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Dome



A publication for the Johns Hopkins Medicine family

Volume 66 • Number 6 • July/August 2015



JOE RUBINO

Cancer's Persistent Foe

More than 30 years ago, Drew Pardoll took the first steps toward his goal of creating therapies that tap the strength of patient immune systems. His determination is paying off.



Learn more about the strategic priority for biomedical discovery online at hopkinsmedicine.org/strategic_plan.

THE 10-YEAR-OLD GIRL WAS DYING. It was 1984, and Nicole was the first patient at The Johns Hopkins Hospital to receive a bone marrow transplant from an unrelated donor. She had been injected with healthy marrow, rich in disease-fighting immune cells, to replace material that had been decimated by cancer and radiation. But the donated immune cells were attacking her organs. The condition, known as graft-versus-host disease, occurs in about half of bone marrow recipients and is now treated with drugs that suppress the immune system. These days, it is rarely severe enough to be fatal.

At the time, Drew Pardoll was an oncology fellow, saddled with the searing assignment of caring for a child who would not live to adolescence. One night, as he flipped through the science journal *Nature*, an article about the workings of the immune system caught his attention. He thought about Nicole's foreign immune cells, attacking both cancer tumors and healthy organs, powerful enough to kill her. And he contrasted her experience to that of bone marrow transplant patients who survived graft-versus-host disease, their cancer beaten back by the same immune system attack.

Drew Pardoll, above, in 1992, and in 2015, below.



KEITH WELLEN

(continued on page 4)

Helping Our City Heal

RONALD R. PETERSON
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Baltimoreans have engaged in significant reflection following the tragic turmoil that erupted in April after the death of Freddie Gray from injuries sustained while in police custody. Clearly, much remains to be done to eliminate social inequities and injustice in our city and elsewhere, despite the genuine progress that has been made in recent decades.

While pondering how we can better address these

crucial issues, it is helpful to remember some of the remarkably effective efforts we have already undertaken.

For example, in early spring, we took part in two distinctly different events that celebrated the impact of Johns Hopkins Medicine's decadeslong commitment to improving the lives and opportunities of those who reside in the communities surrounding The Johns Hopkins Hospital.

On June 4, my colleagues and I were touched to be recognized by Big Brothers Big Sisters of the Greater Chesapeake, which honored Johns Hopkins Medicine's more than two decades of work to improve the career opportunities and health of youth in our community.

We have continuously expanded our outreach. We began in the mid-1980s with what became our year-round health career development and youth mentoring program, Bond-to-Bond. Designed to support high school students in the Johns Hopkins Hospital area by exposing them to a variety of careers in health care through internships within our hospital, school of medicine and the broader health care system, this program is still very much in demand.

Twenty-one years ago, we also began our Johns Hopkins Summer Jobs Program, which since then has provided health care work and mentoring experiences for more than 2,500 young people. We have extended our outreach through the Dunbar High School Health Partnership and our Adopt-A-Class program for fourth graders. We also have supported the Start on Success Program for students with disabilities, as well as the Baltimore Area Council of the Boy Scouts of America's Scoutreach Program, which serves the most at-risk and disadvantaged youth in underserved neighborhoods and communities. And, as much as Johns Hopkins Medicine has done to help the youth of our community with these and other programs, we are making plans to do even more.

Community leaders have told us that summer activities and employment for Baltimore's young people are the highest priority. As a result, we are expanding our current summer jobs program to provide employment opportunities for more city youth. In partnership with Baltimore City's summer jobs program, YouthWorks, Johns Hopkins is committed to increasing our placements by 50 percent, providing 300 more young people with paid internships across our institutions. Johns Hopkins Medicine will work hard to meet that commitment.

On the night of May 26, a crowd packed Turner Auditorium for our Dancing with the Hopkins Stars benefit for United Way. By the end of the evening, more than \$52,000 was raised to support United Way's long-term strategies to create a region in which families have a place to call home, are financially stable, and have access to quality and affordable health care, and where students succeed in school.

Ten teams of top faculty, staff and students trained for weeks to perform a variety of dances, including the tango, the Hustle and hip-hop. It was a delight for me to emcee this event, which was an exceptional example of how deeply Johns Hopkins Medicine cares about our community.

Like our programs dedicated to youth mentoring, Johns Hopkins Medicine's strong support for United Way is just one more example of how we have demonstrated our enduring dedication to alleviating the challenges of poverty and developing healthier communities in the neighborhoods we share.

Learn more: See our Community Engagement Inventory at hopkinsmedicine.org/ebcommunityaffairs/directory.html.



Megan Tschudy, assistant medical director of the Harriet Lane Clinic, uses Epic to improve population health.

Reaching Out to Families in Need

Epic helps Harriet Lane Clinic doctors reach patients whose pharmacies were destroyed by looting.

THE IMAGES ARE BROADCAST around the world: thick gray smoke pouring out of a Baltimore CVS. Windows smashed. Merchandise stolen. A woman smells fire in the night air as her local drugstore burns.

Days later, her phone rings. It's Jessica Berger, medical resident at the Harriet Lane Clinic of The Johns Hopkins Hospital, offering to move her children's prescriptions to a different pharmacy. As they talk about the family's health, the woman requests a refill of albuterol, the medication her son relies on to calm his asthma.

Berger looks at the child's medical record, open on her computer screen, and sees that the prescription was filled recently. She asks if the child is having asthma attacks, and the mother says he is. Berger helps her set up an appointment for her son, writes a prescription for albuterol and sends it electronically to the new pharmacy.

The woman was among those telephoned by Harriet Lane clinicians after the April 27 riots in Baltimore. Members of the Harriet Lane team suggested the outreach during staff meetings in the days following the violence. Megan Tschudy, assistant medical director for the Harriet Lane Clinic, recognized that Epic, the electronic medical record system, could be used to identify families with prescriptions at looted pharmacies.

Project administrator Gian Bonetti tapped Epic to generate a list of all 157 Harriet Lane families with active prescriptions at shuttered pharmacies. The task took less than half an hour, he says, adding that it would have been prohibitively time-consuming under the paper record-keeping system in place before Harriet Lane switched to Epic in 2013.

Clinicians reached 102 families on the list and left messages when possible for the rest. Doctors switched pharmacies for 71 patients, asked how residents were coping with the unrest, referred people to city services, and scheduled well visits and asthma treatment appointments.

"Every family we spoke with was extremely thankful for our outreach efforts," says Tschudy.

"We were being proactive instead of waiting for patients to call us," says Berger. "Everybody was appreciative. I was touched by the response."

The protests and violence in Baltimore have drawn attention to the challenges faced by many of the city's poorest residents, a population served by the Harriet Lane Clinic. Of the 7,500-plus children and adolescents seen by the clinic each year, 94 percent are on public insurance, says Tschudy.

Founded in 1912, the clinic serves as a complete medical home, with services that include after-school tutoring and mental health treatment. Through a program called Health Leads, staffed by Johns Hopkins University undergraduates, patients are connected to such resources

as food pantries, job training and low-cost child care.

The pharmacy outreach wasn't the first time Epic helped Harriet Lane clinicians identify and help a specific category of patients. In March, with Bonetti's help, Tschudy created a list of 200 children and teens who suffer from both allergies and asthma. Maria Miles, a clinic community health worker, contacted the families before allergy season began, reminding patients to take their asthma medications regularly, asking if refills were needed and sharing other strategies for coping with poor air quality.

"This is what preventive medicine is about," says Tschudy.

—Karen Nitkin

Learn more about the Harriet Lane Clinic: bit.ly/1GMqrw3.

Learn how Tina Cheng, director of general pediatrics and adolescent medicine, fights health disparities: bit.ly/1FNJFza.

After-Care Clinic: A Bridge for Patients at Risk

Pilot program offers timely follow-up care and services.



Pharmacist Amanda Sowell checks Deron Bridges' blood-thinning level, as After-Care Clinic co-director Rosalyn Stewart, far left, and emergency medicine physician Anneliese Cuttle look on.

BY THE TIME DERON BRIDGES arrived at the Johns Hopkins Hospital Emergency Department in late April, he was struggling to breathe. He also had an active cough and chest pain. Bridges, 24, has a history of asthma and recurring pulmonary embolisms—sudden blockages in a lung artery. The condition places him at high risk for life-threatening blood clots.

Bridges developed severe symptoms after not taking his daily blood thinner pill for an extended period. On discharge, a nurse advised him to resume taking his medication. Then she scheduled an appointment for the following week for Bridges to see a doctor at the recently opened After-Care Clinic.

This new protocol, says internist Rosalyn Stewart, who co-directs the clinic with emergency medicine physician Arjun Chanmugam, improves the odds that patients who struggle with managing their health will avoid further emergency

care or readmission to the hospital.

A joint effort among the departments of Medicine, Emergency Medicine, Care Coordination, Ambulatory Services, Surgery and Pharmacy, the After-Care Clinic serves as a safety net for these patients. Its goal: to extend primary care services for those in need of rapid follow-up—within

“PATIENTS COMING TO THE HOSPITAL ARE SICKER THAN THEY’VE EVER BEEN. SO WHEN WE SEND THEM HOME, WE NEED TO MAKE SURE THEY HAVE WHAT THEY NEED TO MANAGE AND TO GET FOLLOW-UP.”

—MELISSA RICHARDSON, THE JOHNS HOPKINS HOSPITAL’S DIRECTOR OF CLINICAL RESOURCE MANAGEMENT

a week after discharge from the hospital or evaluation in the ED.

Located on the seventh floor of the Johns Hopkins Outpatient Center and open Mondays, Wednesdays and Thursdays from 4:30 to 7 p.m., the clinic offers medical evaluation, blood work, lab tests, pharmacy access, education and social services.

The new clinic mirrors national efforts to keep patients released from the hospital on top of their health care needs. A recent study by the Center for Studying Health System Change, a Washington, D.C.-based research group, found that roughly one-third of adult patients discharged from the hospital don’t see a physician within the advised 30 days. Experts say that’s a key reason so many are readmitted.

“Patients coming to the hospital are sicker than they’ve ever been,” says Melissa Richardson, The Johns Hopkins Hospital’s director of clinical resource management. “So when we send them home, we need to make sure they have what they need to manage and to get follow-up.”

Over time, adds Stewart, “we want to make the After-Care Clinic an entry point for patients into a ‘medical home’ that connects them with Johns Hopkins primary care—the place where they can receive comprehensive services and patient education continuously under one roof.”

The After-Care Clinic is not an urgent care center, nor is it a primary care office, explains Stewart. Rather, it provides a setting where patients can be assessed, treated and transitioned to a community provider.

There’s also a financial reason for the clinic. Under new Medicare laws, hospitals are responsible for patients 30 days postdischarge and can incur substantial penalties for patients who are readmitted

unnecessarily.

Six days after his ED visit, Bridges arrives for his clinic appointment. He tells Stewart and nurse practitioner Nancy Feeley that he’s doing OK.

“Good news,” says Feeley. “Your CT scan shows no pneumonia.” She listens to his chest and hears a murmur. “That could be because of clots in your lungs.” Stewart dons a stethoscope, listens and agrees. Then, after taking a drop of blood and using specialized equipment, pharmacist Amanda Sowell discovers that his blood-thinning index is 1.

“Getting to 2 is your goal,” says Sowell. She and Stewart tell Bridges to continue on the second blood thinner prescribed the previous week. Before he leaves, Feeley reminds him to schedule a follow-up appointment with a primary care provider to chart his progress.

Despite the clinic’s best efforts, however, patients can fall through the cracks. Many, says Stewart, fail to provide their phone number. And about 50 percent of scheduled patients don’t show up for appointments.

For Bridges, who lives just blocks from The Johns Hopkins Hospital, the After-Care Clinic feels natural. “When I was growing up, Hopkins was a second home for my family, like when I got hurt playing football,” he says. “My aunts, uncles and grandparents all came here too.”

If Stewart has her way, The Johns Hopkins Hospital will become his—as well as other clinic patients’—medical home. Meanwhile, she hopes to expand the clinic model it at other Johns Hopkins hospitals.

—Judy F. Minkove

Learn more about the After-Care Clinic: bit.ly/JHHaftercareclinic.

Conversations About Safety

New website for patients deciphers Johns Hopkins’ patient safety and quality performance efforts.

WHEN COLLEEN CAROLL’S HUSBAND became a patient at Johns Hopkins Bayview Medical Center in 2012, she knew he was in good hands. The hospital had a reputation for excellent care. But there were still several scary unknowns. Would staff members wash their hands before caring for her husband? Would the doctor clearly explain how to take any new medications? Would someone tell her how to care for her husband once they got home?

Now Johns Hopkins Medicine provides a resource for answering such questions. The Patient Safety and Quality website, introduced in May, gives consumers important information about the health system’s quality of care and the patient experience, allowing them to understand the institution’s quality of care performance scores and helping them draw their own conclusions about each hospital’s performance.

The site shares how Johns Hopkins Medicine is working to continuously improve its performance on five initial safety issues: the patient experience, infection rates, hand hygiene, hospital readmissions and standard processes of care known as core measures. Information about the institution’s five adult inpatient hospitals and home health care service focuses on how well each entity

provides evidence-based care.

“This site is about our patients and the communities we serve. Our goal is to build relationships and trust, rather than just share data,” says Matt Austin, the project’s leader and a faculty member with the Armstrong Institute for Patient Safety and Quality.

One innovative feature offers a portrait of trends over time. Consumers can view three years’ worth of performance data to track each hospital’s progress and learn how it compares to national and state averages.

“What struck me is how staff members narrowed in on an area like hygiene and hand-washing, and how the data showed that they actually improved their compliance,” says Caroll, now a member of the Johns Hopkins Bayview Patient and Family Advisory Council.

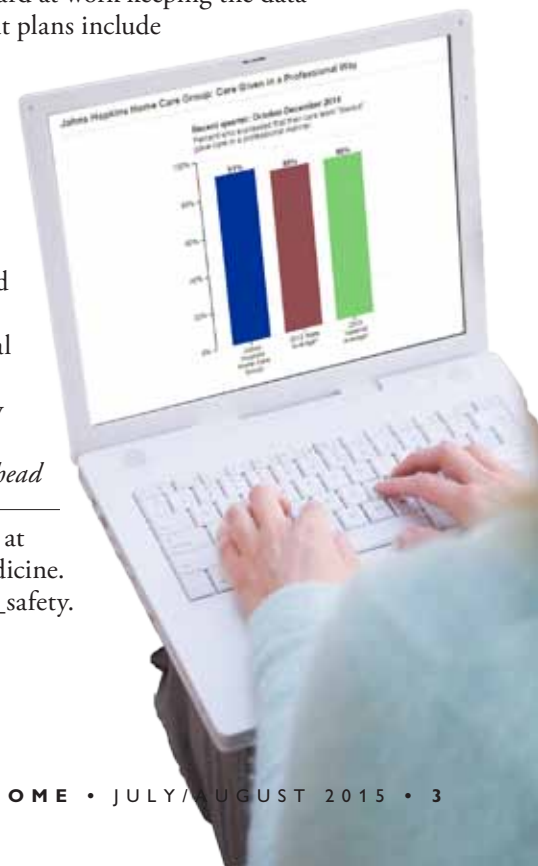
The project took more than two years and enlisted quality experts, graphic designers, Web strategists, communicators and data analysts from the health system’s five adult inpatient hospitals and home health care group. More than 40 former patients and family members, including Caroll, advised the team and reviewed the site for ease of use and functionality. The final product allows patients and families to review data and learn about the ways frontline clinical staff members support safety and quality.

Although the site just launched, the Armstrong Institute is already hard at work keeping the data relevant. Current plans include

adding other measures, such as pediatric quality data, information about community physicians’ performance and the amount of common surgical procedures performed annually at each hospital.

—Lisa Broadhead

Learn more at hopkinsmedicine.org/patient_safety.



Cancer's Persistent Foe

(continued from page 1)



Drew Pardoll arrived at Johns Hopkins at age 15 and never left. Top left, receiving his undergraduate degree in 1977, with parents Helen and Joe, and Wen Shen, now a Johns Hopkins gynecologist. Bottom left, Pardoll poses with fellow residents in 1983 as he pursues his M.D./Ph.D. Above, Pardoll today heads the Cancer Immunology Program.

"I decided two things," says Pardoll, 58, leaning forward in a leather chair in his fourth-floor corner office of the Bunting Family and Jacob and Hilda Blaustein Family Cancer Research Building. "One was that the immune system was the most powerful anticancer weapon that we had, more powerful than any drug. The other was that we had to understand how to regulate it so we could focus it more on the cancer."

With that "aha" moment, Pardoll began decades of research, at first in obscurity and now as a leader in immuno-oncology, a field that is transforming cancer treatments by tapping the power of the immune system to shrink and eliminate tumors. Today, FDA-approved treatments and clinical trials based in part on Pardoll's discoveries are extending the lives of people with melanoma, lung cancer and other forms of cancer.

"Drew and his team are leading research that not only tremendously advances the field, but also generates new optimism about cancer treatments," says Landon King, executive vice dean of the Johns Hopkins University School of Medicine.

Turning immune system insights into life-saving drugs, however, is a long and expensive process, requiring substantial investment and no promise of success. "The big cost jumps are when you go into clinical trials," says Pardoll, director of the Cancer Immunology Program. "The funding system in academic centers can't support that."

To move his ideas forward, he teamed with investors to start an immuno-oncology company, Amplimmune, in 2006. When it was acquired by MedImmune for \$500 million in 2013, investors took notice. Last year, Pardoll joined other immuno-oncology entrepreneurs to create Potenza Therapeutics in Cambridge, Massachusetts.

These business deals are lucrative for the researcher and Johns Hopkins, and they provide funding and business support critical to shepherding his discoveries forward. Says Pardoll: "The only things that matter for me is FDA

approval and having the therapies available around the world."

Immuno-Oncology

The human immune system is astonishingly complex and nimble, one day fighting the flu and the next making sure a paper cut stays infection-free. "It has to be ready for any invader," says Pardoll. "Chemotherapy is one drug at a time. The immune system is trillions of different drugs."

The idea of tapping this powerful internal weapon is not new. More than 120 years ago, William Coley, a bone surgeon at New York's Memorial Hospital (now the Memorial Sloan Kettering Cancer Center), noticed that patients with cancer who got infections often saw their tumors shrink or disappear. In 1891, Coley began testing the phenomenon by injecting his patients with bacteria to spark an immune system response against the cancer.

Despite some success—and many excruciating failures—the procedure fell out of favor, particularly after radiation became the standard cancer

treatment at the turn of the 20th century.

Coley's theory was not in dispute. Scientists just had to figure out why immune systems are so good at vanquishing so many invaders yet so bad at stopping the spread of cancer. And they had to figure out how to tell immune system cells to attack cancer but spare healthy parts of the body.

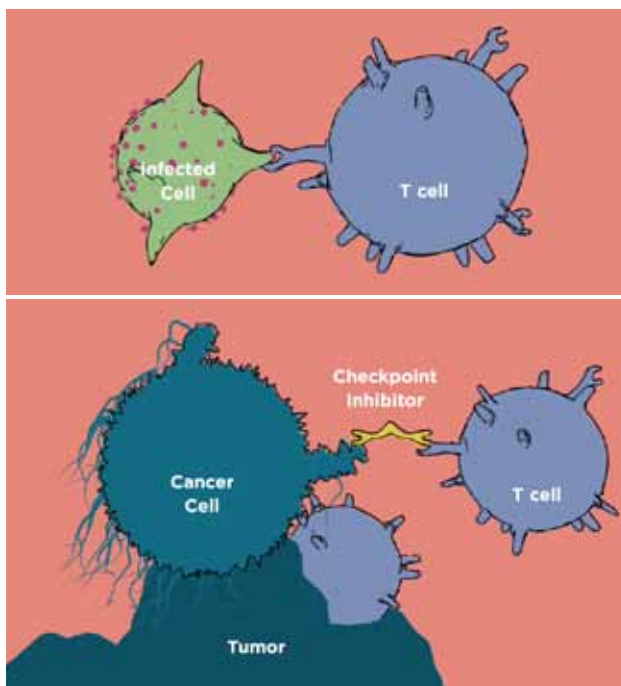
Pardoll began tackling those questions when he was 27. Under the guidance of Johns Hopkins professors Donald Coffey and Bert Vogelstein, his Ph.D. advisers, he studied the immune system at the National Institute of Allergy and Infectious Diseases, a place devoted to research of immune response disorders.

"Don, Drew and I had weekly meetings about the best way to eventually conquer cancer, and [studying the immune system] was one of the approaches we discussed often," says Vogelstein, whose own pioneering work has focused on the genetic mutations that cause cancer.

Preparing to Attack

Pardoll was used to taking the lead. He had skipped three grades while growing up in Elizabeth, New Jersey, becoming a Johns Hopkins undergraduate at age 15. He enrolled in the school of medicine just three years later. But this quest could not be rushed. When Pardoll joined the Johns Hopkins faculty in 1988, he was still far from his goal of developing immune-based cancer vaccines.

"You have to take 10 shots on goal to score that one goal," he says. "Cancer has beaten us



HOW IMMUNO-ONCOLOGY WORKS: The top panel shows how the immune system's T cells attack infected cells. Healthy cells give off signals called checkpoints, which tell the T cells they are not a threat. However, cancer cells can send out the same checkpoint signals, causing the T cells to back down. The bottom panel shows how new drugs called checkpoint inhibitors create a path that allows the T cells to override the checkpoint and attack.



The Next Frontier

More than 1,500 cancer researchers crowded into the auditorium, taking every available seat and standing in rows against the walls. It was June 2012, the annual meeting of the American Society of Clinical Oncology. Anticipation was high as Suzanne Topalian, director of the Melanoma Program at Johns Hopkins, walked to the podium.

Topalian and other Johns Hopkins investigators, including Julie Brahmer, director of the Thoracic Oncology Program, and Topalian's husband, Drew Pardoll, had teamed with Bristol-Myers

Squibb to develop and test a cancer drug called nivolumab. Known as a checkpoint inhibitor, nivolumab works by dissolving a shield called PD-1 that protects tumor cells from immune system attack.

The drug had been given to 296 patients with advanced cancers, including lung, renal cell, prostate, colorectal and melanoma. Their disease had survived multiple treatments. But with nivolumab, tumors shrank in about 25 percent of subjects across cancer types.

As she explained the study's results to the packed room, Topalian delivered the best evidence to date that checkpoint inhibitors can triumph over cancer. In a follow-up at the same convention the following year, she reported even better news—the benefits in most patients lasted 12 months or longer. Immuno-oncology is “the next frontier” in cancer treatments, Topalian said in an interview at the time.

In December 2013, *Science* magazine endorsed that view, declaring immune-based cancer treatments the breakthrough of the year.



The faculty, staff, fellows and students of the Cancer Immunology Program. Front row, left to right, Leisha Emens, Suzanne Topalian, Elizabeth Jaffee, William Nelson, Drew Pardoll, Charles Drake, Jonathan Powell, Michael Lim and Young Kim.

“Oncologists, a grounded-in-reality bunch, say a corner has been turned and we won't be going back,” it said.

Investment followed. “Big pharmaceutical companies are getting in the game,” says Elizabeth Jaffee, deputy director of the Johns Hopkins Kimmel Cancer Center. She is developing immuno-oncology vaccines for pancreatic cancer with the support of drug companies that are funding multisite clinical trials.

As a result, treatments are moving into the marketplace. In 2014, the FDA approved two melanoma treatments based on the anti-PD-1 discoveries pioneered at Johns Hopkins: Merck & Co.'s Keytruda and Bristol-Myers Squibb's nivolumab, marketed as Opdivo. Early this year, Opdivo also won FDA approval for treatment of advanced lung cancer.

—Karen Nitkin

on a lot more occasions than we've beaten cancer.”

Over time, Pardoll and other researchers began to understand how cancer cells protect themselves from the immune system and its T cells. Think of T cells as the troops in a hardworking, multitasking army, working to keep the body healthy by recognizing and attacking invaders. When the battle is victorious and good health has been restored, a protein receptor on the T cell, known as a checkpoint, tells the troops to stop fighting, like an army sergeant delivering a “stand down” command. But cancer cells also emit signals telling T cells not to attack. As a result, the army backs down, allowing tumors to grow and spread.

Immuno-oncology research at leading academic medical centers around the world focuses on creating “checkpoint inhibitors” that block these “don't attack” messages, freeing the T cells to vanquish cancer. Much of that work centers on an immune system brake expressed by T cells called PD-1. PD stands for programmed death, because T cells emit it when their work is done, as a way of calling off their immune system attack. PD-1 merges with molecules expressed by tumor cells to create a checkpoint brick wall that prevents the T cell troops from reaching the enemy cancer.

Today, Pardoll leads the Cancer Immunology Program at Johns Hopkins, where about 30 scientists are seeing dramatic progress in their pursuit of immuno-oncology treatments. “We expect the program to grow significantly with the many opportunities ahead,” says William Nelson, director of the Johns Hopkins Kimmel Cancer Center.

Starting a Company

These are klieg-light days for immuno-oncology. But back in 2006, the spotlight on researchers like Pardoll was considerably dimmer.

That's when Arnold Oronsky came to Johns Hopkins in search of investment ideas. Oronsky, with a Ph.D. in immunology from Columbia University's College of Physicians and Surgeons, is a partner of InterWest, a Menlo Park, California, firm that invests in early-stage health care and information technology.

Pardoll and his team told Oronsky they had discovered several molecules expressed by cancer cells that

interacted with PD-1 to block cancer cells from immune attack. Oronsky liked what he heard. “Because he had a background in asthma and allergy, he believed in the immune system,” says Pardoll. “We were not specifically thinking about creating a company until he proposed it.”

Pardoll came up with the name Amplimmune, because the company would develop therapies that amplify the potency of the immune system. Oronsky secured \$10 million each from InterWest and from the Wellcome Trust, a U.K.-based foundation. In early 2007, the company hired its CEO: Michael Richman, a businessman-biologist who had run other cancer therapy companies.

“Amplimmune had exciting technology and prominent scientists, but they had a hole with respect to the business,” recalls Richman. “It looked like a great opportunity.”

“CHEMOTHERAPY IS ONE DRUG AT A TIME. THE IMMUNE SYSTEM IS TRILLIONS OF DIFFERENT DRUGS.”

—DREW PARDOLL

The company launched in 1,500 square feet of laboratory and office space in the David H. Koch Cancer Research Building and moved to Rockville six months later. It now occupies a 20,000-square-foot facility in Gaithersburg, with on-site biologics manufacturing.

In August 2013, seven years after that initial \$20 million investment, Amplimmune was purchased by its neighbor MedImmune, an arm of the global biopharmaceutical firm AstraZeneca, for \$225 million, plus \$275 million as agreed-upon milestones are reached.

“It made a lot of sense to bring Amplimmune into the MedImmune family,” explains Richman. “MedImmune had its own pipeline of immune therapy.” With Pardoll serving on MedImmune's science advisory board, the company continues to develop therapies that “target the critical areas of the immune system that cancer can hijack to escape destruction,” says Ronald Herbst, MedImmune's vice president for oncology research and development.

Soon after the acquisition, MedImmune and Johns Hopkins forged a five-year, \$6.5 million research partnership, with both sides contributing funding and expertise to move forward several research projects, including immuno-oncology.

The sale of Amplimmune to MedImmune showcased Pardoll's business acumen as well as his research. “It made a big splash, with big numbers and high visibility,” says King. In the spring of 2014, MPM Capital asked Pardoll to be a founder of Potenza Therapeutics, an immuno-oncology startup.

Commercial Appeal

With Pardoll leading the way as co-chair of the Committee on the Innovation Ecosystem, launched in 2013, Johns Hopkins is helping researchers bring their ideas to the marketplace, either by licensing discoveries to companies or by forming enterprises of their own.

In 2015, the Technology Transfer Office was renamed Johns Hopkins Technology Ventures, and Christy Wyskiel, with a background as an institutional investor in medical technology and life sciences companies, was hired to helm it. A fast-track licensing program was rolled out, and a business incubation space, FastForward East, opened on Wolfe Street on the East Baltimore medical campus, a companion to FastForward Home-wood, which opened in the Stieff Silver Building in June 2013. Another innovation hub, at 1812 Ashland Ave., is scheduled to open in August 2016 with 25,000 square feet of space for startups.

Johns Hopkins researchers launch about 10 companies per year, says Wyskiel. “Yet few researchers are able to attract large institutional funding, as Pardoll did, and have a successful liquidity outcome.”

When commercialization pays off, as it did with Amplimmune, the inventors and their lab get half, and the rest is split between the school, department and university. In 2014, Johns Hopkins collected \$16.5 million in licensing revenue, and leaders believe the potential for additional revenue is enormous.

Still, financial rewards are only part of the story. “Amplimmune is a success mainly because it brings cancer treatments that much closer to patients,” Wyskiel says.

“I've always been impressed with Drew's approach to science,” says Vogelstein. “He tries to get at the basic scientific aspects first, understanding the biological aspects of the process. But he has always had therapy in mind, and as soon as he sees an opportunity for taking his benchwork to the bedside, he immediately implements it. This has meant more rapid translation of his ideas to the clinic than virtually any other researcher I know.”

As his therapies move forward in the private sector, Pardoll keeps learning more about the interactions between immune systems and cancer. He is investigating new checkpoint molecules and teaming again with Vogelstein, this time to study how cancers with different genetic compositions react to immune therapies. “This work brings together two fields of cancer research that normally do not interact,” he says.

There will be successes and failures, but Pardoll remains focused. “We don't think there's a single cancer that can ultimately beat the patient's own immune system,” he says. ■

—Karen Nitkin



Every day, Johns Hopkins Bayview Medical Center patients, their family members and staff stroll through the labyrinth. Below, Hopkins Bayview financial manager Nicole Utech walks a path with her husband after exchanging wedding vows at the site.



Circle of Healing

The labyrinth at Johns Hopkins Bayview Medical Center offers a path for quiet contemplation.

ON A COOL DAY, A WOMAN with short, cropped white hair walks slowly, following the lines of a large concentric circle. Behind her looms Johns Hopkins Bayview Medical Center. Although cars speed by just yards away, a shoulder-high hedge blocks any noise, preserving a sense of tranquility.

The circular path is one that thousands have trod over the past 15 years. Since the labyrinth opened on June 7, 2000, it has served as a haven for those who have come—in sun and in drizzle, on warm summer days and frigid winter evenings—to seek a spot for quiet contemplation.

Some look for inspiration, like the surgeon who routinely walks the circular path before a complex operation. Others seek comfort, like the grief-stricken nurse who must care for others while she mourns the loss of her own child. The concentric stone path has also seen its share of happy moments: local moms pushing strollers, neighborhood teens—even a summer wedding.

“The idea is to walk in with whatever burden is on your heart, and then to walk around the labyrinth really being ‘present,’” says Hopkins Bayview chaplain Marian Boyer. “Once you get to the center, you can release the concern and, ideally, walk out of the labyrinth having achieved some sense of clarity about it.”

Some visitors, like the white-haired woman, conclude their walk by sitting quietly for a time on one of several benches that line the circle’s periphery. Others share their musings in a journal that’s kept in a protective cover beneath one of the benches:

I have found that the path to my destination is not always straight. If I am feeling lost, well, I might still be headed in the right direction ...

I come to walk for my mom who could not, and she always wanted to walk this circle. She was a patient here. She is gone to be with the Lord. I walk and talk and

think of my mother.

I found a sense of mindlessness, but a good kind. Not like when you get lost in TV or electronics or books, but in yourself.

I would like to say: Don’t give up. No matter what. Never give up ...

An Artful Vision

Anita Langford, formerly vice president for care management services at Hopkins Bayview, has been involved with the labyrinth since its inception. She was brought onto the project after learning that local modern dancer Nancy Romita wanted to establish a labyrinth in Baltimore as a way to promote healing through movement arts. Romita partnered with Hopkins Bayview to secure funding, which came in large part from the TKF Foundation of Annapolis. Then, she and Langford collaborated to find a suitable location—between the John R. Burton Pavilion and the Francis Scott Key Pavilion buildings.

Dave Tolzmann was the project’s designer. “It became clear to me that designing a labyrinth was moving people through space—that I was designing choreography,” he told *The Baltimore Sun* soon after the labyrinth’s opening.

The circular space he created, constructed of cobble pavers in gray and salmon, is 60 feet in diameter, with paths wide enough for wheelchairs. The center

is always visible and accessible. There are no false turns.

“We thought it would be a great healing place, a peaceful spot for patients and families to come, as well as for employees and community neighbors,” recalls Langford.

Paula Teague, senior director of spiritual care and chaplaincy at Hopkins Bayview, often walks the labyrinth when she has a particularly thorny issue to puzzle through.

“There’s something about being able to get outside—to clear the cobwebs and get out of your normal space,” she says.

The Ideal Venue

Hopkins Bayview’s Nicole Utech has been a regular visitor for years, often taking a lunch hour break from her work as a financial manager. “I like the idea that if you’re following these lines, you get to lose yourself,” she says, “no matter what’s distracting you. Just focus on the pattern.”

When it came time for her wedding, Utech and her fiancé, Michael, lit upon the labyrinth as the ideal location. “For the past 10 years, I’ve been practicing more of a Buddhist lifestyle,” she says. “I wanted our wedding space to reflect that mindset—peaceful and meditative.”

On July 26, 2014, a light rain threatened to put a damper on things. But as the bride stepped out of the limousine, “the sun came out—it was gorgeous.” She walked through an archway into the space and down “the aisle,” with guests standing gathered on either side in two half-circles. Nicole and Michael said their vows in front of the labyrinth’s small gurgling water feature.

“For months afterward, I would walk by the labyrinth on my way into work—it just made me smile every time,” Utech says. This month marks a year since her wedding. These days, when she walks the circle, her thoughts are focused on the next big milestone in her life: the couple’s baby, due to arrive in August.

—Sue De Pasquale

“THE IDEA IS TO WALK IN WITH WHATEVER BURDEN IS ON YOUR HEART, AND THEN TO WALK AROUND THE LABYRINTH REALLY BEING ‘PRESENT.’”

—MARIAN BOYER,
JOHNS HOPKINS BAYVIEW
MEDICAL CENTER CHAPLAIN



A Favorite Path

Fifteen years after it was established, the labyrinth remains a welcome sanctuary for healing and meditation on the campus of Johns Hopkins Bayview Medical Center. Once a month, from April through November, staff members turn out for a 4 p.m. labyrinth walk. After chaplain Marian Boyer distributes a brief meditation, those who have gathered set out alone and in pairs to think as they stroll.

Each month’s walk has a theme. For instance, April’s community-centered walk, Donate Life, focuses on organ donation. May’s walk serves as a memorial service. In early December, Light the Labyrinth, a multicultural celebration that kicks off the Season of Light, typically involves music and dancing, with participants laying candles along the labyrinth’s paths.

What's for Lunch?

Six nutritionists share their midday meal strategies.



Taco Salad

Steak salad; low-carb high-fiber brownie

Red and white quinoa with cucumber, tomato and kidney beans

Chili; gluten-free goat cheese cornbread

Shredded chicken and cabbage topped with dressed fish sauce; cranberry and flaxseed brownies

Lasagna and salad

CAN YOU MATCH THE NUTRITIONIST WITH HER LUNCH?

BRINGING LUNCH TO work instead of eating out can save money and improve health. But choosing nutritious, tasty and easy-to-make meals day after day can be challenging.

Six registered dietitians with the Johns Hopkins Institute for Clinical and Translational Research provide lunchtime inspiration. Each woman takes a different approach, influenced by her research, clinical work and particular nutrition needs. One is a distance runner who energizes with carbohydrates, while another chooses foods that combat menopause symptoms. All load up on fruits and vegetables, avoid foods made with artificial ingredients, and drink lots of water. They also eat healthy fats, enjoy occasional indulgences, and don't obsess about calories.



For recipes, visit hopkinsmedicine.org/dome.

The Low-Carb Eater: Bobbie Henry, 31, began eating a low-carbohydrate diet about five years ago to combat reactive hypoglycemia, a condition that impairs her ability to regulate blood sugar. As a result, her dramatic energy spikes and troughs have disappeared, she says. Henry treats patients in the Adult Epilepsy Diet Center, where research is showing that diets that are high in fat and low in carbohydrates can lower seizure rates. Her indulgences: super-dark chocolate (85–90 percent cocoa), pizza.

The Local and Sustainable Advocate: Diane Vizthum, 29, gravitates toward food that is locally grown. Recently, she and her husband purchased a quarter cow (more than 100 pounds of meat) from a Harford County farm. The grass-fed beef is portioned, packaged and in their freezer, ready for quick meals made with “a lot of vegetables, healthy fat, whole grains and protein,” says Vizthum. Her indulgences: dark chocolate, cookies, brownies.

The Athlete: Melissa Moser, 25, runs about 70 miles per week and needs a diet that fuels all those footsteps. She tries to get about 60 percent of her calories from carbohydrates, 20 percent from protein and 20 percent from fat. Her research showing the dangers of food additives for people with kidney disease inspires Moser to “eat real food.” Her indulgences: apples with peanut butter, trail mix, dry cereal, ice cream, chocolate.

The Antioxidant and Estrogen Proponent: Hong Brereton, 66, likes to cook, modifying recipes from her native Vietnam to meet her nutrition goals. She adds broccoli sprouts and other members of the cabbage family to prevent cell damage and fight disease, and chooses flaxseed and other foods with plant chemicals called phytoestrogens to combat the symptoms of menopause. Her indulgences: fruitcake, mango, dates and a banana eaten with a wedge of Laughing Cow cheese.

The Busy Food-Lover: Meghan Ames, 27, captains a bicycling team, rock-climbs, hikes and takes yoga classes. When she can grab a few minutes in the kitchen, she'll make a big pot of something easy, like soup or a grain-based salad, and bring the leftovers with a green salad for lunch. Ames, a school of nursing nutrition instructor and state obesity program coordinator, offers simple weight-loss advice: Move more, eat lots of produce. Her indulgence: mint chocolate chip ice cream.

The Working Mom: Susan Oh, 43, sneaks as much produce as she can into the diets of her three children, ages 8 to 12. She often makes entrees with tomato sauce, which contains the antioxidant lycopene, and adds pureed vegetables, including butternut squash, mushrooms, carrots, bell pepper, onions and garlic. She cooks on the weekends so she can heat up dinners during hectic weeknights; her family brings leftovers for lunch. Her indulgence: chocolate cake.

—Karen Nitkin

(Key: Bobbie, steak; Diane, taco; Melissa, quinoa; Hong, shredded chicken and cabbage; Meghan, chili; Susan, lasagna.)

Lifetime Achievement Award



Ronald R. Peterson, president of The Johns Hopkins Hospital and Health System and executive vice president of Johns Hopkins Medicine, has received the 2015 Lifetime Achievement Award from Big Brothers Big Sisters of the Greater Chesapeake in recognition of his personal and organizational commitment to multiple youth mentoring programs in Maryland. Peterson spent 14 years on the board of directors of the Maryland Mentoring Partnership, which merged with Big Brothers Big Sisters, and serves on the board of another Baltimore-based mentoring nonprofit, the Living Classrooms Foundation. He also has been closely involved with Johns Hopkins Medicine's participation in the Bond-to-Bond youth mentoring and career development program, the Adopt-A-Class program, the Johns Hopkins Summer Jobs Program and the Dunbar High School Health Partnership.

New Senior VP and CFO



Ronald Werthman has become senior vice president and chief financial officer for Johns Hopkins Medicine and the Johns Hopkins University School of Medicine. A 22-year veteran of finance and strategic planning for Johns Hopkins Medicine, Werthman succeeds **Richard Grossi**, who retired after 37 years with Johns Hopkins. Previously, Werthman was senior vice president of finance and the treasurer and chief financial officer for The Johns Hopkins Hospital and Health System. As co-leader of Johns Hopkins Medicine finance and of the Strategic Plan's performance priority, Werthman spearheads efforts to reduce system costs while improving patient care.

Administrative Appointments



Ralph Hruban, M.D., has been named the Baxley Professor in Pathology, director of the Department of Pathology, director of pathology for Johns Hopkins Medicine and pathologist-in-chief for The Johns Hopkins Hospital. A 1985 graduate of the Johns Hopkins University School of Medicine and a faculty member for 25 years, Hruban has served as interim director of the department since February 2014. Hruban also directs the Sol Goldman Pancreatic Cancer Research Center and the Division of Gastrointestinal/Liver Pathology.



Thierry Huisman, M.D., professor of radiology and radiological science, pediatrics, neurosurgery and neurology, has been appointed director of the Department of Imaging at Johns Hopkins Bayview Medical Center. Formerly chairman and radiologist-in-chief of the Department of Diagnostic Imaging at the University Children's Hospital in Zurich, Switzerland, he was recruited in 2007 to join the faculty at Johns Hopkins, where he is also medical director of the Division of Pediatric Radiology.



SPIRITUAL CARE TRIUMPH: After a rigorous credentialing process, three members of Johns Hopkins' Clinical Pastoral Education Program recently earned certification as associate supervisors from the Association for Clinical Pastoral Education. Pictured from left, Emmanuel Saidi, Tahara Akmal and Tommy Rogers spent four years training at Johns Hopkins. Saidi, a Catholic priest from Malawi, says he's benefited from the Johns Hopkins mission to help others within a diverse environment. Akmal, a Muslim raised in California, who grew up with interfaith parents observing both Christian and Muslim holidays, says she appreciates that every spiritual journey is unique and

requires constant self-reflection. Rogers, an Episcopal priest and Oklahoma City native, says he's found that a patient's spiritual experience is as important as his or her religious tradition. Rogers has accepted a position as executive director of Bishop Anderson House in Chicago, while Akmal and Saidi remain undecided about their next career moves. "It's rare for a clinical pastoral education center to send three students to be certified at one time, and even rarer that they all passed," notes Ty Crowe, assistant director of the program. Learn more about the Department of Spiritual Care and Chaplaincy at bit.ly/JHMspiritualcare.



Kim Sherbrooke, M.H.A., has become vice president and chief operating officer of the Office of Johns Hopkins Physicians. She will oversee the ambulatory care operations at sites where Johns Hopkins-employed physicians practice. Her responsibilities also include overseeing the training, education and engagement for community physicians aligned with or employed by Johns Hopkins. She will collaborate with the Office of Managed Care Contracting and will be the primary lead for assessing and implementing telemedicine in ambulatory care and for Access Services. Previously, she was chief operating officer for Indiana University Health Physicians.



Leslie Tung, Ph.D., professor and director of the undergraduate program in biomedical engineering, has been named interim director of the department, succeeding **Elliot McVeigh, Ph.D.**, who resigned as department director after serving eight years at its helm. Tung, a graduate of the Massachusetts Institute of Technology and a 19-year veteran of The Johns Hopkins University's Department of Biomedical Engineering, oversees the largest undergraduate major at The Johns Hopkins University.

Becker's Best

The Johns Hopkins Health System has been named to *Becker's Hospital Review* 2015 list of 50 Great Health Systems to Know. It also named **Richard Grossi**, recently retired senior vice president and chief financial officer of Johns Hopkins Medicine, as among the 150 Hospital and Health System CFOs to Know.

Ebola Response Kudos

The Johns Hopkins Hospital has received the Maryland Hospital Association's Distinguished Service Award for the creation

of the Johns Hopkins Hospital Ebola Response Team. In recognizing the hospital's initiative, the association cited the team's bravery, dedication, compassion and readiness to provide care at a moment's notice for potential patients with Ebola virus disease.

Greenhealth Recognition

The Johns Hopkins Hospital has received the Greenhealth Emerald Award and the Circle of Excellence Greening the OR Award from Practice Greenhealth, a nonprofit organization promoting sustainability in health care. Johns Hopkins was one of only 10 institutions in the country to receive the Greening the OR Award.

Johns Hopkins Bayview

Medical Center has received the organization's Partner Recognition Award in acknowledgment of the medical center's implementation of early-phase, effective programs to promote environmental sustainability.

EAST BALTIMORE



Xinzhong Dong, Ph.D., professor of neuroscience and neurosurgery, has been named a Howard Hughes Medical Institute investigator. He is one of 26 newly tapped investigators and will receive a renewable five-year appointment that provides salary and benefits to foster the work of his research team, which studies the mechanisms behind sensation, including pain, itch and touch.



Jonathan Lewin, M.D., senior vice president of integrated health care delivery, co-chair for Johns Hopkins Medicine strategic planning, professor and director of the Department of Radiology and Radiological Science, and radiologist-in-chief for The Johns Hopkins Hospital, has been elected president of the American Roentgen Ray Society.



Paul Nagy, Ph.D., associate professor of radiology and radiological science and director of the Johns Hopkins Medicine Technology Innovation Center, has been named one of eight Health Care Innovator honorees chosen by the *Baltimore Business Journal* out of more than 60 nominees. Nagy received recognition for health care education. He is program director for multidisciplinary clinical leadership programs in patient safety and quality, clinical analytics, and commercial ventures creation.

JOHNS HOPKINS BAYVIEW MEDICAL CENTER

Maria Rowena Benitez, R.N., has been named by the Department of Nursing as its Nurse of the Year for 2015. A 10-year veteran of the medical center, Benitez is a nurse on the Wenz Orthopaedic Unit. Among other things, Benitez was credited for implementing hourly rounding on the unit to improve patient satisfaction and safety.



Dancing with the Hopkins Stars Raises \$50K

Hundreds turned out on May 26 to be wowed by their fleet-footed colleagues in the Dancing with the Hopkins Stars fundraiser for United Way. We've got lots of great photos to share at hopkinsmedicine.org/dome.

Dome

Published 10 times a year for members of the Johns Hopkins Medicine family by Marketing and Communications.

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