

# MOFFITT MOMENTUM<sup>®</sup>

Volume 7, Issue 2

## MEET OUR NEW PRESIDENT & CEO

Cancer visionary is poised to elevate patient care and research

## A GLOBAL CHALLENGE

Collaborating in Ghana to save lives

## PROMOTING RACIAL EQUITY

What Moffitt leaders are planning



# Leadership Message



Timothy J. Adams  
Chair, Moffitt Institute Board of Directors

Dear Friends,

Our mission remains to contribute to the prevention and cure of cancer, and our dedication to the mission during the past challenging year is illustrated throughout this issue of Momentum magazine.

As the COVID-19 pandemic took much of the world by surprise, Moffitt Cancer Center strengthened safety measures and harnessed technology to keep team members and patients safe. Amy Sapien shares how she stayed strong while undergoing urgent surgery during a time when a necessary no visitor policy kept her from seeing her loved ones.

Other news this year highlighted racial inequities and uneven hardships faced by minority communities, spurring us to recommit our efforts against racism and disparities. Our executive leadership held a roundtable discussion to examine what has been done and, importantly, what more can be done to make meaningful change in support of racial equality.

Florida has the second highest cancer burden of any state in America, and, clearly, Moffitt must continue to be a resource for our patients by planning and building for the future. Construction is underway on a new

inpatient surgical hospital on McKinley Drive, in anticipation of a 65% increase in patient volumes and a 33% increase in surgeries over the next 10 years. The new facility, scheduled for completion in 2023, will expand the cancer center's capacity for inpatient care and modernize our ability to treat and cure cancer.

As this issue of Momentum goes to press, we are thrilled to announce that Patrick Hwu, MD, has been appointed the new president and CEO of Moffitt Cancer Center. He brings 31 years of oncology experience and comes from The University of Texas MD Anderson Cancer Center, where he has served as the division head of Cancer Medicine. Prior to serving in these leadership positions at MD Anderson, Dr. Hwu completed a fellowship at the National Institutes of Health in medical oncology and immunology. We invite you to read more about Dr. Hwu, his passion for immunotherapy research and his vision for the cancer center.

We hope you enjoy reading these insightful stories that underscore the scope of our growth, clinical and scientific innovation and initiatives to help bring an end to cancer.

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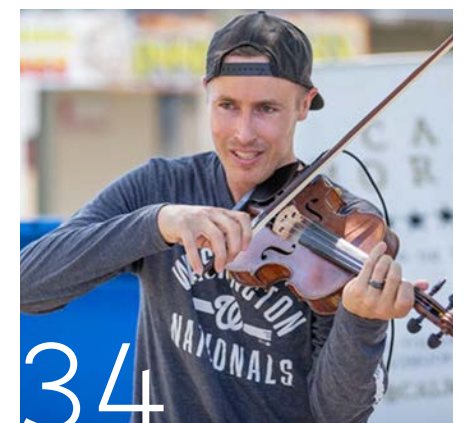
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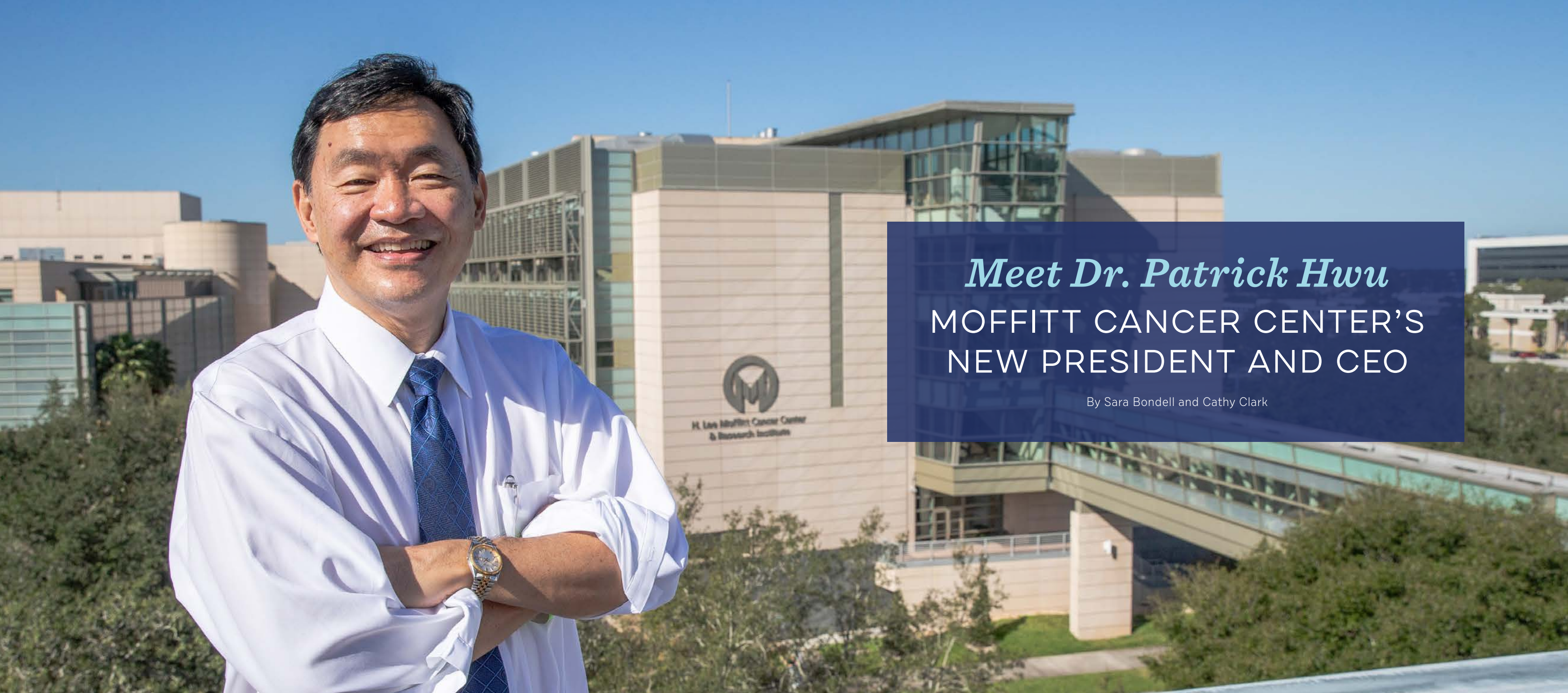
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## *Meet Dr. Patrick Hwu* MOFFITT CANCER CENTER'S NEW PRESIDENT AND CEO

By Sara Bondell and Cathy Clark

*Moffitt Cancer Center is proud to announce that Patrick Hwu, MD, has been appointed the new president and CEO of the cancer center. He brings 31 years of oncology experience and comes from The University of Texas MD Anderson Cancer Center, where he served as the division head of Cancer Medicine. During his 17 years at MD Anderson, he was chair of the Department of Sarcoma Medical Oncology and co-director of the Center for Cancer Immunology Research. Additionally, he was the first chair of the Department of Melanoma Medical Oncology. Prior to serving in these leadership positions at MD Anderson, Hwu completed a fellowship at the National Institutes of Health in medical oncology and immunology.*

### LEADING THE BAND

By day, Patrick Hwu, MD, works to cure cancer. By night, he wears sunglasses and jams on his keyboard. He is a member of The CheckPoints, a band comprised of cancer researchers and physicians from across the country. It's named for a type of immunotherapy treatment that removes immune cells' brakes – or checkpoints – and enables them to attack cancer.

Hwu and his mates have a regular gig: They're the house band for the Society for Immunotherapy of Cancer and play to hundreds of their colleagues at two scientific conferences a year.

"We have a bunch of nerdy immunology friends that get together and they dance until it's after midnight," said Hwu. "It's a ton of fun."

Fun isn't a word often associated with cancer care, but there is surprisingly more in common between the disease and a rock 'n' roll band than meets the eye. While science is left-brain oriented, music stimulates the creativity-focused right side. Together, they make the perfect pair; Hwu often uses his creative side to answer research questions.

Working at a cancer center is also a band of sorts, and Hwu is excited to take the lead in the Moffitt Cancer Center band of clinicians, researchers, team members and patients.

"Being in a band is learning to work together, listen to each other and work as a team, so it's very much like that with science and medicine," said Hwu. "We have to work as a team. We have to really listen to each other and make space for each other, and then move together."



*Dr. Patrick Hwu and colleagues play at the Society for Immunotherapy of Cancer scientific conferences.*



***“Being in a band is learning to work together, listen to each other and work as a team, so it’s very much like that with science and medicine.”***

#### COMPASSION AND WORK ETHIC

Hwu’s parents, Mark and Margaret, grew up in different regions of China: Margaret south of Beijing and Mark near Hong Kong. After immigrating to the U.S., the pair met in Cincinnati, Ohio, where Margaret taught chemistry at a nursing school and Mark earned his doctorate in chemical engineering.



They raised Hwu and his three sisters in St. Albans, West Virginia, a small town with about 13,000 people. Both successful in their fields, Hwu’s parents taught their children not only the importance of science and research, but also

compassion and work ethic. Both began their careers in a new country with few resources. Mark washed dishes to make ends meet. When the couple became U.S. citizens, the story made the St. Albans newspaper.

“That shaped the importance of a work ethic to get where you want to go and to be goal-oriented,” said Hwu. “They always encouraged education and to be appreciative of being part of this country. They had to earn that, earn their citizenship, and it always stuck with me.”

Music also stuck with Hwu from a young age. After his father, who didn’t play himself, tried to teach his son to play piano using a how to book, Hwu began formal lessons in the third grade. As he got older, he gravitated from classical music to rock, which inspired a love of rock ‘n’ roll. It wasn’t long before he learned to play Styx’s “Come Sail Away.”

He played the trumpet in high school and took his first trip to Tampa in 1981, when he played with the St. Albans Red Dragon Band in the Gasparilla Parade. He had no idea he would return to Bayshore Boulevard almost four decades later as the CEO of Moffitt.

But Hwu already knew he would become an oncologist. His first experience with cancer came when a teacher and classmate were both diagnosed with leukemia. St. Albans didn’t have a hospital that could offer treatment, so both had to travel to the National Cancer Institute in Maryland. And later in life, both of his parents would become cancer

survivors – Margaret with breast cancer and Mark with prostate cancer.

“I saw people around me getting cancer and really not a lot of places to treat the disease,” said Hwu. “I saw there were a lot of new therapies that were needed. Very early on in my life, I saw cancer clearly as a problem I wanted to tackle.”

Hwu’s passion led him into an accelerated undergraduate-to-medical school program where he developed an interest in immunotherapy. He eventually walked through the same doors his teacher and classmate once did – at the National Cancer Institute for his medical oncology fellowship.

Though his academic journey was demanding, music was never too far away. Each step of his career came with a new opportunity to play in a band. As an intern, he was in a band called Move the Cat; in residency, he played in As Is. When he arrived at the National Cancer Institute, he helped form the band Protocol Violation, a name with a cheeky nod to clinical trials.

“A violation isn’t something you are supposed to do on protocols, but it was one of those rebellious rock ‘n’ roll names,” joked Hwu.

***“Very early on in my life, I saw cancer clearly as a problem I wanted to tackle.”***



*Dr. Patrick Hwu’s parents stressed science and research, coupled with compassion and work ethic. L-R: Mark, Patrick and Margaret Hwu.*

Hwu kept the protocol violations to his music and pushed forward with his immunology work alongside the best and brightest during the infancy of the field.

#### FAMILY BAND

In a rock band, the musician on the keyboard plays the underlying chords of the music, creating the structure of the song and listening closely to the other instruments and the singer who sings the melody. Hwu’s ear for music taught him the importance of good listening skills in medicine.

“If you don’t listen to the nurses, you are in big trouble,” said Hwu. “That’s how I got through my residency, listening to them. And I actually married one of them, so I am still listening to nurses every day.”

Hwu and his wife, Katie, have two adult daughters, Emily and Ally, and a 14-year-old bichon frise named Maisy, who was diagnosed with mucosal melanoma four years ago. Maisy received a melanoma vaccine approved for pets that was designed by the tuba player in The CheckPoints. Today, she is cancer free.

***“If you don’t listen to the nurses, you are in big trouble.”***

Quarantining during the COVID-19 pandemic has brought Hwu and his family closer than ever. Hwu built a dance floor inside their Houston home for Ally, a dance major who needed somewhere to practice while away from her college campus. In return, his daughters taught him the ways of Generation Z college students and “addicted” their dad to food delivery apps. They also introduced him to the social media video app TikTok. With the goal of getting 100,000 views, Ally asked her parents to join in.

In one video, Hwu participates in a sibling challenge, answering questions about his daughters. In another, he and the family are wearing bath robes and sunglasses dancing to a song from “Mamma Mia!”

“I thought, who’s ever going to see this? So I might as well do it,” said Hwu.

Hwu doesn’t let his viral video fame go to his head. Instead, it’s taught him the power of social media and inspired ideas to harness the platforms to promote Moffitt and cancer research. And as for the videos, they are minutelong snippets that capture a monthslong quarantine, memories the Hwu family, under ordinary circumstances, wouldn’t have documented. While the idea of quarantining surrounded by women may scare some men, it’s something Hwu cherishes.

He’s used to it, after all, growing up in a home with sisters.

“I learned that if you listen to the women around you, you’ll be guided well and your life will be fine,” said Hwu. “That’s been a principle that’s worked for me my whole life.”

***“That’s how I got through my residency, listening to them.***

***And I actually married one of them, so I am still listening to nurses every day.”***

#### TAKING THE BAND ON THE ROAD

While Hwu has had an impressive career so far, the opportunity to lead Moffitt is one of his most exciting challenges, and he is ready to embrace all Moffitt and Tampa have to offer. Swapping landlocked Texas for the Sunshine State, he is looking forward to waking up every morning by the water and has plans to try his hand at paddleboarding. He is a National Football League fan and will now be cheering on Tom Brady and the Buccaneers.

And of course, his keyboard is coming with him. Once he finds a drummer, bass player and a few others, can a Moffitt house band be far behind?

All that’s missing is a catchy name.

#### BENEFITS OF COLLABORATING; THE EARLY YEARS

As creative collaboration has proved necessary for his music band’s success, similarly, Hwu knows the value of partnerships in his work as a physician-scientist.

He considers himself fortunate to have worked with Steven Rosenberg, MD, PhD, using immunotherapy to treat patients at the National Cancer Institute, early in his career. Rosenberg pioneered the development of effective immunotherapies and gene therapies for patients with advanced cancers. Hwu completed a fellowship in Medical Oncology and Immunology at the NCI from 1989 to 1993.

“T cells [an essential part of the immune system] naturally grow against melanoma,” said Hwu. “If you place melanoma cells in a culture dish and add a growth factor called interleukin-2, the T cells naturally grow out that recognize melanoma. You can then give those cells back to the patient to kill the tumor.” Hwu, working with Rosenberg, routinely used this tumor-infiltrating lymphocyte therapy to treat patients.



*Dr. Patrick Hwu discusses benefits of mass spectrometry with staff scientist Lancia Darville (left) in the Proteomics Core Facility.*

The work using TIL showed success in patients with melanoma, but not all cancers. “We were frustrated because we couldn’t do this with other kinds of cancers, very common cancers like colon, breast and ovarian,” said Hwu.

#### A NEW CAR TAKES OFF

Hwu and his colleagues with Rosenberg’s group were looking at ways to train immune cells to recognize the tumors. He began working with world-renowned immunologist Professor Zelig Eshhar of Israel’s Weizmann Institute of Science, who was doing a sabbatical at the NIH.

“This was in the early 1990s, at which time I was on a separate project putting genes into T cells. Zelig had devised a method of putting antibody genes with signaling genes in immune cells to redirect different cells, but he hadn’t done it in primary T cells.” They worked together, initially focusing on genetically engineered T cells for three kinds of cancers.

The team used chimeric receptor genes against ovarian, colon and breast cancers. The only one that worked robustly was the one against ovarian cancer, so they pursued that one with a clinical trial, which resulted in the first CAR T against cancer. Their findings suggested the strategy may allow new approaches toward the adoptive immunotherapy of cancer in humans. The team, including Hwu, Eshhar and Rosenberg,

published their first paper focused on CAR T in the *Journal of Experimental Medicine* in 1993, with Hwu as the lead author and Eshhar the senior author. “Now, this work is refined, and it is known exactly which optimal genes and which signaling areas to use. But we were barely able to get genes in the T cells at that time in the early 1990s,” said Hwu.

Over the following years, Hwu published more than 300 clinical and scientific research papers in prestigious medical-scientific journals, the likes of *Nature Medicine*, *Blood* and *The New England Journal of Medicine*, along with invited articles, editorials, book chapters, manuals and other teaching publications. His name appears on more than a dozen U.S. patents related to adoptive immunotherapy and targeted treatment of cancer; he has served as principal investigator on even more clinical trials focused on immunotherapy.

#### AN EARLY CONNECTION

Hwu’s relationship with Moffitt Cancer Center goes back to our early days. He recalls coming to Tampa to deliver a Grand Rounds lecture around the time when Moffitt had earned its status as an NCI Comprehensive Cancer Center. He had been invited by Julie Djeu, PhD, former chair of the Immunology Department, known for her pioneering work in helping identify the role of natural killer cells in activating the immune system to kill tumor cells.



*Dr. Alexander Anderson (left) tours Dr. Patrick Hwu through Moffitt’s Department of Integrated Mathematical Oncology collaboratorium.*

“It was a great experience, and I remember Julie telling me stories of when they started doing research at the early days of Moffitt. It’s really interesting because the place had risen so fast,” said Hwu. “I remember remarking to myself back then how impressed I was at how fast that the center had grown from zero to comprehensive cancer center status.”

Hwu has been a member of Moffitt’s Scientific Advisory Board since 2012, and he has served on advisory boards to numerous other cancer centers during his career.

“I feel like I am doing a service to other cancer centers because, in the end, we’re not competing. We’re just trying to treat cancer because the only goal is to try to come up quicker with a cure and have patients have good outcomes now and better outcomes in the future,” said Hwu.

#### RESEARCH IS KEY TO BETTER THERAPIES

Upon his arrival, Hwu will see patients with melanoma in the clinic and will also do collaborative research in T-cell therapy. The aim is to make the cells more potent, which will enable treatment with fewer cells, thus decreasing the cost of the therapy and making it more scalable and more effective.

One thing Hwu would like people to know is the importance of research. “Research could absolutely lead to better therapies for patients. Our goal must be to give the patients the best care today, but we also have to continually improve that. Because as long as 600,000 people are dying in this country of cancer every year, 45,000 in the state of Florida, we’ve got to change that, and research can change that.”

He cited examples of using CAR T cells to treat patients with lymphoma and how immunotherapy has helped cure many of these patients. Targeted therapy and immunotherapy

are offering hope to patients with melanoma. “People used to say, ‘How can you take care of melanoma patients? Isn’t that depressing?’ And this was said throughout much of my career,” said Hwu. “But now, over the last five years, all the science has caught up and been translated to the clinic, and patients are doing very, very well. Patients who absolutely would have passed away quickly 10 years ago, 15 years ago, are being essentially cured and living a long life with their families, which is what we want. A durable survival, that’s what we really want and it’s through research.”

#### PREVENTION, SERVING THOSE IN OUR CATCHMENT AREA

In addition to coming up with novel agents to treat cancer, Hwu believes that prevention is another important area. “We have a very strong Population Science group because, in the end, the best way to treat cancer is to not get it or to catch it early,” said Hwu. “That’s probably going to be the most impactful in the long run, and a requirement of a comprehensive cancer center is to look at things that involve prevention. How the institution is affecting what we call the catchment area is very important, how we are going out and serving the people in our catchment area.”



***“Research could absolutely lead to better therapies for patients.”***

***HWU’S VISION: To make the most impact on helping cancer patients survive, to decrease cancer-related deaths, and to have Moffitt be the group that makes the most impact. “There are a lot of areas along the way that we’re going to focus on to accomplish this.”***

# RESEARCHING ANSWERS IN AFRICA

*Collaboration takes aim at cancer disparities by working with colleagues in Ghana*

By Ann Miller Baker



Dr. Kosj Yamoah (L) and Dr. Louis Harrison

Photography: Nicholas Gould

If your ancestors and relatives were dying from cancer at twice the rate of the rest of the population, wouldn't you want someone to figure out why – and how to stop it?

This medical mystery makes cancer more deadly for a significant portion of Moffitt Cancer Center's patients. To unravel the clues, Moffitt physician-scientists are reaching out to another continent: Africa. More than 5,500 miles from Tampa in Ghana, Moffitt is working on a collaboration that could help us understand why cancer is so much more prevalent – and deadly – among African American patients.

Consider: African American men are more than twice as likely as whites to die of prostate cancer. African American women are nearly twice as likely as whites to develop deadly triple-negative breast cancer. Both prostate and breast cancer are among the most common and aggressive forms of cancer in Ghana, where 98% of the population is Black. The same holds true for cancer in other parts of Africa.

What role might African heritage play in these cancers on separate continents? And how could understanding the biology of these cancers improve the odds for patients of African descent, here and worldwide?

"At Moffitt, our mission is to contribute to the prevention and cure of cancer. Understanding the disease and treating it better is in the wheelhouse of our mission. And quite often, we can learn a lot about cancer and its treatment by studying populations different than ours," says Louis Harrison, MD, department chair, Radiation Oncology. In addition to treating patients, Harrison is Moffitt Cancer Center's chief partnership officer. "Nowhere in Moffitt's mission statement does it limit our efforts to Tampa, Hillsborough County, Florida, or even the United States. We aspire to help everybody."

Harrison and his fellow radiation oncologist Kosj Yamoah, MD, PhD, traveled to Ghana's capitol city of Accra in November

2019 to further solidify this collaboration with several Ghanaian hospitals and universities. During a whirlwind week of seminars and meetings, they updated physician colleagues on the latest advances in radiation therapy. They formalized an agreement to allow select Ghanaian oncology residents to complete part of their studies at Moffitt. And they met with small groups of Ghanaian physician researchers to discuss next steps, publishing studies together and even someday conducting clinical trials collaboratively.

Why Ghana? It turns out that this collaboration – as well as the complex tangle of African American genetic heritage – both trace origins back to this chunk of West Africa once known as the Gold Coast.

## MOFFITT COLLABORATOR'S AFRICAN ROOTS

At an age when most American kids are starting second grade, Kosj Yamoah was already the subject of news headlines in Ghana. The youngest of four, he taught himself to read by borrowing his siblings' textbooks. He quickly surpassed his peers and made national news after acing Ghana's high school entrance exam – at age 7. At boarding school with his siblings, Yamoah became a de facto health officer by age 10. He routinely accompanied older students to the nearby hospital to act as a liaison with their physicians, fueling his interest in a medical career. "As much as I enjoyed studying and making my own discoveries," he reflects, "I felt most alive when I was helping people recover."

Yamoah was still completing his radiation oncology residency and fellowship in Philadelphia when he was awarded two highly competitive research grants. He'd already discovered the perfect intersection for his research and clinical interests: prostate cancer and its inordinate incidence and mortality among Black men, both in the U.S. and Africa.

*"Nowhere in Moffitt's mission statement does it limit our efforts to Tampa, Hillsborough County, Florida, or even the United States. We aspire to help everybody."*

“It made sense to focus my efforts on this disease,” says Yamoah. “I wanted to work with people globally to look at one common problem from both the advanced world and the developing world. So I started by looking at the landscape of prostate cancer in Ghana through the eyes of a tertiary institution, the Korle Bu Teaching Hospital in Accra. That’s really where the collaboration started.”

One of his first collaborators, fellow radiation oncologist Dr. Joel Yarney, now runs Ghana’s National Radiotherapy Oncology and Nuclear Medicine Centre at Korle Bu. He recalls Yamoah, then barely in his 30s, visiting the center to befriend him in research. “It didn’t require any formal ‘memorandum of understanding’ letters,” Yarney says with a laugh. “We became friends and started cooperating.”

Over the past nine years, Yamoah has made Yarney’s office his first stop on multiple trips to Ghana annually. The pair has even published studies together and share similar long-range visions of improving Black people’s odds against cancer no matter where they live. Getting there will take a series of steps. But Yamoah says it starts with simply showing up year after year.

**“I wanted to work with people globally to look at one common problem from both the advanced world and the developing world.”**

“Having face-to-face interactions and the exposure to understand what you’re dealing with by being there, these are the things that build success,” notes Yamoah. “You also need time to build shared intellectual integrity and know that we’re here to help each other. It cannot be rushed.”

Despite spending half of his life in the U.S., Yamoah says he can still easily relate to his Ghanaian colleagues. “The lessons of childhood and understanding the culture don’t go away,” he says. Nor does his appreciation for what Ghanaians can do despite limits on resources and technology.

That, says Yarney, gives his Ghana-born colleague an edge in developing this collaboration. “When you’ve never been to a place like this, you can have the wrong perceptions about Africa and the underdeveloped world,” observes Yarney. “I think some of it stems from ignorance. All that the press would have us believe is the pictures they show in the media. But there is wide variation. Within a country, there may be resources, expertise that could be capitalized on for doing collaborative work.”

Once you’ve been to a place, you see many things you can no longer ignore – no matter how heart-wrenching they are.



Photography: Ann Miller Baker

Medical students, professors and physicians at the University of Cape Coast attend a special lecture presented by Dr. Louis Harrison. The guest lecture was one of several Drs. Harrison and Kosj Yamoah presented at universities and hospitals during their November 2019 visit.



Photography: Ann Miller Baker

A map of the Triangular Slave Trade Route on display at the Cape Coast Castle plots the path of European traders to various ports in Africa, where weapons and baubles bought human lives. Similar maps in epidemiological studies illustrate how African genes were introduced to the Americas from colonial days through the Civil War.

#### MAPPING THE SOURCE OF AFRICAN AMERICAN GENES

They’re called castles; centuries-old fortified buildings with sweeping views of the Gulf of Guinea. The beauty of the setting belies their hideous history. They were built by Europeans as safe places to stash treasured African timber, ivory and gold before shipping it elsewhere for sale. But in the 1600s, as European colonization of the Americas grew, castle storerooms became dungeons to hold a newly valuable commodity: slaves – 17 million over four centuries, by some estimates – for shipment and sale in the New World.

The Cape Coast Castle 100 miles west of Accra is the second largest of 25 slave castles still standing along Ghana’s coast. Here, visitors descend 10 feet underground into a four-room dungeon lit only by small ventilation shafts high in one wall. The dungeon could hold hundreds of male prisoners, who sat and slept on bare rock with only a trench to carry away their wastes. Traces of their blood, urine, feces and even flesh are ground into the top layers of the dungeon floor. Conditions in the female slave dungeon are equally horrific, with the perverse addition of a hole in the wall for merchants and military to survey and select captives to rape.

Near the female dungeon, twin doors open to the sea and the last glimpse those captives who’d survived the castle would ever see of their native land. The “Door of No Return” led to ships that would carry them to lifelong servitude in the Americas.

“It’s a visit that leaves you speechless,” observed Harrison, who toured the castle along with Yamoah and more than 20



Photography: Ann Miller Baker

“The Door of No Return” at the Cape Coast Castle provides the last glimpse enslaved people would see of their African homeland before being shipped against their will to the Americas.

**“It’s a visit that leaves you speechless.”**

Korle Bu residents and students on their way to Harrison’s lecture at nearby University of Cape Coast. “This is a visit that makes you contemplate the generations that were lost to such depravity, captivity and unfairness. And it makes you want to redouble your efforts to try to give back what you can never give back, which is all that’s been taken away.” Upstairs in the Cape Coast Castle, a museum recounts the pre-colonial cultures that populated this region. An auction block stands beside objects traded for slaves: glass beads, whisky bottles and the firearms to fight tribal wars that produced captives for sale.

But it’s a display map that drew Yamoah’s interest. The Triangular Slave Trade Route plots the path of European traders to various ports in Africa, where they’d trade weapons and baubles for enslaved people. Traders then sailed various transatlantic routes to ports in the Caribbean, and North and South America, where slaves were sold and



Photography: Ann Miller Baker



Images from the Cape Coast Castle on the Gulf of Guinea show a beautiful setting that belies its hideous history as part of the slave trade. Of the estimated 60 million Africans amassed for sale as slaves, only a small percentage survived the voyage to the Americas<sup>1</sup>.

ships were loaded with sugar, cotton, coffee and tobacco for the European market – and the triangular track started all over again.

“You’ll see versions of this same map in epidemiological studies,” says Yamoah. The routes illustrate how African genes were introduced to the Americas from colonial days through the Civil War.

Clearly, African Americans owe the bulk of their genetic makeup (82% by some estimates) to ancestors who lived in Africa prior to the trans-Atlantic slave trade. There is European ancestry mixed in as well (16-17%) – partly, it’s presumed, from the offspring of slaves and masters. But the native African genetic component is by no means uniform. It, too, is a stew of tribal lineage from across the world’s most genetically diverse continent<sup>2</sup>. The various paths laid out in Triangular Slave Trade Route maps provide clues as to where African captives might have been loaded onto ships for sale, but not where they originally came from.

In short, African Americans’ genetic makeup is a hodgepodge we don’t yet understand.

That’s critical to 21st century cancer care, with its focus on genetic mutations that drive cancer and genetic biomarkers that give clues to its treatment. Most of what we know and have harnessed to fight cancers in specific populations (like BRCA mutations and breast cancer) has been based on work with patients of European ancestry.

What might researchers uncover if they could understand African Americans’ complicated genetic heritage? For Yamoah, a key step is being able to draw comparisons to the source, in Africa. That means comparing not only their genetic makeup but also the epigenetic changes in similar tumors from both continents. The comparisons might lead to subtle changes in diagnosis and treatment that could reduce cancer disparities for all patients of African descent.

“We are moving very rapidly to an era where medicine will be practiced at an individual level,” says Yamoah. “I believe that, if the African continent is not at the forefront of these discoveries, we will only stand to worsen the disparities gap, where we will not know how to treat people of African origin because we haven’t done the work when it was time to.”

Thanks to the progress being made by this collaborative effort, that time is near.

#### THE FOUNDATION LAID THUS FAR

It may be years before physician scientists in Ghana have the tools to preserve tissue samples and data in a biorepository that could foster international collaborative research into all types of cancers in patients of African descent. But thanks to Yamoah and Moffitt Cancer Center’s collaborative efforts with Yarney and the National Radiotherapy Oncology and Nuclear Medicine Centre at Korle Bu, a solid foundation has been laid.

#### DURING LAST NOVEMBER’S VISIT, YAMOAH AND HARRISON WITNESSED SOME MAJOR MILESTONES.

- A retrospective clinical database with diagnosis and treatment details of all Korle Bu prostate and breast cancer patients from 2003 to 2019 has been culled from thousands of paper medical charts. The Korle Bu staff and trainees who assembled the database under Yamoah’s and Yarney’s guidance now know much more about how data needs to be tracked for future research and clinical trials.
- Ghana now boasts 15 radiation oncologists whose skills can be deployed to fight all types of cancers, unlike surgical or chemotherapy approaches. To put it in perspective, Ghana’s 15 radiation oncologists must serve a nation of 30 million, while Moffitt alone has 15 radiation oncologists on its staff.

- Six more radiation oncology residents are in the education pipeline, and the Ghana College of Physicians and Surgeons formalized an agreement to allow select residents to earn credit for studying at Moffitt for six months to a year.
- The first two Ghanaian physicians who traveled to Moffitt for study, Drs. Francis Asamoah and Hannah Ayettey-Anie, have now returned to Korle Bu with deepened skills on newer technologies and exciting ideas for the future.
- After years of lobbying Ghana’s Ministry of Health for funding, the National Radiotherapy Oncology and Nuclear Medicine Centre at Korle Bu has a new building and new equipment to provide radiation therapy to more than 1,600 patients per year. This includes five new planning systems, an on-site CT scanner and the center’s new linear accelerator. It’s capable of delivering radiation more precisely to tumors deeper in the human anatomy than the workhorse cobalt-60 machine that has served patients for more than 20 years. The new technology means Korle Bu will be able to deliver treatments comparable to many of those provided at

Moffitt, opening the way to greater comparative research within the Moffitt/Korle Bu collaboration.

- Some of the trainees that Yamoah and Yarney have worked with through the years are now faculty at institutions throughout Ghana, and they maintain a willingness to be part of research efforts going forward. In fact, some have even helped to gather data and biopsy samples from Ghanaian prostate cancer patients for comparative analysis with those of African American patients treated at Moffitt.

As the collaboration deepens and progresses, Yamoah can see a future that will benefit patients at Moffitt and in Ghana and well beyond.

“Ten years down the line, I want to see that we understand the biology now and we can actually offer the personalized care to every human being on the planet as needed. I think that’s the responsibility whether you are Black or white: to make sure that whatever scientific exploration you’re doing is helping humanity in an equitable way. That’s what I want to see.”

*“Ten years down the line, I want to see that we understand the biology now and we can actually offer the personalized care to every human being on the planet as needed.”*

Photography: Ann Miller Baker



Visiting possible collaborators was an integral part of the trip for Drs. Louis Harrison and Kosj Yamoah, from lectures at the University of Cape Coast (left), to a tour of the recently completed University of Ghana Medical Centre near Accra (top right) and checking out new radiation therapy equipment at Korle Bu Hospital (lower right).

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# TWO BLAZE TRAIL

## *From Ghana to Moffitt Cancer Center*

By Ann Miller Baker



Francis Asamoah, MD



Hannah Ayettey Anie, MD

### For progress to be made, someone has to go first.

Francis Asamoah, MD, was the trailblazer for Ghana's collaborative efforts with Moffitt Cancer Center. While still a resident at the Ghana College of Physicians and Surgeons, Asamoah came to Tampa in 2018 to work and learn in the laboratory of Kosj Yamoah, MD, PhD, whose interest in the roots of prostate cancer spans two continents.

The two met through Yamoah's frequent visits to Ghana and the Korle Bu Teaching Hospital where Asamoah works. "I tagged along on some of his research work with prostate cancer," said Asamoah, "and that led to my initial research fellowship in his lab. Following that, we had a publication that we thought necessitated that I do some clinical work investigating the use of brachytherapy to help our National Radiotherapy Oncology and Nuclear Medicine Centre improve the outcomes of the patients we see here

*"Here in Ghana, resources are never enough. Seeing what interventions are available out there and the outcomes that are being derived out of that...has been a great eye-opener."*

in Ghana. That led to the decision to pursue a second year of fellowship at Moffitt."

Asamoah said spending two years at Moffitt was "an eye-opening experience, on many fronts," starting with the clinical treatment options available to patients in the U.S. "Here in Ghana, resources are never enough," noted Asamoah. "Seeing what interventions are available out there and the outcomes that are being derived out of that; how much technology, innovation, caregiver time and facility time goes into these outcomes that we read about in publications has been a great eye-opener. And it encourages me to do a bit more for my patients in terms of how much effort I really put in it."

In Ghana, oncologists are the "go-to" experts for all types of cancer, "anything from the crown of their head to the sole of their feet," Asamoah explained. They provide systemic treatments like chemotherapy, targeted drugs

or hormonal therapy. They also direct radiation therapy, including brachytherapy in which seeds or pellets containing radioactive material are surgically implanted to kill cancer cells and shrink tumors. The National Radiotherapy Oncology and Nuclear Medicine Centre recently acquired new technology that will allow greater use of more sophisticated brachytherapy approaches like those Asamoah saw at Moffitt.

"Getting the opportunity to have hands-on exposure to various brachytherapy techniques for multiple disease sites – head and neck cancers, sarcomas, prostate, gynecological and some skin cancers – also opens up options to use our scarce resources differently in Ghana," said Asamoah. "If it's possible to move some patients from external beam radiation treatment and get comparable outcomes with brachytherapy, and therefore be able to reduce the wait times of patients who would need to have external beam treatment, I think that's something that we can explore a bit more."

As Asamoah was wrapping up his Moffitt fellowships in 2019, a second Ghana trailblazer arrived on the Tampa campus. The trailblazer, Hannah Ayettey Anie, MD, has strong family connections to medicine. Her father, the Rev. Professor Andrews Seth Ayettey, has a MBChB from the University of Ghana Medical School and a PhD from Cambridge University and serves as a professor at the University of Ghana. The former dean of its medical school has taught anatomy to many of the nation's professionals, including Asamoah and Yamoah. Ayettey Anie was a medical student studying anatomy when she first met Yamoah while he was a teaching assistant in the cadaver dissection lab. Years later, when their paths crossed again at Korle Bu Teaching Hospital, Yamoah suggested Ayettey Anie visit Moffitt to work and learn in his lab.

That opportunity became a reality in April of 2019, when Ayettey Anie traveled to Tampa through Moffitt's Academic Visiting Scholar program. In addition to shadowing Moffitt physicians as they treated patients with a variety of cancers, she would split her time between Yamoah's lab and the DeBartolo Family Personalized Medicine Institute.

For Ayettey Anie, who has an interest in genetics, it was a perfect fit. "I have a lot of interest in targeted therapies," she said. "I saw next-generation sequencing, analysis, results coming in for different mutations and tumor mutational burden for patients referred from Moffitt to the personalized medicine team. That way, I could actually see what kind of somatic mutations these patients had, and what line of treatment the physician pharmacists group was proposing based on those results."

Being able to tailor treatments based on genetic information in native African, as well as African American, patients is a goal Ayettey Anie shares with the rest of the Ghana/Moffitt collaborative. She knows it will require collaborative research, and she was happy to learn more about how clinical research trials are set up and run. "The unique thing was seeing the randomization being done firsthand, trials being organized there and then. Seeing the process with its challenges and setbacks was interesting and very enlightening.

*"Seeing the process with its challenges and setbacks was interesting and very enlightening."*

"I had a few discussions with people about the possibility of Ghana being part of multicenter clinical trials. The feedback was that it may be difficult at this time, with all the requirements. In Africa, sometimes we don't meet all their criteria," she explained. "For most of these big trials, where we in Africa have a huge patient population with cancers at almost any stage, it would be wonderful. The patients would benefit from free drugs while on these trials. We could learn a lot more; the trials can publish data not only on the African American population, but also on the African population. And I think that will help us really determine which therapies are beneficial to our patients."

Ayettey Anie is also the faculty secretary for radiology, radiotherapy and oncology at the Ghana College of Physicians and Surgeons, the prime trainer of Ghana residents before their final fellowship examination. "It puts me in a very good position to be able to open more discussions forward for more people to experience what I have at Moffitt. So, I think this has been a very fruitful experience and also one that will help strengthen the Moffitt/Ghana collaboration. I'm sure it will open wider doors in the future."

*"...I think this has been a very fruitful experience and also one that will help strengthen the Moffitt/Ghana collaboration. I'm sure it will open wider doors in the future."*

# Making the Necessary Changes to Promote Racial Equity



## A Roundtable Discussion Among Cancer Center Leaders

By Cathy Clark

**Diversity and inclusion are founding values of Moffitt Cancer Center, and the institution has long been an ardent advocate of health equality. During these challenging and turbulent times, we must continue to speak out for and act on what is right and just.**

“We value human life and embrace the qualities that make each of us unique as human beings. We condemn racism, discrimination, exploitation and oppression of any kind,” said Founder H. Lee Moffitt.

Moffitt has done a great deal as an organization to promote inclusion and equity, and the organization’s commitment to equality and justice remains undeterred. Realizing more can and should be done, the cancer center’s executive leadership participated in a roundtable discussion to examine what has been done and, importantly, what can be done in the weeks, months and years ahead to make meaningful change in support of racial equality.

**Q: Let’s start with your personal perspective of the challenges we are facing as we work together to achieve racial equality.**

**TIM ADAMS:** I think we’ve all experienced racial inequality in our career, but I think with our singular focus on our mission, all one has to do is to look at disparities and outcomes and access to health care. There are whole communities out there that don’t have access to Moffitt Cancer Center. And then if you were to just look at our outcomes compared to the community, if they did have access to Moffitt, more people would be alive today. Moffitt can have a real impact on things beyond just our own four walls by trying to help solve that problem of access.

**DR. DOUG LETSON:** One of our biggest hurdles is going to get everybody on the same page because many people don’t realize that we have these inequalities... About two or three

**“We value human life and embrace the qualities that make each of us unique as human beings. We condemn racism, discrimination, exploitation and oppression of any kind.”**

years ago Dr. Binitie and I felt there was an inequity in the number of Black faculty... So, we started searching through the numbers and found that Black faculty represented [only] 3 to 4% of our faculty.

**DR. JOHN CLEVELAND:** I agree with Doug. There are big inequities, and we need to take a multi-pronged approach to deal with racial inequality on several fronts.

**MARIA MULLER:** In my fundraising career, I have been conscious of the lack of representation of the community in fundraising teams...whichever institution I have worked for. We need to do a better job of communicating the [career] opportunities.

**DAVID DE LA PARTE:** When you see the data, the lack of equality is obvious. I think sometimes it’s hard to look at the data...but the fact of the matter is we are aware of inequalities. We’re an organization of action...and with data and awareness, we can develop measurable objectives and we will become more equal; we will become more inclusive. I think that’s the starting point. Data, awareness, education and measurable outcomes will change the reality of inequality.

**Q: Moffitt Cancer Center has made great strides in removing racial barriers and promoting diversity and inclusion; however, would you say more work needs to be done? And, specifically what would you like to see?**

**DR. EDMONDO ROBINSON:** I think about a couple of things based on my experiences [such as] what is the environment like for team members? Is this an environment that embraces diversity and inclusion, or is it an environment that sort of tolerates it, or is it an environment that doesn’t pay any attention to it at all? Or is it one that is nurturing where people from diverse backgrounds are enabled and encouraged to succeed?

Responsibility to create such a nurturing environment is that of the leaders. Do we have concrete steps in place to ensure we are moving forward? And what are the data? Let’s take a look. Let’s not be embarrassed by it; don’t shy away from it. Let’s look at our own data. There are some areas where we are pretty good...but let’s increase our diversity in some other areas. And then let’s put some concrete tactics in place – not just a list of goals.

And how do we hold people we work with accountable to do the same?

**YVETTE TREMONTI:** I think there are a lot of things Moffitt has done early on. That said, there’s always improvement we can make as an organization. Some areas of opportunity are transparency... I think data is important. I remember a couple years ago, working with the Women in Oncology group we looked at both minorities and women in leadership, and we certainly don’t have a representation in our leadership team that represents our workforce or our community and that’s something we aspire to do. You have to have very clear tactics to achieve it. It doesn’t just happen overnight. You definitely have to have a clear strategy and steps.

**MARIA MULLER:** People of color [are not always] getting the kind of career advice they need earlier on from schools or from home, and they’re not getting internship opportunities and work experience that are afforded other people. I think the pipeline issue is a fundamental one, and I think organizations like ours have to work with the community to start further back – whether that’s going into schools or going into communities and sharing information about the roles there are at Moffitt, in medical science; and a whole range of things, such as marketing, IT and fundraising.

**DR. JOHN CLEVELAND:** David and I have a shared goal of rolling out a center of excellence or Institute of Health Disparities Research. We have four centers of excellence [lung cancer, melanoma and non-melanoma skin cancer, immunization and infection research and evolutionary therapy]. Why not a big initiative on health disparities research? We have a strong cadre of investigators here who are Black who could be leaders of such a center or Institute.

**JACK KOLOSKY:** One of the things we need to do is have this candid discussion that will make all of us probably feel uncomfortable at some level as we address these issues, but I think having that uncomfortable discussion will get us to a better place... I think this is the right time and the right situation for us to have that candid discussion.

[The supplier diversity initiative] is pretty successful, but we didn’t get there overnight. There were two things that made it successful. One was creating opportunities, ensuring that diverse organizations were a part of it. And the second was that we had quantifiable and specific goals. I know people confuse goals with quotas, and it was never about that. I feel we need to be both creating the opportunity and being quantifiable and directional and ensuring that everyone understands what the goal is going forward.



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Physician-in-Chief, President,  
Moffitt Medical Group



MARIA MULLER  
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EDMONDO ROBINSON, MD, MBA,  
FACP, Senior Vice President  
Chief Digital Innovation Officer



YVETTE TREMONTI, CPA, MBA  
Executive Vice President  
Chief Financial and  
Administrative Officer

I feel like those are the same opportunities [to promote diversity] we have for just about anything else, whether it's patient recruitment, clinical trials, hiring – things that we as a leading cancer center should be able to implement if we all put our minds to it.

**Q: Discuss how you and your team are committed to making the necessary changes to make a positive difference at the cancer center and in our community.**

**DR. DOUG LETSON:** One of the things that bothers us the most is health care disparities. Not everybody's given the same opportunity for cancer care, and that's a problem, because we know that at Moffitt your best chance of beating cancer is here. And not everybody has a chance to get here. John and I are running a retreat [with the physicians, researchers and Moffitt Diversity] dealing with racial inequalities to address some of the diversity issues related to clinical trials and research, faculty recruitment and mentorship.

**TIMOTHY ADAMS:** What hasn't changed is our mission. The more diverse group we have, the more likely we are to hit the mission. We had the foresight to add inclusion to our values because we saw the importance. We need to make this whole thing mission centered, which will cause it to be sustainable and cause us to think outside the box about how we impact things at scale.

**DR. EDMONDO ROBINSON:** We have the very difficult task...of delivering cancer care, despite social determinants of health.

We know that there is income inequality, educational inequality and frank racism in our society. We mustn't use that as an excuse; because our mission doesn't say contribute to the prevention and cure of cancer when it's convenient.

**YVETTE TREMONTI:** Getting involved in the organization and leading groups is one of the ways that I can help. We're all involved, whether it's in searches or hires, and I think we need to hold each other accountable.

**DR. JOHN CLEVELAND:** We have to get educated about the needs of the community and then educate our community about what we can do to improve their lives, improve their outcomes and reduce the risks of cancer. I think it takes us reaching out as leaders and leading by example, and I challenged all leaders in the cancer center to do so.

**DAVID DE LA PARTE:** There's probably nothing more debilitating than bias or prejudice other than ill health. [It is] devastating to the individual and their family. If we can improve access to the care we provide to communities that, for many reasons go back to bias and prejudice and socioeconomic inequality, then that's a huge contribution. If we can make discoveries around the mechanics of cancer in a particular minority population and have cures or preventions associated with those findings, then that's a huge contribution to leveling an unlevelled playing field.

While considerable work remains to be done, Moffitt leaders are dedicated to making the necessary changes to make a positive difference at the cancer center and in our community.

# What Cancer Center Leaders ARE PLANNING

During the roundtable, the executives made it clear that they and their teams are committed to make the necessary changes to spur transformation.

Problems identified include lack of access, need for expanded outreach and education, need for enhanced recruitment and mentoring opportunities for Black faculty, and the need for clinical trials tailored to minority populations. Successfully addressing these issues will involve a long-term commitment. Plans include the following:

## IMPROVED ACCESS

Digital innovation: Proactively design, build and leverage digital tools from an equities and disparities perspective, with the aim of helping to give people access to Moffitt services. This includes cancer center team members, patients, members of the community and recruits. Digital tools can also be designed to help prevent cancer through education, screening and prevention.

## OUTREACH

Boost outreach initiatives to prevent cancer with education and screening through community outreach and encouraging cancer center leaders to become more directly involved with community organizations; these initiatives are to include:

- Expand the Moffitt Program for Outreach, Wellness, Education and Resources, or M-POWER, which is under the Department of Community Outreach, Engagement, & Equity.
- Enhance partnerships through the Tampa Bay Community Cancer Network, a group of academic and community-based organizations with the goal of creating and implementing sustainable and effective community-based interventions to impact cancer disparities in the Tampa Bay area.

## RECRUITMENT, MENTORING AND RETENTION

When engaging search firms, assure diversity is intentional and, as much as possible, included as part of the contract. Working with the Faculty Diversity Oncology Program:

- Develop and implement a recruitment strategy that

addresses inequalities, focused on research and medical faculty.

- Develop a mentorship and sponsorship program involving research and medical faculty.
- Develop plans for retention of Black faculty.

## EDUCATION, CAREER DEVELOPMENT

- Create more educational and internship opportunities with minority high school students.
- Expand SPARK, the Summer Program for the Advancement of Research Knowledge, a sponsored internship program for undergraduates.
- Create diversity fellowships across all cancer center programs and services for postdoctoral training.
- Initiate outreach efforts to minority-based universities to establish programs aimed at mathematics and science, with the aim of recruiting the next pool of talent.
- Create health disparities scholarships or fellowships for Black or African American trainees of health disparities research.

## MINORITY CLINICAL TRIALS

- Create a minority clinical trials office.
- Improve access to, and roll out, clinical trials that address the specific needs of the cancer center's minority communities.

## FUNDING DIVERSITY EFFORTS

- Expand fundraising priorities with the aim of funding more diversity research and clinical trials.
- Created a scholar award through the George Edgecomb Society, to fund disparities research at Moffitt by Black faculty.

## BEYOND MATH AND SCIENCE

- Encourage and lead groups with inclusion and diversity interests at the cancer center.
- Create volunteer opportunities outside the medical and research arena, such as fundraising.



# EMBRACING AND CELEBRATING OUR DIFFERENCES

## *Moffitt Diversity Fosters A Culture of Equity, Respect and Inclusion*

By Cathy Clark

***Moffitt Cancer Center has embraced and promoted diversity since its early days, and in 2006 the cancer center recruited B. Lee Green, PhD, to strengthen and expand the efforts to address diversity, inclusion and equity.***

“For me, diversity is all about creating an environment that looks like the community we serve, where people within the organization feel they are respected and appreciated in an environment where we not only embrace our differences but also celebrate them,” said Green, vice president, Diversity, Public Relations and Strategic Communications.

In July 2006, Green joined the cancer center as senior member, Health Outcomes and Behavior Program, and to lead the newly formed Moffitt Diversity department. By November of that year, Green hired Cathy Grant as the department’s director. They began setting goals, establishing partnerships within the center and throughout the community and addressing challenges some might have considered insurmountable.

Internal challenges included strengthening a centerwide culture of equity, respect and belonging that supports team member inclusion and culturally competent care for patients. Within the community, a big issue was establishing access to care, overcoming system barriers and working directly with the clinical team to embed cultural competence into patient care.

### SEEING MOFFITT AS A WELCOMING PLACE

“A big thing for us was the relationship with our diverse communities,” said Grant. “They didn’t see Moffitt as a place where they could go. They didn’t see themselves represented within the organization. There needed to be attention to our relationship with those communities to help them understand that you are welcome here, and that this is a place where you and your family can come and receive world-class cancer care.”

***“A big thing for us was the relationship with our diverse communities.”***

Green recalls one of his first meetings in the community “like it was yesterday.” He had met with a prostate cancer support group of African American men. “After giving my talk, I expressed how I was looking forward to working with them and asked if there were any questions, thoughts or comments. I was not expecting what I heard,” said Green. “They thanked me for being there but then said they would not be going to Moffitt Cancer Center as they did not see it as a place they could go, that it was not for them. Of course, I was blown away.”

***During the months and years following their arrival, Green and Grant worked to position the cancer center as a resource among underserved communities, as an organization delivering culturally and linguistically competent care through prevention education and mutually beneficial partnerships. The achievements included:***

- Refocusing the community outreach and education efforts. A part of that plan was to rename the department to the Moffitt Program for Outreach, Wellness, Education and Resources, or M-POWER. The overall mission of M-POWER is to help reduce cancer health disparities by empowering community members to take an active role in preventing disease and maintaining overall health. M-POWER developed healthy lifestyles and cancer-specific educational workshops in English and Spanish. The program also connected community members in need to screening voucher programs for breast, colorectal, lung and prostate cancers. Recently, M-POWER has become part of the Community Outreach, Engagement & Equity team under the direction of Susan Vadaparampil, PhD, MPH. This office was created in 2018 to enhance Moffitt Cancer Center’s efforts in addressing community needs from a research perspective.
- Establishing Moffitt’s Community Benefit initiative, which ensures that the cancer center’s community impact directly responds to the needs of patients, families and clinicians through advancing cancer prevention, early detection, clinical care and research, especially for those at-risk populations disproportionately impacted by cancer.
- Partnering for men’s health by leading the efforts for many years with community partners to hold an annual Men’s Health Forum, which served a growing number of men in the Tampa Bay area community without access to regular health care services.
- Growing Moffitt’s Language Services Department as a bridge to ensure equity in care through helping individuals with limited English proficiency and deaf and/or hard-of-hearing patients.

“The beautiful thing is that through our work over the past years, when we go into the community now, the tone has completely changed. African Americans, Hispanics and individuals from other minority communities are increasingly seeing the cancer center as a resource for them and a place where they are welcome,” said Green. “Is it perfect? I would say not, but I am very proud of the work that the team, particularly the outreach team, has done to help dispel the myth that this is not a place that is welcoming.”

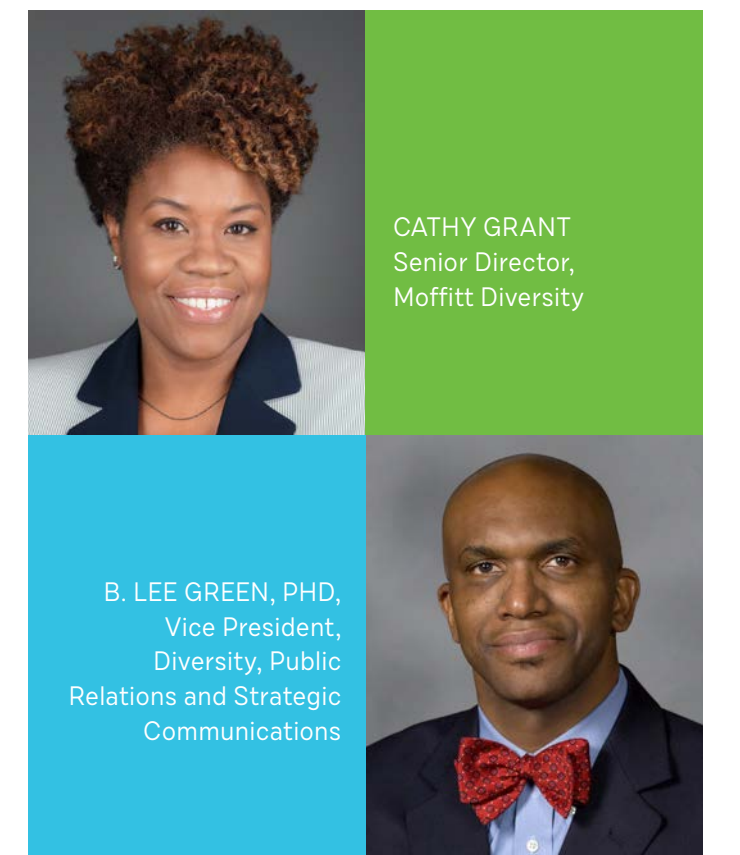
Grant said among the many diversity-related initiatives she has helped establish over the years, one of the initiatives she feels made the most positive difference has been work the

cancer center has done with the LGBTQ community. “The work with this community is something we did ahead of many other health care organizations, such as the collection of data regarding sexual orientation and gender identity. We were doing that before many other hospitals were doing it,” said Grant. “This is something our Moffitt team members brought to the table, and it led to research efforts around this community. We have been able to improve our policies and improve our processes to support this community, and I think we have made great strides that have put us ahead of the curve when you look at some other health care institutions. So, I’m really proud of that work.”

Grant noted that in 2020 Moffitt was named a Healthcare Equality Index (HEI) Leader in LGBTQ Healthcare Equality for the ninth consecutive year in the Human Rights Campaign Foundation’s HEI report.

In addition to the outreach work aimed at minorities in the Tampa Bay area, Moffitt Diversity began establishing voluntary, employee-led groups called Team Member Engagement Networks, and working with leadership in establishing a Faculty Diversity Oncology Program aimed at recruiting, mentoring and retaining minority faculty members.

“I’m so encouraged by the future of our team member networks because I think they are going to explode over the next few years,” said Green.



*“I’m so encouraged by the future of our team member networks because I think they are going to explode over the next few years.”*

In another accolade, the cancer center ranked No. 5 on DiversityInc’s 2020 Top Hospitals & Health Systems list. This is the fifth year in a row Moffitt has placed among the nation’s top companies for capital representation, workplace practices, supplier diversity and leadership accountability. Rankings from 2016 to 2020 have been No. 6, 4, 4, 3 and 5, respectively.

Green attributes much of the national recognitions that Moffitt has received because of Cathy Grant’s leadership. “She is one of the most talented leaders in the field of diversity and inclusion from across the country, and we are fortunate to have her at Moffitt,” said Green. “And we are also fortunate to have incredible leadership support that started with David de la Parte. His guidance has been instrumental in our overall success.

#### A POSITIVE LOCAL ECONOMIC IMPACT

Another area requiring attention upon arrival and having a positive impact over the years is supplier diversity. The cancer center recognizes the importance of supplier diversity in all aspects of procurement and business practices and is committed to the inclusion, development, growth and utilization of diverse suppliers. Yet during the early days, evidence of such commitment was virtually nonexistent.

“When we first started that program, we were not doing well in terms of doing business with minority or woman-owned companies. Our numbers were so low, very close to 0%, and I remember how embarrassing it was to report them at a community meeting,” Green recalls.

They put a plan into place, and Green describes the progress as phenomenal. “We had so many key leaders and team members who worked hard to make significant progress in this area,”

*“Leadership support at Moffitt is absolutely incredible. The way they have responded to this current situation has been outstanding.”*

said Green. “Jack Kolosky has been instrumental in working with us and the community on this issue.”

In fiscal year 2020, the percentage of Moffitt’s overall expenditures spent with diverse suppliers was 14.8%, and during the past five years the increase in diversity spending was 49.86%. This growth represents a positive local economic impact in the communities the cancer center serves.

Despite progress in cancer treatment, screening, diagnosis and prevention over the past few decades, the Black/African American community continues to face higher cancer rates and cancer deaths. In 2017, Moffitt created the George Edgecomb Society, comprising a passionate group of community leaders, which raises funds for Moffitt research into cancer health disparities within the Black/African American community. Since then, the George Edgecomb Society has awarded six grants totaling \$400,000 to support research and clinical treatment efforts of scientists focused on cancer health disparities.

#### RESPONSE PLAN SEEKS TO MAKE A LASTING COMMITMENT

Clearly, Moffitt Diversity, working in concert with the cancer center and community partners, has made much progress in eliminating or reducing inequities and barriers to health equity. In order to continue making progress, however, it is essential to renew and strengthen those efforts, particularly in view of the global community’s demand for accelerated efforts to end long-standing racial inequities. To that end, Green and Grant created a cancer center Response Plan for Diversity, Inclusion and Equity.

Green is confident that the long-term response plan designed to close gaps in the Black/African American and other marginalized communities will be initiated and successfully implemented. “Leadership support at Moffitt is absolutely incredible,” said Green. “The way they have responded to this current situation has been outstanding.”

The response plan aims to make a lasting commitment in addressing racial equality and identifies nine priority areas to receive intentional focus: climate, dialogue, recruitment and retention, education, health disparities, community, data collection, faculty inclusion, and resources.

## Cancer in the time of COVID

Mom Amy Sapien and her son Landen were both diagnosed with cancer. Then the pandemic hit.

By Sara Bondell

AMY & LANDEN SAPIEN  
*Cancer Survivors*



Photography: Nicholas Gould

**AMY SAPIEN WOKE UP** from surgery at Moffitt on April 13. Her hair was dyed pink and her ankle sported a new tattoo of Dory from “Finding Nemo,” the blue fish with the can-do attitude and the mantra “Just keep swimming.”

Her left breast was gone. And she was alone. At the same time, Sapien’s nearly 8-year-old son, Landen, was 10 miles away in another hospital, being treated for leukemia.

“My husband dropped me off for my surgery before the sun came up that day and then turned around and took Landen to the hospital for a platelet infusion,” said Amy. “I just thought to myself, this is hell.”

COVID-19 has forced hospitals and cancer centers like Moffitt to change the way they see patients, increase reliance on telemedicine and even limit the use of research facilities by the very people searching for new treatments and cures.

Clinicians combed through patient schedules to determine which upcoming appointments could be pushed back and which ones could be converted to virtual visits. Before COVID-19, 76 Moffitt providers were performing virtual visits. A month later, there were almost 200, and telemedicine grew more than 5,000%.

On the research side, only one researcher was allowed in each lab on campus and studies requiring in-person visits were suspended. While 15 clinical trials were halted, more than 200 remained open.

While no cancer surgery is truly elective, surgeons identified which procedures could be delayed, like the removal of nonaggressive tumors and secondary reconstructive surgeries. About 30% of nonurgent surgeries – about 60 to 65 a week – were delayed during the four-week height of the pandemic.

The cancer center also put into place a no-visitor policy, added screening checkpoints at entrances and ramped up cleaning efforts around the hospital. On-site conferences and meetings were canceled, and international travel was

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*As news of COVID-19 emerged, Moffitt Cancer Center began initiating its previously existing pandemic plan in earnest. Team members displayed resilience during the COVID-19 pandemic and other challenges faced in 2020.*



*“My husband dropped me off for my surgery before the sun came up that day and then turned around and took Landen to the hospital for a platelet infusion.*

*I just thought to myself, this is hell.”*

Photography: Nicholas Gould



Photography: Diamond View Studios



Photography: Diamond View Studios



Photography: Diamond View Studios



Photography: Nicholas Gauld

prohibited for team members. For patients, the isolation has been the worst part. Amy Sapien was diagnosed at the peak of the COVID-19 pandemic, and she went to the majority of her appointments alone.

With no visitors allowed in the hospital, she recorded videos for her sons on her cellphone after her surgery. She told 3-year-old Corben to be good for Grandma and to keep using the big-boy potty. But her message to Landen had a different tone. "I am OK. Look at me. I am OK," she told him.

***"I am OK. Look at me.  
I am OK."***

But there is one fear she couldn't shake, a fear no cancer patient should also have weighing on her mind: What if I get COVID-19?

### PLANNING FOR A PANDEMIC

When the first COVID-19 cases were reported in China earlier this year, cancer center leaders carefully monitored the situation. Once the virus began popping up in the United States, they knew it was time to act.

"All of a sudden we were no longer able to conclusively connect a COVID-19 patient with a travel history," said Robert Keenan, MD, vice president, Quality and chief medical officer. "That's when you start saying it's jumped the pond, it's here, and that this could get quite serious."

The cancer center activated its incident command center, a general emergency management team typically used during hurricanes. Focused on the pandemic, the group created almost two dozen subgroups involved in various operations across the hospital. A team from the Infection Control and Infectious Diseases departments took the helm and reviewed plans established by multiple health care organizations during the Ebola outbreak in 2014.

"With Ebola, the plans focused on caring for individual patients and trying to keep health care workers protected," said Keenan. "We didn't have the same concerns that we do now with the coronavirus, spreading through a large portion of the population."

The team was able to adapt the Ebola model to fit the current needs and established a COVID-19 response plan within weeks. It laid out four levels of escalation, with triggers that would determine if and when the hospital needed to move to a higher level of caution.

Moffitt now had a playbook to manage not only infected patients, but also any impacts the virus would have on daily operations.

With fears spreading throughout the medical community about a shortage of personal protective equipment, the cancer center took inventory of what it had and started looking for ways to get more.

The cancer center added 39 vendors and entered into 20 new agreements with current vendors for product substitutions.

***"There is no question that COVID-19 jolted us into a new way of thinking and there's a lot asking, what will this new normal be?"***

By early summer, the number of N95 masks increased by more than 500% and the number of gloves increased by 325% compared to the same time period in 2019.

Moffitt nurses found ways to consolidate treatment to reduce the waste of isolation gowns, decreasing the number of gowns used by 8% compared to the same time last year.

Thankfully, the cancer center never ran out of any personal protective equipment during the first wave of the pandemic. At its lowest point, the cancer center had about one week's worth of supplies for certain sized masks and gloves.

After securing necessary equipment and prioritizing patient care, the next challenge was COVID-19 testing. At the beginning of the pandemic, Moffitt had to send samples to a lab in Salt Lake City, which could take up to two weeks for results.

With an immediate need for an in-house test, the cancer center's labs validated their own. The COVID-19 screening clinic can now give some patients same-day results, with the chance of receiving a false negative result less than 1 in 1,000.

"If a patient gets a positive result in our screening clinic, we are postponing surgery or treatment if we can, and if there is a negative result we know with 99.9% accuracy they don't have COVID-19 and we are comfortable going through with surgery or treatment," said Bryan McIver, MD, deputy physician-in-chief.

Since the beginning of the pandemic through Oct. 11, Moffitt ran slightly more than 16,000 COVID-19 tests. Currently the cancer center is conducting an average of 3,300 tests per month.

### RARE DIAGNOSIS

Even before the pandemic, the Sapiens lived a cautious life. In April 2019, Landen started feeling ill a few days before his seventh birthday. A doctor at a walk-in clinic asked if there was a family history of leukemia and recommended seeing a pediatrician for a blood panel. The pediatrician diagnosed Landen with tonsillitis, and the family walked out triumphantly.

Cancer, Amy told herself, what a crazy thought.



Photography: Diamond View Studios

Days later, the family was at a pet store shopping for a fish when Landen collapsed. His skin was gray, lips white and he was disoriented. Landen was admitted to the hospital and diagnosed with a very rare pediatric cancer called T cell acute lymphoblastic leukemia. He began what will be a grueling 3 ½ years of treatment.

With an immunocompromised child at home, the family rarely left the house. Amy had all of the groceries delivered and they missed their extended family Christmas celebrations when a relative got sick.

"We didn't go anywhere," said Amy. "We probably left the house four times in the past year because even the flu could kill Landen when he didn't have an immune system."

In February, the family was watching a movie together in bed. Amy's husband, Callen, moved his arm out from underneath his wife. "What is that?" he asked her. "Is that a lump?"

Both Amy's mother and grandmother had breast cancer, but Amy had tested negative for a BRCA mutation, an inherited gene that increases risk. She had put off her mammogram in 2019 when she turned 40 because Landen was at the height of his treatments.

A biopsy showed Amy's left breast had invasive lobular carcinoma, a type of breast cancer that begins in the milk glands and spreads. She would need a mastectomy. She asked to have both breasts removed. But because of the COVID restrictions, having her other breast removed would have to wait, since that surgery was deemed elective.

"Whatever I can do to put an end to this as quickly as possible," said Amy. "I have a kid who is sick and I need to be in fighting shape as long as possible."

After surgery, she began 12 weeks of chemotherapy.

Amy dyed her hair pink and shaved it into a mohawk to match Landen's. She was determined to show her boys that she is not a victim. That she is not going down without a fight.

"I have to have chemotherapy four times, my son has had it hundreds," said Amy. "We can't even put us in the same arena."

When Landen transitioned to maintenance therapy this spring, the family was looking forward to getting out more. Landen was taking oral medication at home and his immune system was building back up. He was excited to see his cousins, go out to eat and return to school in the fall.

COVID-19 ruined those plans.

"It feels like there is a kid using a magnifying glass to burn the ants and we are the ants," said Amy. "We could almost see victory with maintenance therapy coming and then I got hit with breast cancer and then wait, there's a pandemic with no vaccine."

COVID-19 meant no big eighth birthday party for Landen. Instead, he had a water balloon fight with his cousins with a "no man's land" in the middle of the field to keep everyone at a safe distance. He will now be learning virtually for third grade instead of in the classroom with his friends. The Sapiens don't accept meals from neighbors and politely decline offers from others to clean their house. They are more isolated than ever before.

"These are times where we would be relying on others to help, but we just can't take that risk," said Amy.

## NEW NORMAL

As coronavirus cases surged in Florida and other states over the summer, and patients and families like the Sapiens stayed close to home, Moffitt continues to stock up on personal protective equipment and use data collected from the first waves to help identify the start of a new peak earlier.

"The fact that we have been through the first waves makes us more knowledgeable on how to prepare," said Keenan. "We can do a lot of planning, but no one will know if the next wave will be similar to this one, worse or better." Another wave hitting during flu season can also complicate things.



While it is still uncertain what the world post-COVID-19 will look like, one thing is for sure: Things will never be the same.

"There is no question that COVID-19 jolted us into a new way of thinking and there's a lot asking, what will this new normal be?" said Keenan.

The new normal could include social distancing for the next year and a large majority of the workforce working from home full time. About half of Moffitt's nearly 7,000 team members worked remotely at the beginning of the pandemic.

The cancer center's more robust telemedicine program has forever changed the ways patients can access care. The cancer center can now use the technology to deliver care to patients who are too sick to travel or live far away.

The Sapien family is also embracing its new normal. Both Amy and Callen are back to work, and Callen's mom quit her job so she can help care for Landen and Corben without fear she has been exposed to the virus.

While they didn't get to celebrate Landen's birthday and start of maintenance therapy the way they imagined, the Sapiens did follow through on the promise of a puppy. River the Bernedoodle, half Bernese mountain dog and half poodle, joined the family in May. Training a new puppy brings chaos, but also the positivity and normalcy the family has been craving.

As Amy and Landen continue their treatments, they will lean on each other, safe from the dangers of the outside world. And like the tattoo on Amy's leg says, they will just keep swimming.



# Driving Digital Discovery

Moffitt Cancer Center's new artificial intelligence, machine learning and digital innovation teams are working to make the cancer center the most digitally enabled in the world

By Sara Bondell

## WE LIVE IN A DIGITAL WORLD.

Almost everyone has a supercomputer in their pocket. With a click of a button, you can have a package delivered to your doorstep. You can ask Siri where the nearest restaurant is.

But what about your health care?

"Health care isn't yet present in your day-to-day digital life," said Edmondo Robinson, MD, MBA, chief digital innovation officer at Moffitt. "Health care has a ways to go to catch up to the rest of the digital world."

There has been a major push to digitize health care, with health care organizations harnessing new technology to improve business operations, communications and direct patient care. Many of these technologies use artificial intelligence and their underlying machine learning algorithms to transform workflows and improve decision-making. In order to develop these solutions, you must have high-quality data.



Moffitt began investing heavily in its data ecosystem about a decade ago when it established its first enterprise data warehouse, the Health and Research Informatics platform. In order to take advantage of cutting-edge technology, the cancer center would need data – electronic medical records, biobanking systems, patient information, cancer registry data, survival information – and ways to mine that data for research and clinical purposes.

“Over time we realized we needed to work more with unstructured data, like the text of an electronic medical record,” said Dana Rollison, PhD, vice president and chief data officer. “These reports are generated from dictation so we needed more sophisticated tools to pull information out of them.”

In 2016, the Enterprise Wide Analytics Strategy Steering Committee was formed to take a broader look at all of the institution’s data needs, from payer strategies to clinical care. The committee determined a priority initiative was utilizing AI to obtain more timely information on cancer diagnosis and staging from the text of pathology reports, using cancer registry data to train the algorithms.

#### ARTIFICIAL INTELLIGENCE

AI is a wide-ranging branch of computer science concerned with building computers that are programmed to act and think more like humans.

“A lot of the technology used to extract or mine information is based in AI,” said Rollison. “We recognized AI also has applications across the research and clinical spectrum, like in drug discovery, health outcomes and behavior research, imaging analytics and prediction of treatment outcomes.”

At the end of 2018, the cancer center hired its first AI officer, J. Ross Mitchell, PhD. Mitchell began working on the Nvidia DGX-1 supercomputer.



Dr. J. Ross Mitchell

Photography: John McFarland

### *“A lot of the technology used to extract or mine information is based in AI.”*

“It has the same power as the No. 1 supercomputer in the world in 2008 called the Roadrunner installed in Los Alamos,” said Mitchell. “That contained 20,000 processors, 300 racks of equipment, took up 6,000 square feet and cost \$100 million to build.”

Moffitt’s supercomputer is about the same size as a typical personal computer tower.

Once the infrastructure was in place, Mitchell had to train the supercomputer for deep learning, a field within AI that deals with algorithms inspired from a human brain to aid machines with intelligence without explicit programming. Using a powerful new natural language processing tool called Bidirectional Encoder Representations from Transformers, or BERT, Mitchell’s goal was to extract information from pathology reports to help identify clinical trials and treatment pathways for cancer patients.

“If you want to put a patient on a clinical trial, someone has to look through the pathology reports manually and try to figure out what they might be suitable for,” said Mitchell. “That is an incredible drain on resources, time, treatment, everything. For years, it’s been a dream to have a computer use its power to do this, but that hasn’t really been possible until now.”

Mitchell trained the Nvidia DGX-1 supercomputer on Wikipedia pages, books, abstracts found in biomedical search engines and discharge notes from intensive care unit encounters. He brought in almost 14,000 cancer center pathology reports and taught the machine how to answer questions. It was now possible to search the pathology report database for 51 different organs and 26 different types of solid cancers.

The program can determine the histology of a tumor with 96.7% accuracy and the tumor site with 92.9% accuracy. The next step is to improve the performance and training of BERT using 470,000 pathology reports to extract even more information from health records to better facilitate personalized medicine.

“A patient can come in and literally within minutes we could search their pathology reports and then we can start suggesting clinical trials they may be suitable for rather than relying on someone to go and look,” said Mitchell. “If we get the criteria for the clinical trial and we can extract this, then we are a huge step toward automating finding patients their clinical trials.”

Not only can the technology speed up the process of identifying clinical trials, it can also be used to further valuable research on treatment pathways. When a patient is diagnosed with a certain type of cancer, there is usually a standard treatment protocol for that cancer. Moffitt’s Clinical Pathways program has established treatment protocols and tracks patients’ progress with the goal of better preventing, detecting and treating cancer.

“This system will help enormously with tracking how patients do, compared to how on-protocol they were,” said Mitchell. “This will be huge for tracking progress over time.”

#### MACHINE LEARNING

In July, the cancer center became one of the first in the world to launch a dedicated machine learning department, which focuses on accelerating scientific discovery in cancer research and translating these powerful tools from the computer memory to the bedside.

“Moffitt is ahead of the game with this department and its prospect of making personalized medicine a reality,” said Issam El Naqa, PhD, department chair, Machine Learning. “I never thought there would be a machine learning department at a medical institution at this early stage.”



Dr. Issam El Naqa

Machine learning can enable researchers to identify new complex patterns from data that can be used to diagnose cancer earlier, identify novel drug targets for treatment, predict which patients will respond to certain therapies and optimize personalized care plans. The department will also focus on automating tasks to reduce human error and better allocate scarce medical resources.

“As humans, we can only process about four to five variables at the highest level,” said El Naqa. “A computer can process thousands of variables and give clinicians guidance and help optimize decision-making.”

### *“A computer can process thousands of variables and give clinicians guidance and help optimize decision-making.”*

El Naqa is one of three researchers in the department and plans to add three more faculty members and three software engineers in the next five years.

“We are not only doing research, but also trying to get deployment into the clinic,” said El Naqa. “We are giving priority to work that can be directly translated, not just ‘pie in the sky’ ideas. We want ideas that are translatable to the clinic and that will have an impact on patients’ care.”

#### DIGITAL INNOVATION

A core pillar of Moffitt’s strategic plan is digital care and discovery, and to execute that plan the cancer center needs to prioritize ideas and create a digital roadmap for the future.

Robinson was hired in 2019 as the cancer center’s chief digital innovation officer. He works hand in hand with Health and Data Services, IT and the new digital teams to advance technology in business operations, clinics, research, education and consumer areas.

“To truly ‘become’ digital and not just ‘do’ digital requires strategic planning, design, development and implementation focused on the end game of preventing and curing cancer,” said Robinson. “If you are going to truly transform how we do business, you have to wrap it around your mission and strategic goals.”

Earlier this year, Moffitt formed a committee of clinicians with data science backgrounds and a passion for digital innovation. The committee, chaired by Mitchell, will operate as a think tank to prioritize which ideas should move forward. Projects that have a direct benefit to patients will always move to the top.

“Moffitt’s uniqueness is that we have an eye for translational research,” said Rollison. “The research mission and clinical mission are so well aligned that we drive the science to be applied to the bedside and look to answer research questions that are very clinically relevant.”

The combination of advanced analytics and AI with digital innovation will drive Moffitt’s patient-centered care into the future. There are more than 500,000 unique patients in the system, and the machine learning and AI teams will continue to develop new algorithms to mine data and recognize patterns that impact care. Those projects will inspire digital innovation and build the framework to push the cancer center onto another level of the digital world.

“We are in this for the long haul,” said Robinson. “The goal is for Moffitt to be the most digitally enabled cancer center in the world.”

# BLOOD COUNTS

A bone marrow transplant  
from his brother and the love  
from his wife brought  
Caleb Morris back to life.

By Sara Bondell

CALEB MORRIS  
*Cancer Survivor*

Photography: Nicholas Gould



# IT'S A LOVE STORY PULLED FROM THE PAGES OF A FAIRYTALE.

“We were so aware of the idea that you can just be living your life, enjoying the world, and then one day that’s all over.”

Boy meets girl. Boy takes girl on a picnic. Boy marries girl. Two beautiful babies make four.

Caleb and Kristen Morris make love feel golden and effortless. The Oklahoma country boy and sun-kissed California girl make the perfect pair, and 10 years later they are still gazing into each other’s eyes as if it were the first time.

But behind that gaze, the pair is bonded by tragedy. Caleb lost his then 3-year-old brother to brain cancer. Kristen watched breast cancer claim the lives of both her grandmother and mother.

“We were so aware of the idea that you can just be living your life, enjoying the world, and then one day that’s all over,” said Kristen. “Bad stuff happens, and we know you don’t get a pass just because you’ve been through it before.”

Caleb and Kristen didn’t get a pass. In 2019, Caleb was diagnosed with cancer. They would once again fight the deadly disease, but this time, together.

## SOMETHING MAJOR

2019 was supposed to be a relaxing year for the Morris family. They had spent the previous few years in constant motion – building a home in Oklahoma while traveling the country looking for a new place to live. Caleb, a violinist, had decided to pursue music full time, and they were looking for a city where he could build his career while raising their two children, Rowdy and Summer Jo.

They settled in Tarpon Springs where Caleb and his violin found a home on the Sponge Docks, a small Greek village lined with authentic restaurants and souvenir shops. The locals and tourists quickly fell in love with the tall, handsome violinist in the backwards baseball cap, eyes closed, body swaying to the beat as he played original songs, classic rock favorites and chart-topping hits.



Photography: Nicholas Gould

The family was returning from a monthlong trip across Europe when Caleb began feeling ill. He chalked it up to a travel bug, but his symptoms lingered for weeks. Kristen urged him to go to the doctor, and tests showed

he had extremely low blood counts. He was sent immediately to the emergency room.

“We were so utterly shocked,” said Caleb. “At first I thought it was a wrong reading; there’s just no way it’s something major like this.”

But it was something major, a type of blood cancer called myelodysplastic syndrome. It’s a disease most commonly found in older adults. Caleb was only 31.

The diagnosis was a huge blow for the young couple, whose kids were just 3 and 6 at the time. They tried to push aside the dark cloud of their past – the terrifying knowledge that none of their other family members had survived cancer.

“I thought, he’s got this, he is the ideal cancer patient because he is so healthy, strong and tough,” said Kristen. “But the other part of me was literally like, am I about to become a widow? Am I about to become a single mom?”

Caleb spent the first month of treatment at Moffitt getting multiple blood transfusions a week and then began a chemotherapy regimen.

“The thought of not being able to be there for my family, I just can’t even go there,” said Caleb. “I knew I had to keep fighting to the bitter end and do whatever it takes.”

## HOPE FOR A CURE

After two months of chemotherapy, Caleb was in remission. But because the disease was likely to return, a bone marrow transplant was his only chance for a cure.

Caleb didn’t have to look far for a potential donor. He is not only a twin, but the oldest of 13 children. All of his siblings over 18 were tested; his younger brother Micha was a perfect match.

Micha Morris refused to lose another brother to cancer. “I always had a feeling deep down that I was going to be the match,” he said. “When it did turn out to be me, I was extremely honored to do it. To have the opportunity to give him a prosperous life with his family, that is a great privilege.”

Finding a donor turned out to be the easy part.

“There’s no way you can prepare for a transplant,” said Caleb. “I don’t think there’s any way you can grasp it until you go through it. They have to take you down to ground zero and then build you back up with new cells.”

One of Caleb’s clinicians recognized him immediately. Physician assistant Danielle Baratta had seen Caleb play violin at the Sponge Docks and was a fan.

Baratta couldn’t believe the young musician with a beautiful family was about to go through such a difficult time.

“I think it’s important to establish a bond and I love that bond,” said Baratta. “You get to know the patients and their families, their likes and dislikes, you get to know them as people. That is very gratifying for me.”

Baratta was a big part of Caleb’s support team. He not only was in physical pain, but also struggled with not seeing his children. Because transplant patients are severely immunocompromised, the hospital does not allow visitors under 12. Family and friends from all over the country pitched in to take care of Rowdy and Summer Jo while Caleb was hospitalized.

Kristen refused to leave his side and was Caleb’s caretaker and chief advocate. A few weeks after his transplant, Caleb was released to stay in the nearby Hope Lodge. But when



Kristen Morris

Photography: Nicholas Gould

he began vomiting blood, Kristen urged him to return to the hospital. His blood counts were extremely low and transfusions weren't working. He was admitted to the intensive care unit where he remembers very little.

"I watched this tall, strong, handsome Oklahoma farm boy just roll up into himself into this bald, hairless, gray human being," said Kristen. "It was just so sad to watch him disintegrate like that."

But slowly, one small victory at a time, Caleb began to recover. One day, he sat up. Another, he was able to get out of bed. Soon, he could sit at a keyboard and tried playing the violin again. He constantly had his eyes set on the 100-day mark, a milestone for transplant recipients that is considered a turning point in recovery.

"It felt like I would never get there because there were a lot of times when the pain was so bad I didn't know how I was going to get through the next 10 minutes, much less an hour or a

day," said Caleb. "But I knew I had to keep fighting because what if I didn't go home to my family?"

#### 100 DAYS

Shortly after hitting the 100-day mark, Caleb was able to return home to his children for the first time in months.

Rowdy and Summer Jo greeted their dad with open arms, a playlist of all his favorite songs playing in the background.

"It was literally one of the best days of my life," said Caleb. "Being able to hug them, feel their little arms wrapped around me and my arms wrapped around them and to be back together."

Caleb told Summer Jo he would be there to walk her down the aisle.

"It felt kind of like a honeymoon, like the glow of falling in love

**"I got really inspired during my transplant. Even though I was so sick and didn't pick up my violin for about two months, I would hear the music in my head."**

and a new baby and coming home," said Kristen. "It was like this hazy, glowing thrill that he was actually here."

Life began to look like it used to. Caleb read books to Rowdy and Summer Jo in bed, their limbs so intertwined it was hard to tell where one ended and another began. The family played in the water at the beach, sand sticking to their wet tanned skin. And Caleb returned to the Sponge Docks, where hundreds welcomed him back for his first performance.

Baratta was among them. "It was just the best day," she said. "That is the reason people undergo this horrible experience of transplant and the complications that occur post-transplant. It's to live their lives again and he was doing that."

Through even the worst times, Caleb never lost his passion for music. "It's part of me and it's who I am," he said. "I got really inspired during my transplant. Even though I was so sick and didn't pick up my violin for about two months, I would hear the music in my head."

He eventually turned the music in his head into songs, creating an entire album filled with original songs inspired by his cancer journey.

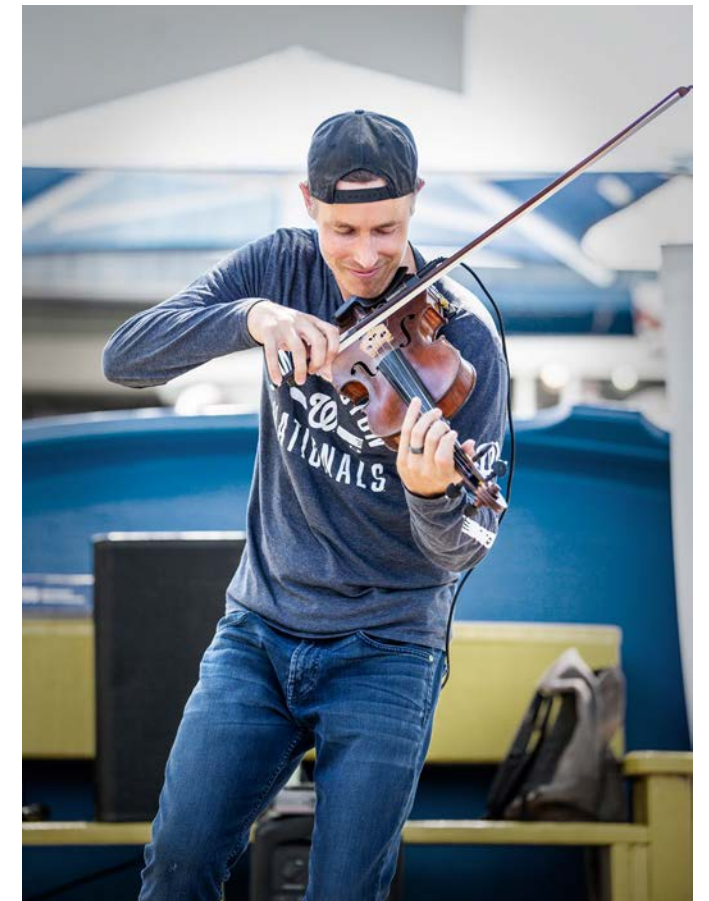
Caleb's transplant strengthened his relationship not only with his music, but also with Micha and Kristen, the cornerstones of his recovery. Micha and Caleb always shared DNA, but now they joke they are double brothers, Micha's blood literally running through Caleb's veins.

"Micha and I have always had a connection, but through this whole process we have gotten even closer," said Caleb. "He saved my life and I am indebted to him forever. His willingness to donate, it was without a shadow of a doubt, no hesitation at all."

When it comes to his wife's dedication, it's difficult for Caleb to find the words and hold back the tears. "I feel like if it wouldn't have been for Kristen – her fighting for me – I don't seriously know if I would be here today," he said. "She pulled me through."

For Kristen, there was never any doubt she would do what it takes to help Caleb claw his way back to life.

"It almost feels like we were born for this fight, that we were meant to do hard things together and just love each other so much," she said.



Photography: Nicholas Gould

**"I always had a feeling deep down that I was going to be the match. When it did turn out to be me, I was extremely honored to do it. "**



*Caleb's brother Micha (L) donated life-saving bone marrow.*

Photography: Nicholas Gould

#### HAPPY ENDING

The fairytale may look a little different, but Caleb and Kristen are getting their happy ending after all. More than a year since his transplant, Caleb is healthy and thriving, on the violin and at home.

"Cancer is something that is so horrible and something I would never wish upon anyone, much less myself," said Caleb. "But I feel like in a way I am so grateful for so much. I feel like I am a better person and I look at life so differently. It just changed me as a person."

That overwhelming feeling of gratitude sneaks its way into Caleb's life from time to time, mostly when he is doing mundane things like paying bills and cleaning up after the kids. A trip to the grocery store for bread ended in tears in the parking lot.

"Because we are here, and not in a hospital," said Kristen. "Because Caleb could walk to the car, because we were alone. And it felt like, what have we done to deserve this goodness? We are here. And hopefully, we don't forget that."

# HOW TO BREAK *A Vicious Cycle of Cancer*

Researcher designs molecule  
to halt breast cancer bone metastasis

By Cathy Clark

For some patients with breast cancer, bone metastasis can pose more danger than the initial diagnosis. Marilena Tauro, PhD, has made it her mission to help stop what is called the vicious cycle of cancer cell growth into the bone.

“One of the problems with some breast cancer patients is that when they arrive in the clinic, their cancer already has metastasized,” said Tauro, a research scientist in Moffitt’s Tumor Biology Department. “And the skeleton is one of the most affected organs, mainly because the bone offers the perfect conditions for the cancer cells to seed and grow – it is truly a fertile soil for cancer.”

*“One of the problems with some breast cancer patients is that when they arrive in the clinic, their cancer already has metastasized.”*

Tauro, a chemist and a biologist, is using novel molecules she developed while earning her PhD in pharmaceutical chemistry at the University of Bari, Italy. Much of her current preclinical work at Moffitt is focused on molecules designed to attack breast cancer cells that had escaped the primary tumor site and spread to the bone.

“During my PhD work, I designed and synthesized multiple series of small molecules as inhibitors of different enzymes involved in the tumor microenvironment,” said Tauro. The presence of cancer cells in bone induces a vicious cycle between tumor cell growth and bone resorption.

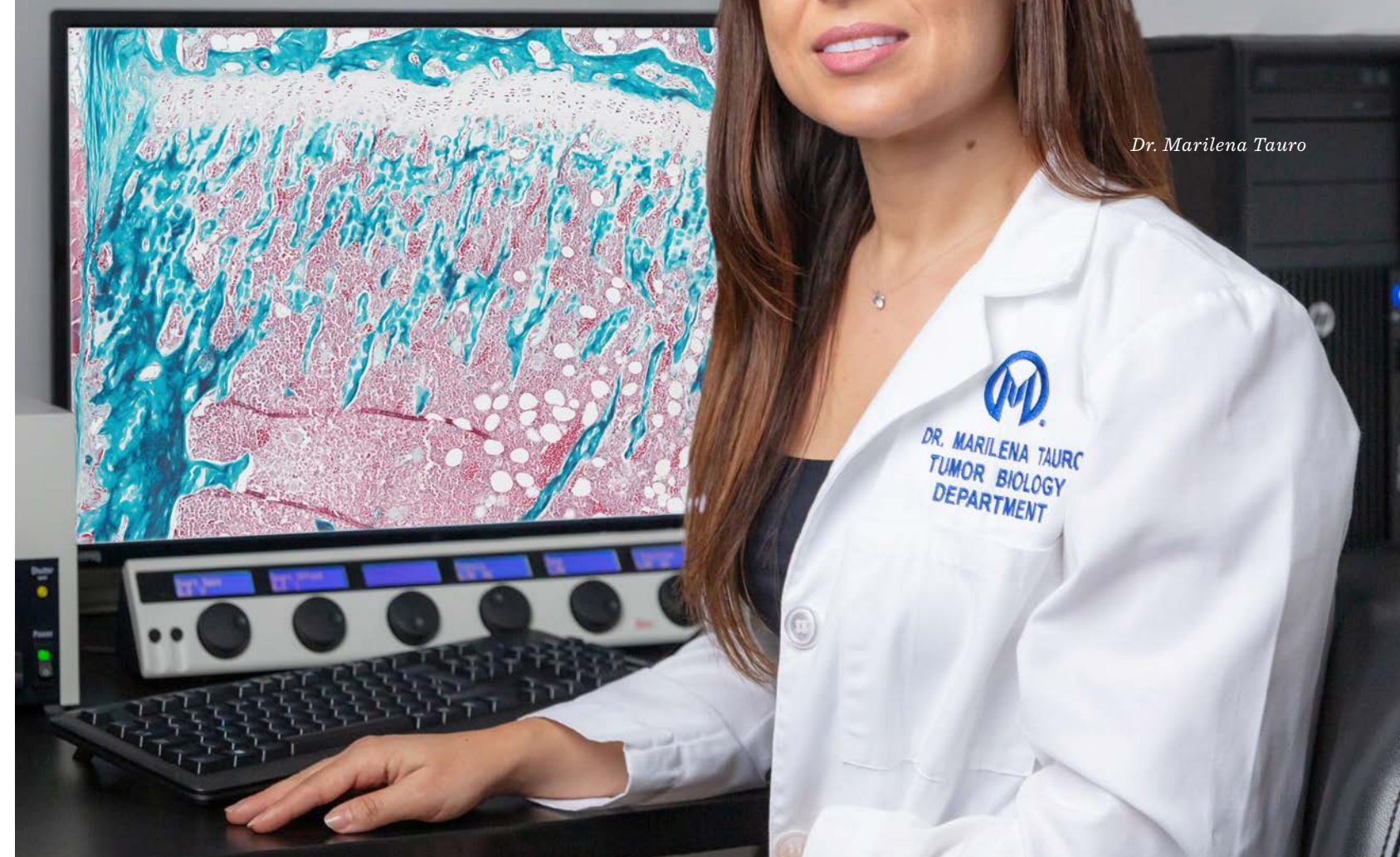
“In the chemistry lab, I was able to take the backbones of two different molecules and fuse them into one that could be selectively active in the bone, to break the vicious cycle and arrest cancer growth,” she said.

Bone metastasis is serious, with 70% of primary tumors spreading to the bone (spine, pelvis, ribs and long bones). The harsh symptoms can include bone pain, fractures and spinal cord compression. Treatment options for this condition include chemotherapy, radiation therapy, surgery, bisphosphonates (a class of drugs that prevent the loss of bone density, used to treat osteoporosis and similar diseases) and pain management.

“We have basically two types of bone cells: osteoblasts, the ones that form the bone, and osteoclasts, the ones that ‘chew’ the bone and are involved with bone resorption. The balance between the two of them gives us the healthy skeleton,” said Tauro. “But when the cancer cells arrive to the bone, they make the osteoclasts produce many enzymes leading to degradation of the bone itself, which gives space for the cancer cells to grow. In the bone tissue are many growth factors and as they get released, they end up becoming the nutrients for cancer cells.” Tauro identified the role of specific enzymes, called matrix metalloproteinases, involved at different steps of the metastatic process. Those enzymes get released from both cancer and bone cells, activating factors that facilitate cancer growth. Ultimately the cancer cells take over the bone and result in the formation of a new tumor.

Tauro and her colleagues are using a well-established model to study the effectiveness of the molecules she developed to help break the cycle with the aim of preventing bone metastasis. The molecules she designed are capable to accumulate only into the bone, avoiding side effects in other organs. Here, they fit into the enzyme and disrupt the cycle. She works in the laboratory of Dr. Conor Lynch in Tumor Biology and also works with the Drug Discovery Department on drugs being produced at Moffitt and tested as possible clinical trial candidates. With her background in chemistry and biology, Tauro understands the challenges in both fields and is able to help transition a drug from its discovery and

*“We are living in an exciting time for technologies and science.”*



Dr. Marilena Tauro

Photography: Nicholas Gould

bring it to preclinical testing, with the ultimate goal of seeing the science translated into a clinical trial.

“We are living in an exciting time for technologies and science,” said Tauro. “I hope this research opens a new way to design drugs that can stop this vicious cycle mechanism that cancer cells use to grow and spread.”

Tauro considers her vocation to be a mission and clearly is passionate about her research and advocacy work. For the patients who develop breast cancer in their lifetime, her work could be a benefit. Her work is not limited to breast cancer, however, because the study model she uses for stopping the vicious cycle of cancer cells to the bone also is relevant to multiple myeloma and prostate cancer that has spread.

“We are all together in this fight against cancer, and every morning when I wake up, I feel I have to come to work to change even one person’s life,” said Tauro. “When you walk

across the clinic wearing your lab coat and patients stop you and talk to you with so much hope in their eyes, you have a moral duty to do as much as you can to make a difference. The research is the cure! We made so much progress in cancer care because of research, but much more must still be done.

“It is super exciting because now we have all the technologies to make incredible discoveries and advance faster in this field. Because this is a continuous fight against time. Nobody can waste time. And it’s an investment. Whatever we are doing today is going to pay off. That’s my biggest motivation.”

*“The research is the cure! We made so much progress in cancer care because of research, but much more must still be done.”*

# Moffitt Cancer Center's FUTURE TAKING SHAPE



Construction Underway  
on New Inpatient Surgical Hospital

By Ann Miller Baker

*Venture less than two miles from Moffitt Cancer Center's familiar Magnolia campus hospital, and you can see the future taking shape.*

A new inpatient surgical hospital, 10 stories high with nearly a half-million square feet of space, is rising on the 21-acre McKinley campus directly across from the Richard M. Schulze Family Foundation Outpatient Center. The new facility will expand Moffitt's capacity for inpatient care and modernize our ability to treat and cure.

When completed in 2023, the new hospital will boast 128 inpatient rooms – and the capacity to expand to 400 beds as demand grows. It features 19 operating rooms large and

flexible enough for current and future technologies, as well as 72 pre- and post-operative rooms. Digital imaging capabilities will include three MRI scanners, three CT scanners and two nuclear cameras. A pedestrian walkway across McKinley Drive will link the new hospital to our existing outpatient center. Another walkway will provide convenient access to an adjacent three-story parking garage with nearly 500 spaces.

The economic impact of the new facility will be significant, creating upwards of \$120 million in direct salaries with 5,500 workers estimated to work on the project from beginning to end. Additionally, Moffitt is committed to the inclusion of diversity vendors in all aspects of the expansion hospital construction project. The construction management team working on the project consists of Barr & Barr and Horus Construction Services (a local, Tampa-based minority owned business). Working with Moffitt as part of the cancer center's

supplier diversity outreach efforts, Barr & Barr and Horus Construction Services conducted two supplier diversity vendor outreach events in 2020.

The \$400 million project comes not a moment too soon. Over the next 10 years, Moffitt anticipates a 65% increase in patient volumes and a 33% increase in cancer surgeries. The cancer center's existing 34-year old hospital has been maxed out under today's demands with no space to grow. But it still will be needed after the expansion hospital is completed. The Magnolia campus hospital will serve patients with blood cancers and other diagnoses that lend themselves to non-surgical treatments like stem cell transplants and innovative immunotherapies such as CAR-T.

"I guess we're a victim of our own success," said founder and former Florida Speaker of the House H. Lee Moffitt. "We are the 'go-to' place when you get cancer – whether for a second opinion or treatment. As word gets out of how good we are, more and more people are seeking help at the center."

"Florida has the second highest cancer burden of any state in America," noted Timothy J. Adams, chair, Moffitt Cancer Center Institute Board of Directors. "Moffitt must continue to be a resource for our patients by building for the future."

## DESIGNING THE FUTURE WITH IMAGINATIVE TOOLS

Designing for the future required the input and imagination of many who will use the new hospital. Physicians, nurses, lab personnel, pharmacy staff, even leadership and administrators

– and most importantly, patients and families – more than 170 stakeholders took part in four immersive design events (IDE) in early 2019 under the guidance of architects HDR, Inc.

"It's an interactive process to bring groups from varying backgrounds together and work towards the same goal," explained Susan Avon, director of Moffitt Space Planning and Programming. Designers get immediate feedback from frontline staff. And in the end, everyone involved becomes a mutual author of the final plan.

**"Moffitt must continue to be a resource for our patients by building for the future."**

To free the imagination, the IDE used some simple tools. Blocks representing patient rooms, work spaces, storage areas, equipment and other items were shuffled around on paper floor plans. Pieces of yarn were snaked along drawn hallways to represent the workflows of moving staff, supplies and patients throughout the building. When one group encountered a roadblock, they could quickly brainstorm with others to find a solution. For example, when lab personnel needed to configure their space differently to accommodate equipment, their colleagues working on adjacent surgical suites were able to trade a corner of their space.

"We had many instances like that," said Avon, "little things that might never have happened if people hadn't been in the room together to have the conversation."



*A new inpatient surgical hospital will be completed in 2023 on the east side of North McKinley Drive, across from the Richard M. Schulze Family Foundation Outpatient Center. The new \$400 million, 498,000-square-foot facility will serve as an inpatient surgical hospital for Florida's growing cancer population.*



Once imagined on paper, full-scale room mock-ups were created for participants to walk through and make adjustments. Cardboard walls framed space for beds and equipment, with photos of outlets, sharps containers and light switches in their assigned places. That was an incredibly valuable experience for Laura Barber, a member of the Patient and Family Advisory Council and caregiver to husband Steve throughout his treatment at Moffitt.

“There’s no way, in my opinion, that you could make all the decisions we needed to make without actually being in the space,” said Barber. “It really gave you an idea of the scale and scope of what we were hoping to accomplish.”

“Everyone brought a different point of view,” said Sachin Apte, MD, associate chief medical officer. “We wanted to be sure to take everyone’s expertise into account, so that we could build the most patient-centered, family-centered and efficient facility possible.”

#### SPACE TO INNOVATE

For physicians like neurosurgeon and neuro-oncologist Arnold Etame, MD, that meant operating rooms designed with flexibility and space to innovate.

“The surgeons who did this 30-40 years ago, would be blown away if they could see the three-dimensional navigation systems incorporating critical white matter and tumor information that we currently use to safely operate on the brain,” said Etame. Nor would they likely have imagined a surgeon controlling robotic instruments from a console in the OR. Or wearing 3-D goggles to view high-definition video of the surgical field on an LCD screen. Or intraoperative MRI for real-time tumor imaging during surgery. Or using fluorescent lighting to clearly see the edges of a tumor dyed purple from special dyes ingested by the patient.

Those technological innovations have already arrived. Fitting them into the cancer center’s existing operating rooms has been challenging. Etame said the new hospital’s surgical suites needed to be larger to accommodate multiple imaging and navigation systems - and flexible enough to incorporate technologies we haven’t yet imagined.

“It’s 100% driven by the desire to improve our patient care,” said Etame, “and the desire for us to safely take care of as many patients as possible in a timely fashion.”

For nurses like Itai Gwede, RN, BSN, MSN, OCN, the key for the new hospital was not only larger patient rooms but

more of them. As patient care manager of the Magnolia hospital’s 4-South unit, she and her staff treat patients after their surgeries.

“We know patients are out there waiting to come to Moffitt for care,” said Gwede. “The new hospital design gives us 32 patient rooms per unit versus the 24 we have now. That alone will allow us to increase the number of patients we serve and reduce wait times.”

Gwede said uniformity in the patient room size, shape and layout will make delivery of care more efficient. Added technology - like allowing patients to control room temperature with their own smart devices rather than asking staff to assist - will give nurses more time to focus on care. A “family zone” within each patient room, complete with a fold-out couch and work area, will allow patients to have their needed support at hand in a hopefully post-COVID world. Even simple touches like windows to allow for more natural light will promote healing.

“When you create a home-like environment, your patients heal better and faster,” said Gwede.

**“When you create a home-like environment, your patients heal better and faster.”**

For Jason Beaver of the Patient and Family Advisory Council, another important factor was spaces beyond patient rooms. “We wanted to see open air, warm and inviting spaces within the new hospital,” said Beaver. His fellow PFAC member Laura Barber agreed. “This facility is going to be beautiful, with gardens and elements of Florida nature.

“Moffitt’s new hospital is really going to set a precedent for other hospitals,” said Barber. “It’s going to be a safe and welcoming place.”

It’s a welcome that will extend to so many who will be counting on Moffitt Cancer Center in years to come.

“This hospital will increase the power and speed with which Moffitt can translate our discoveries to the benefit of all people,” said Jack Kolosky, executive vice president and chief operating officer. “It will blend the most advanced medical and surgical technologies with a patient-centered approach that brings us closer to achieving our vision - to transform cancer care through service, science and partnership.”

# Extending

## Moffitt Cancer Center’s Reach

**There is more than a new surgical hospital on the horizon to extend Moffitt Cancer Center’s reach to patients in need of its first-rate care and research. Here are just a few examples of projects in the works:**

#### ADVENTHEALTH PARTNERS IN WESLEY CHAPEL, CELEBRATION AND BEYOND

Moffitt and AdventHealth are partnering to enhance both institutions’ ability to deliver the highest quality cancer care to patients throughout Florida. A new jointly-run clinical research and infusion center adjacent to AdventHealth Celebration Hospital is slated to open this fall. It will provide world-class cancer treatment and better access to early phase clinical trials to patients in Central Florida. And a new Moffitt outpatient satellite cancer center is nearing completion at AdventHealth Wesley Chapel.

Beyond these physical locations, the Moffitt - AdventHealth partnership reached a new milestone this summer with the announcement that the two institutions are working together to establish AdventHealth as a consortium partner within Moffitt’s National Cancer Institute (NCI) Cancer Center Support Grant - the grant that signifies NCI Comprehensive Cancer Center designation.

“Recognition as an NCI consortium will strengthen science at both institutions and provide cancer patients across Florida with increased access to cutting-edge treatments, personalized medicine and innovation,” said John Cleveland, PhD, executive vice president and center director at Moffitt. “It will also provide the opportunity to expand Moffitt’s impact across the state.

#### ROOM TO GROW IN PASCO

Earlier this year, Moffitt finalized the purchase of 775 acres of former ranch land in Pasco County near the Suncoast Parkway. Plans are still under development, but the site is expected to become home to a life sciences research building as well as space for expanded clinical services. It is hoped the development will become a magnet for biotech companies.



*Moffitt and AdventHealth are building an outpatient cancer center on the campus of AdventHealth Wesley Chapel in Pasco County.*

#### EXPANDING CLINICAL RESEARCH TO VETERANS

Moffitt has established a partnership that expands its clinical research to military members being treated at the Tampa Bay area’s two veterans’ administration hospitals. Patients at Bay Pines VA Healthcare System and James A. Haley Veterans’ Hospital are now being enrolled in a Moffitt Cancer Center study related to prostate cancer in African American men. Infrastructure is currently being developed to allow the cancer center to offer more research studies and clinical trials through the two VA hospitals in the future. In so doing, Florida’s 1.5 million veterans will expand the cancer center’s ability to study and develop new therapies to treat cancer.

#### CONTRACT RESEARCH ORGANIZATION TO ACCELERATE IMMUNOTHERAPY SOLUTIONS

By the end of 2020, Moffitt will be home to a first-of-its-kind contract research organization (CRO) focused on accelerating immunotherapy research. The subsidiary will provide a one-stop-shop for pharmaceutical and biotech companies to accelerate their immuno-oncology and cell therapy research through collaborative clinical trial support and administration.

Based on the cancer center’s years of successful industry research partnerships, the CRO will offer end-to-end services for pharmaceutical and biotech companies. This will include preclinical study, manufacturing, clinical trial design and oversight, as well as data management and regulatory assistance. The goal is to take a company’s drug or medical device from initial discovery to clinical testing and Food and Drug Administration approval.

### ABOUT MOFFITT CANCER CENTER

Moffitt Cancer Center in Tampa, Florida, has made a lasting commitment to the prevention and cure of cancer, working tirelessly in the areas of patient care, research and education.

### MISSION

To contribute to the prevention and cure of cancer

### VISION

To transform cancer care through service, science and partnership

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# THANK YOU

## Miles for Moffitt 2020 VIRTUAL RACE

Thank you for participating in our virtual Miles for Moffitt 2020 on October 24. **It's not too late to move for what matters – you can continue to support cancer research at Moffitt by making a gift at [MilesforMoffitt.com](https://MilesforMoffitt.com).**



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H. Lee Moffitt Cancer Center & Research Institute, an NCI Comprehensive Cancer Center – Tampa, FL

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Visit [MOFFITT.org](https://MOFFITT.org) to find out about our upcoming events

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