters are under 45, their care is coordinated through the Young Women With Breast Cancer (YWBC) program.

It is part of a trio of MSK programs with specialized expertise dedicated to the needs of younger adults. The group also includes the Center for Young Onset Colorectal and Gastrointestinal Cancer and the Lisa and Scott Stuart Center for Adolescent and Young Adult Cancers.

These programs were developed in part to deal with a disturbing rise in the number of people under 50 — including people in their teens and twenties — who are diagnosed with a variety of cancer types, including breast, colorectal, prostate, and lung.

Many factors contribute to this. Some patients have not yet reached the age for recommended routine screenings such as mammograms and colonoscopies. Therefore, their cancer is detected at a more advanced stage, when outcomes are worse. Cancer in young patients is also sometimes more aggressive.

Finding out why more young people are being diagnosed with cancer is a major focus of MSK

Breast medical oncologist Dr. Shari Goldfarb leads the Young Women With Breast Cancer Program. Her research focuses on improving quality of life during cancer treatment and throughout survivorship.

Sisters Jo and Jan Claire Luzarraga were diagnosed with the same form of breast cancer just months apart and are part of the Young Women With Breast Cancer Program. "I just feel they care for you differently at MSK," says Jan Claire.

Nurse Joe Bacani often cares for younger adults. “I have what I call an unfortunate advantage,” he says. “I was a blood cancer patient when I was 18 years old.”

programs. The three specialized centers are also devoted to helping people whose lives have been upended.

“These patients face unique challenges because of the time of life when they are diagnosed,” says breast medical oncologist **Shari Goldfarb, MD**, who leads the YWBC program and treats the Luzarraga sisters. “We look to address fertility, family planning, sexual function, self-identity, interpersonal relationships, career building, and more, often with the help of social workers.”

As a woman in her mid-20s, Jo says, “It was very comforting to have my care team raise the issue of fertility. I’m glad to know resources are there if I want them.” She also appreciated help navigating the finances of paying for her cancer care, a particularly daunting concern for younger people.

After her diagnosis, big sister Jan Claire was struggling with her own challenges. She says, “I’m at a different stage of life than Jo, as a 40-year-old parent of a young daughter who is living with my partner. Dr. Goldfarb and her team really helped me deal with the anxieties of working while being a mom in cancer treatment.”

That balancing act is helped by team members including Alanna Jamner, the research coordinator for the YWBC program. “I look to make sure patient care is streamlined, so for example if laboratory work is scheduled for one day and an MRI on the next, I’ll reschedule so patients can get everything done at once,” she says. “We work behind the scenes to help reduce stress for patients and their families to help them get the best care possible.”

Jan Claire says it’s invaluable “to have a medical team that understands all the things you’re juggling. I feel they just take care of you differently at MSK.”

The Human Touch

Empathetic care is also a goal of **Joe Bacani, RN**. He is a nurse in the Center for Young Onset Colorectal and Gastrointestinal Cancer.

The center, co-founded by gastrointestinal oncologist **Andrea Cercek, MD**, and gastroenterologist **Robin Mendelsohn, MD**, was the first in the world devoted to the specific needs of younger adult patients and has seen more than 4,000 patients since its founding in 2018. Bacani has been there from the beginning.

“I have what I call an unfortunate advantage,” says Bacani. “I was a blood cancer patient when I was 18 years old. I tell patients I don’t know exactly what they’re going through, but I’ve sat in the seat where they’re sitting.”

Bacani says his own experience “definitely makes my work personal. I can connect with patients from the get-go. I’m now 39. Many of the people I care for are my peers. And some are actually young enough to be my children.”

Caring for the whole person is paramount, says Bacani. “Obviously we are focused on taking care of you as a patient. But we’re also taking care of you as a mother or potential mother, as a spouse, as an employee, as a student. All the aspects that make that person who they are.”

For Jon Tenan, “one of my biggest goals in life was to be a good dad.” He came to MSK with a life-threatening stage 4 colorectal cancer diagnosis at 37. With a wife and two children under 5 years old, he says, “we were planning for life without me, which was more heartbreaking than anything I hopefully will ever do again.”

Jon credits his MSK care team, led by gastrointestinal medical oncologist, **Zsofia Stadler, MD**, with saving his life. He also relied on clinical social worker **Hadley Maya, LCSW**.

“Many younger patients are the first person in their network of friends to face cancer, and it can be really isolating,” says Maya. “Some want advice on how to navigate dating with cancer. Others have their own children and also have parents who want to play an active role in their treatment.”

For Jon, Maya was a vital resource. “Hadley was very helpful in figuring out how my wife and I could talk to our children in ways that made it digestible,” he says. “Like, ‘Daddy has an illness called cancer, and we’re working with the best doctors in the world to make it better.’”

Expertise and Empathy

A major reason younger patients come to MSK is for expertise — and answers.

“Younger people come to us and ask, ‘Why did this happen to me?’” says **Lisa DeAngelis, MD, MSK’s Chief Physician Executive**. “While we can’t always answer that question, we do have unprecedented insights into the underlying biology of many tumors, which can guide testing for a genetic trait that predisposes to a cancer appearing in a young person. This information can also guide treatment and assure better outcomes.”

There are almost 2,000 interventional clinical trials testing novel treatments at MSK that are designed and led by the leaders of their respective fields.

“There is no place that comes close to that portfolio,” says Dr. DeAngelis.

It’s this expertise that has given both Luzarraga sisters comfort and optimism. Jo has just completed active treatment and is feeling well. Jan Claire expects to finish her therapy in the spring.

For nurse Bacani, helping younger patients facing cancer feels like his destiny. “I know this sounds corny,” he says, “but after going through my own cancer journey, I knew that if my experience could touch one person then my purpose in staying here on Earth has been fulfilled.” •

> “Dr. Goldfarb really helped me with the anxieties of working while being a mom in cancer treatment.”
>
> — Jan Claire Luzarraga, breast cancer patient

Dr. Cercek’s research is supported by the MSK donor community, including **Bob and Anna Lou Schaberg** and the **Frechette Family Foundation**.

Additional support for the research collaborations was provided by the MSK donor community, including **Scott M. and Lisa G. Stuart**.

Dr. DeAngelis holds the **Scott M. and Lisa G. Stuart Chair**.

Dr. Cercek holds **The Ford Family Chair**.

FOR US, IT'S PERSONAL

Every day, the people of MSK give their all. In triumphant moments and challenging ones, we are dedicated to making a difference for our patients and in the discovery science that will impact the world. Whether for a patient or a trainee, we create moments of connection, comfort, and confidence that anything is possible.

Nurse Tawheed Issa grew up watching his grandmother, a nurse, care for patients with kindness and compassion. Her ability to make patients feel better not just physically but emotionally inspires him every day.

Margaret Bediones
Dedicated to Serving the Underserved

For MSK nurse Margaret Bediones, RN, taking care of people extends far beyond the walls of the MSK Ralph Lauren Center (RLC) in Harlem. She is committed to improving the health of people from underserved areas across New York City.

Born in the Philippines, Margaret's journey to help others began with a promise she made to herself when she was just 12 years old. After her father passed away from cancer of the spleen, she vowed to dedicate her life to caring for others in any way she could.

"I couldn't do anything to help my father, who was gone so quickly when I was young," Margaret says. "That's when I decided to become a nurse."

Her dedication to serving the underserved began when she was a nursing student.

"Part of our training focused on community outreach, where we would go to remote areas with limited — or even no — access to clinics. The nearest community hospital was miles away," Margaret says. "So we set up a clinic in the town hall with one of our doctors and offered medical care to the community, which included checking vital signs and blood sugar levels, providing wound care at times, and giving the residents appropriate referrals. We also offered education on hygiene, nutrition, vaccinations, and dental care."

When she joined the MSK Ralph Lauren Center 14 years ago, she was excited to join a team that was passionate not only about providing excellent patient care, but also about its outreach to connect with the surrounding community in Harlem.

"I love talking to people to educate them about the importance of cancer prevention and screening," Margaret says. "It's a rewarding feeling when I see the people that I talk to in the field come to the clinic. We have all these resources at MSK RLC, and I want people to know about the great medical care that's in their own neighborhood."

Brandon Cuevas
MD-PhD Candidate, Inaugural Class of the Cancer Engineering Program at MSK

Brandon Cuevas was just a sophomore in high school when he set his sights on becoming a physician-scientist at Memorial Sloan Kettering Cancer Center (MSK). "My aunt was diagnosed with stage 3 breast cancer," says Brandon, who grew up in and around New York City. "It was the first time I had seen someone close to me face such a serious illness, and each visit to the hospital was filled with uncertainty."

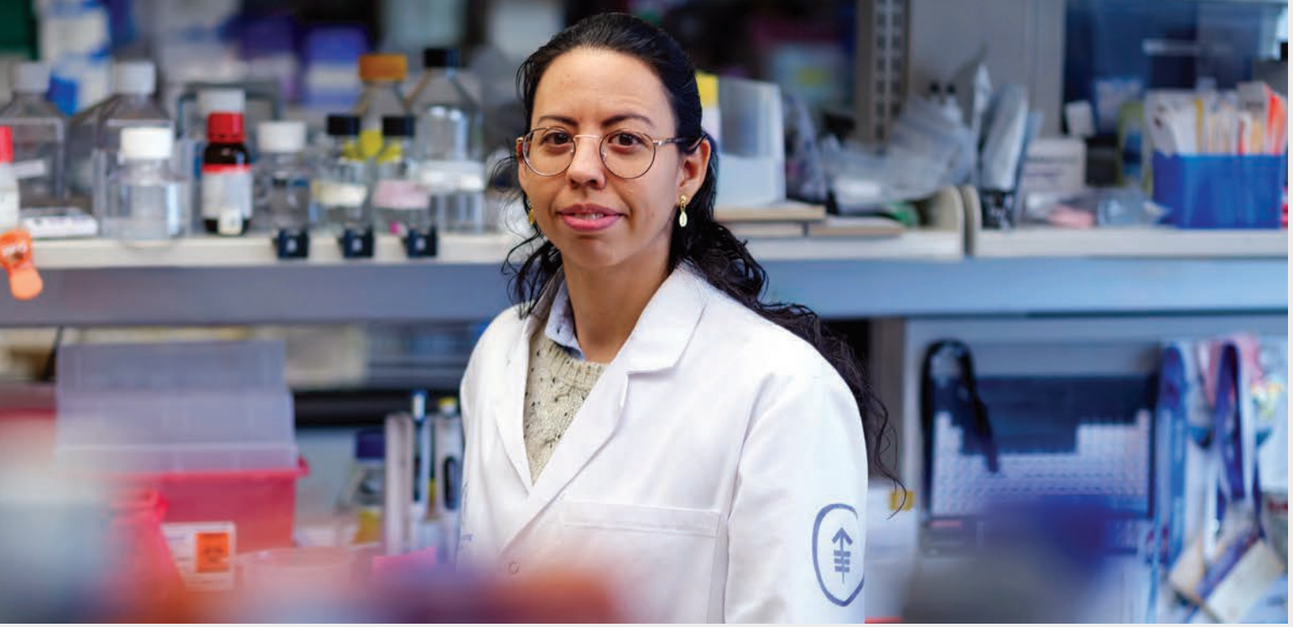
That intimate experience with the impact of cancer inspired him to train to become an oncologist, with the hope, says Brandon, of one day conducting meaningful research that would directly impact the lives of patients like his aunt. Twelve years later, he is an MD-PhD candidate in the Tri-Institutional Program and one of 13 students in the inaugural class of the Pat and Ian Cook Doctoral Program in Cancer Engineering, the first such program in the world.

It was during his surgery rotation at MSK as a medical student that Brandon witnessed firsthand how engineering disciplines such as robotics and artificial intelligence can improve patient outcomes. "That instantly lit a lightbulb in me," he says, "that opportunity to revolutionize cancer treatment using these new technologies." **Daniel Heller, PhD**, one of Brandon's mentors and the co-director of the new Cancer Engineering program, encouraged him to apply.

Brandon says he's learning as much from the questions asked by his classmates, who come from diverse backgrounds and disciplines, as from formal instruction. "MSK places a big emphasis on teamwork and group activities, so we're invited to tackle real problems that haven't been solved," says Brandon. "Like how to treat a glioblastoma, which is an aggressive brain tumor with a very low survival rate — less than 10% of patients survive within five years. It's very tough to treat pharmacologically, but the instructor encouraged us to split up into groups and to think about ways to do it anyway, and that discussion actually led to an interesting idea."

Even as students, Brandon and his classmates have the chance to be pioneers.

Brandon hopes to eventually run a lab focused on finding better cancer therapeutics: "Just being able to be that bridge between medicine and research is such a privilege, one that not many places can offer."



Moralba Dominguez Garcia
Reaching New Heights

For Moralba (Mora) Dominguez Garcia, PhD, being a Research Scholar developing radiopharmaceuticals against cancer is a dream come true.

Like so many trainees who come to Memorial Sloan Kettering Cancer Center (MSK) from around the world after earning a PhD, she was drawn by the mission. "MSK is the place where we try to do something good — to cure cancer."

Mora says her journey was quite unconventional.

"Life is very weird, the ways that get chosen for you," she says.

She was raised in Cali, Colombia, by parents who never went to college but prized education.

They had two non-negotiable rules for their three studious daughters: good grades in school and then sports.

For Mora, math, chemistry, and physics were a piece of cake. The science-minded girl aced them all and eventually fell in love with research, specifically chemistry.

"I wanted to do something that creates knowledge and can help other people," she says.

The sports requirement was not so easy to balance with her studies. Her mother found an extracurricular track-and-field practice that would fit into Mora's schedule and signed up her preteen daughter for the high jump.

"Every day I was training with professional athletes. Obviously, it was a lot of effort for me," she laughs, remembering her struggle to keep up with them.

But their competitive spirit lit a fire. "Just watching them, I was, like, Oh, my gosh, yeah. I want to try that."

By the time Mora was in her second year of college, she had become an elite athlete, a pole vaulter who had started to compete internationally, and the first and only female pole vaulter in her state for several years. The sport found her, she believes. Serendipity.

But after two injuries, she had to leave the field, and she dove back into science.

Mora is now training in the Jason Lewis Lab in a rapidly evolving field of precision medicine called radiotheranostics, which combines diagnostic imaging with targeted therapy for specific types of cancer. She is investigating strategies that use radiation for the simultaneous early detection and treatment of pancreatic cancer.

She's exploring the integration of radio chemistry with antibody drug conjugates (ADCs), which are designed to target and kill tumor cells while leaving healthy cells. She describes it as a kind of dual therapy, one part drug and one part radiation to improve the therapeutic effect.

"Maybe, one day, my work will help save the life of someone," Mora hopes.

As always, Mora has set a high bar for herself, determined to clear the hurdles.

Shakima Grant
The Face of MSK in the Community

From the day Shakima Grant was hired as a care coordinator at MSK, in 2007, she says she knew she had found her purpose.

"It always felt like I was meant to be here," says Shakima, whose grandmother passed away from stage 4 ovarian cancer that very same year. Her grandmother lived in Harlem and yet had never heard of MSK, nor had she voiced any symptoms that might have sent her to the doctor sooner to get diagnosed at an earlier and potentially curable stage.

"Awareness is crucial, and it's the reason I went back to school to earn my master's degree in health education and promotion," she says.

Today, Shakima is Senior Community Programs Manager, and her mission is forging a strong relationship between MSK and the people in its community to improve access to world-class cancer care. She has become a beacon of information, raising awareness and connecting people with MSK's cancer screening and prevention services in their own neighborhood.

The goal of improving cancer care for everyone took a leap forward in 2024, as MSK moved ahead with plans to build a new state-of-the-art building on its main campus in Manhattan. Known as The Kenneth C. Griffin Pavilion at MSK, the facility will meet the significant surge in the number of cancer cases expected in the coming years. It will offer more patients advanced technology, cutting-edge robotics, and the latest in surgical suites.

"Being part of the community team at this time in MSK's history is an incredible honor and responsibility," says Shakima. "We are spreading the word and opening the doors for more patients than ever before to receive the best cancer care in the world, right in their backyard."

MSK has made it a priority to explain how the visionary Kenneth C. Griffin Pavilion at MSK project will proceed and the life-saving difference it will make to the community near MSK. People in the neighborhood know that Shakima is the person at MSK they can call to stay informed.

"I'm proud to be that friendly face in the community," she says. "I'm doing this in memory of my grandma and to make it easy for anyone to receive care at MSK."

Chaplain Yusuf Hasan
Keeping Spirits Up

Imam Yusuf Hasan had never heard of MSK in 1991, when he was asked to visit a Muslim patient who was dying of cancer. But he knew there was a need. There were no Muslim chaplains on MSK's Healthcare Chaplaincy team until he came along to fill that void. He's remained at MSK supporting patients and caregivers ever since.

"I'm the type of person who likes to be where the most difficult issues are in the community, and MSK is one of the most difficult places to work because of the nature of cancer," explains Imam Hasan.

In 1996, he completed his internship and clinical training at MSK to become the first board-certified Muslim chaplain in the United States. "I get a great blessing from sitting at the bedside of the sickest of the sick and making sure to see them as human beings and not just an illness," says Imam Hasan.

Patients are thankful when he visits. "I'm honored to do the work that I do, and I thank them for allowing me to be part of their journey," he says. "I've dedicated my life to keeping people's spirits up when they are at their lowest."

Imam Hasan finds plenty of time for joy, too, proudly volunteering with Harlem's African American Day Parade for 45 years.

"The parade gives us a time and place where we come together and enjoy each other and showcase the absolute best of the African American community," says Imam Hasan, who has been chairman of the parade since 2013.

He's especially proud that the MSK Ralph Lauren Center in Harlem is now a parade sponsor and says that MSK's support sends an important message to the people who live there.

"People see MSK in the community, and they feel less afraid and more comfortable coming to MSK for treatment at the best hospital for cancer in the city and probably in the country."

Charlene Jerome
Superhero of Hope

Charlene Jerome, a specialist in patient financial services, is a superhero in the eyes of one of the many patients she's helped. So much so that patient Melissa Thompson sings her praises. Literally.

Melissa surprised Charlene with an original rap song she titled "Queen Charlene: Patients' Superhero of Hope." Here's a sample:

> "Through the maze of
> paperwork and patient fear,
> With Charlene's expertise,
> all the hassles clear."

Melissa, a single mother, had been diagnosed with metastatic breast cancer. But she couldn't afford the co-pay for the chemotherapy drug prescribed to slow down the growth of cancer cells. The drug would give Melissa the best chance to control further spread.

Melissa reached out to the drug's manufacturer for financial help but got overwhelmed by the required paperwork. Her doctor wasn't aware that she hadn't yet filled the prescription. Melissa felt more guilty at each visit. She kept delaying treatment. She lost hope.

It's Charlene's job to find financial assistance for patients with large co-pays that their insurance doesn't cover. She hunts for free drugs, deep discounts, and financial aid so MSK patients can focus on healing.

"We don't want patients who are already being treated for cancer to have to be on the phone constantly with a manufacturer," Charlene says. "Imagine dealing with your diagnosis and having to deal with that too."

For Melissa, the co-pay was almost equal to her income. The financial burden led her to delay getting her medication for weeks, then weeks turned into months. Aware that fear and embarrassment were putting her at risk of the cancer spreading, she finally reached out for help and connected with Charlene.

"She had a long story, and I listened," Charlene recalls. "I just listened."

Then Charlene rolled up her sleeves and got to work.

By working with Melissa's care team, financial coordinators, and the pharmacy department, Charlene found a solution for Melissa. Charlene's team also created a new system to flag cases like this one, so patients don't fall through the cracks.

Melissa is now taking the drug she needs.

Along with the rap song, she thanked Charlene in a letter. "I want to spend as many years with my young daughter as possible," Melissa wrote. "You have given me a new lease on life. I hope you know that you make an incredible impact in the work you do."

THE MSK CAMPAIGN: LEADING SCIENCE. CHANGING LIVES.

We are at a moment of unprecedented hope and opportunity. In 2024, MSK celebrated 140 years of discoveries that have changed lives around the world. But despite all of our progress, cancer rates are rising. Cancer research has reached a critical turning point, and we appreciate all the ways our giving community is helping us meet the demands of the future.

MSK Kids patient Cairo with Child Life Specialist Irini Economos

MSK Giving

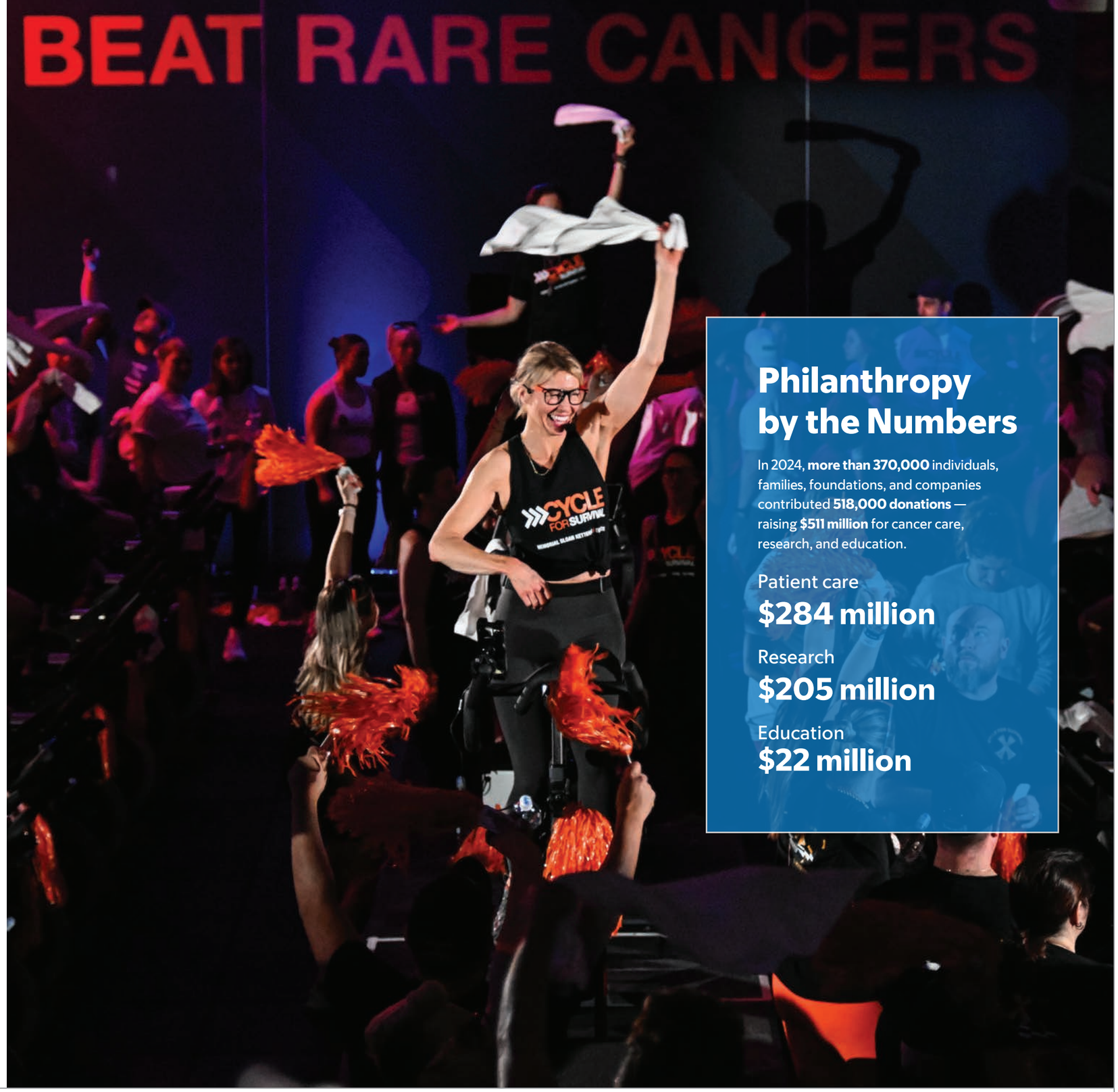
In 2024, we invited the MSK Giving community to join an ambitious effort to raise $6 billion by 2030 and shape the future of cancer care — The MSK Campaign: Leading Science. Changing Lives. In response, MSK donors contributed $511 million to advance MSK's mission of ending cancer for life, and every single dollar donated is making a real difference in the way we treat and understand cancer.

The MSK Campaign is a unique opportunity to stretch the limit of what cancer care can be. Organized across six strategic initiatives, it ensures that the world's top cancer doctors and scientists have the resources needed to create new treatments and cures, turning MSK's legacy of innovation into impact.

Already, The MSK Campaign has created new initiatives in data science and cancer vaccines, established the first engineering PhD program focused on cancer, and so much more.

"When this community joins together, we can do great things," says MSK President and CEO Selwyn M. Vickers, MD, FACS. "Philanthropy is essential to everything we do."

The MSK Giving community welcomes everyone. Ninety-seven percent (97%) of MSK donors gave less than $1,000 in 2024. Whether you ride with Cycle for Survival, run with Fred's Team, give now or through thoughtful future arrangements, you are part of the MSK Giving community, and every dollar donated is part of The MSK Campaign. Thank you for creating a better future for people with cancer worldwide.



Riding at Equinox Bryant Park to beat rare cancers with Cycle for Survival

Philanthropy by the Numbers

In 2024, **more than 370,000** individuals, families, foundations, and companies contributed **518,000 donations** — raising **$511 million** for cancer care, research, and education.

Patient care
$284 million

Research
$205 million

Education
$22 million

The MSK Giving Community in 2024: Together, Advancing MSK's Mission

22,500 people
raised money on MSK's behalf.

Donors live in
84 countries
and all **50 states**.

114,000 donors gave
to MSK for the first time.

67,000 donors
made two or more donations.

239 donors
told us that MSK was
in their estate plans.

48,000 donors
increased their giving.

370,000 donors
gave to MSK.

97% of donors
gave gifts of less than $1K.

Jessica McCutchan and Farzana Rahman, both Angio/Interventional Technologists, at the David H. Koch Center for Cancer Care at Memorial Sloan Kettering Cancer Center

Tom Scalera and Brett Ravage, who both lost their spouses to cancer in 2019, were married the day after Thanksgiving 2024.

It was a magical late autumn evening last year, in the heart of a charming Connecticut town. Family and friends had gathered to celebrate the marriage of Brett Ravage and Tom Scalera, a beautiful couple getting a second chance at love.

But what makes Brett and Tom's wedding extraordinary, and their reception unforgettable, is what the bride and groom did that day for love.

The pair turned their wedding reception into a major fundraiser in support of Memorial Sloan Kettering Cancer Center (MSK) and its mission: ending cancer for life. This idea was not just admirable. For the bride and groom, it was deeply personal.

"It all came together for us," Tom explains. "This MSK fundraiser was a good way to convert our journey into something even more meaningful."

In lieu of gifts, they told guests, they would gratefully accept any donation large or small to the Memorial Sloan Kettering Legacy of Love fundraiser, established in memory of Aaron and Rebecca, the beloved spouses they had lost to rare cancers five years earlier.

"We put our blood, sweat, and tears into fundraising for MSK," Tom said. "And with our special wedding fundraiser, we also put our heart and soul into it."

A Match Made in Heaven

Brett and Tom's journey together began in 2019, as two grieving spouses who had just lost the loves of their lives to rare cancers — Aaron to Ewing sarcoma, a type of bone cancer, and Rebecca to metastatic breast cancer. Although Tom and Brett lived in the same town, just one mile apart, they didn't know each other. "We had only met briefly before our tragedies struck," Tom says. But their lives, in fact, had been intersecting at so many points that falling in love seemed almost like fate.

"We say it's kind of a match made in heaven," says Tom.

The connector was Tom's spouse, Rebecca, a psychologist, who had received a diagnosis of late-stage breast cancer in 2015. It was a total shock. Although determined to beat the odds, she knew her treatment options were limited. Rebecca also quickly learned that she could make a difference. Only a small percentage of breast cancer research dollars are funneled into metastatic breast cancer (the Metastatic Breast Cancer Alliance estimates it's around 7%). Rebecca set out to change that.

In 2016, she launched the Cancer Couch Foundation with a clear goal, to fund metastatic breast cancer research. She partnered with MSK to help accelerate treatment and someday find a cure.

In 2018, just across town, Brett's healthy and fit husband, Aaron, began to experience hip pain. He was diagnosed with Ewing sarcoma at another medical center. Because Aaron's disease is so rare in adults, he came to MSK Kids to be treated by **Leonard H. Wexler, MD**, and the pediatric oncology experts. That year Brett and her family joined a Cycle for Survival team called Pedaling Sunshine and raised $50,000 for research into rare cancers at MSK.

When Aaron's cancer had metastasized and Brett was looking for guidance about navigating advanced disease, a mutual friend introduced her to Rebecca.

"Although Rebecca was in treatment, she was always looking to help everybody, and she certainly helped me," says a grateful Brett.

Brett and Tom's blended family at a Cycle for Survival event fundraiser for MSK research into rare cancers

"She was a very big support for me, and she guided me in a lot of great directions. We became fast friends."

By 2019, Aaron's disease had progressed rapidly, and Rebecca knew that she, too, had limited time. They died within six months of each other, plunging their heart-broken spouses into the isolation of COVID, two single parents with five children between them, lost in grief, trying to survive the pandemic.

Brett, a mother of three, had made a promise to Rebecca to watch over her two children. She and Tom began to text.

"I would periodically check in on Tom and the kids," she says, "Just to say, I've been there."

Over many months, a friendship slowly grew. Then sparks. They say that love broke through the darkness. They knew from their happy marriages what a beautiful love felt like. "And we knew we had it again!" Tom says.

I Do/We Do

Tom is now president of the Cancer Couch Foundation, which has raised more than $6 million.

Brett and Tom's full-circle MSK journey from loss to love to giving back

Brett is a passionate fundraiser for her Pedaling Sunshine team, which has raised over $3 million.

Tom and Brett pledged their "I dos" — not just in the creation of their new life together, but to stay steadfast in their mission to raise money for MSK in memory of Rebecca and Aaron.

"This is the greatest foursome of all time," Tom says, making a golf analogy. "We think about Aaron and Rebecca and keeping them a part of everything we do."

In losing their beloved spouses, they found their way to each other. Making space for more love, says Brett, has been their best wedding gift. "Your heart can always grow bigger." •

The Society of Memorial Sloan Kettering Cancer Center

The Society of Memorial Sloan Kettering Cancer Center (MSK), composed of over 120 philanthropist volunteers dedicated to MSK's mission, raised an extraordinary $6.9 million in the 2023–2024 season.

For more than 75 years, The Society has worked side by side with MSK leadership to raise essential funds for the institution's top priorities. The Society is currently supporting the six strategic initiatives identified in **"The MSK Campaign: Leading Science. Changing Lives."** Its efforts are making an enormous impact, fueling innovations in cancer care, research, and education.

"The Society is integral to MSK's success — a powerful partner providing essential support for high-potential, high-priority initiatives that truly change the lives of people with cancer here at MSK and worldwide," says **Lisa DeAngelis, MD, MSK's Chief Physician Executive and Scott M. and Lisa G. Stuart Chair**.

Recognizing the unprecedented number of young people being diagnosed with cancer, The Society is funding research through its 2024–2025 Campaign to identify why young people are being diagnosed more frequently with colorectal cancer and develop new treatment options for this growing population.

MSK made history in June 2022 when gastrointestinal medical oncologist **Andrea Cercek, MD**, and **Luis Diaz, MD**, Head of the Division of Solid Tumor Oncology and Grayer Family Chair, and their colleagues at The MSK Center for Young Onset Colorectal and Gastrointestinal Cancer published remarkable results from a small clinical trial for young people with a specific type of rectal cancer. Every person in the study achieved complete remission after being treated with an immunotherapy. Through its Campaign, The Society is helping to fund additional research to ensure that many more people can benefit.

"I am incredibly touched and grateful to The Society of MSK for recognizing the value of my team's work and investing in an evolving field of cancer research," says Dr. Cercek. "The Society's philanthropy will drive MSK's success in this area, enabling my colleagues and me to take risks and pursue bold ideas to answer cancer's biggest questions."

The Society also raised money for other high-priority patient care initiatives for both MSK Kids and adults, and financial support for postdocs. The 2024 Society Spring Ball Initiative funded Artificial Intelligence and Noninvasive Technologies for Oncologic Dermatology, emphasizing the group's championship of innovation.

Claudia Taylor Overstrom, President, The Society of MSK.

While The Society has a deep history within the MSK Giving community of donors, its work is firmly focused on building a better future for every person touched by cancer. •

Dr. Cercek holds **The Ford Family Chair**.

Dr. Diaz holds the **Grayer Family Chair**.

Dr. DeAngelis holds the **Scott M. and Lisa G. Stuart Chair**.

Patient Veronique (Vero) at an MSK Kids Halloween party

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Gifts of $100,000 and above

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Jane and Daniel Och

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Israel Englander
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Statistical Profile

Memorial Sloan Kettering Cancer Center

	2020	2021	2022	2023	**2024**
PATIENT CARE					
Total Patients Treated	60,063	63,727	66,837	71,233	**74,098**
Total Admissions	22,822	24,142	24,113	25,591	**26,009**
Adults	21,517	23,060	23,123	24,519	**25,022**
Children	1,305	1,082	990	1,072	**987**
Average Patient Stay (days)	7.1	7.1	7.18	7	**7.02**
Bed Occupancy Rate[1]	85.9%	91.3%	88.17%	94.8%	**95.1%**
Total Outpatient Visits: (Includes telemedicine visits)	782,021	904,732[2]	931,889[2]	1,002,260	**1,046,023**
Outpatient Visits: Manhattan	282,009	344,443	370,348	404,152[3]	**412,179**
Outpatient Visits: Regional Network	172,127	237,487	269,722	304,240	**317,766**
Outpatient Telemedicine visits	327,885	322,802	291,819	294,462	**316,078**
Screenings	45,549	51,185	56,023	61,264	**67,150**
Surgical Cases	23,967	26,764	26,504	28,646	**29,494**
Radiation Oncology New Starts: Manhattan	4,173	4,607	4,573	4,725	**4,779**
Radiation Oncology New Starts: Regional Network	6,666	7,460	7,803	8,365	**8,341**
Total Chemotherapy Treatments: Manhattan	111,447	121,247	124,134	130,100	**129,857**
Total Chemotherapy Treatments: Regional Network	162,371	173,802	185,242	201,526	**212,457**
Diagnostic and Interventional Radiology Procedures	591,450	659,966	684,225	738,363	**790,378**
Clinical Research Studies	1,254	1,898	1,935	1,861	**1,806**

[1] Based on adjusted bed count
[2] Corrected calculation to ensure consistent methodology
[3] Adjusted from previous 2023 data which counted telemedicine and in person visits in Manhattan together. Those items are now counted separately.

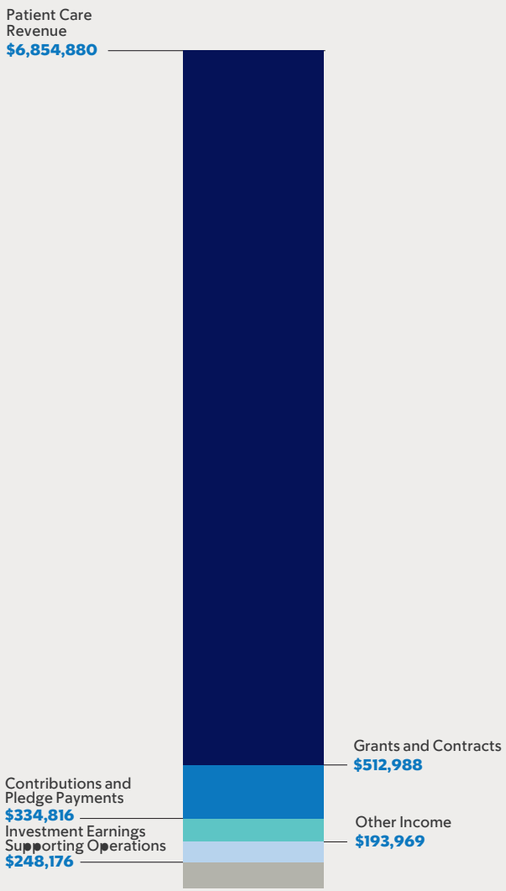
	2020	2021	2022	2023	**2024**
STAFF					
Sloan Kettering Institute Members	137	140	158	158	**155**
Hospital Attending Staff	1,417	1,457	1,508	1,493	**1,507**
Advanced Practice Providers	885	901	1,082	1,053	**1,152**
Registered Nurses	3,993	4,063	4,645	4,638	**4,714**
Administrative and Support Staff	14,774	14,937	14,468	13,754	**13,664**
Total Staff[(1)]	21,105	21,461	21,838	21,077	**21,175**
Volunteers	432	262	438	370	**394**
EDUCATION					
Residents and Clinical Fellows: Positions	460	568	592	595	**599**
Residents and Clinical Fellows: Annual Total	1,619	1,691	1,952	1,824	**2,167**
Research Fellows	277	184	183	207	**225**
Research Scholars	150	105	102	135	**157**
Research Associates	153	182	138	140	**169**
Graduate Research Assistants	28	34	34	41	**36**
PhD Candidates	282	300	317	312	**363**
MD-PhD Candidates	21	26	25	25	**32**
Registrants in CME Programs	6,582	6,507	7,685	7,615	**7,317**
Medical Observers	31	12	73	81	**91**
Medical Students	246	350	445	401	**529**
Nursing Students	507	475	570	610	**617**
Social Work Students	0	8	7	7	**7**
Radiation Oncology Technology Students	19	18	15	12	**11**
Physical Therapy Students	4	9	6	6	**4**
Occupational Therapy Students	3	4	4	3	**3**
Laboratory Medicine Students	20	20	19	26	**20**

In 2024, 17 staff members held dual appointments in both the Sloan Kettering Institute and Memorial Hospital.

Financial Summary
Memorial Sloan Kettering Cancer Center

2024 TOTAL OPERATING REVENUES
(Dollars in Thousands)

$8,144,829



2024 TOTAL OPERATING EXPENSES
(Dollars in Thousands)

$7,942,637

Combined Statements of Activities
Memorial Sloan Kettering Cancer Center

	2020	2021	2022	2023	**2024**
OPERATING REVENUES (Dollars in Thousands)					
Patient Care Revenue	$ 4,261,296	$ 5,011,551	$ 5,393,762	$ 6,082,112	**$ 6,854,880**
Grants and Contracts	347,540	411,772	427,125	475,076	**512,988**
Contributions	175,641	162,290	183,434	201,427	**188,470**
Net Assets Released From Restrictions	105,975	198,462	202,595	189,579	**146,346**
Other Income	357,654	443,099	220,422	184,042	**193,969**
Investment Earnings Supporting Operations	159,090	171,191	203,106	221,992	**248,176**
Total Operating Revenues	5,407,196	6,398,365	6,630,444	7,354,228	**8,144,829**
OPERATING EXPENSES					
Compensation and Fringe Benefits	3,184,891	3,315,428	3,628,897	3,714,129	**3,990,592**
Purchased Supplies and Services	2,123,302	2,312,86	2,689,562	2,943,840	**3,382,634**
Depreciation and Amortization	412,493	422,309	437,224	430,356	**436,837**
Interest	103,682	112,663	122,813	131,625	**132,574**
Total Operating Expenses	5,824,368	6,163,263	6,878,496	7,219,950	**7,942,637**
Excess (deficit) of Revenue Over Expenses	(417,172)	235,102	(248,052)	134,278	**202,192**
Philanthropic Revenue	263,572	576,457	452,083	448,663	**505,424**
Capital Spending	264,706	218,168	547,591	407,777	**468,993**
BALANCE SHEET SUMMARY					
Assets	13,315,250	14,941,252	14,012,590	14,681,783	**15,489,903**
Liabilities	5,246,709	5,116,862	5,272,308	5,447,927	**5,499,098**
Net Assets	8,068,541	9,824,390	8,740,282	9,233,856	**9,990,805**

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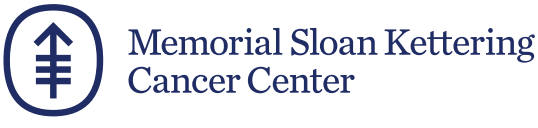

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