Volume 3, Issue 1

MOFFITT MOMENTUM®

PORTRAITS OF COURAGE

MIRACULOUS VISION
Partnership serves migrant community

GENERATING OPTIMISM
New voice for head and neck cancer

SEEKING ANSWERS
Innovative use of math yields cancer clues

Alan F. List, M.D.
President & CEO
Moffitt Cancer Center

MOFFITT MOMENTUM®
VOLUME 3, ISSUE 1

Dear Friends,

We are happy to share this edition of Moffitt Momentum magazine with you. Each person you read about is an integral part of our broad-based community of courage.

Margarita Romo started Farmworkers Self-Help with little more than a resolve for Florida's migrant workers to have a better life. It took her strength of mind and will, along with years of hard work, to turn that dream into reality. Today this underserved group has access to better health care and cancer prevention education, coupled with the availability of screening, early detection and treatment. Her courageous perseverance is paying off, and the farmworkers' agency was among the first to partner with the Tampa Bay Community Cancer Network, an initiative funded by Moffitt and the National Cancer Institute®.

Dr. Christine Chung's ambition and aptitude could have taken her down any number of paths leading to success. Her determination to face a challenge ultimately led her to Moffitt where she chairs the Head & Neck-Endocrine Oncology Department. Her aims are to create a stellar head and neck cancer center of excellence and to give the very best available treatment to patients with these difficult-to-treat cancers.

The magazine also highlights other physician-scientists who are working in alliance with each other and with industry to develop new, better ways to detect and treat cancer.

Research psychologist Dr. Thomas Brandon is dedicated to understanding and altering behaviors, such as smoking, that affect the onset of cancer. His health outcomes work includes developing ways to help people quit using tobacco and to stay quit.

Amanda Ramos describes her diagnosis and recovery from a rare, potentially debilitating type of sarcoma. She says the expertise and support of her surgeon Dr. Odion Binitie and radiation oncologist Dr. Jacob Scott made the treatment easier to endure. Her plans now that her leg is saved? She is returning to her active lifestyle and hopes to go skiing next year.

We hope you enjoy reading these portraits of courage. Clearly, the courage of these individuals inspires ours.

FARMWORKER Empowerment Champion Earns Sapphire Award

Cancer Network Partner Labors To Reduce Gaps In Health Care

By Michelle Bearden

In her little corner of the world in Dade City, Florida, Margarita Romo is a bona fide rock star.

But forget the bright lights and flashy cars. This is a celebrity focused solely on helping others in one of Pasco County's poorest communities, nicknamed "Tommytown." Since she founded Farmworkers Self-Help, Inc., in 1982, Romo hasn't veered from her relentless mission to better the lives of seasonal and migrant farmworkers with education, advocacy and organizing.

"Giving a voice to those who don't have one," Romo says of her nonprofit. "And once they get that voice, empower them to use it."

Margarita Romo
Champion

Photography: Ray Reyes

"Giving a voice to those who don't have one…

Romo's selfless work has earned her honors and accolades across a wide and diverse spectrum. Among them: being named to the Florida Civil Rights Hall of Fame for making significant contributions to improvement of life for minorities; winning the Sapphire Award from the Florida Blue Foundation for making a positive impact on health-related outcomes for at-risk people; and being honored as a community hero by the Lightning Foundation for her efforts in enhancing the lives of immigrants. Tampa Hispanic Heritage, Inc., named her Hispanic Woman of the Year.

And there's no measuring how many lives have been saved through Romo's partnership with the Tampa Bay Community Cancer Network (TBCCN), an initiative funded by Moffitt Cancer Center and the National Cancer Institute. Farmworkers Self-Help (FSH) is one of 28 TBCCN community partners in the three-county network (Hillsborough, Pasco and Pinellas) that brings together local programs with medical and academic professionals to find solutions to health disparities and that brings health equity to under-resourced areas. FSH was one of the founding agencies when TBCCN was established.

"Margarita is an individual who is going to make things happen," says Moffitt's Cathy Meade, Ph.D., R.N., one of the network's leaders. "She doesn't take no for an answer. She's a true champion of her people."

Not bad, for a woman just months away from her 80th birthday.

All this recognition makes Romo a little uncomfortable. She prefers being in the trenches rather than the limelight. She just wants to get things done.

"It takes a village to raise a child, and it takes a village to win an award," she says. "It's always a group effort. We've accomplished a lot, and we see improvements in so many areas. But there really is no time to sit still and pat ourselves on the backs. We've got so much more to do."

No one understands the hardscrabble plight of the farmworker better than Romo. It's in her blood.

She's from Dallas, the daughter of Mexican-American migrant workers. Her parents traveled seasonally from Texas to Michigan, picking vegetables for sub-poverty wages. Even at an early age, she knew it was a hard, hard life.

"No matter how much you make, you're always behind," she says. "Nothing was fun about it."

When she was 3, her mother died of cancer. Her father had no choice but to place her and her three brothers in an orphanage. He visited often, but it wasn't the same. When he remarried a Lithuanian woman who only spoke to her in English, Romo had to abandon her native language.

"It was like an eraser just wiped everything out I had ever known," she said. Even her name was changed to "Margaret."

She doesn't have fond memories of her stepmother. After briefly moving back home, Romo ended up spending her teenage years in a convent.

The next decade of her life was a tumultuous one. At 17, she married a World War II veteran after he and her father cut a deal. Romo found out soon enough that her new husband was an alcoholic who suffered from post-traumatic stress disorder.

After three children she raised mainly on her own, Romo got a divorce. When she was 25, she made the plunge again. That marriage would last 18 years and produce three more children. It also was a time of personal torment, when a severe depression led to several suicide attempts and drinking whiskey straight up. At one point, she committed herself to psychiatric care for three weeks and underwent electroshock treatments.

Romo credits God for lifting her out of her fog in her mid-30s. She began meeting with a group of women in Tampa for a weekly Bible study, finding solace in the spiritual discussions. Finding that faith built the sturdy foundation she would need in the years ahead as an advocate for the underserved.

"It's taught me to never give up because you never know what's around the corner," Romo says. "And trust in God. I can tell you he's been very good to me."

In the early 1970s, she became a translator for evangelists who visited migrant camps in Tampa. One thing led to another, with Romo taking on the responsibility of accompanying workers to medical clinics and helping them register for Social Security, and starting a support group for farmworkers in Pasco County.

She always knew about the inequities and challenges that migrant workers face. But the needless death of a little girl is what propelled Romo into her life's work.

Not quite 5, Norma was in a Bible study class taught by Romo at one of the migrant camps. The teacher was smitten by the sweet child, the daughter of farmworkers who didn't speak English.

Tragedy struck in the winter of 1981 when Norma fell out of the passenger side of a pickup truck that her mother was backing out of a convenience store parking lot. Norma was taken to the local hospital where she lay in a bed in a hallway but was

… and once they get that voice, empower them to use it."

refused care due to not having insurance, even though her family pleaded for her to be treated and promised future payment.

After several hours, Norma was transferred to another hospital, but it was too late to save her life. The second hospital thought she had head injuries, but her injuries were internal. After finally being treated for the internal organ damage caused by the truck having run over part of her abdomen, she seemed to be recovering, but she took a sudden downturn and did not return to consciousness.

After a few days, her father and mother had to make the decision to unplug the machines that kept their child alive. The family donated her organs.

"Never should have happened," Romo says, still visibly upset to this day.

Romo would not allow Norma's death to be in vain. She led the effort to raise funds for the funeral and the tombstone. She helped the parents sue for negligence, which resulted in a partial settlement.

More important, it became the genesis for FSH. From its modest beginnings on Romo's front porch where she offered assistance to migrant newcomers, FSH has grown to a sprawling complex of converted homes, housing multiple programs and services aimed at helping farmworkers. They're all lined up along Lock Street, which also bears the name "Calle de Milagros." Romo went to the Pasco County Commission to get that done, making her case for the "Street of Miracles."

Indeed, it is a miraculous vision for the impoverished community. There's a main office, a youth recreational center, a thrift store, a barber shop and an educational center. There's also Resurrection House Mission, a Lutheran church pastored by Romo's son, and a park, where local children play soccer and families meet for picnics.

The free health clinic needs a volunteer doctor. She promises herself that by fall, she will have one in place.

When Romo isn't bustling around the neighborhood, she's likely in Tallahassee lobbying for a bill that will benefit her clients. She usually brings along students, so they, too, can learn the art of advocacy.

FSH volunteers like dance director Londa Edwards (top) work with Margarita Romo to help empower the underserved. FSH vice president Jose Amateco (center) recently graduated from Saint Leo University and aims to attend nursing school at USF.

This thrift store is one example of the numerous self-development programs and services that FSH facilitates (bottom).

Romo and Ana Limas (right), FSH administrative assistant

The operation has a $200,000 budget, with funding from grants, churches and individual donations, and a thrift store. The staff is small, supplemented by volunteers, and no one earns big money, including Romo.

"She doesn't take no for an answer. She's a true champion of her people."

She's come to the conclusion that she's better off single. A third marriage in the 1980s only lasted a few years because her husband didn't get why she was so passionate and committed to this cause. Now she can devote as much time as she needs to the issues at hand without answering to anyone.

"I've simplified my life, in some ways. I don't own a car or a house," she says. "Possessions don't mean anything to me. Why should they? You can't take it with you."

Romo has a knack for cultivating relationships from all walks of life. Moffitt's Cathy Meade is grateful she's part of that wide circle.

Farmworkers Self-Help was one of the first partners to join the TBCCN alliance. Members meet formally three times a year and attend an annual retreat. In between that, there are plenty of phone calls, emails and other conversations, all with the same purpose: To focus on the medically underserved.

"Information and education are critical. With this mutual back and forth, we can learn from each other," Dr. Meade says. "For example, we can teach people in communities why a Pap test is critical, and they can help us develop a program that is friendly and relevant."

Romo concurs. "They bring the medical smarts, we bring the street smarts. Together, anything is possible."

The partnership has produced several successful initiatives so far. Moffitt sent a bus to Tommytown, bringing on-site mammograms to women who had no transportation. It helped with a health fair last year organized by the farmworkers, and it assisted with an educational video featuring a breast cancer patient and her journey. A prostate cancer screening program is now underway to reach out to the male population, and a health ambassador program aims to get the word out about cervical cancer and Pap tests. These highlight just a few TBCCN collaborative initiatives.

"You can't offer these programs from afar. You have to be in the communities where they're needed," Dr. Meade says. "And who knows these communities better than our partners?"

Some unexpected benefits have come from this union. Romo says if her people had ever heard of Moffitt Cancer Center, it was an "unreachable" place, certainly not available to them. Now they see the cancer center as a place of hope for their cancer-related health issues.

And once attitudes are changed toward institutions that provide medical care and promote healthy habits, "we're going to save a lot more lives," Romo says. "They're training us on how to take responsibility for our own health. This is how you change the system. And it's starting right here, right now. I'm just so happy to be part of it."

"They bring the medical smarts, we bring the street smarts. Together, anything is possible."

TBCCN Has Long History Of Building Community Partnerships For Better Health

What would you call a dynamic force that creates and implements community-based partnerships with health centers, nonprofit organizations, faith-based groups, adult education, literacy groups and Moffitt Cancer Center?

This collaborative network is the Tampa Bay Community Cancer Network (TBCCN). TBCCN was initially funded in 2005 by a grant from the National Cancer Institute (NCI) as one of its 25 Community Networks Programs.

The goal? To create and implement sustainable and effective community-based interventions to impact cancer disparities in the Tampa Bay area.

"Rather than assume those in the 'ivory tower' know what is best for the community, TBCCN was established on the principle of community-based participatory research," says Thomas Sellers, Ph.D., MPH, center director, Moffitt Cancer Center.

Today, TBCCN includes 28 partners, including Farmworkers Self-Help, Inc. (featured in this issue of Moffitt Momentum® magazine), Catholic Charities Mobile Medical Services, Haitian American Foundation of Tampa Bay, Latinos Unidas por un Nuevo Amanecer (LUNA), Suncoast Community Health Centers, University Area Community Development Corporation, Inc., Faces of Courage, Tampa Family Health Centers, Premier Community HealthCare and many others. TBCCN is now expanding to other counties.

"Moffitt has a long history of seeking to meet the needs of the community," Dr. Sellers says. "To that end, Dr. Cathy Meade has championed efforts to build community partnerships for better health under the auspices of TBCCN."

Working with a larger team, Dr. Cathy Meade and Dr. Clement Gwede — both members of Moffitt's Health Outcomes & Behavior Program — are the energetic motivation behind TBCCN.

Dr. Meade's research and education interests involve finding innovative ways to impact health disparities, producing culturally and literacy relevant cancer communications and creating sustained community-based education and outreach initiatives for medically underserved populations. She has served in NCI work groups designed to increase awareness of the impact of literacy in healthcare. Additionally, her work focuses on developing cancer training programs that increase the number of underrepresented scientists. She leads Project LINK (Leaders In New Knowledge), an NCI-funded year-round research training program, housed at Moffitt for underrepresented high school and undergraduate students.

Romo (right) with Moffitt's Cathy Meade, Ph.D., R.N.

"Rather than assume those in the 'ivory tower' know what is best for the community, TBCCN was established on the principle of community-based participatory research ..."

Dr. Gwede's research centers on these broad goals: reducing cancer disparities through community-based interventions to promote informed decision making and early detection for prostate and colorectal cancer, increasing participation of racial-ethnic minorities in clinical research and symptom management interventions to improve quality of life. Dr. Gwede recently was appointed as one of 15 members to the Florida Cancer Control and Research Advisory Council (CCRAB). CCRAB was founded by state statute in 1979 with the intent of advising the Legislature, governor and surgeon general on ways to reduce Florida's cancer burden.

Whatever you choose to do, be the very best at it. If you're a chef, work in a three-star Michelin restaurant. If you become a housekeeper, rise to the top and own the whole company. If you play the piano, be the accomplished concert pianist on the center of the stage.

Christine Chung, M.D.

Photography: Cliff McBride

Meet Dr. Christine Chung

Empathy And Ambition Merge, Giving Voice To Patients With Head And Neck Cancer

By Michelle Bearden

DR. CHRISTINE CHUNG'S SECURE LIFE AS SHE KNEW IT ENDED ABRUPTLY AT AGE 16.

Her mother, seeking a better future for her children, moved from South Korea to America with her daughter and two sons. They settled in Los Angeles, where they had some extended family. It was supposed to be a new beginning, but Dr. Chung didn't feel that way. She couldn't speak English and was overwhelmed by the strange new culture.

Back home in South Korea, she had been the smart kid leading the class. Now she was unsure of herself and reserved, qualities that got misinterpreted by her peers. If they noticed her at all, they mistakenly dismissed her as not very bright.

In those difficult years, Dr. Chung held dearly to her mother's words: Whatever you choose to do, be the very best at it. If you're a chef, work in a three-star Michelin restaurant. If you become a housekeeper, rise to the top and own the whole company. If you play the piano, be the accomplished concert pianist on the center of the stage.

That advice would help chart the course of her remarkable career in research and medicine.

In September 2015, Dr. Chung made her mother proud again when she left her post as associate professor in the Department of Oncology at Johns Hopkins University in Baltimore and joined Moffitt Cancer Center as chair of the Department of Head and Neck-Endocrine Oncology.

"Dr. Chung has excellent ideas about the future developments of head and neck-endocrine cancer care," said Louis Harrison, M.D., chair of the Department of Radiation Oncology and part of the search committee that hired Dr. Chung. "She shares Moffitt's focus on the importance of the multidisciplinary approach to these diseases."

Dr. Harrison describes her as a "nationally recognized leader in the field who has a great intellect and is driven by a passion for outstanding clinical care and innovative research."

Dr. Chung has settled in quickly, already a fan of jogging along Bayshore Boulevard to keep fit. More importantly, she feels very fortunate to be a part of her new Moffitt team.

"An incredible opportunity," Dr. Chung says. "Moffitt's reputation was a big factor in coming here. And I've since learned that Tampa is such a lovely place to live. So it's a win-win."

CAREER PATH INCLUDES RESEARCH WORK AT NCI

Dr. Chung's studious nature has always kept her focused and determined.

Although she enjoyed and excelled at playing the piano, her strongest suits in school were science and math — both of which did not require polished language skills.

"That's what always made the most sense to me," she says. "I knew I would follow some type of career path in this area; I just wasn't sure exactly what."

She opted to stay close to home for her undergraduate studies, majoring in biochemistry at the University of California, Los Angeles (UCLA). Once she had her degree, she knew it was time to leave the comfort zone of her adopted city, which was heavily populated by Korean immigrants.

"I didn't move halfway across the world to be a part of the same community I had left behind. I wanted to assimilate," she says. She especially wanted to improve her spoken English skills. So Dr. Chung accepted a job as a research assistant at the National Cancer Institute in Bethesda, Maryland. In her new environment, she made it a point to socialize with non-Asians.

"It matters to me to be a great doctor, so I wanted to zero in on where I could be the most help and challenge myself."

"In an effort to meet more non-Koreans to practice English, I met a Dutchman and ended up with a Dutch boyfriend," she says with a smile. "He was instrumental in helping me to bridge any communication and cultural gaps I had."

She and Robbert Slebos, Ph.D., of Amsterdam, eventually married and had two children. Maryke, 18, a recent graduate of the Friends School of Baltimore, is looking at several prospective colleges, including the University of Tampa. Son Ricky, 15, attends Tampa Preparatory School. Dr. Chung's husband of 21 years also relocated here to accept a position as a staff scientist in the lab of Eric Haura, M.D., where he will conduct lung cancer research using proteomics technology.

INTRIGUED BY AN ESPECIALLY CHALLENGING DISEASE

Dr. Chung's road to Moffitt has been an impressive one, with multiple degrees, fellowships, teaching positions and research projects. She earned her master's in interdisciplinary science studies with a focus in molecular biology at Johns Hopkins University and her medical degree at Eastern Virginia Medical School. She completed her residency and fellowship in internal medicine and medical oncology at the University of North Carolina, Chapel Hill. Her schooling and training have also taken her to the Vanderbilt University in Nashville and Johns Hopkins University in Baltimore.

It was in the last year of her fellowship in Chapel Hill that Dr. Chung began focusing on head and neck cancers, which include cancers arising from the skull base down to the larynx (voice box). True to form, she was drawn to a very challenging area of oncology.

"These cancers are difficult to treat, starting with the location," she says. "You're dealing with parts of the body that are so visible and functionally crucial such as eyes, ears, nose, mouth and voice box," Dr. Chung says. "All of it intrigued me. In this specialty, there is no room for error, or a person could be severely disfigured or have difficulty performing very basic functions in life.

"It matters to me to be a great doctor, so I wanted to zero in on where I could be the most help and challenge myself."

There is also a stigma attached to several of these cancers because many are triggered by tobacco or alcohol abuse, or HPV (human papillomavirus, a common sexually transmitted infection in the United States). She says some 40,000 to 45,000 new cases of these cancers combined are diagnosed every year.

"The attitude toward these patients sometimes is, 'Well, you caused this. It's your own fault.' I don't look at it that way at all," she says. "When patients come through my door, I do not judge. That's something I learned as an immigrant."

And some of her patients are unable to speak because they've had their voice boxes or tongues removed. Again, Dr. Chung relates to the silence. It brings back memories of her early years in America, when she struggled with learning a new language and spent more time listening than talking. She empathizes with those who have no voice, because she once felt that way, too.

She also can identify with the feeling of not being recognized on one's own merits.

As a female physician in a male-dominated field, she can relate to having been routinely dismissed. She recounts a typical past occurrence. "I come into the room to meet the patient, and go through what needs to be done. They politely nod and then they ask when the doctor will be there."

She can laugh about that today, but she becomes serious when discussing the importance of research and patient care.

FINDING THE SAFEST, YET MOST EFFECTIVE TREATMENTS

Dr. Chung currently has two specialty areas of head and neck cancer research that involve HPV-associated cancer and tobacco-related cancer.

HPV-positive head and neck cancer patients get a good prognosis and have a high chance of cure, but the treatment is "very toxic," she says. She is trying to identify personalized therapy that would decrease the toxicity of the treatment. "We want to find out the least intense treatment with the least amount of toxicity and that effectively will cure the patient," she says.

She's also involved in a research project for HPV-negative head and neck cancer patients, where the patients typically have a poor prognosis and the cure rate is "terrible." Many of these patients have tobacco-induced cancers. She wants to safely intensify the treatment and, ultimately, improve survival.

PERSONAL TOUCH HELPS GENERATE OPTIMISM

David Lee, 57, feels he's in the "best hands possible" with Dr. Chung.

Last fall, the Plant City man went in for a routine exam of his carotid artery. Tests revealed something ominous: a mass in his neck. After a biopsy, he was diagnosed with stage 4 tonsil cancer with metastasis to his neck lymph nodes.

Dr. Chung had just arrived at Moffitt. She explained in layman's language his options for treatment and what he could expect. She listened to his concerns and patiently answered all his questions.

And, Lee relates, she did something unexpected: She called to check on him during her off hours and let him know she was available any time he needed her.

"I've had about as good a cancer experience that you could hope for," says Lee, who completed his chemotherapy in December. "It's not over yet, but I feel good. I feel like I'm going to beat this. And knowing Dr. Chung is in charge gives me a lot of optimism."

AIM: TO DEVELOP THE BEST HEAD AND NECK CANCER CENTER OF EXCELLENCE

She has grand plans for the department she now chairs.

Dr. Chung is adding new surgeons, medical oncologists and endocrinologists specializing in head and neck and endocrine cancers to her staff in order to bring new talent and expertise to the clinical and research mission. She is also planning to seek a SPORE grant from the National Cancer Institute in the near future. SPORE (Specialized Programs of Research Excellence) grant projects promote interdisciplinary research and move scientific research findings to the clinical setting. These grants are not easy to obtain. Moffitt currently holds a SPORE grant for melanoma research and is the only Florida recipient of SPORE funding.

Where does she see the department in five years?

"The very best in the country," she says emphatically. And then Dr. Chung corrects herself.

"The best in the world. I want my department to be the best head and neck cancer center of excellence in the world. And it's entirely possible."

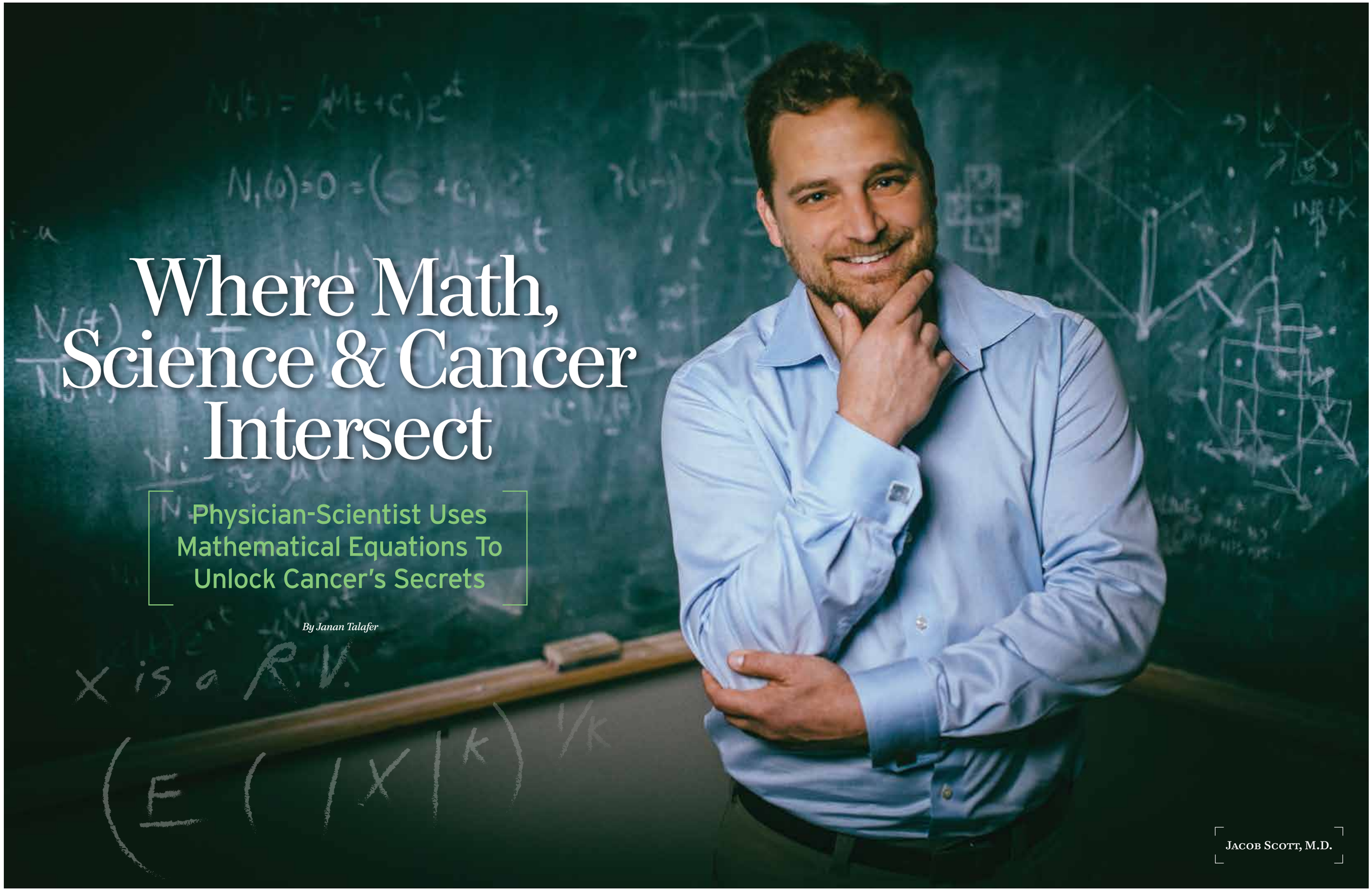
After all, a daughter doesn't forget her mother's words.

"The best in the world. I want my department to be the best head and neck cancer center of excellence in the world. And it's entirely possible."

Where Math, Science & Cancer Intersect

Physician-Scientist Uses Mathematical Equations To Unlock Cancer's Secrets

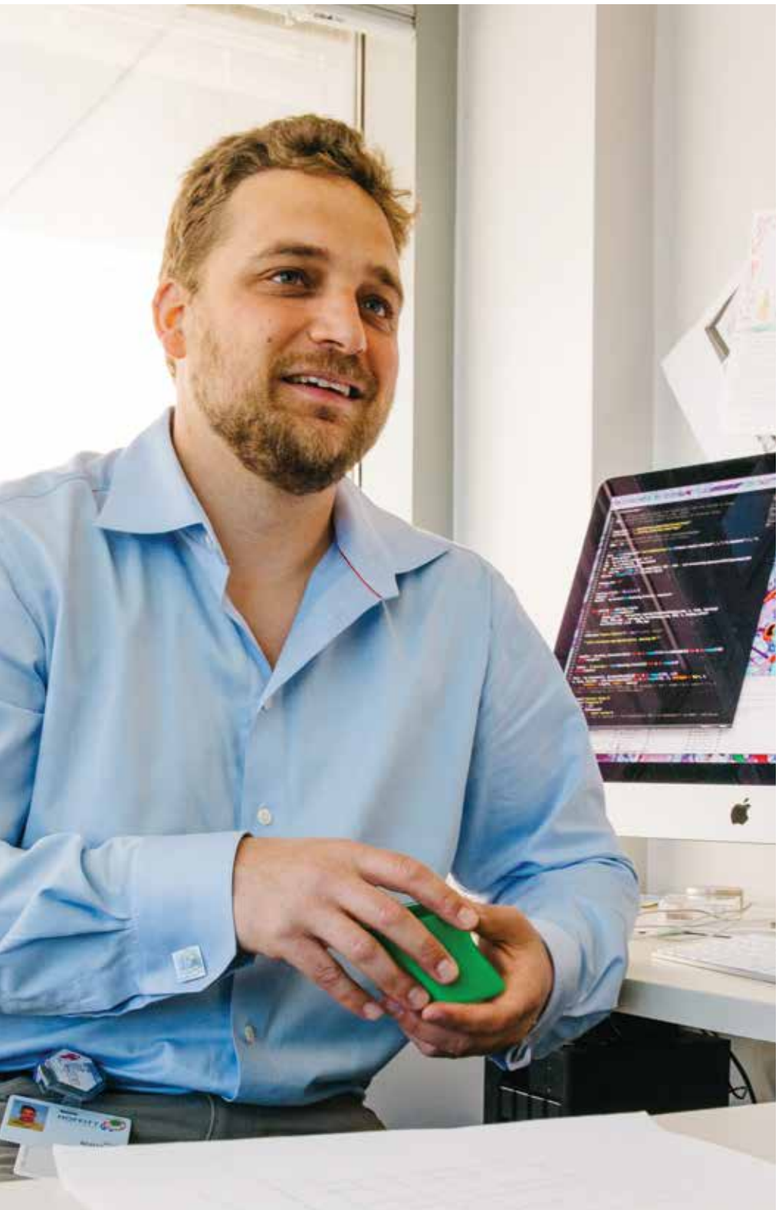
By Janan Talafer



Jacob Scott, M.D.

Photography: Ray Reyes

Jacob Scott, M.D., or Jake as he prefers to be known, tosses a Slinky back and forth, from one hand to the other. He has a blue one and a green one, and one of them is always in constant motion, like his mind, which never stops asking questions in the search for a cure for cancer.



The Slinkys help him still his thoughts, he says. It's more than a nervous habit; it's almost a meditative trick to help focus a creative mind that has boundless energy and curiosity.

In fact, he thinks and speaks so quickly it's almost hard to keep up, as if he's on a race against time, which in a way he is. He's only 39, but he's driven to find a breakthrough in cancer treatment.

Like many of the physician-scientists at Moffitt Cancer Center, Dr. Scott is looking for answers to what he calls $10 million questions like: What is the exact moment when cancer begins to metastasize? Or how do cancers acquire resistance to drugs that initially seem to kill them?

"Questions like this keep me up at night, along with concern about my patients, my doctoral thesis at Oxford and how well I can yell, 'I'm a codfish,' " Dr. Scott says.

That's quite a combination. The reference to codfish comes from the Disney movie Peter Pan, where Captain Hook yells, 'I'm a codfish.' "

Dr. Scott calls me over to his computer and in between showing me images of complicated color graphs and charts of tumor growth, he displays a video of his adorable 3-year-old son, Rhys, charging forward with a toy light saber, yelling, "I'm a codfish."

That he's a family man, as well as a dedicated doctor, is quite evident.

Dr. Scott and his wife, Sarah, have two children, Rhys, and Maren, 7. One of his patients likes to tell the story of how she was feeling very depressed and Dr. Scott, fresh from a weekend of watching The Little Mermaid with his daughter, broke into the theme song of the movie to cheer her up.

"I'm eager to get home and be with my family, but after the kids go to bed, then I am eager to get back to work, which is so meaningful to me," he says.

SEEKING ANSWERS USING A BOARD AND CHALK

At Moffitt, Dr. Scott is a radiation oncologist and section chief of sarcoma. Sarcomas are relatively rare cancers that grow in the bones and connective tissues — the muscles, cartilage, nerves, fat and even blood vessels.

He also is a team member of Moffitt's Integrative Mathematical Oncology Department. IMO is made up of an innovative research group of biologists, physicists, mathematicians, computer scientists and clinicians who are combining science, math and "first principles" to better understand, predict and treat cancer.

That means rather than searching for answers with a microscope in the lab, Dr. Scott uses a computer and a chalkboard. His chalkboard is covered in mind-boggling mathematical equations.

"I like to use the lens of mathematics to think about things and to see what we can't see," says Dr. Scott, who has a passion for scientific inquiry, algebra, physics and abstract theoretical math.

His research focuses on developing mathematical models to gain insight into how cancer evolves to resist treatment. Better understanding of the concept of "cancer evolution" might be the key that unlocks new ways of treating patients, he says.

His clinical interests include how to tailor radiation oncology treatment so it is personalized based on the patient's genetic profile, similar to the new standard of treatment for targeted biological agents. The goal is to deliver the right amount of radiation to the right patient to reduce side effects and improve survival.

When Dr. Scott looks out the window of his office, he sees posted on a nearby building the cancer center's mission statement — "To contribute to the prevention and cure of cancer."

"When I am frustrated with my work on the research side, I can turn around and look out the window and be reminded of why I am here," he says.

DRIVEN TO FIND THE BETTER ANSWER

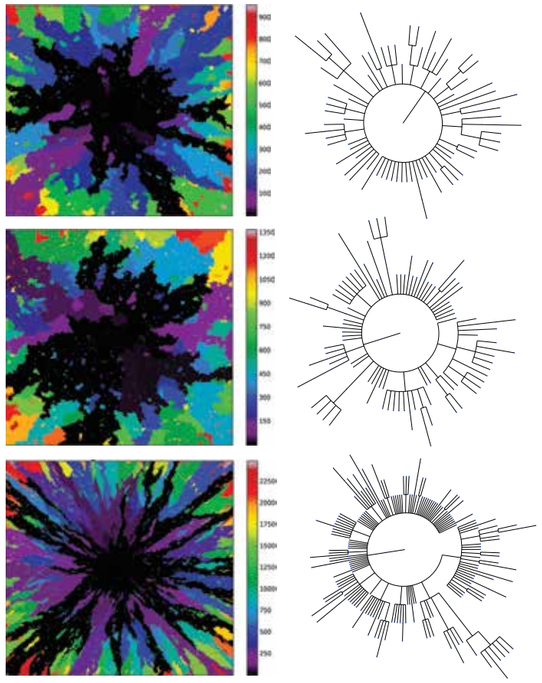
But on the other hand, he says, it can be a hard balance to be treating patients with the best evidence-based medicine currently available and then to come back to the research side and question everything.

"I like to use the lens of mathematics to think about things and to see what we can't see."

"I'm driven to always looking under the hood for what might be a better answer," says Dr. Scott, who looks like he could be equally at home in a classroom, talking to patients, or running, rock climbing, biking or playing rugby — all of which he does.

He has climbed New Hampshire's White Mountains, wrestled in college and coached wrestling at Stanton College Preparatory School, in Jacksonville, Florida, where he taught physics for a year before he went to medical school.

He has also played rugby with the Tampa Bay Krewe and at St. John's College at Oxford in the United Kingdom, where this year he receives his Ph.D. in mathematical biology. His son, Rhys, is named after the Welsh rugby player Adam Rhys Jones.



Dr. Scott uses mathematical models to understand how cancers acquire resistance to targeted biological agents and to tailor radiation therapy based on patient-specific genomic and anatomic factors.

Dr. Scott didn't set out to be a doctor. His father was a U.S. Army Ranger in Vietnam. His grandfather was on a battleship in World War II. In high school in a suburb of Cleveland, Ohio, he got hooked on physics.

After graduation, he got an appointment to the U.S. Naval Academy, where he studied astrophysics. The next step was the nuclear submarine base in Kings Bay, Georgia, where he served as junior officer in the U.S. Navy. But once his military duty was complete, he knew he didn't want to continue a career in the service.

At the suggestion of a physician he met while rock climbing at a gym, he applied for medical school. He was already 30; nearly everyone else was in their early 20s. He was also married. But that didn't deter him. Medical school changed the path of his life.

At Case Western Reserve University School of Medicine in Ohio and later through additional training at the University of South Florida and Moffitt Cancer Center, he finally found his path — taking care of patients with cancer, first as a radiation oncologist and then more recently as a mathematician researching cancer to better understand, predict and treat the disease.

"Cancer patients are an amazing breed. They're like combat vets," Dr. Scott says. "Both are choosing to look life in the eye despite everything. You have to honor both of them on the journey."

Amanda Ramos
Survivor

Photography: Ray Reyes

"CANCER REMINDS YOU TO TELL EVERYONE YOU LOVE THEM."

By Janan Talafer

THE TERM "SUPER MOM" MUST HAVE BEEN INVENTED FOR 36-YEAR-OLD AMANDA RAMOS.

When this bubbly, energetic mom is not busy driving her teenage daughters, nieces and nephews to sports events, band practice or school, she works full-time as a paralegal at a Sarasota law firm.

At home, on her farm in rural East Sarasota County, she cares for an assortment of horses, cows, chickens and dogs. She also loves to cook, and whenever she can, she finds time to paddle board, ride horses, fish and play football or softball with her large extended family.

It's a dizzying pace that many would find hard to juggle. But Ramos does it with a smile and a kind word for everyone.

Now she has added knitting to her list of activities, thanks to new friends she met at Hope Lodge, where she stayed while undergoing treatment at Moffitt Cancer Center.

A RARE SARCOMA

Last year, Ramos was diagnosed with epithelioid hemangioendothelioma, a very rare malignant tumor of her hip. It's so rare that only about 20 cases are diagnosed in the U.S. every year. Children and young adults are those primarily affected.

Classified as a vascular sarcoma, epithelioid hemangioendothelioma can appear anywhere in the body, but it commonly grows in the soft tissues and bones. In her case, the tumor appeared at the top of her thighbone — the femur. It also affected the ball of the femur where it attaches to the hipbone.

Today, both her doctors — Odion Binitie, M.D., an orthopedic surgeon specializing in bone and soft tissue sarcomas, and Jacob Scott, M.D., a radiation oncologist and section chief of sarcoma — consider Ramos well on the way to recovery. But getting there certainly had its ups and downs.

Ramos is grateful for the tremendous support she received from everyone — her family and friends, her co-workers, her Moffitt health care team, and also the people she met at Hope Lodge.

A diagnosis of cancer or any traumatic experience reminds you what life is all about, Ramos says. "It makes you realize how much you mean to people and how much they mean to you. And it reminds you to tell everyone you love them."

Last September, on her birthday, she received what she calls "the best birthday present ever." A biopsy of her lymph nodes showed no sign that the cancer had spread.

BROKEN BONES LEAD TO A CANCER DIAGNOSIS

A series of accidents involving her leg and hip were complicated by a diagnosis of a rare cancer.

"It all started about three or four years ago," Ramos says. "We were at the softball field. Being the rambunctious person I am, I ran over and jumped on a good friend I had not seen in a while. That's when I dislocated my hip."

A friend who was a physical therapist helped ease the hip back into place, and a doctor later prescribed physical therapy. But the hip never fully healed and was always uncomfortable, Ramos says.

Two years ago on a dare, Ramos, who is only five feet tall, jumped over a fence. "Don't ever tell me I can't do something because then I have to try it," Ramos jokes. "I cleared the fence, but when I landed I heard a snap. I knew right away that I had broken my leg."

The break was severe enough to require surgery to place a metal rod in her tibia, followed by weeks of bed rest. But even after a year, she was still in a lot of pain, especially at the top of her leg near her hip. "I kept thinking, I don't have time for this," Ramos says.

Then one night, she woke up hot and kicked the covers off the bed. Just that small action was enough to break her femur, quite a shock considering that the thighbone is the strongest bone in the body. "The pain was so severe I couldn't breathe," Ramos says. Her youngest daughter called 911.

When X-rays showed a suspicious mass, local hospital officials called a medical helicopter service to transport her to Tampa General Hospital. Doctors there confirmed she had a tumor and arranged for her to be transferred to Moffitt.

"God sent me to Tampa General so I could go to Moffitt," Ramos says. "It was there I met Dr. Binitie and Dr. Scott, the most compassionate doctors I have ever met. They were my angels."

At Moffitt, Dr. Binitie temporarily stabilized the fracture with an external fixator. A more permanent fix would have to wait until biopsy results determined whether the tumor was malignant.

"The fixator looked like a little metal cage on my leg with pins sticking out about a foot," Ramos says. "It was crazy."

During the wait, Ramos moved back home to Sarasota, but not to the farm, where she couldn't take care of herself. Instead she moved in with her brother and sister-in-law and their children.

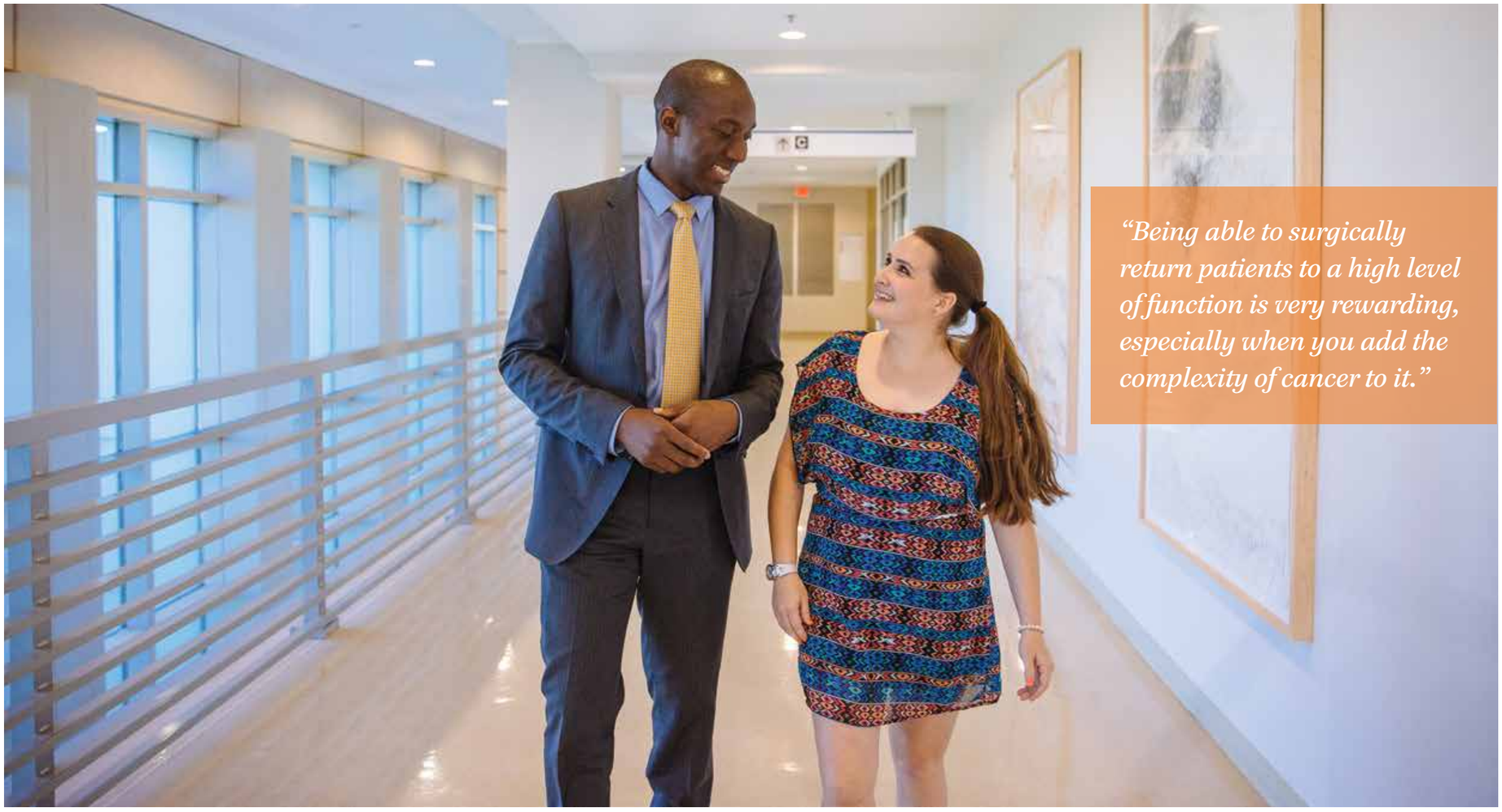
"I am a very independent person, and I could not do anything for myself," Ramos says. "On top of everything, my sister-in-law was seven months' pregnant. My family gave me such amazing support. Everyone, including my mother and my other brothers, pitched in to help."

When biopsy results came back that the tumor was cancerous, Ramos was in shock. "These are words you never want to hear," she says. "I was in disbelief."

Dr. Binitie recommended surgery to remove the malignancy in the top of her femur, including the ball that attaches to the hip joint. She wasn't even 40 yet and would need a hip replacement to accommodate an artificial joint.

"Another doctor might have said we are going to amputate, but Dr. Binitie specializes in rebuilding, protecting and preserving limbs. He said, 'I can fix this for you,'" Ramos says.

After the surgery, she underwent an additional six weeks of radiation therapy overseen by Dr. Scott. Rather than drive back and forth to Sarasota, she stayed at the American Cancer Society-sponsored Hope Lodge located next to the Moffitt campus. During this time, she also received physical therapy to help her regain mobility after the hip replacement.



"Being able to surgically return patients to a high level of function is very rewarding, especially when you add the complexity of cancer to it."

A COMPLICATED DIAGNOSIS

"Amanda's cancer was a very complex diagnosis," Dr. Binitie says. "If a surgeon had treated it as a straightforward fracture, there might have been unforeseen consequences. For example, if he or she had used a rod to treat the fracture and placed it into the tumor without realizing it, that could potentially have allowed the tumor to spread or even placed the entire femur at risk."

That's the advantage of coming to a National Cancer Institute-designated comprehensive cancer center, Dr. Binitie says. "At Moffitt, we have an entire multidisciplinary team of medical oncologists, radiation oncologists and surgeons all devoted to sarcoma, which is a rare diagnosis and requires a certain level of expertise and experience."

Dr. Binitie was born in the United Kingdom, grew up Nigeria and came to the U.S. when he was 16. After completing college at Florida State University, he came to Tampa to attend medical school at the University of South Florida and stayed to complete a residency in orthopedic surgery. He graduated in USF's first group of orthopedic surgery residents.

His next step was additional training at Children's Hospital in Philadelphia, where he completed a pediatric orthopedic fellowship, followed by a second fellowship at Moffitt Cancer Center in musculoskeletal oncology. Dr. Binitie currently treats adolescents and young adults in Moffitt's Sarcoma Program and pediatric patients at Johns Hopkins All Children's Hospital.

"I asked Dr. Binitie if he would pray with me before the surgery," Ramos says. "I prayed that God would guide his hands. He is my hero. He can just walk into a room and you feel better."

"Being able to surgically return patients to a high level of function is very rewarding, especially when you add the complexity of cancer to it," Dr. Binitie says. "The technology is continually advancing and allowing us to save extremities."

With her leg saved, Ramos is anxious to get back to exercising. In fact, she had considered going skiing with her daughters during Christmas break last year. "My doctors immediately vetoed that idea," she says. "Maybe this year."

Odion Binitie, M.D.

"We bring the power that we have — the science and the patients — and industry brings their strengths."

INNOVATION OFFICE — CONNECTS — Moffitt and Signal Genetics For Myeloma Research

INDUSTRY AND RESEARCH COLLABORATION HOLDS HOPE FOR MYELOMA PATIENTS

By Nancy Christie

KENNETH H. SHAIN, M.D., PH.D.

Photography: Ray Reyes

Developing new and better ways of treating cancer is not unlike putting together a puzzle. All the pieces have to be there and linked in the proper configuration before the picture can emerge.

For Moffitt medical oncologist and clinician scientist Kenneth H. Shain, M.D., Ph.D., the "puzzle" centers on multiple myeloma, a type of cancer that develops in the plasma cells found in bone marrow. The second-most common hematologic malignancy/blood cancer, multiple myeloma remains a mortal disease despite numerous advances. Importantly, researchers are still seeking ways to more specifically tailor the treatment to achieve the best outcome for each patient, and they are showing marked improvements, notes Dr. Shain, who is the scientific director of the Moffitt Myeloma Working Group.

That takes both money and industry collaboration, but with the assistance of Moffitt's Office of Innovation and Industry Alliances and the efforts of physicians such as Dr. Shain, there is hope for new advancements in the treatment of multiple myeloma.

THE LINK BETWEEN INDUSTRY ALLIANCES AND CANCER SCIENTIFIC RESEARCH

Although the laboratory may be where much research begins, Dr. Shain notes that industry partners are an integral part of the successful "bench to bedside" progression, especially given the reduction in government funding for the past 10 years, "which makes doing clinical research or translational research very difficult."

For example, he says, new pathways have been identified through research that may be critical targets for different drugs. "And to demonstrate these pathways are critical, not just in a petri dish or in a flask in a lab but also clinically relevant, you need to partner with pharmaceutical companies or industry and academic centers who have therapies that might target these pathways."

Although industry alliances have long been a part of research, Dr. Shain says, "we're turning to it now even more so because there is this need to continue to move forward and strive to improve our sense of understanding and our translational research. And that part of that goal aligns very well with industry."

That's where the Innovation Office comes in, as the critical liaison between academic or cancer research center investigators and industry. The Innovation Office identifies industry partners whose pharmaceutical library of specific compounds or assay system aligns with research being done at Moffitt.

"We bring the power that we have — the science and the patients — and industry brings their strengths: their technology or their capital to help fund the research," explains Dr. Shain. From there, the Innovation Office works at defining the parameters of the relationship: timelines, goals, decision points and any intellectual property protections.

The Signal Genetics alliance currently in place is an example of the collaboration between science and industry that holds hope for myeloma patients.

As Dr. Shain explains, "Signal Genetics developed a gene expression profile in multiple myeloma that is prognostic, which in simplest terms, helps categorize patients as either high risk or low risk, meaning how well or poorly they are expected to do. Through our partnership, we hope to either improve on that profile or develop a new one that might be more predictive in terms of drug response or specific parts of therapy. Ultimately, by working together, we hope to develop new patterns and predictive signatures using gene expression profiles."

The collaboration, which took three years to coordinate and includes both technology and funding from Signal Genetics, encompasses three separate projects.

PROJECT 1 aims to identify patients who are at high risk to advance from the slow-growing (indolent) disease stage to active disease, and start them on the appropriate treatment before the disease has a chance to progress.

PROJECT 2 aims to identify a gene expression profile or signature that will predict early relapse post-transplant in patients for whom the disease has reached active stage, as well as seek other and better alternatives to stem cell transplant.

PROJECT 3 aims to use the outcomes of current therapeutics patients are receiving at Moffitt to identify gene expression signatures that will predict either a response or lack of response to those drugs, leading to personalized therapy for individual patients to improve results.

Signal Genetics is bringing not only its technology to the partnership but also the funding to help support the work Moffitt researchers are doing. "It's a great example of the collaborative process and what every strategic alliance should be like," Dr. Shain says. "We are all working together to develop new tools to maximize efficacy and avoid toxicity on a per-patient basis to create a personalized treatment regimen."

In addition to the Signal Genetics partnership, the Innovation Office has other alliances in the pipeline, including those with TG Therapeutics, Lion Biotechnologies, Celgene, Acetylon Pharmaceuticals and Rosetta Genomics.

For Dr. Shain, his focus on research was influenced in part by his father, William G. Shain, Ph.D., a neuro-biologist at Seattle Children's Research Institute, whose most recent work involved examining the neural microenvironment in Parkinson's disease.

While his father deals with the micro-environment of the brain, "you can say I deal with the micro-environment of myeloma," Dr. Shain explains. He attributes this focus to his time as a research graduate student at the University of South Florida in the late 1990s.

Dr. Shain divides his time among clinic work, conducting clinic trials and performing research focused on multiple myeloma and other blood disorders.

There, he worked in the lab of William Dalton, M.D., Ph.D., the former CEO of Moffitt Cancer Center and now CEO of M2Gen®. "With his mentorship and leadership, I learned much about translational research — the 'bench to bedside' concept — which I found very enjoyable and exciting," Dr. Shain says. "So I finished my Ph.D. under his leadership and went back to medical school. Myeloma was the disease he taught, so since 1997, I have known what I wanted to do."

Since then, Dr. Shain completed his residency in internal medicine followed by a fellowship in hematology/oncology at the University of South Florida. Currently, he is conducting clinical trials with the aim of improving the standard of care for patients with myeloma.

With the latest technological advancements and the increase in industry alliances, researchers can look forward to discovering a variety of new therapeutics and protocols to help develop better ways to identify and treat patients with cancer.

As for Dr. Shain, his goal is both deceptively simple and far-reaching:

"To personalize our care for patients — using the right drug at the right time in the right way for the right patient."

Thomas Brandon, Research Psychologist, PREVENTS CANCER BY FIGHTING TOBACCO SMOKING

By Randolph Fillmore

As our lives unfold, the mentors who help shape our career interests, paths and goals may come in all sizes and shapes, and from a variety of sources. Some mentors, in fact, may come from unlikely sources. Thomas Brandon, Ph.D., a clinical psychologist, chair of Moffitt's Department of Health Outcomes and Behavior, and director of Moffitt's Tobacco Research and Intervention Program, is quick to admit that his earliest psychologist mentor was comedian Bob Newhart, playing the role of Chicago-based psychologist Dr. Robert Hartley on a popular sitcom that aired during the 1970s.

"It may be surprising to many, but when Bob Newhart played a psychologist on TV, he inspired many of today's psychologists," Dr. Brandon says. "Not long ago, the American Psychological Association invited him to be a guest speaker at an APA professional meeting. The ballroom was a sell-out. Despite all the laughs, his TV portrayal of a psychologist really highlighted how psychologists help people."

Photography: Ray Reyes

THOMAS BRANDON, PH.D.

THE ROAD TO BECOMING A RESEARCH PSYCHOLOGIST

A native of Berkeley, California, Dr. Brandon started his academic career at the University of California, Berkeley. He originally planned to major in biochemistry to become an orthodontist but later switched his major to psychology (thanks, Bob). He was right at home at UC Berkeley because his mother worked at the university and his father at the nearby Berkeley Co-op grocery store. His father moved to the U.S. from Ecuador as a child in the 1930s, and his mother came to the U.S. from West Germany after having escaped East Germany with her family after World War II.

After earning his bachelor's degree in psychology at Berkeley, Dr. Brandon's next academic step led him to the University of Wisconsin-Madison, where he came under the instructional wing of Dr. Timothy Baker, a clinical psychologist and psychology professor and a pioneer in tobacco research. Dr. Baker played a central and inspirational role in Dr. Brandon's development as a research psychologist and in his choice of a career path researching addictive substances.

Dr. Brandon received his Ph.D. in 1990 following his clinical psychology internship at Indiana University Medical Center in Indianapolis. During that year, he also taught psychology at Indiana University-Purdue University, Indianapolis.

While in graduate school, Dr. Brandon met another psychology student named Karen Obremski when both worked in Dr. Baker's lab at the University of Wisconsin. Karen went on to earn her Ph.D. in psychology at Indiana University-Bloomington. They eventually married and quickly shuffled off to the State University of New York at Binghamton, where they both landed their first full-time faculty positions. The Brandons stayed at Binghamton until 1997, when they left for Tampa and the University of South Florida to join the faculty of the USF Department of Psychology.

HELPING SMOKERS KICK THE HABIT

Studying the role of tobacco in cancer — and not only its role in lung cancer — has been a research emphasis for several decades in disciplines as diverse as public health, psychology and biochemistry. Tobacco research spans the chemical nature and addictive qualities of tobacco to finding ways to break the nicotine addiction. The goal: spare the lives of smokers who may be destined to get cancer, and reduce the billions of health care dollars spent treating the growing list of smoking-related cancers. At Moffitt, Dr. Thomas Brandon was charged with establishing the Tobacco Research and Intervention Program (TRIP), a research group dedicated to understanding and treating tobacco addiction.

"Tobacco research, with a sharp focus on helping people quit smoking, has been a priority at Moffitt from the beginning," Dr. Brandon explains. "Originally, our treatment research at TRIP focused on bringing people into the smoking cessation clinic for face-to-face counseling. That mission changed when the nicotine gum and patch, and then other smoking-cessation medications, became available, and fewer people sought one-on-one counseling to quit smoking."

At Moffitt, Dr. Thomas Brandon was charged with establishing the Tobacco Research and Intervention Program (TRIP), a research group dedicated to understanding and treating tobacco addiction.

TRIP expanded its research to developing and testing "self-help" methods to quit smoking. The program produced booklets and other educational materials to assist people who were trying to quit on their own. The new emphasis on "self-help" led to the development of innovative materials that translated cutting-edge smoking cessation counseling into a written format that could reach far more people in a cost-effective manner.

Forever Free®, TRIP's self-help booklet series aimed at tobacco cessation, was so effective that the National Cancer Institute adopted it to assist in its national efforts to help people quit smoking. Since its first edition, *Forever Free* has had many variations to meet the needs of different populations of smokers. Spanish-language versions have encouraged Spanish-speaking smokers to quit. Versions for expectant mothers have helped them to quit smoking and have healthier babies. The booklets have been used with state tobacco quitlines and cancer hospitals around the country, and a British version was developed with researchers in the United Kingdom. A unique emphasis of the booklets is their focus on preventing smoking relapse among people who have already quit smoking.

"Past studies had shown that up to 95 percent of smokers who have quit will relapse within a year," Dr. Brandon explains. "About 50 percent of expectant mothers quit smoking while they are pregnant, but the relapse rate after they have had their babies is extremely high. Sustained quitting is what is important, and that is what we have emphasized in all of our intervention efforts."

TRIP's staff of researchers has worked diligently in designing, carrying out and evaluating smoking cessation programs, Dr. Brandon says. Many TRIP studies have enrolled hundreds, or even thousands, of smokers to test the effectiveness of their interventions and find ways to further improve them and to reach even more smokers.

The success of TRIP has not been due to his efforts alone, of course, and Dr. Brandon cites as critical the work carried out by:

- **David Drobes, Ph.D.**, TRIP associate director whose research focuses on tobacco craving and environmental cues to smoke, interactions between nicotine and alcohol, neurocognitive effects of nicotine use and withdrawal, and genetic markers of smoking risk;
- **Vani Simmons, Ph.D.**, an associate member at TRIP with research interests in the development of smoking cessation and relapse prevention interventions for special populations, including college students, cancer patients and ethnic minorities; and
- **David Evans, Ph.D.**, an assistant member at TRIP who focuses on understanding how nicotine affects cognitive processes such as attention, and how this contributes to tobacco addiction.

"The success of TRIP is based on the combined efforts of the dedicated team of faculty researchers, support staff, and students we have assembled," Dr. Brandon says.

Promoted to chair and program leader of Moffitt's Department of Health Outcomes and Behavior Program (HOB) in 2012, Dr. Brandon remains at the helm of TRIP, but he has donned an additional hat. As HOB program leader, he directs Moffitt's efforts to contribute to the prevention, early detection and control of cancer through the study of health-related behaviors, health care practices and health-related quality of life. It's a good fit since what Dr. Brandon has been fighting for over his whole career — freedom from the destructive clutches of tobacco — has emerged as one of the best ways to avoid getting cancer.

"HOB research seeks to understand and alter behaviors that affect the onset or detection of cancer, such as smoking, sun protection, diet, and HPV vaccinations and cancer screenings," Dr. Brandon says. "We also aim to improve the quality of life of cancer patients and reduce health disparities in cancer incidence, treatment, and outcomes."

He credits Moffitt's Paul B. Jacobsen, Ph.D., psychologist and professor, as a long-time mentor. It was Dr. Jacobson's position that Dr. Brandon moved into in 2012 when Dr. Jacobson was named associate center director, Division of Population Science.

A NEW CLOUD ON THE RESEARCH HORIZON

The newest research challenge for Dr. Brandon and his TRIP colleagues comes with the emergence of e-cigarettes. Unlike conventional cigarettes, e-cigarettes vaporize a liquid. Vapers (a slang term for people who use e-cigarettes) inhale a flavored aerosol cloud that may or may not contain nicotine.

While the popularity of e-cigarettes has exploded in the past few years, research is way behind their emergence into the marketplace, says Dr. Brandon, and many questions about e-cigarettes need answers. Seeking answers, Moffitt recently received a five-year, $3.6 million grant from the National Institutes of Health to study e-cigarette use, understand patterns of use and determine if they can be an effective tool for quitting traditional smoking.

"There are roughly 500 brands of e-cigarettes and probably thousands of available flavors," Dr. Brandon explains. "Most researchers believe that using e-cigarettes must be far less dangerous than smoking traditional cigarettes because the aerosol produced by e-cigarettes does not include the known carcinogens, carbon monoxide or tars that kill smokers, but the aerosol probably is not completely benign."

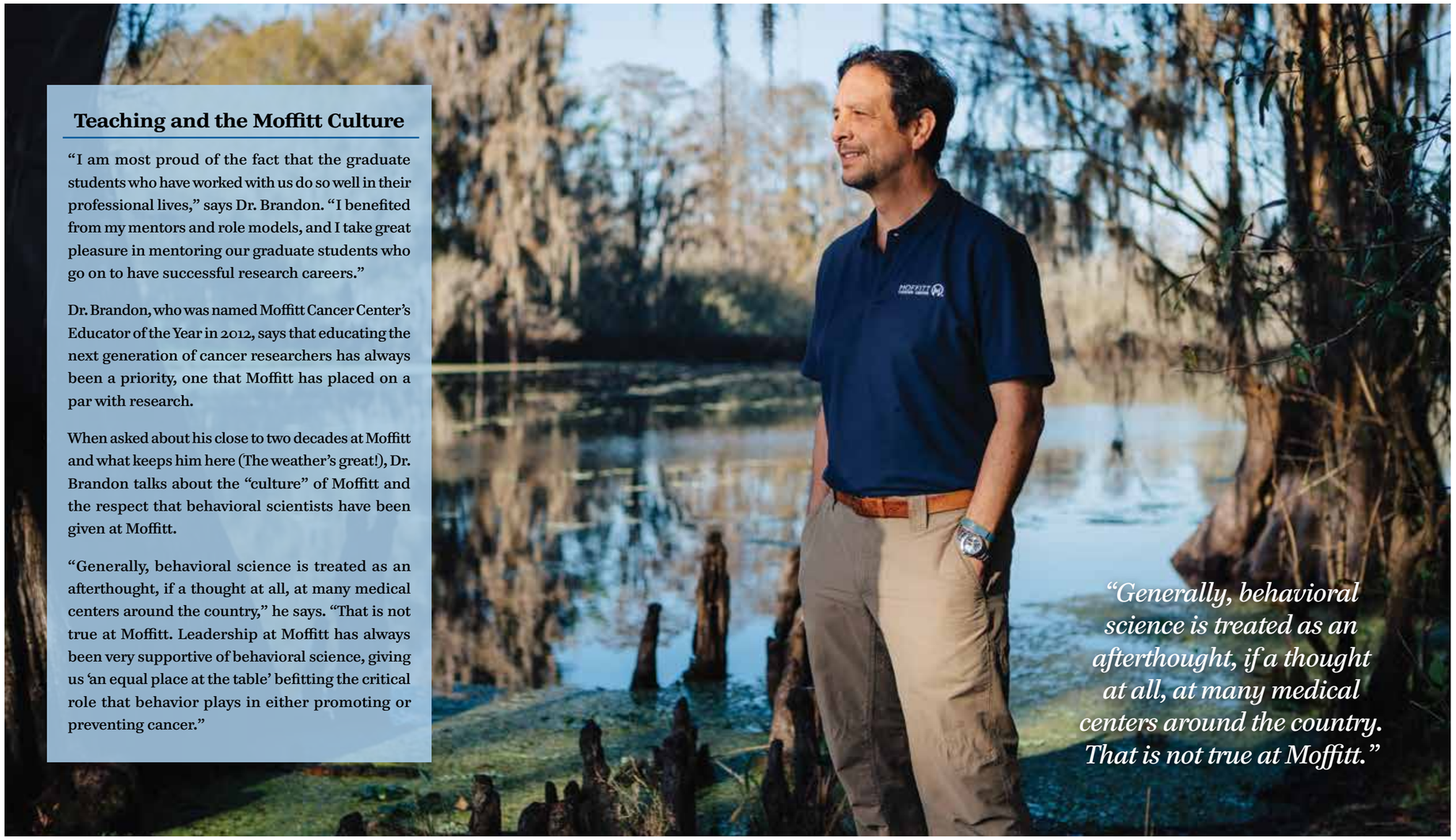
The new research effort is expected to provide valuable data about the long-term use of e-cigarettes and their potential value for quitting smoking. Do e-cigarettes help tobacco smokers to quit? Or do they make it easier to continue smoking tobacco? Are some smokers who are trying to quit "stuck" using both cigarettes and e-cigarettes?

"Millions of smokers are using e-cigarettes to try to quit smoking," Dr. Brandon says. "But because there is a lack of data, we are unable to advise them whether e-cigarettes actually present an effective smoking cessation strategy. We want to learn how e-cigarettes are used over time and whether users are eventually successful at quitting tobacco. We will be interviewing e-cigarette users to learn about their experiences and their perceptions of the pros and cons of e-cigarettes."

In the study, Moffitt will enroll 2,500 e-cigarette users throughout the nation who will be followed for 24 months. The study will include sending surveys every three months to the e-cigarette users. Although most e-cigarette users report that they started the products as a way to quit or cut down on their smoking, current research is unclear about whether e-cigarettes are really useful in this way. "We're still in the early stages of research on these devices," says Dr. Brandon, "but I am cautiously optimistic that they will turn out to be beneficial for quitting smoking. However, it may be a decade or more before we learn about their long-term safety."

WORK AND PLAY

Concerning his career, Dr. Brandon says he is able to look back at the long trail of published studies carried out at TRIP, the similarly long list of graduate students passing through on their way to professional careers, and the many smokers who have "kicked the habit," and feel great satisfaction that his three-decade career, like a research study with a positive outcome, has been successful and effective.



Teaching and the Moffitt Culture

"I am most proud of the fact that the graduate students who have worked with us do so well in their professional lives," says Dr. Brandon. "I benefited from my mentors and role models, and I take great pleasure in mentoring our graduate students who go on to have successful research careers."

Dr. Brandon, who was named Moffitt Cancer Center's Educator of the Year in 2012, says that educating the next generation of cancer researchers has always been a priority, one that Moffitt has placed on a par with research.

When asked about his close to two decades at Moffitt and what keeps him here (The weather's great!), Dr. Brandon talks about the "culture" of Moffitt and the respect that behavioral scientists have been given at Moffitt.

"Generally, behavioral science is treated as an afterthought, if a thought at all, at many medical centers around the country," he says. "That is not true at Moffitt. Leadership at Moffitt has always been very supportive of behavioral science, giving us 'an equal place at the table' befitting the critical role that behavior plays in either promoting or preventing cancer."

"Generally, behavioral science is treated as an afterthought, if a thought at all, at many medical centers around the country. That is not true at Moffitt."

He enjoys the occasional foreign travel to professional meetings and symposia that comes with his job. When not attending sessions, he likes to immerse himself in local culture, walk the city streets, talk with people, and visit shops and important sites. Recent trips have taken him to Spain, the Netherlands and England.

Dr. Brandon and his wife Karen, who also is an addiction researcher, have one daughter, Clara, a biology major at the University of Florida, who is eyeing a career as a biology field researcher. The Brandon family enjoys life in Tampa, especially canoeing or kayaking out on the Hillsborough River where they can enjoy breathing fresh air, commune with nature and spot wildlife such as the rare, pink-tinged roseate spoonbill birds and alligators lurking along the riverbanks.

Patients, Chemists *and* Patenting Professionals JOIN UP

By Randolph Fillmore

Photography: Ray Reyes

PARTNERSHIP AIMS TO FIND COMPOUNDS THAT INHIBIT CANCER CELLS

"We all know that a goal in cancer research is to move discovery from the 'bench to the bedside,' but today's efforts at drug discovery are more likely to start at the bedside where patients donate tissue for research carried out at the scientist's bench."

~ Moffitt medicinal chemist Nicholas Lawrence, Ph.D.

"The long and winding road …" is a familiar lyrical statement about love, life and waiting recorded by The Beatles almost 50 years ago. But that lyric could also apply to the long and circuitous route traveled by Moffitt scientists to bring new and effective cancer drugs to the patient's bedside. Uncountable hours are spent in the laboratory learning new things by testing huge libraries of compounds on cancer cells to observe their effects.

Getting a patent for a compound that may be the foundation for a new cancer drug begins in the medicinal chemist's laboratory. After "proof of concept" has been established through a variety of experiments and once a real discovery has been made — but long before the clinical trials of a new drug begin — the "long and winding road" from discovery to the patient's bedside begins with the patenting process.

When a Moffitt scientist makes a "disclosure" to Moffitt's Office of Innovation and Industry Alliances on the discovery, the Innovation Office initiates a complicated and exacting process that culminates in the patent application. Fortunately, Moffitt has a team of professionals who guide a promising discovery along its patenting and commercialization journey from the "bench to the bedside."

INVENTIONS MUST BE PATENTABLE AND MARKETABLE

"Before filing a patent application, we need to make sure that the new discovery is patentable and marketable," explains Praba Soundararajan, Ph.D., a registered patent agent in Moffitt's Innovation Office. He is responsible for assisting in patenting Moffitt's intellectual property. "Some inventions may be patentable but not marketable, or marketable but not patentable. At the beginning of the patenting process, we determine how new and different an invention may be in light of prior patents."

It may take many years for a discovery to finally find its way to the clinic as a new drug, Dr. Soundararajan explains. Once the "newness" and the claims about the discovery have been hammered out, the Innovation Office files a patent application at the U.S. Patent and Trademark Office in Washington, D.C., where the patenting process may take several more years.

Since Moffitt's Innovation Office was established in 2003, Moffitt has had 445 disclosures, filed 332 patent applications and received 53 patents. In recent years, the rate at which Moffitt scientists make disclosures and receive patents has escalated.

Dr. Soundararajan, who hails from Pondicherry, India, the same city from which the movie "The Life of Pi" originated, earned his Ph.D. in neuroscience from Dalhousie University in Halifax, Canada. He began his career as a stem cell scientist investigating the disease mechanisms of amyotrophic lateral sclerosis (ALS), often called "Lou Gehrig's disease." A few years ago, he made the career-changing decision to become a registered patent agent, which required taking intensive courses and passing a rigorous examination. As a U.S. Patent and Trademark Office registered patent agent, he came to Moffitt in 2014.

After a scientist achieves a breakthrough in the lab, is the long wait for the patenting process to be completed a little frustrating?

"Yes," says Moffitt medicinal chemist Nicholas Lawrence, Ph.D. "But we are well positioned at Moffitt to have a high chance of not only getting a patent on our discoveries, but also getting the discovery to the clinic and to the patient's bedside. The process of delivery for new medicines is slow. There's a lot of testing to ensure that drugs are safe and work well. This simply takes time."

Dr. Lawrence, originally from the West Sussex city of Chichester, England, received his Ph.D. in organic chemistry from Cambridge University. Before coming to Moffitt in 2004 and joining Moffitt's Drug Discovery Department, he worked with scientists at The Paterson Institute for Cancer Research, part of the University of Manchester in England. His wife, Harshani Lawrence, Ph.D., also was recruited in 2004 and serves as staff scientist in the Chemical Biology Core facility at Moffitt.

"Before filing a patent application, we need to make sure that the new discovery is patentable and marketable."

"Without patients donating tissue samples, a lot of this work could not be done."

Nicholas Lawrence, Ph.D.

Medicinal chemists at Moffitt work closely with their biologist colleagues who identify proteins related to the mechanisms of cancer development. Once these proteins are identified, the chemists begin looking for compounds that can inhibit cancer cell growth, which may involve discovering and defining complicated biological pathways and genetic "switches" related to cancer.

PATIENCE, KNOWLEDGE AND LUCK

To discover compounds that are active against the mechanisms of cancer, medicinal chemists and their colleagues need patience, perseverance and knowledge, along with a dose of luck, Dr. Nicholas Lawrence says. In the search for compounds that inhibit cancer cell development and growth, scientists test thousands of compounds against established cell lines of cancer to determine their effect, if any.

While the success of the drug discovery scientist includes an element of luck, the work of the patent agent is more like detective work, says Dr. Soundararajan.

"Preparing a patent application is more like the work of a Sherlock Holmes," he says with a smile. "Whether we are investigating the possibility of patenting a drug, a diagnostic, a medical device or intellectual property, we have to thoroughly search through what is already out there to confirm that our find is unique."

WITH PERSEVERANCE, HOWEVER, THE DISCOVERIES ARE MADE.

For example, Dr. Lawrence focuses much of his work on developing new anti-cancer agents that can be targeted to inhibit cancer cells. Among his recent investigations is work aimed at finding compounds that inhibit the activation of STAT3, an important regulator of many biological processes.

"STAT3 is a signal transducer. It's like a protein switch that can turn on cancer cell growth and is implicated in a great number of different kinds of cancers," Dr. Lawrence explains. "We developed, along with our co-workers in Moffitt's Drug Discovery Department, a compound that can inhibit STAT3 activation, and the compound was patented in 2012."

The best outcome is that a compound receives patent approval and that Moffitt's Innovation Office finds industry partners to license and develop the compound into a drug. With help from the Innovation Office, Moffitt's patented compound that successfully inhibited STAT3 in laboratory experiments will be licensed to a pharmaceutical company. Then the company will further work with the compound to develop a therapy that can move the discovery into clinical trials to show safety and efficacy.

Another Moffitt-patented, highly potent, multi-targeting inhibitor developed in Dr. Lawrence's lab recently was licensed to Aptose Biosciences for developing a new therapeutic for

Praba Soundararajan, Ph.D.

targeting underlying mechanisms of cancer. The small molecule agent originally developed by a team of Moffitt scientists inhibits a protein family that targets both genes and specific enzymes that regulate cancer cell growth.

PATIENTS ARE THE ACTIVE PARTNERS

The medicinal chemists and the patenting pros do not work alone. Moffitt patients are active participants in finding tomorrow's successful cancer treatments, Dr. Lawrence notes.

"Without patients donating tissue samples, a lot of this work could not be done," Dr. Lawrence says. "We hear a lot about the 'bench to bedside' path for a discovery that becomes a new therapy, but there is also a 'bedside to bench' pathway by which patient tissue donation becomes critical to our success. Our research has become circular. It's a loop."

On weekends, Dr. Lawrence enjoys cycling in Hillsborough County's Flatwoods Park, known for its own long, seven-mile, paved loop road. As he glides under the Florida sun through the palms and pines on his classic 1990 Raleigh 14-speed, does he think about the patients, small molecules, mechanisms of cancer and the latest technologies to inhibit the disease?

"Of course," he says.

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

Notable

MOFFITT LEADERS DISCUSS "MOONSHOT" CANCER INITIATIVE WITH WHITE HOUSE SENIOR OFFICIALS. Dr. Thomas A. Sellers and Dr. William S. Dalton led a delegation from the Oncology Research Information Exchange Network (ORIEN) on Jan. 29 at the White House. The group met with senior officials from the Office of the Vice President and the Executive Office of the President and discussed how ORIEN could serve as a model for nationwide collaborations in cancer research.

AMERICAN ASSOCIATION FOR CANCER RESEARCH AND MOFFITT HOSTED A CANCER RESEARCH POLICY FORUM. With support from the National Cancer Institute and American Association of Cancer Institutes, Moffitt and AACR hosted a cancer research policy forum that addressed progress, promise and challenges in the era of precision medicine. Forum panelists included Dr. Douglas R. Lowry, NCI Acting Director, U.S. Rep. Gus Bilirakis, 12th District of Florida and U.S. Rep. Kathy Castor, 14th District of Florida.

DR. SEBTI RECEIVED THE NATIONAL CANCER INSTITUTE OUTSTANDING INVESTIGATOR AWARD. The prestigious award is given to well-established cancer researchers with proven track records to encourage long-term projects of unusual potential in cancer research. Dr. Saïd Sebti's 7-year award totals $6,415,284. Dr. Sebti joined Moffitt in 1996 and has authored more than 290 journal articles on various areas of cancer research. Recently, he was elected as a member of the National Academy of Inventors and was recognized by *Nature* publishing as one of top 20 translational researchers.

NCI GRANTS PHYSICAL SCIENCES-ONCOLOGY CENTER $10.4 MILLION GRANT TO STUDY EVOLUTION AND CANCER THERAPY. Moffitt's Integrated Mathematical Oncology Department uses mathematical models to better understand cancer progression and treatment. This team-driven science has led to pioneering work that was acknowledged through the award from the National Cancer Institute, designating Moffitt as one of the five Physical Sciences-Oncology Centers in the U.S.

Visit **MOFFITT.org** to find out about our upcoming events

WHEN YOU DONATE TO CANCER RESEARCH your gift will go directly to helping researchers and scientists develop the medicines and protocols that will advance cancer treatments and help cure patients. Simply put, your generosity will help save lives. Every gift, no matter the size, makes a difference. Now is the time to get involved and help make a difference. Visit **MOFFITT.org/Giving** to find out more.

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