



2019 Pelotonia Investment Report

The James



THE OHIO STATE UNIVERSITY
COMPREHENSIVE CANCER CENTER

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Pelotonia 2019

When fundraising for Pelotonia ended in early October, the cumulative total raised by this grassroots cycling event over the past 11 years was more than \$205 million and counting.

Thanks to Pelotonia’s major funding partners—AEP Foundation, Huntington, L Brands Foundation, and Peggy and Richard Santulli—every dollar raised by riders, virtual riders, volunteers and donors goes directly to cancer research at The Ohio State University Comprehensive Cancer Center – James Cancer Hospital and Solove Research Institute (OSUCCC – James).

As the monetary totals continue to rise, the impact of Pelotonia on the goal of ending cancer becomes ever greater. As this report will show, the money is allocated to seven major spending areas: our new Pelotonia Institute for Immuno-Oncology (PIIO), an Intramural Research Program (for faculty scientists), a Pelotonia Fellowship Program (for students), New Recruit Research, Instruments of Discovery, Statewide Initiatives (for cancer prevention) and Strategic Research Investments.

In addition to the Pelotonia funding partners, we want to thank the 7,484 riders, the more than 3,300 virtual riders and the over 3,000 volunteers who, along with countless donors and facilitators, made Pelotonia 2019 another big success. You’re all helping us pursue our shared vision of a cancer-free world.



Raphael Pollock, MD, PhD
Director, The Ohio State University
Comprehensive Cancer Center



William Farrar, MD
CEO, James Cancer Hospital and
Solove Research Institute

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PELOTONIA SURPASSES \$200 MILLION FUNDRAISING MARK

Pelotonia 2019 may be remembered for a pair of important achievements in the quest to end cancer.

One is surpassing the \$200 million mark in overall fundraising for this annual grassroots cycling event that benefits cancer research at Ohio State. At this writing, Pelotonia 2019 participants had helped boost the 11-year total to more than \$205 million.

The other is an announcement made on July 26—a week before the Aug. 2-4 Pelotonia 2019 weekend—that Pelotonia has pledged \$102,265,000 over five years for the formation of the Pelotonia Institute for Immuno-Oncology (PIIO) at the OSUCCC – James. The largest portion of this pledge—\$65 million—will fund the PIIO. The rest of the pledge will continue to support previously established Pelotonia-funded initiatives. Immuno-oncology, which harnesses the body’s immune system to fight cancer at all levels, from prevention to treatment to survivorship, is widely considered to be the next frontier in cancer prevention and treatment (see story about the PIIO on page 7).

These achievements, perhaps more than ever, have enabled Pelotonia participants past and present to sense the fruits of their labors in pursuit of their one goal to fund life-saving cancer research. The PIIO and the rising fundraising total were referenced often during the Aug. 2 opening ceremony for Pelotonia 2019.

Cancer survivor and ceremony emcee **Ethan Zohn**, a former professional soccer player who in 2002 won the hit reality TV show “Survivor Africa” and directed his winnings toward charitable work and community involvement, lauded Pelotonia’s PIIO commitment and noted that the “2,265” in the pledge total honors the 2,265 riders who participated in the first Pelotonia

cycling event in 2009, “who had the vision in this community to help put an end to cancer.” Zohn noted that Pelotonia funds also will continue to support several long-established endeavors at the OSUCCC – James. “This PIIO initiative is in addition to all of the other things that The James is doing (with Pelotonia money),” he said.

Pelotonia President and CEO **Doug Ulman** told the crowd that he and the Pelotonia team “are so grateful for everything you do. This new institute belongs to you. You created it with your time, talent and treasure, and it will change and save lives across central Ohio, the United States and around the world. It’s a testament to you.”

Guest speaker **Sanjay Gupta, MD**, a neurosurgeon and internationally renowned medical reporter known for his many TV appearances on health-related issues, said he was there to help celebrate “something that I think is a growing revolution in medicine”—noting that he used the word “revolution” very specifically in this case.

“As a doctor and journalist, we don’t like to use certain words like ‘cures’ and ‘breakthroughs’ and ‘miracles,’ because in some respects they imply that the work is already done,” Gupta said. “The work is not done. There’s work that still needs to be done, and since I’ve spent time here at The James and with Pelotonia and with Doug Ulman, I have a pretty good feeling that the work is going to be done.

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continued... PELOTONIA SURPASSES \$200 MILLION FUNDRAISING MARK

“Immunotherapy is tremendously exciting stuff, but it doesn’t work for everyone, and that’s where there’s work that still needs to be done,” Gupta said, adding that scientists don’t know why not everyone responds to immunotherapy. “But we hope answers will come out of this research.”

“Whenever you cross that finish line, you’re not just doing it for yourself, but for countless people you’ll never meet.”

Dan Rosenthal, chairman of the Pelotonia Board of Directors, called the opening ceremony a mix of emotions. “It’s a celebration of all the innovation, of all the survivors, but at the same time we mourn those we’ve lost, and it’s that mix of emotions that makes the Pelotonia movement so interesting,” he said. Rosenthal agreed with Gupta that much immunotherapy work remains to be done. “That’s why we get back on the bike, that’s why we work on new immuno-oncology treatments for the people who aren’t responding to the treatments that exist.”

He also introduced and welcomed a few OSUCCC – James leaders to the stage, including (below left to right) James CEO **William Farrar, MD**; PIIO Founding Director **Zihai Li, MD, PhD**; and OSUCCC Director **Raphael Pollock, MD, PhD**.



Pollock told the audience he found it amazing that, in its 11th year, Pelotonia had raised nearly \$200 million (at that moment). He pointed out that he has the honor of being not only the OSUCCC director and a cancer surgeon, but also a cancer survivor.

“My own survivorship is due to a drug that was developed chiefly at Ohio State, with your support and Pelotonia funding over the past 10 years,” said Pollock, who is being treated at The James for chronic lymphocytic leukemia. “I will be taking this drug for the rest of my life, but it is definitely keeping me alive, and I and my family thank you.”

Ohio State University President **Michael Drake, MD**, identified and thanked some of the leaders at the OSUCCC – James “who are directly involved with work that we’re doing, who are involved with the research and the patient care and the support that make such a difference to all of the people here, in our hospitals, and in hospitals and medical facilities around the world that benefit from the research we do here.”

Zohn gave special thanks to Pelotonia’s key funding partners (see page 5), whose collective generosity enables every participant-raised dollar to go directly to cancer research at the OSUCCC – James. He also offered encouragement to riders.

“Whenever you cross that finish line, you’re not just doing it for yourself, but for countless people you’ll never meet,” he said. “Pelotonia has the power to inspire and to unite this community ... so let’s continue to fight for this cause and see the hope that is born in someone else’s eyes because of something we were able to do for them.”

PELOTONIA 2019 FUNDRAISING TOTAL REVEALED NOV. 14

Key Pelotonia Funding Partners



Major Funding Partners

AEP Foundation



Huntington



L Brands Foundation

Peggy and Richard Santulli



Supporting Funding Partner

Harold C. Schott Foundation



Notable Funding Partners

Cardinal Health



Diamond Hill Capital Management



Nationwide

2019 was Pelotonia’s 11th year, and the total amount raised by riders, virtual riders, volunteers and donors since 2009 had surpassed \$205 million when this Pelotonia Investment Report went to print. Fundraising for Pelotonia 2019 officially ended on Oct. 4. The total amount raised for this year’s event, along with the 11-year cumulative total, was to be revealed at a Nov. 14 celebration event at COSI in downtown Columbus.

Thanks to Pelotonia’s key funding partners (see column at left), every dollar raised by riders, virtual riders, volunteers and donors goes directly to cancer research at the OSUCCC – James.

Pelotonia President and CEO **Doug Ulman** says more than 30,000 people from around the world have ridden in the cycling event since it began in 2009, and he reports that the event over the years has benefited from over 1.3 million donations by people from more than 100 countries and all 50 U.S. states. The 7,484 cyclists in Pelotonia 2019 were from 39 states and 11 countries. This year’s event also benefited from more than 3,300 virtual riders and over 3,000 volunteers.



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10-YEAR PELOTONIA FINANCIAL SUMMARY

Pelotonia funding supports projects that address many aspects of cancer, including diagnosis, treatment, psychosocial issues, prevention, accelerated drug development and large initiatives that help change the landscape of cancer care. Pelotonia dollars support seven major areas:

- **Pelotonia Institute for Immuno-Oncology (PIIO)** – The newly formed PIIO is made possible by a Pelotonia pledge of \$102,265,000 over five years. Immuno-oncology is widely considered to be the next frontier in cancer prevention and treatment. The largest portion of this pledge—\$65 million—will fund the PIIO;
- **Intramural Research Program** – This program funds Idea Grants, clinical trials and other initiatives proposed by teams of faculty researchers who need to gather early data for innovative projects that may lead to larger external grants;
- **Fellowship Program** – This program enables Ohio State students in any discipline or level of scholarship to conduct cancer research with faculty mentors;
- **New Recruit Research** – Pelotonia funds can help newly recruited researchers continue their work upon arrival at Ohio State;
- **Instruments of Discovery** – This program supports purchases of sophisticated equipment needed for cutting-edge cancer research;
- **Statewide Initiatives** – These large projects take aim at specific cancer types by working with community hospitals throughout Ohio to promote prevention, early detection and better outcomes for patients;
- **Strategic Research Investments** – Large investments support such initiatives at the OSUCCC – James as the Drug Development Institute, Digital Pathology and the Total Cancer Care® protocol.

Bringing Knowledge to Bear in the Fight Against Cancer

Pelotonia research funding has been allocated to investigators in 11 of the 15 colleges at Ohio State, as well as at Nationwide Children’s Hospital in Columbus and Cincinnati Children’s Hospital Medical Center:

- College of Medicine
- College of Public Health
- College of Nursing
- College of Dentistry
- College of Pharmacy
- College of Veterinary Medicine
- College of Food, Agricultural and Environmental Sciences
- College of Law
- College of Education and Human Ecology
- College of Engineering
- College of Arts and Sciences

Allocation of Pelotonia Funds (2009-June 2019)

Category	Percentage
Strategic Research Investments	32%
New Recruit Research Support	22%
Intramural Research Program	17%
Fellowship Program	15%
Instruments of Discovery	9%
Statewide Initiatives	5%

PELOTONIA INSTITUTE FOR IMMUNO-ONCOLOGY (PIIO) LAUNCHED AT OHIO STATE WITH \$102,265,000 INVESTMENT

From left: Ohio State University President Michael Drake, MD; cancer survivor Christine Sander; PIIO Director Zihai Li, MD, PhD; OSUCCC Director Raphael Pollock, MD, PhD; and Pelotonia President and CEO Doug Ulman.

The Ohio State University Comprehensive Cancer Center – James Cancer Hospital and Solove Research Institute (OSUCCC – James) on July 26 announced formation of the Pelotonia Institute for Immuno-Oncology (PIIO), a comprehensive bench-to-bedside research initiative focused on harnessing the body’s immune system to fight cancer at all levels — from prevention to treatment and survivorship.

The PIIO was made possible by a pledge of \$102,265,000 over five years from Pelotonia, the grassroots cycling event that over the past 11 years has raised more than \$205 million for cancer research at Ohio State.

The largest portion of the pledge—\$65 million—will directly fund the PIIO. The remaining dollars will continue to support

such established Pelotonia-funded initiatives as: fellowships for students wanting to conduct cancer research with faculty mentors; Idea Grants enabling teams of faculty scientists to pursue innovative research; statewide research initiatives focusing on cancer prevention; and the purchase of equipment for cancer research. The OSUCCC – James is also supporting the PIIO with a \$35 million commitment to expand and sustain modern research infrastructure.

To **Zihai Li, MD, PhD**, founding director of the PIIO, the institute’s formation was not the beginning but a continuation of early successful endeavors in the relatively new discipline of immuno-oncology, which is widely considered the next frontier in cancer prevention and treatment.

“You may ask this question: ‘Cancer immunotherapy—Are we there yet?’” Li said when addressing the audience at a PIIO celebratory event held outside The James. “The answer is a resounding ‘Yes!’ Immunotherapy provides exciting and expanding arsenals for fighting cancer. It refuels the immune system so that it actually can find and destroy the sneaky cancer cells wherever they hide.”

Li said immunotherapy also can stop cancer cells from developing and spreading, decreasing the chances for recurrence.

“In the last five years we have seen extraordinary results of immunotherapy for several deadly cancer types, including lung cancer, melanoma, leukemia and others,” he said. “However, there are still many remaining critical unanswered questions regarding cancer immunotherapy.”

Hence the need for an institute dedicated to this modality. The cancer program plans to add up to 32 faculty over the next five years to work within the PIIO. Multiphase laboratory renovations will take place during this time to create advanced cellular lab facilities, immune monitoring

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continued... PIIO LAUNCHED AT OHIO STATE

and discovery platforms, immunogenomics, systems immunology and other research areas for start-up initiatives and collaborations with other academic centers and industry partners.

Several Ohio State and Pelotonia officials spoke at the PIIO celebratory event, including Ohio State University President **Michael Drake, MD**, OSUCCC Director **Raphael Pollock, MD, PhD**, Pelotonia President and CEO **Doug Ulman**, and Li, a world-renowned authority in immunology who was recruited from the Medical University of South Carolina Hollings Cancer Center to lead the new institute. Li arrived at Ohio State last April.

Drake said the Pelotonia pledge of \$102,265,000 is “the largest gift ever to the cancer center and one of the largest gifts in university history.” He explained that the “\$2,265” numbers in the pledge honor the 2,265 riders who took part in the inaugural Pelotonia cycling event in 2009.

“This gift will allow for an entirely new level of collaboration, research and discovery—a level possible only at a comprehensive university like Ohio State,” Drake said. “On behalf of the university, I want to express my sincere gratitude to everyone in the Pelotonia community for their generosity and support over the past decade. None of this

would be possible without their amazing dedication and passion.”

Pollock said the potential for immunotherapy is so strong that university leaders are confident it will become another standard treatment modality for cancer along with surgery, systemic therapy (such as chemotherapy and hormonal therapy), precision or targeted therapies, and radiation therapy.

“Unlike those therapeutic approaches, the immunotherapeutic approach seeks to harness the body’s own immune defenses against cancer, rather than bringing something from the outside in that might directly attack the cancer itself,” Pollock added. “We anticipate—and this is some of the work of the institute—that these modalities will be combined in the majority of cases, working to complement each other’s strengths while downplaying the weaknesses and the toxicities.”

He noted that some new and effective immune treatments have already been developed and launched at the OSUCCC – James, “and in fact for some types of tumor systems, immunotherapy has replaced chemotherapy or other approaches as the front line of treatment as recently as 18 to 24 months ago. However, we need to better understand how we can harness a patient’s own antitumor response while expanding the range of cancers that will be amenable to this new therapy.”

Li mentioned a number of unanswered questions regarding immunotherapy.

“Only 10 to 20 percent of patients benefit from current immunotherapies. The question is, ‘Why?’” he said. “How do we identify patients who will benefit from this modality? How can we convert patients who are non-responders to responders? And in arming the immune system to fight cancer, how do we assure that the immune system doesn’t go overboard and lead to harming normal organs?”

Li said the PIIO is attempting to answer these and other questions. “We partner with the exceptional researchers and physicians at the OSUCCC – James who are already working in this field, and we will recruit more than 30 leading experts who will bring ground-breaking and game-changing ideas to Ohio State. Together, we’ll gain greater knowledge of how the immune system works, and we’ll use this knowledge to exploit weaknesses in cancer cells and tumors so we can turn laboratory discoveries into bedside treatments.”

Ulman called the PIIO event “a momentous day” in celebration of an institute “that will change and save thousands and thousands of lives. It’s the reason we ride (in Pelotonia). It’s the reason we raise money. It’s the reason this community has come together for more than a decade to significantly reduce the impact that cancer has on all of our lives.”

INSPIRING INNOVATION

Researchers Pursue Fresh Approaches With Help From Idea Grants

External grant funding can be hard to obtain for pursuing innovative ideas in cancer research, but Pelotonia-funded Idea Grants help Ohio State scientists overcome that problem.

Each year, the OSUCCC – James awards several Idea Grants that enable teams of faculty researchers to gather early data for their insightful projects so they can later apply for larger grants for this work from sources such as the National Cancer Institute.

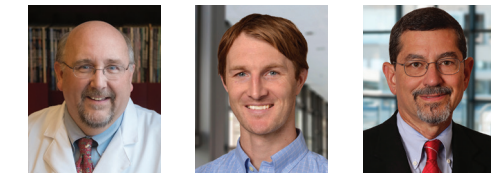
Since 2010, the OSUCCC – James has awarded 157 Idea Grants totaling \$17.6 million to research teams encompassing over 300 investigators across 11 of the 15 colleges at Ohio State, as well as Nationwide Children’s Hospital and Cincinnati Children’s Hospital Medical Center. These competitive awards provide support for two years and for up to \$200,000 each.

OSUCCC Director **Raphael Pollock, MD, PhD**, says the dedicated community of Pelotonia riders, virtual riders, donors, volunteers and corporate sponsors should take pride in helping to fund Idea Grants that ultimately advance cancer research.

“Through these grants, we are able to maintain and bolster momentum for moving our scientists’ emerging ideas forward into research projects that are helping us change the landscape of cancer care,” Pollock says.

Here are examples of Idea Grants awarded in a recent funding cycle, listed along with their principal investigator(s), their OSUCCC – James research programs and brief descriptions of their work.

Impact of Black Raspberries on Microbiome



Investigators: (from left) Steven Clinton, MD, PhD, and Daniel Spakowicz, PhD, both of the Molecular Carcinogenesis and Chemoprevention Program, and David Carbone, MD, PhD, Translational Therapeutics Program

Microbes that live in and on humans have been shown to affect our health in many ways, including cancer risk. Some bacteria are thought to cause more inflammation, which has been linked to cancer, while other bacteria lower inflammation. But few studies have been conducted to determine if intentionally altering bacteria to decrease inflammation is associated with reduced cancer risk. In this study, researchers are evaluating whether a concentrated black raspberry nectar can alter the microbiome in people who are at an increased risk of developing lung cancer.

New Immunotherapy Approach for Lung Cancer



Investigator: Dwight Owen, MD, Translational Therapeutics Program

Immunotherapy, which trains the body’s natural defense mechanisms to recognize and then specifically attack cancer cells, has transformed lung cancer treatment; however, there is still no cure for lung cancer that has spread to other parts of the body. In this clinical trial, researchers are studying a new form of immunotherapy, known as PBF-1129 while in testing, that works differently than existing approaches and is one of the first oral formulations of immunotherapy. This study will determine whether a routine blood test can help identify patients most likely to respond to this new treatment approach.

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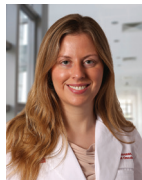
Predicting Immunotherapy Outcomes in Melanoma



Investigator: Christin Burd, PhD, Cancer Biology Program

Cancer immunotherapy relies on the body's immune system to attack tumor cells. Immune system function declines with age, but how this impacts the effectiveness of immunotherapies is unclear. Burd's team has identified a blood-based biomarker to measure "immune fitness"—an individualized measure of immune system strength and functionality. In this clinical trial, the team will determine whether this biomarker can be used to predict patient responses and/or drug toxicity in melanoma patients undergoing immunotherapy treatment. Results could help oncologists identify and improve the outcome for patients at risk for severe drug side effects or disease progression.

Reducing Neurologic Side Effects of Colorectal Cancer Treatment



Investigators: Anne Noonan, MD (top), and Shuiying Hu, PhD (bottom), Translational Therapeutics Program

The drug oxaliplatin is commonly used to treat colorectal cancer; however, it causes quality-of-life-impacting neurological side effects in over 50% of patients. Preclinical studies by OSUCCC – James researchers have shown that these effects are linked to a protein (OCT2) that regulates drug uptake into the peripheral nerves. In this study, researchers are evaluating whether they can reduce peripheral nerve damage—which often occurs in hands and feet—by blocking OCT2 with combination of the FDA-approved drug dasatinib.



Pancreatic Cancer Immunosuppression and Disease Progression



Investigator: Thomas Mace, PhD, Translational Therapeutics Program

Pancreatic cancer is the third-leading cause of cancer-related death in the United States, and the disease has limited treatment options. Newer immunotherapy treatments are ineffective in the disease. In this preclinical study, researchers are investigating how a protein expressed specifically in the pancreatic tumor microenvironment promotes cancer growth. This knowledge will help scientists develop ways to interrupt this molecular pathway as a means of stopping pancreatic cancer progression. It may also build rationale for new and more effective immune-stimulating combination treatment approaches.

Exploring Genomic Target for Cancer Prevention



Investigator: Kay Huebner, PhD, Cancer Biology Program

To reduce the toll of cancer on human lives, scientists must discover targets for cancer prevention. This study looks at a tumor suppressor whose loss promotes cancer development in many types of cancer in association with loss of an enzyme, thymidine kinase, which is needed for stable normal DNA synthesis. In this laboratory study, researchers will determine if dietary thymidine supplementation can suppress cancer development. Differences in outcomes based on thymidine supplementation will support planning of similar prevention trials in humans.

TRAINING THE NEXT GENERATION

Student Cancer Researchers Gain Pelotonia Support

The Pelotonia Fellowship Program annually allots \$2 million to support Ohio State students in any discipline or level of scholarship who want to conduct cancer research under the guidance of faculty mentors at the OSUCCC – James.

Since the program began in 2010, it has awarded 525 fellowships for projects undertaken by 244 undergraduates, 154 graduates, 121 postdoctoral fellows and six professional students. It also has provided international research experiences for a number of Ohio State undergrads in India and Brazil, and it has brought students from those nations to contribute to cancer research at Ohio State.

Students apply competitively for the fellowships, which are peer-reviewed and issued by a committee of faculty cancer researchers chaired by Pelotonia Fellowship Program Director **Rosa Lapalombella, PhD**. Lapalombella is an associate professor in the Division of Hematology at Ohio State and a member of the Leukemia Research Program at the OSUCCC – James.

On this and the next two pages are profiles of three Pelotonia fellowship recipients, including an undergraduate, a graduate and a postdoctoral fellow.



Rohan Makhijani, an undergraduate majoring in biomedical sciences at Ohio State, admits he was "exhausted and ready to give in" at the 40-mile rest stop of his inaugural Pelotonia ride in 2018.

"I was cramping in both legs and slowly falling to the ground next to my bike," recalls Makhijani, who was riding the 55-mile New Albany to Gambier route as part of the Buckeye Student Riders (BSR) – Pelotonia Fellows team. But another rider helped him up and said, "We've almost made it!" As the rider walked away, Makhijani saw the word "Survivor" on the back of his shirt.

"He gave me the inspiration to drink some pickle juice, stretch out and finish the final 15 miles," says Makhijani, the recipient of a Pelotonia fellowship that enabled him to conduct cancer research in the lab of Steven Clinton, MD, PhD, a professor in the Division of Medical Oncology at Ohio State and co-leader of the Molecular Carcinogenesis and Chemoprevention Program at the OSUCCC – James.

For Makhijani, that burst of inspiration was the most memorable moment of his ride, an experience throughout which he "felt the rush of support and excitement" from other riders and the many roadside spectators along the way. "The ride experience surpassed my expectations. I realized the power and impact of the Pelotonia community and what it represents."

Makhijani's Pelotonia-funded research focused on preventing or reversing the effects of cachexia, a skeletal muscle-wasting condition experienced by some patients with certain cancers. Although his Pelotonia fellowship has expired, he remains in the Clinton lab as he progresses through his senior year.

"Dr. Clinton is still my mentor," Makhijani says. "My work, in collaboration with the (Christopher) Coss and (Mitch) Phelps lab in the College of Pharmacy, now addresses the adverse effects of androgen-deprivation therapy experienced by patients with prostate cancer on skeletal muscle physiology. Different project, similar goal."

After he graduates, he plans to attend medical school and to someday work at an academic hospital. "I hope to practice medicine as a teaching physician and also leverage new technology to innovate patient care," he says.

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continued... TRAINING THE NEXT GENERATION

For his ride in Pelotonia 2019, he followed the same route and rode in the same peloton as last year. And this year he had a better idea of what to expect.

“Leading up to Peloton weekend last year, I was beyond nervous,” Makhijani says. “I had never ridden more than 18 miles in a single ride and had never ridden on hilly roads. I didn’t know what I was getting myself into. But I knew thousands of people successfully finish every year, and that everyone at the event supports each other.”

In June of this year he started training on a stationary bike. After he obtained a bicycle through the Team Buckeye lease program, he rode trails around his home area of Dayton in preparation for Pelotonia 2019 weekend.

“I was most looking forward to seeing the community of riders and volunteers in action again,” Makhijani says. “At the beginning, throughout the ride, at the rest stops and at the finish, the feeling of community and pride is overwhelming. I remembered my first ride vividly, and I was excited to recapture those special feelings this year.”

*A Pelotonia fellowship award is helping **Marcos Corchado** extend his deep interest in developmental biology—the study of how organisms grow and develop—to cancer research that he hopes will lead to new treatments.*

“I’m really interested in developmental biology, and there’s



a lot of overlap between this discipline and cancer research,” says Corchado, a PhD candidate who works in the lab of Helen Chamberlin, PhD, a professor in Ohio State’s College of Arts and Sciences, Department of Molecular Genetics. Chamberlin’s work focuses on understanding molecular processes underlying organogenesis, or the development of organs—aspects of which can provide insight into human disease.

“I like to think of a tumor as an organ that is growing without any control, and a lot of the mechanisms that work in developmental biology are the same mechanisms that go wrong in cancer,” Corchado says. “So cancer research is interesting to me because I’ve already had a passionate interest in developmental biology.”

Corchado, who was born in New York and moved to Puerto Rico when he was 8 years old, is using his Pelotonia fellowship to study the role of the tumor microenvironment, or the area surrounding a tumor, in cancer maintenance.

“Generally when we think about cancer, we think of pathological signals that the tumor itself produces,” says Corchado, who holds a dual undergraduate degree in mechanical engineering and biology from the University

of Puerto Rico – Mayagüez. “My research is studying signals that come from outside the tumor, or the tumor microenvironment, which is derived from mesodermal tissue.

“Much less is known about these signals, which makes them interesting to study. We screen the mesoderm (a part of the tumor microenvironment) to see which genes, when turned off, can actually reduce cell proliferation.”

Specifically, he is studying the LPR-3 protein, which is required for over-proliferation of mutated cells. “By studying LPR-3, I aim to uncover mechanisms by which surrounding tissues contribute to cancer, with the long-term goal of identifying new treatments,” he explains.

Corchado is working toward a PhD in molecular genetics and plans to pursue a career in biomedical research at a medical institution. He is grateful to have received a Pelotonia fellowship to help him on his way. “It gives me the resources to do my research for the next couple of years, which is a big relief for me.”

He was a virtual rider in Pelotonia 2019 with the Buckeye Student Riders (BSR) – Pelotonia Fellows team, but he experienced the event with the same team in 2018 as a 200-mile rider, although illness prevented him from riding on Pelotonia weekend.

“What I most enjoy about the Pelotonia experience is the opportunity to contribute to cancer research both in the lab and outside the lab by fundraising,” he says.

*As a basic-science biologist, **Safiya Khurshid, PhD**, spends each day at work striving to understand the biological processes that transform cells from normal to cancerous.*

“I strongly believe that with extensive research and technological breakthroughs, we can make this world cancer-free,” says Khurshid, who works in the lab of Dawn Chandler, PhD, at Nationwide Children’s Hospital.

Chandler is an associate professor in the Department of Pediatrics at Ohio State and a member of the Cancer Biology Program at the OSUCCC – James, where her work focuses on the regulation of pre-mRNA molecular splicing and how its disruption can lead to pediatric diseases such as cancer.

Khurshid attributes much of her early-career success to her mentor. “Dr. Chandler has played a huge role in my life as a cancer biologist,” she says. “She

has taught me scientific as well as life lessons, without which I would hardly be successful.”

With Chandler as her mentor, Khurshid—a native of Kashmir who earned her PhD at the University of Cologne in Germany—received a Pelotonia fellowship for a project on targeting insulin receptor alternative splicing to treat pediatric rhabdomyosarcoma, a rare form of soft tissue sarcoma that most typically affects children and adolescents.

“My project deals with alternative splicing and how we can use this process or mechanism to target this cancer in its earliest stages,” Khurshid says. “If we can stop cells from producing isoforms (variants) that make them cancerous, perhaps we can stop the transformation process of the cell at a very early stage.”

She was thrilled to receive a Pelotonia fellowship for this work. “These fellowships have had a lot

of impact on cancer research and have helped a lot of post-docs and other students further their careers,” she says. “I think I got mine at just the right time. I needed it and was very excited to get it.”

She became even more determined to study cancer when it struck her family. “I was brought to my knees when my father was diagnosed with colorectal cancer,” she says. “Being a cancer researcher, I understand the complications of this disease, but I also believe that research can help us find ways to eradicate it.”

A member of the Nationwide Children’s Hospital peloton (riding group), Khurshid rode with her husband, Mohsin, on the 25-mile Columbus to Pickerington route to celebrate the life of her father, who is now a cancer survivor.

“More than ever before, I am proud to be his daughter,” Khurshid says, adding that she also was riding “for the life, strength and resilience of a dear friend’s mom who is battling lung cancer,” and for “all the kids and their families at Nationwide Children’s Hospital who trust us to give them hope.”

“I have been working in cancer biology for the last several years, and there is nothing that inspires or interests me more,” she says, noting that she hopes to someday hold a faculty position “so I can run my own lab and continue working to cure cancer.”

Pelotonia Fellowship recipient Safiya Khurshid, PhD (left), pauses with her husband Mohsin and son Ahmed.



STATEWIDE INITIATIVES

PELTONIA DOLLARS HELP RESEARCHERS TARGET COLORECTAL, ENDOMETRIAL & LUNG CANCER IN OHIO

Funds from Pelotonia are helping the OSUCCC – James change the landscape of cancer care by supporting three statewide initiatives that promote early detection and better outcomes for patients with colorectal, lung and endometrial cancers in Ohio.

Genomics-Driven Statewide Endometrial Cancer Research Initiative Underway

A statewide clinical cancer research project called Ohio Prevention and Treatment of Endometrial Cancer (OPTEC), which is supported by \$1.25 million in Pelotonia funds, aims to recruit up to 700 women with endometrial cancer from partner hospitals across the state and screen them for Lynch syndrome (LS) and other inherited genetic conditions linked to greater risk of endometrial, colorectal, stomach and ovarian cancers.

Their tumor samples will undergo molecular profiling to identify targeted treatments personalized to each patient's tumor characteristics. Patients identified with LS and their at-risk family members will be educated about the importance of genetic testing and cancer-prevention strategies based on their increased risk for LS-associated cancers. Those whose tumors have defective DNA mismatch repair will be considered for immunotherapy clinical trials for endometrial cancer.

OPTEC is led by **David Cohn, MD**, and **Paul Goodfellow, PhD**, with multiple collaborators from the OSUCCC – James and Nationwide Children's Hospital Research Institute. OPTEC will conduct its LS screening with a novel one-step genetic sequencing technique developed by Goodfellow and **Elaine Mardis, PhD**, a geneticist at Nationwide Children's

Hospital Research Institute. In addition, genomic profiling will help identify patients who are most likely to benefit from new medical therapies, including immunotherapy drugs that target certain proteins.

OPTEC also is supported by a five-year, multimillion grant that the National Cancer Institute (NCI) awarded in July 2018 to principal investigators Goodfellow, Mardis and **Heather Hampel, MS, LGC**, for a study titled "Combined NGS Tumor-Based Detection of Germline Lynch Syndrome Mutations and Prognostic Classification of Endometrial Cancers." The NCI grant extends research supported by Pelotonia and supports the study of nearly 1,000 additional tumors from women with endometrial cancer.

The grant will help researchers develop low-cost and highly sensitive tumor-based DNA methods to identify women with inherited forms of endometrial cancer and, at the same time, test for genetic changes useful for treatment planning. Studying DNA specimens prepared in clinically approved laboratories will make it possible to rapidly translate research findings to tumor-based testing that can be applied to all endometrial cancer patients and thus improve cancer prevention and treatment.

Ohio Colorectal Cancer Prevention Initiative Draws to Successful Close

A five-year statewide initiative to screen newly diagnosed colorectal cancer patients and their biological relatives for Lynch syndrome has closed but will have far-reaching benefits by setting the stage for future LS screening in Ohio and around the nation.

Funded over five years (2013-18) by \$4.3 million from Pelotonia, the Ohio Colorectal Cancer Prevention Initiative (OCCPI) established a 50-hospital network to accommodate screenings for Lynch syndrome (LS), an inherited genetic condition that predisposes to colorectal, endometrial, ovarian, stomach and other cancers. The LS screenings identify patients and family members who may be at risk of developing these cancers so they can take precautionary measures, including heightened surveillance (e.g., colonoscopies) for early detection.

OCCPI Director **Heather Hampel, MS, LGC**, associate director of the Division of Human Genetics at Ohio State, says the OCCPI enrolled 3,346 newly diagnosed colorectal cancer (CRC) patients, of whom 143 tested positive for LS. She also reports that 204 of their relatives tested positive, and another 101 CRC patients were found to have a hereditary cancer syndrome other than LS.

The initiative has also resulted in six publications in prestigious medical journals, including *Journal of the American Medical Association (JAMA) Oncology*, *Gynecologic Oncology*, *Gastroenterology* (two articles), *Family Cancer* and *Journal of Medical Genetics*. The overall results of the study are being analyzed in preparation for publication.

Hampel and colleagues estimate the OCCPI will save about 1,000 years of life and provide some \$32 million in community benefit because of the lives it has saved in Ohio through early

diagnosis of LS and, consequently, through a reduced need for cancer treatment. "Our study findings demonstrate the need and value of screening early-onset CRC patients for LS," Hampel says, noting that her team is working to help launch this screening approach nationally. "We believe the OCCPI can serve as a roadmap for other states to implement LS screening as well."

OSUCCC – James Leads Statewide Initiative Against Lung Cancer

Recruitment continues for a statewide clinical research initiative taking aim at lung cancer, the No. 1 cancer killer among men and women in the United States. Led by **Peter Shields, MD**, **David Carbone, MD, PhD**, **Mary Ellen Wewers, RN, PhD, MPH**, and **Barbara Andersen, PhD**, the initiative is called Beating Lung Cancer in Ohio (BLC-IO) and is supported by \$3 million from Pelotonia.

The initiative will draw upon a network of 50 hospitals around Ohio that was established by an earlier Pelotonia-funded statewide project (the OCCPI, see above). BLC-IO has two aims: to assess the impact of advanced gene testing and expert advice on lung cancer treatment and patient survival; and to improve smoking-cessation rates among smokers with lung cancer and their family members (assess the impact of centralized telephone counseling and provider support on smoker cessation). A three-year patient recruitment period began in March 2017.

Project leaders anticipate that more than 2,000 newly diagnosed patients with stage IV non-small cell lung cancer will enroll in BLC-IO via the community hospital network. Enrollees will receive free testing for more than 300 genes in their cancer specimens, and the physicians who treat them will receive expert support for interpreting test results and determining treatments. BLC-IO also will provide smoking-cessation support for up to three years to all participating patients and family members.



Andersen



Carbone



Cohn



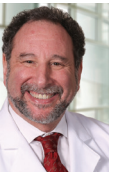
Goodfellow



Hampel



Mardis



Shields



Wewers

CANCER SURVIVOR RIDES WITH NEW TEAM BRUTUS PELOTON



Jeremy Hitchens

If spectators in Pelotonia 2019 noticed one peloton (riding group) that seemed nuttier than the others, they needn't have wondered why.

It was a new peloton called Team Buckeye – Team Brutus, and some of the

riders therein, including captain and cancer survivor **Jeremy Hitchens**, have formerly played the part of Brutus Buckeye, the famed mascot of The Ohio State University.

“We like to joke around that we’re the most spirited team in Pelotonia,” says Hitchens, 27, a native of Tipp City, Ohio, who adds that this fun-loving peloton also contains family members and friends of those boisterous biking Brutuses.

Other members include Hitchens’ girlfriend Lexi Fye, a former Ohio State cheerleader who met him when they both were on the squad (she was a virtual rider); his dad John, an airline pilot; and his friend **Gabe Gemberling**, also a former Brutus Buckeye who has survived cancer.

Hitchens admits that the team’s Brutus bunch may have had an advantage when cycling in the August heat, having romped around in a hot costume for long periods during warm early-season football games in Ohio Stadium and elsewhere. The secret to getting by, he says, was to stay hydrated, much the same as Pelotonia riders must do.

“We like to joke around that we’re the most spirited team in Pelotonia.”

For Hitchens, who graduated from Ohio State in 2015 with a degree in marketing, the Pelotonia 2019 ride—his first—was a personal milestone since it took place just three days after he had completed his most recent chemotherapy regimen on July 31. Despite undergoing treatment, he had been training for his 100-mile ride with friends by cycling 20 miles per day, five days a week.

Hitchens’ cancer journey began in August 2018 when he was diagnosed at the OSUCCC – James with rhabdomyosarcoma, a form of soft-tissue sarcoma made up of cells that normally develop into skeletal muscle. His tumor was on a muscle in his lower abdominal region and abutted his spine.



His diagnosis was followed by six rounds of chemotherapy and 35 rounds of radiation therapy prior to his March 5, 2019, surgery to remove a tumor the size of a large grapefruit. Some three weeks later, he began his postsurgical chemotherapy.

Interestingly, he says, his diagnosis came just four months after his friend Gabe Gemberling’s May 2018 diagnosis with osteosarcoma (bone cancer). Gemberling, who was still on the Brutus squad at the time, also was treated at the OSUCCC – James.

So was 2018 a purely bad year for these Brutus alums?

“I don’t necessarily look at it as bad, and I know Gabe feels similarly,” says Hitchens, who thinks his faith in God and his upbeat attitude have served him well. “We believe we were given this because we’re strong enough to go through it. I feel like God prepares you for certain things and doesn’t give you anything too big to handle.”

He says his faith also has kept him calm. “This entire time I’ve never felt like I was scared. Everyone

expects me to be negative or down, but I’ve never been that. My dad and I like to talk about facing this with joy and happiness instead of fear and doubt.”

Hitchens also attributes his success so far to the support of his friends and family (including his mother, Crystal Hitchens) and to his “amazing medical team at The James.” He specifically mentioned his surgeon **Valerie Grignol, MD**, his oncologist **David Liebner, MD**, his radiologist **Meng Welliver, MD, PhD**, and OSUCCC Director **Raphael Pollock, MD, PhD**, who leads the sarcoma team.

“After working for a couple of years as Brutus on the Buckeye Cruise for Cancer (an annual Caribbean fundraiser for cancer research at Ohio State), I decided that if I ever had cancer, I’d be treated at The James,” he says. “They have outstanding doctors and nurses and other caregivers who were all great to me even before I was a patient. The James has always been near and dear to my heart, and I want to give back.”

Hitchens is also glad for a chance to say these things. “As Brutus, we’re never allowed to speak,” he grins. “But I’m speaking now.”



Several members of Team Buckeye – Team Brutus show their spirit on Pelotonia weekend. The 29-member peloton comprised members of The Ohio State University Cheerleading and Brutus Buckeye Alumni Society along with some of their friends and family members.

INSTRUMENTS OF DISCOVERY

10X GENOMICS CHROMIUM CONTROLLER OFFERS SINGLE-CELL ANALYSIS IN CANCER RESEARCH



The 10X Genomics Chromium Controller is housed within the Genomics Shared Resource of Ohio State's Biomedical Research Tower.

A small black box that easily fits on a standard laboratory bench within the Genomics Shared Resource (GSR) facilities in Ohio State's Biomedical Research Tower is generating much excitement among cancer researchers at the OSUCCC – James.

Purchased with Pelotonia funding support, it's called a 10X Genomics Chromium Controller, a sophisticated machine that, along with other complementary equipment within the GSR, is helping scientists understand the complexities of human biology more fully than ever with the goal of applying that knowledge to targeted therapies based on the molecular characteristics of individual cancers.

10X Genomics, the company that produces the Chromium Controller, says this instrument, together with assay-specific kits, is enabling researchers to “go beyond traditional gene expression analysis to characterize cell populations, cell types, cell states and more, on a cell-by-cell (or single-cell) basis ... providing a comprehensive, scalable solution for cell characterization and gene expression profiling of hundreds to tens of thousands of cells,” including rare cell types. The GSR, which is now combined with the Genomics Services Laboratory at Nationwide Children's Hospital, is one of 20 shared resources available to cancer researchers at Ohio State. The GSR provides

a centralized source of high-throughput genomics technologies, offering instrumentation and expertise for DNA and RNA analysis using sequencing, genotyping, real-time PCR (a molecular biology lab technique based on the polymerase chain reaction) and other services. The GSR is led by Director **Richard Wilson, PhD**, and Co-Director **Amanda Toland, PhD**. Both are members of the OSUCCC – James.



Pearly Yan, PhD, (left) one of two technical directors of the GSR, says the most popular assay for the 10X Genomics system at Ohio State is single-cell transcriptome analysis. Transcriptome refers to the entirety of messenger RNA molecules in the genes of an organism.

“A lot of people are very excited by this assay,” says Yan, a research assistant professor in the Division of Hematology at Ohio State and member of the Leukemia Research Program at the OSUCCC – James. “Several groups of scientists have talked to us about it. We already have embarked on 20 studies and finished 12.”

Yan says the 10X Genomics system offers advanced single-cell analysis that, as opposed to bulk cell sequencing, gives investigators a sharper and more refined look at cellular biology, benefiting both basic science investigators and translational researchers who apply discoveries to clinical care.

One key area of translational study for the 10X Genomics system, she says, is cancer recurrence. “Often when therapy fails, it's not due to the full-blown mature cancer cells not responding to therapy, but rather the evasion of quiescent stem or progenitor cells (earlier lineage of mature cancer cells) from the treatment,” she explains. “Chemotherapy

targets rapidly growing cells. The stem/progenitor cells are slow growing. They may also have gained additional genomic alteration(s), thereby protecting them from treatment effects. They then are poised to become full-blown cancer cells later.”

However, through single-cell analysis (sequencing), scientists can examine all types of individual cells or cell populations—including the stem/progenitor cells—and identify their characteristics, hoping to find weaknesses that can be therapeutic targets.

“They want to discover the Achilles' heel,” Yan says. “That's what this is all about. When we do bulk sequencing, most of what we see are the bulk cancer cells, along with other material that infiltrates the bulk cancer. We see very little of the important stem/progenitor cell populations, but they can be revealed through single-cell analysis.

“The most important thing the 10X Genomics system does for translational investigators is to identify the types of cells in the tissue of interest,” Yan adds. “Basically when a patient's cancer recurs, we want to see the cell populations and their gene profiles within the tumor.

“The software that comes with the 10X system, as well as other open-source software, will tell the researcher the hallmark of any particular group of cells—the fine composition—so they can be examined further. If anything suspect is found in these groups, the researcher can validate the 10X findings by other means to determine the true cause of disease recurrence.”

NEW HOPE: PELOTONIA FUNDS SUPPORT CLINICAL TRIAL RESEARCH AT THE OSUCCC – JAMES

Novel Anticancer Vaccine Shows Promise in Phase I Study

Promising results from an OSUCCC – James phase I clinical trial on a novel peptide vaccine suggest an important potential benefit of this vaccine and warrant its continuing development for treating patients with metastatic or recurrent solid tumors that overexpress the HER-2 protein.



Led by principal investigator **Pravin Kaumaya, PhD**, a professor in the Department of Obstetrics and Gynecology at Ohio State and member of the Translational Therapeutics Program at the OSUCCC – James, the

trial demonstrates that the vaccine, called B-Vaxx, is well tolerated and can generate sustained anti-HER-2 immune response compared to humanized monoclonal antibodies, to which most patients develop resistance.

This study, which was supported in part by funding from Pelotonia and by grants from the National Cancer Institute, gave preliminary indication that peptide vaccination may help patients avoid therapeutic resistance and may offer a promising alternative to monoclonal antibody therapies such as Herceptin® and Perjeta®.

Reporting in the journal *Clinical Cancer Research*, Kaumaya and colleagues state that HER-2 is overexpressed in multiple epithelial tumors, including breast, gastro-esophageal, endometrial (uterine), ovarian, colorectal and lung cancers. They also note that HER-2 is associated with more aggressive forms of cancer, increased metastasis and decreased survival, making it a key therapeutic target in many malignancies.

The scientists describe B-Vaxx as a B-cell epitope-specific vaccine that combines two peptide B-cell

epitope vaccines. These two peptide constructs were conceived and designed by Kaumaya.

“Overall, immunotherapy using cancer vaccines is an exciting and rapidly evolving field in oncology that leverages patients’ immune systems to target cancer,” the scientists write in *Clinical Cancer Research*. “Chimeric B-cell epitope peptide vaccines incorporating a ‘promiscuous’ T-cell epitope offer an attractive immunotherapeutic option in the treatment of cancer.”

The primary objectives of this first-in-human clinical trial were to assess the safety and toxicity of immunization, determine the optimum immunologic/biologic dose of the new combination HER-2 vaccine, measure humoral and cellular immune responses and evaluate the vaccine’s therapeutic benefit.

The trial, which took place entirely at Ohio State, involved 49 patients with metastatic or recurrent tumors and a median of four prior lines of chemotherapy who received at least one inoculation of B-Vaxx. Of these, 28 patients received three or more vaccinations. Two of these patients showed a partial response, and 14 exhibited stable disease. The scientists note that most patients had minimal or no toxicities, and that no dose-limiting toxicities were observed.

Immunotherapy using cancer vaccines is an exciting and rapidly evolving field in oncology.

Overall the scientists conclude that, in addition to being well tolerated and able to generate sustained anti-HER-2 immune response, the vaccine induced patient antibodies that showed potent antitumor activity.

Given the successful phase I results, Kaumaya says, “Continuous development of the vaccine is ongoing at the OSUCCC – James in a phase II trial.”



2019

BRINGING TOP CANCER RESEARCHERS TO OHIO STATE

Some of the brightest minds in cancer research are attracted to the OSUCCC – James, and Pelotonia dollars often help these researchers continue their work when they arrive.

In the past 12-15 months the OSUCCC – James has recruited more than 40 senior- and junior-level medical scientists, including these prominent senior-level researchers, all of whom received direct funding support from Pelotonia:

Zihai Li, MD, PhD



Zihai Li, MD, PhD, is a medical oncologist and immunologist who was recruited from the Medical University of South Carolina in April to become founding director of the new Pelotonia Institute for Immuno-Oncology (PIIO) at the OSUCCC – James, where he also is in the Translational Therapeutics Program. Li, who specializes in mechanisms of immune regulation in cancer, will help the cancer program build on its already strong work in immunotherapy, widely considered to be the next frontier in cancer treatment. Featured on pages 7-8, the PIIO is a bench-to-bedside research initiative that focuses on harnessing the immune system to fight cancer at all levels, from prevention to treatment and survivorship.

Allan Tsung, MD



Allan Tsung, MD, was recruited from the University of Pittsburgh Medical Center (UPMC) to become director of the Division of Surgical Oncology at Ohio State and a member of the Translational Therapeutics Program at the OSUCCC – James. His research examines the role of innate immunity in injury-induced inflammation and the tumor microenvironment of primary and metastatic liver malignancies. Tsung, who directed the Liver Cancer Program at the UPMC Hillman Cancer Center, brings a prolific research laboratory to Ohio State.

Philip Tschlis, MD



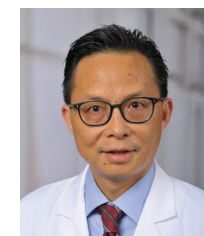
Philip Tschlis, MD, was recruited as a professor in the Department of Cancer Biology and Genetics at Ohio State and as co-leader of the Cancer Biology Program at the OSUCCC – James. He came from Tufts University School of Medicine in Boston, where he was a professor of hematology and oncology and also served as executive director of the Molecular Oncology Research Institute. His lab focuses on using insertional mutagenesis and other genetic strategies to identify genes involved in causing cancer or regulating phenotypic changes in tumor cells.

Jing “Jenny” Wang, PhD



Jing “Jenny” Wang, PhD, a professor in the Department of Cancer Biology and Genetics at Ohio State and member of the Cancer Biology Program at the OSUCCC – James, studies molecular mechanisms and therapeutic targets of colon cancer metastasis and drug resistance. Wang was recruited from the University of Nebraska Medical Center, where she was a professor in the Eppley Institute for Research in Cancer and Allied Diseases. One of her many research aims is understanding molecular mechanisms of colorectal cancer metastasis, recurrence, tumor dormancy and drug resistance.

Yiping Yang, MD, PhD



Yiping Yang, MD, PhD, an expert in cancer immunology and immunotherapy, serves as professor and director of the Division of Hematology at Ohio State. Yang, who was recruited from the Duke Cancer Institute and Duke University School of Medicine, specializes in the treatment of lymphoma, leukemia and virus-associated malignancies. He is in the Leukemia Research Program at the OSUCCC – James. He also will be a collaborator in the new Pelotonia Institute for Immuno-Oncology (PIIO) directed by Zihai Li, MD, PhD (see Li’s profile at left).

Theodore Wagener, PhD



Theodore Wagener, PhD, was recruited from the University of Oklahoma Health Sciences Center to become an associate professor in the Division of Medical Oncology at Ohio State. He also co-leads the Cancer Control Program and directs the Center for Tobacco Research at the OSUCCC – James. Wagener’s research focuses on tobacco regulatory science, with an emphasis on evaluating the pharmacological effects and behavioral use patterns of cigarette and non-cigarette tobacco products, such as electronic cigarettes and hookah.

Blake Peterson, PhD



Blake Peterson, PhD, was recruited from the University of Kansas as professor and chair of the Division of Medicinal Chemistry and Pharmacognosy in Ohio State’s College of Pharmacy. He also co-leads the Translational Therapeutics Program at the OSUCCC – James. Peterson’s laboratory pursues interdisciplinary research in bio-organic/medicinal chemistry and chemical biology. His team creates and studies anticancer agents, antiviral agents, molecular probes, tools for target identification and systems for drug delivery.

Junran Zhang, MD, PhD



Junran Zhang, MD, PhD, was recruited from Harvard Medical School to Ohio State as an associate professor in the College of Medicine, Department of Radiation Oncology, and as a member of the Cancer Biology Program at the OSUCCC – James. Her expertise is in DNA damage response (DDR) and replication stress response (RSR), and their impact on human genomic stability, tumorigenesis and cancer therapy. Understanding the molecular mechanisms controlling DDR and RSR is a central topic in cancer biology and therapy.

For more information about Ohio State's cancer program, visit cancer.osu.edu.

For more information about Pelotonia, visit pelotonia.org.

The James



THE OHIO STATE UNIVERSITY
COMPREHENSIVE CANCER CENTER



Introducing

The Pelotonia Institute for Immuno-Oncology

Learn more inside this issue

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