PATHWAYS TO A CURE

ANNUAL REPORT 2021

COLUMBIA

COLUMBIA UNIVERSITY
HERBERT IRVING COMPREHENSIVE
CANCER CENTER

DIRECTOR'S MESSAGE

This past year has brought remarkable challenges to our Cancer Center and those we serve. Throughout this extraordinary year, we have seen tremendous effort from our entire community—our researchers, clinicians, staff, and patient advocates—who have remained committed to our shared mission and to each other.

At the start of 2021, we joined the national effort to drive COVID-19 vaccinations with an inspiring number of volunteers serving at our vaccination sites and in outreach efforts across Columbia University and NewYork-Presbyterian. As we continue to emerge from the pandemic, we are returning to campus safely and responsibly, cherishing the opportunity to reconnect in person.

Through this difficult time our dedication towards accelerating cancer research, treatment, and care has not waned.

Funding to our Cancer Center members from the National Cancer Institute grew by more than 15% in 2020, with over $100 million dollars in cancer-related funding overall. The Vagelos College of Physicians and Surgeons also reached its highest ranking ever, listed No. 5 among medical schools with funding from the National Institutes of Health. We also are proud to stand by our partner, NewYork-Presbyterian, ranked as the No. 1 hospital in New York by *U.S. News and World Report*.

This success continues to grow with notable achievements, including establishment of the COMMUNITY Center at Columbia, a new center supported by the National Institute on Minority Health and Health Disparities focused on reducing health disparities in chronic diseases including cancer, funding from Stand up to Cancer to increase diversity and inclusion in clinical trials, and highly competitive grants from the Mark Foundation for Cancer Research and V Foundation for Cancer Research awarded to our faculty. We also celebrated five new Outstanding Investigator Awards from the National Cancer Institute and National Institutes of Health this year.

We are paying it forward through our Cancer Center pilot funding programs, disbursing over $2 million in 2020 across 30 seed projects that drive new ideas, jump-start collaborations, and enhance innovation across the Columbia cancer research community. We have also sustained our clinical research efforts, ramping up clinical trial enrollment as quickly and safely as possible, maintaining and expanding screening and prevention efforts, and continuing our all-important focus on the communities we serve in northern Manhattan and surrounding areas.

We recently announced the Columbia-Pfizer Clinical Trials Diversity Initiative, an exciting new initiative aiming to reduce health disparities by increasing the participation of underrepresented minorities in clinical trials and enhancing the diversity of clinical researchers. Improving diversity among clinical trial participants is a critical step toward reducing racial and ethnic disparities in health, and a crucial hurdle we are determined to overcome.

Next year we'll reach the 50-year-mark since our Cancer Center's designation by the National Cancer Institute, one year after the signing of the National Cancer Act that spurred cancer research funding across the country. On the heels of the tremendous advancement in research and in care conducted over the last five decades, we at the Herbert Irving Comprehensive Cancer Center envision the next 50 years filled with accelerated innovation, technological advancements, and breakthroughs in therapeutics.

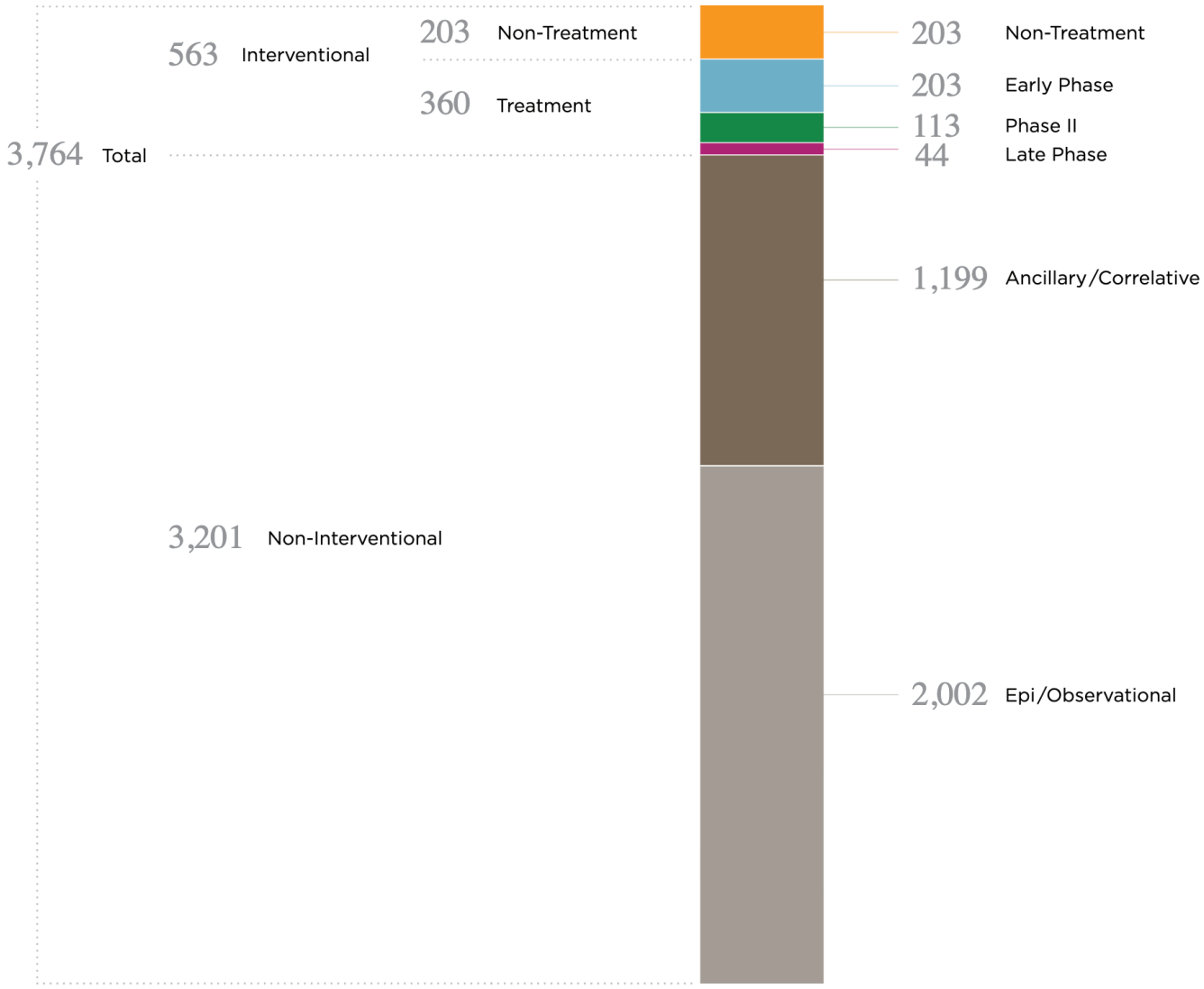
Undoubtedly, this time in our lives has challenged us, and we have emerged united and stronger than ever before. As we look to the future, one thing remains certain at the HICCC: We are committed to providing the highest quality of care for our patients and delivering innovative solutions to the most pressing problems in cancer research. We will continue in our global fight to solve cancer, uncovering answers, and hopefully in our lifetime, finding a cure for all.

Anil K. Rustgi, MD

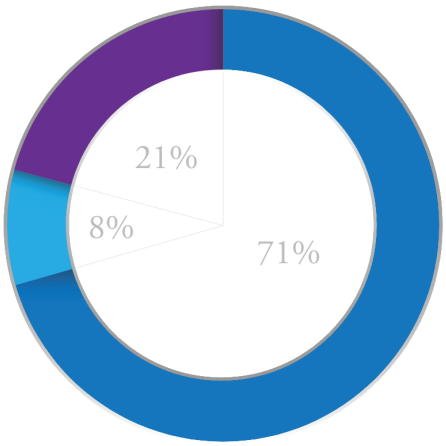
Director, Herbert Irving Comprehensive Cancer Center
Irving Professor of Medicine, Vagelos College of Physicians and Surgeons
Chief, Cancer Service, NewYork-Presbyterian/Columbia University Irving Medical Center
Interim Executive Vice President and Dean of the Faculties of Health Sciences and Medicine, Columbia University Irving Medical Center

RESEARCH SNAPSHOT

TOTAL CLINICAL TRIAL ENROLLMENTS IN 2020



ACTIVE FUNDED PROJECTS IN 2020
RESEARCH FUNDING BY SOURCE GRAND TOTAL
(ALL PROJECTS) $96,302,507

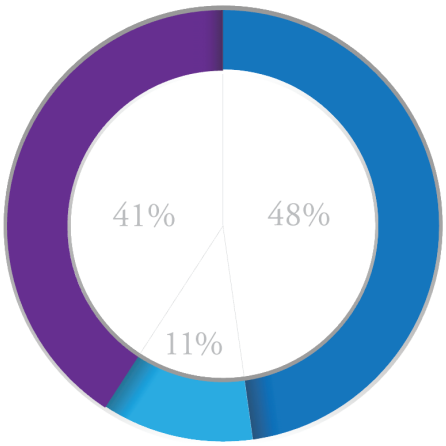


GOVERNMENT
$68,145,393
71%

FOUNDATIONS & ASSOCIATIONS
$8,116,201
8%

INDUSTRY
$20,040,462
21%

RESEARCH PROJECTS BY
FUNDING SOURCE
GRAND TOTAL (ALL PROJECTS)
770



GOVERNMENT
370
48%

FOUNDATIONS & ASSOCIATIONS
87
11%

INDUSTRY
313
41%

PROGRAM MEMBERS OF THE HICCC

The nearly 250 researchers and physicians that are members of the HICCC are dedicated to understanding the complex biology behind cancer, from before it begins to its evolution and spread. The HICCC has four formal research programs that organize our membership.

Cancer Genomics and Epigenomics 54
Cancer Population Science 60
Precision Oncology and Systems Biology 54
Tumor Biology and Microenvironment 69

THE ROLE OF AI IN RADIOTHERAPY
Investigating the power of artificial intelligence-driven radiation oncology

For decades, artificial intelligence (AI) has been tinkered with and applied to a number of diverse sectors, from robotics and computer vision to science and medicine. In oncology, a new form of AI-driven radiotherapy, also referred to as adaptive radiation therapy, is an exciting frontier in precision cancer medicine. With the arrival of a new radiation accelerator machine called Ethos™ at NewYork-Presbyterian and Columbia's Herbert Irving Comprehensive Cancer Center, patients will soon get the benefits of a smarter, automated, and enhanced radiation treatment. The system uses AI to efficiently fine-tune a patient's daily radiation treatment in real-time—while they're actually lying on the treatment machine—and faster than ever before. This technique has the potential to maximize the radiation dose to the tumor, while reducing harm to normal tissues, which may allow for improved cancer outcomes and reduced treatment side effects.

BRINGING THE LATEST IN RADIOTHERAPY TO NEW YORK CITY

Lisa Kachnic, MD, one of the nation's leading radiation oncologists and a pioneer of new approaches to optimize the effectiveness of radiation therapy, came to Columbia University Irving Medical Center in 2019, bringing with her valuable hands-on experience with Ethos™. At her previous institution, Vanderbilt University School of Medicine, she spearheaded an initiative with medical physicist Michael Price, PhD, to develop an adaptive radiation therapy program. After weighing a few different options, they decided to go with Ethos™, a system made by Palo Alto, CA-based Varian Medical Systems, a Siemens Healthineers company.

"This system allows us to add another dimension to what is already personalized medicine," says Dr. Price, who also joined Columbia in April as vice chairman for physics at Columbia's Vagelos College of Physicians and Surgeons. "The degrees of freedom have increased significantly, because not only are we creating a unique plan for every patient, but when it's merited, we can personalize every single treatment that's given."

Typically, a patient's radiation plan is tailor-made by a collaborative team of radiation oncologists, dosimetrists, and medical physicists over the course of about a week. Before radiotherapy begins, the team takes computerized tomography (CT) images of the area of the body that needs treatment and compiles a map (known as the radiation prescription) that indicates which parts need higher doses of radiation than others. In traditional radiotherapy, this map doesn't change, even weeks into treatment when the tumor may have shrunken or other shifts in anatomy have likely occurred.

Conversely, a small number of commercially-available "adaptive" radiotherapy systems, like Ethos™, allow clinicians to update a patient's plan on a session-to-session basis, in real-time. So before the patient receives any radiation, Ethos™ double-checks their anatomy with a previously-acquired CT scan. And instead of having the radiation physician draw the outlines of organs and tumors, which normally take several hours to complete, Ethos™ utilizes artificial intelligence (AI) to automatically determine whether the borders of those regions have changed and create a new radiotherapy plan based on these changes.

"This new plan takes only minutes to create, and meanwhile, the patient never gets up off the treatment table," Dr. Price says. "Then, the physician and the physicist look at this new plan and check the AI's work. It's hardcoded into the system that every single computer-generated region and resultant plan must be checked by a human (i.e. physician) before a treatment is delivered."

In a recent study with Ethos™, Dr. Price and his former colleagues at Vanderbilt University School of Medicine found that the system's updated plans improved target coverage and decreased the maximum dose to nearby organs-at-risk in patients with cervical and rectal cancers.

Other clinicians at the Herbert Irving Comprehensive Cancer Center (HICCC) look forward to harnessing this technology for their own patients and research studies, with hopes of lowering the toxicity and side effects of treatment.

A TAILORED RADIATION PLAN TO TACKLE BRAIN TUMORS

Glioblastoma is the most common malignant brain tumor, with around 12,000 cases diagnosed each year in the U.S. There is currently no cure for glioblastoma, which is often very aggressive and difficult to treat. Affected patients have a poor prognosis, with many of them surviving less than a year after diagnosis.

Tony J. Wang, MD, professor of radiation oncology at Columbia's Vagelos College of Physicians and Surgeons and member of the Herbert Irving Comprehensive Cancer Center

(HICCC), has dedicated his career to helping patients with glioblastoma by finding better ways to deliver radiation to the brain. Currently, glioblastoma is typically treated with surgery to remove as much of the tumor as safely possible, followed by six weeks of radiation therapy and chemotherapy.

While conventional radiation machines treated patients based on fixed plans from images, advancements in technology over the years have allowed for more precise targeting and a greater sparing of critical, healthy structures in the brain. The ability to deliver smaller radiation volumes have led to less adverse side effects.

With Ethos™ therapy now at his fingertips, Dr. Wang hopes to take treatment for glioblastoma a step further with the incorporation of adaptive radiation plans. He was recently awarded a three-year, multi-center research grant to investigate the use of Ethos™ therapy in conjunction with magnetic resonance imaging (MRI) for patients with glioblastoma and other brain tumors.

"Normally, we would use a static radiation plan based off the CT scan that was acquired on the day after surgery. But who is to say that the brain anatomy hasn't changed, especially after a tumor has been resected? Sometimes the surgical cavity can collapse," he says. "If we are able to shrink radiation volumes by adapting their plan, that may potentially help with the patient's quality of life."

Dr. Wang, who also serves as co-director of the Center for Radiosurgery and chair of the Quality and Patient Safety Committee in Radiation Oncology at NewYork-Presbyterian/Columbia University Irving Medical Center, plans to explore the possible benefits of adding information from advanced MRI scans prior to and during the third week of radiation therapy. The purpose of the MRI scans is to see changes in the tumor and surgical cavity and identify sites where the tumor is more (or less) likely to progress that could be targeted with a higher (or lower) radiation dose.

CHANGING HOW RADIATION IS DELIVERED TO PATIENTS

Nearly everyone will get a human papillomavirus (HPV) infection at some point in their lives, with the majority going away on their own, but some can lead to cancer. Specifically, 90 percent of all anal cancers are associated with HPV infection. Despite being highly preventable with vaccines, cases of anal cancer in the United States have been on the rise.

"Anal cancer is a relatively uncommon cancer—much less common than colon or rectal cancer, for example—but has been increasing in incidence," says David P. Horowitz, MD, assistant professor of radiation oncology at Columbia's Vagelos College of Physicians and Surgeons and member of the Herbert Irving Comprehensive Cancer Center (HICCC). "Unfortunately, the standard therapy for anal cancer hasn't changed very much in the past 30 years, so we're really in need of new ways to further increase the effectiveness of our treatment while decreasing side effects."

Many patients with anal cancer can be cured, especially if the disease is caught early. But individuals whose cancer has spread to lymph nodes or other areas of the body have a much higher risk of recurrence and need the highest doses of radiation for treatment.

Dr. Horowitz aims to build on the pioneering work of Lisa A. Kachnic, MD, professor and chair of radiation oncology and associate director for Cancer Network Strategy at the HICCC, who previously demonstrated that a combination of tailored radiation and chemotherapy can lead to a cure. Her innovative technique, called dose-painted intensity-modulated radiation therapy (DP-IMRT), delivers a high dose of radiation to large tumor deposits while giving a lower dose to areas at risk that have no evidence of cancer.

"The challenge [with DP-IMRT] is that we know these tumors actually shrink dramatically over the course of a patient's treatment. So the problem that sometimes arises is that normal tissue, such as the bowel or bladder, can move from the time that we do our original planning for the radiation to when the patient is halfway through the course, for example," he says. "That means we might be giving higher doses of radiation to normal organs than we would ideally like."

Artificial intelligence-based planning and delivery of radiation, also known as adaptive radiation, provides a fast, simple way to make adjustments, potentially on a daily basis. Dr. Horowitz is the lead co-investigator on a multi-center research grant that Dr. Kachnic recently received to evaluate adaptive radiation for patients with anal cancer on their new Ethos™ radiation delivery machine. Dr. Horowitz believes that adaptive radiation may change the way we deliver radiation as it has the ability to spare patients from the sometimes serious side effects while also maximizing the radiation dose directly going to the tumor itself.

BETTER CERVICAL CANCER TREATMENT FOR AN UNDERSERVED POPULATION

Cervical cancer is strongly linked to human papillomavirus (HPV) infection, and although HPV vaccination prevents up to 90 percent of HPV-related cancers, more than 14,000 new cases will be diagnosed this year alone in the United States.

Even before the arrival of HPV vaccines, the introduction of routine Pap tests for screening led to annual declines in cervical cancer incidence and mortality rates. However, progress has not been equal for all racial/ethnic groups and regions. More Black and Hispanic women get HPV-associated cervical cancer than women of other races or ethnicities, likely due to decreased access to screening or appropriate care. Black women also have the highest mortality rate

from cervical cancer compared to any other racial/ethnic group and geographic regions. Other studies have reported socioeconomic disparities, finding that women with lower education levels or who live in high poverty neighborhoods have a greater risk of dying from cervical cancer.

The Herbert Irving Comprehensive Cancer Center (HICCC) is located in the Washington Heights neighborhood of Manhattan and is a member of the National Cancer Institute's (NCI) Minority and Underserved Community Oncology Research Program (MU-NCORP). The NCI's NCORP is part of a multi-million-dollar initiative launched in 2014 by the National Institutes of Health to ensure that all population groups are represented in cancer research.

"We are really well-equipped to study this new artificial intelligence-based adaptive radiation technology in a predominantly underrepresented and underserved minority patient population that is disproportionately affected with locally advanced cervical cancers," says Christine Chin, MD, assistant professor of radiation oncology at Columbia's Vagelos College of Physician & Surgeons who specializes in gynecologic cancers.

Dr. Chin looks forward to offering AI-based adaptive radiation to her patients, which has the potential to both minimize treatment-related toxicity and allow for escalation of radiation dose to more focused areas. Some stages of cervical cancer are treated with radiotherapy alone, meaning that the actual tumor—which requires an especially strong blast of radiation—will still be present.

"The soft tissues of the pelvis are very dynamic, and the current way that we deliver radiation doesn't really account for all the potential changes in shape of the tumor as well as nearby bowel, bladder, and rectum throughout the treatment course over several weeks," she says. "With adaptive radiation, we can escalate dose to the tumor more safely by creating an adapted plan for the patient every day to account for these changes."

DEFINING PRECISION CANCER MEDICINE

New center aims to go beyond identifying the 'right drug for the right patient'

The concept of precision medicine is founded on the basic principle that there isn't a "one-size-fits-all" approach to treating patients. Adam Bass, MD, director of the new Center for Precision Cancer Medicine at the Herbert Irving Comprehensive Cancer Center (HICCC) at NewYork-Presbyterian/Columbia University Irving Medical Center, will tell you that precision cancer medicine has become synonymous with identifying the "silver bullet" to treat an individual patient, offering personalized medicine and tailored care.

This means that a doctor can gather the genetic profile of a patient's tumor, unveil disease-causing mutations, and identify the optimal drug to treat, and at times, eradicate that patient's cancer. Though this model of treatment has transformed care for some, this model requires new perspectives to fulfill its initial promise.

In his directorship, Dr. Bass has set out to define precision cancer medicine, cultivating an all-encompassing scientific hub that pulls from multiple expertise areas and disciplines across the university to tackle precision cancer medicine head-on and in a way that is different to the "silver bullet" concept.

"Today, there is an evolving picture of what precision cancer medicine is and should be," says Dr. Bass, Irving Professor of Medicine at Columbia's Vagelos College of Physicians and Surgeons and co-leader of the Precision Oncology and Systems Biology research program at the HICCC. "Precision cancer medicine needs to be envisioned as understanding how cancer works, which goes beyond individual gene mutations, and using that information to guide prevention, early detection, and therapy. "

Genetic sequencing is an important tool and the advances in that technology have been monumental in propelling the field forward. Knowing the specific genes that are mutated, however, is just one piece of an elaborate puzzle that encompasses the remarkable complexity of the fundamental biology of the cancer cell and of non-cancer cells.

The new center, which launched in September, comprises an actively growing program of physician-scientists working at the interface of cancer biology and the development of new cancer diagnostics and therapies. The center coalesces investigators across Columbia and NewYork-Presbyterian in a 360-degree approach, not only bringing discoveries from the lab to patients' bedsides, but also incorporating research in real time, allowing researchers to understand how cancer evolves and adapts in response to therapies.

To overcome the immense complexity of cancer, multidisciplinary teams are critical and bring unique tools and approaches to the table. Key to this evolving ecosystem is laboratory research, working in the lab with not just cancer biologists but computational biologists, systems biologists, biomedical engineers, and experts in many other fields to uncover how cancers work.

"At Columbia, we have the diversity of expertise to meet that challenge," says Dr. Bass. "In our center's inaugural year, we will focus first on recruiting additional physician-scientists and establishing key infrastructure that will support new research projects from many different investigators. Additionally, we will be reaching out across our community to help develop more cross-disciplinary collaborations. It well could be that the most important advances to come in cancer research may originate from a scientist who has yet to realize they are a cancer researcher."

UP NEXT: THE FUTURE

MINIATURIZING CANCER ON A CHIP

Engineers are working with biologists to revolutionize the study of cancer, disease progression

The unpredictability of how a cancer will behave from one patient to the next has been a defining challenge in developing effective treatments. There has been a long-standing need to create better models of human cancers that can mimic their complexities, which is where Gordana Vunjak-Novakovic, PhD, has arrived at a breakthrough. Dr. Vunjak-Novakovic is University Professor and Mikati Foundation Professor of Biomedical Engineering at Columbia University.

In creating her "Cancer on a Chip" model, Dr. Vunjak-Novakovic now sits at the intersection of biology, engineering, and medicine, utilizing tissue engineering to uncover the biology of cancer metastasis, one of the most pressing challenges in cancer research.

Tissue engineering is a relatively simple concept. If you can create an environment that mimics what a human cell would inhabit inside our bodies, it allows you to study that cell's normal functions in an external setting. These environments are provided on "chips," devices about the size of a credit card, that hold a millimeter sized piece of human tissue and can replicate the function of the specific organ that tissue comes from. In Dr. Vunjak-Novakovic's research, co-developed with researchers Alan Chramiec and Diogo Teles, these chips hold tumors and can model how a cancer will spread to healthy tissues or respond to a specific drug or treatment. To study cancer progression and treatment response in a specific patient, all that is needed is a small sample of that patient's tumor.

One patient at a time, this personalized approach is working to move beyond the conventional trial-and-error model of treatment. It could hold the answers to some of the largest questions in cancer research, namely, how does a normal cell turn into a cancer cell, and why do some people respond to treatments while others do not? The "Cancer on a Chip" model represents the next step forward, where clinicians, engineers, and researchers step out of their siloed disciplines and begin working together towards multidisciplinary solutions. Ask Dr. Vunjak-Novakovic, and she'll tell you that within those collaborations we are making our way towards solving cancer.

ENTERING THE VIRTUAL WORLD OF SCIENCE

How virtual reality is enhancing cancer research and education

Across Columbia University—and the world—adapting to the remote environment brought on by the COVID-19 pandemic has meant embracing emerging technology. For HICCC members Simon Tavaré, PhD, and Brent Stockwell, PhD, that emerging technology is virtual reality (VR). VR utilizes immersive headsets and other hardware to allow users to actively enter and explore a digital environment, rather than passively observing that world on a screen. Drs. Tavaré and Stockwell are applying VR in fields that have yet to really reap the full benefits of this ever-evolving technology.

Dr. Tavaré, director of the Irving Institute for Cancer Dynamics (IICD), is establishing a dedicated VR lab on Columbia's Morningside campus. There, he and his fellow collaborators can analyze cancer data sets within an immersive 3D world. Utilizing the novel software Theia, developed by Suil Interactive as part of the Cancer Grand Challenges IMAXT consortium and diverse collaboration, the IICD is serving as a test site to visualize and explore cancer data in an entirely new, interactive way.

"VR provides a unique platform for viewing and exploring data. Imagine being able to place yourself inside the tumor; it presents a new approach to data analysis," says Dr. Tavaré, who is also a member of the IMAXT consortium and professor of statistics and of biological science at Columbia.

"One interesting medical application of the software allows several clinicians to explore online the molecular annotation of the same tumor simultaneously, allowing for more detailed assessment of the data." Theia is expected to be available soon from suil.ie.

While Dr. Tavaré and his team help to pilot this new paradigm in research, Dr. Brent Stockwell, professor of biological sciences, is using VR to transform the classroom. Since the fall of 2020, Dr. Stockwell has started teaching biochemistry classes using VR. This shift has been driven by an understanding that as learning opportunities have expanded online, universities need to engage students through teaching methods and opportunities they can't get on their own. The immersive environment VR offers also allows students to focus on and interact with subject matter—such as 3D protein models relevant to the course—in ways that are challenging to accomplish in a traditional classroom.

As Dr. Stockwell puts it, "What we would like to provide is a much deeper learning experience, where you're doing things that you really can't do on your own. I think we can accomplish this through virtual reality, by interacting with groups of students together in VR in a way that requires them to totally engage with, immerse and interact with 3D models of molecules."

Scientists and educators are just beginning to unlock the potential of VR, and it is exciting to see how this unfolds with members of the HICCC at the forefront.

As Dr. Tavaré shares, "VR has been around for a while, and we are just scratching the surface of how to apply it to cancer research. We're excited to experiment with how this technology could lead to a deeper understanding of cancer biology, and applications in other areas of data science."

DRIVING DIVERSITY IN SCIENCE

New scholars program links HBCUs and Columbia University

Columbia University Irving Medical Center's Herbert Irving Comprehensive Cancer Center (HICCC) and the United Negro College Fund (UNCF) have created the Ernest E. Just Biomedical Research Scholars @ Columbia, a groundbreaking program that will provide college and graduate students at historically Black colleges, universities, and medical schools (HBCUs) with research opportunities and access to mentors at Columbia University Irving Medical Center (CUIMC) and the HICCC. In turn, faculty at CUIMC will have access to a diverse and talented cohort of students to mentor, and faculty will collaborate on research projects ranging from epidemiological studies to new ideas for cancer therapy.

The program aims to increase the number of Black researchers in tenure-track positions at Columbia and other top-tier biomedical research institutions in the country by providing a critical link between young scientists in the pipeline at HBCUs and established researchers at Columbia University.

The Ernest E. Just Biomedical Research Scholars @ Columbia program developed from discussions about how students at HBCUs can connect with scientists at top-tier research institutions such as CUIMC. The program began this past summer with 12 students from Morehouse School of Medicine who were paired with a faculty researcher at Columbia University's Vagelos College of Physicians and Surgeons, Mailman School of Public Health, or School of Nursing depending on the student's research interests. Students were selected by UNCF and Morehouse School of Medicine and conducted their research with CUIMC faculty remotely in this initial cycle. The program is anticipated to expand next year to students at other HBCU medical schools and undergraduate institutions.

Read what students, faculty, and partners have to say:

"I am grateful for the opportunity to be a part of the E.E. Just Scholars program at Columbia University and develop a long-term mentorship from a notable physician and researcher in Erica Fallon, MD. I was able to start one of my lifetime goals of finding novel treatment options for Wilms tumor, the same pediatric cancer I once had, which has been a huge driver of my interest in practicing medicine and research. It also provided numerous opportunities to develop research skills that I would not have had access to otherwise."

—Erron Collins
E.E. Just Scholar
Doctor of Medicine Candidate, Morehouse School of Medicine Class of '24

"It was an honor to be an E.E. Just Scholar under the leadership of Dr. Kevin Gardner. Working with the Gardner lab was a riveting experience that provided clarity to my career aspirations to become a molecular epidemiologist. The program was intellectually enlightening and broadened my viewpoints in multiple disciplines of medical science."

—Sediqua Bufford
E.E. Just Scholar
Master of Science in Biotechnology, Morehouse School of Medicine Class of '21

"Columbia University is an international powerhouse and leader in science and the humanities in one of the most diverse cities in the world. However, this level of diversity is not reflected within its walls. The E.E. Just Scholars program will cultivate a new generation of scientists, educators, and scholars that will embrace diversity and equity in the practice, delivery, and teaching of the biomedical and behavioral sciences."

—Kevin Gardner, MD, PhD
E.E. Just mentor
Senior Vice Chair of Pathology and Cell Biology, Columbia Vagelos College of Physicians and Surgeons

"As a life scientist, I know first-hand how important it is for students to have these wonderful opportunities where they can participate in cutting-edge research activities in laboratories led by top-notch scientists at places like

Columbia University. Working with investigators like Dr. Kevin Gardner, for instance, provides a great opportunity for our students to gain critical research skills and abilities that will help them matriculate through their respective academic programs, subsequent graduate studies and, ultimately, careers in the life sciences."

—Chad Womack, PhD
Senior Director of STEM Programs and Initiatives at the UNCF
Founder, Ernest E. Just Life Science Society

"The Ernest E. Just Scholars Program is an opportunity to build mutually beneficial relationships. The most innovative research comes when scientists from all backgrounds are represented and have a voice."

—Anil K. Rustgi, MD
Interim Executive Vice President and Dean of the Faculties of Health Sciences and Medicine, Columbia University Irving Medical Center
Director, Herbert Irving Comprehensive Cancer Center

SHENEQUE'S STORY

Diagnosed at 17, Now a Cancer Thriver

Cervical cancer is typically diagnosed in women between the ages of 35 and 44, but Sheneque Hanse was diagnosed at just 17 years old. A freshman in college at the time, Sheneque placed a sudden pause on college to focus on her cancer treatment and care. Under the care of her comprehensive cancer team at NewYork-Presbyterian/Columbia University Irving Medical Center, Sheneque is now disease-free and on a steady road of overcoming cancer.

Sheneque was diagnosed with advanced cervical cancer in the spring of 2019. A Bronx, NY, resident, Sheneque and her parents were seen and advised by a physician at NewYork-Presbyterian Lawrence Hospital to see Alexander Melamed, MD, MPH, physician-scientist at the Herbert Irving Comprehensive Cancer Center and cervical cancer specialist.

Learning that she had stage III cervical cancer and hearing the words "rare" and "cancer" didn't overwhelm Sheneque. Instead, she remembers feeling a sense of responsibility and determination to overcome the disease.

"I was more like, let's get on top of this and let's do what we have to do," says Sheneque. "I trusted Dr. Melamed and all the nurses and doctors caring for me. I felt like everyone wanted to do everything they could to help me."

Sheneque underwent an aggressive treatment plan of chemotherapy and radiation under the care of Dr. Melamed and Drs. Israel Deutsch and Christine Chin. After partially failing to respond to treatment, her team conducted surgery, followed by immunotherapy. Cancer immunotherapy is a newer form of treatment that calls on a patient's own immune cells to invade and kill off cancer cells. While immunotherapy does not have the same side effects as chemotherapy, it is not free of complications.

For Sheneque, immunotherapy has worked successfully to keep her cancer in remission but with that milestone came a rare side effect. Following treatment, Sheneque experienced gradual, waist-down neuropathy and temporary paralysis for 11 months.

Sheneque regained her ability to walk in early 2021. "That was the worse time. I can't thank my doctors enough for working with me every single day through my rehabilitation."

"We've had a lot of setbacks but she didn't give up. We didn't give up," says Dr. Melamed. "Her journey has been remarkable."

FOCUSED ON THE FUTURE

Sheneque's experience at NewYork-Presbyterian/Columbia University Irving Medical Center, including the many interactions with oncology nurses, nurse practitioners, physicians, and physical therapists, have now fueled an interest in pursuing a career in health care.

"Nurses kick ass," says Sheneque, with a laugh. "The nurses, especially during the pandemic when I couldn't have visitors, were always so comforting and nurturing, and so were my doctors. I never felt alone, never felt scared."

Back in college, Sheneque is considering serving as a patient advocate and a voice for young people with cancer, and has documented her cancer journey on social media.

"If I can share any part of my experience with young cancer patients, I would say to always express your emotions," says Sheneque. "Whatever you need to do to make yourself feel better, feel comfortable is top priority. Your well-being and mental health matter most. You're number one."

$1M GIFT TO THE PANCREAS CENTER

To accelerate critical cancer research and advance patient care

Susan S. Mirza has continued her long-standing support of the Pancreas Center at NewYork-Presbyterian/Columbia University Irving Medical Center in honor of her late husband, Muzzafar 'Muzzi' Mirza, with a new gift of $1 million. Sue's commitment will support the center's new 5-year, $10 million Hope Ahead Campaign.

This campaign will solidify the Pancreas Center's place as the nation's leader in the field and bring meaningful benefits to patients at the Herbert Irving Comprehensive Cancer Center (HICCC).

"It is my hope - and I know it would be Muzzi's hope - that our family can help others," says Sue. "We know that the need is urgent. We need to expedite the funding for pancreatic research and care to advance the field forward now. Dr. John Chabot and the team at Columbia are poised to make that happen, and we are proud to support them as we have for the past 14 years."

Established in 2006, the Pancreas Center is a comprehensive, multidisciplinary center dedicated to research and treatment of pancreatic cancer, the third leading cause of cancer-related mortality in the U.S. with the lowest overall survival rate among all cancers. It is one of the toughest cancers to treat and has proven resistant to new generations of targeted and immune-based therapies.

"Sue's gift will have an outstanding impact here at the HICCC. Her long-standing support – and that of Muzzi's extended family and many friends - has helped continue the Pancreas Center's contributions as leaders in pancreatic disease, and it will ensure that our patients receive the highest standard of cancer care possible," said Dr. Chabot, executive director of the Pancreas Center and division chief of gastro-intestinal/endocrine surgery at NewYork-Presbyterian/Columbia University Irving Medical Center.

"I am proud of what the Pancreas Center has achieved, and I feel more determined than ever to carry on the work we still need to do."

CELEBRATING FIVE YEARS OF VELOCITY

Columbia's Ride to End Cancer

This year marked the fifth annual Velocity: Columbia's Ride to End Cancer, bringing together supporters of the Herbert Irving Comprehensive Cancer Center (HICCC) to raise money for innovative cancer research and care. Through the activity of their choice, running, cycling, swimming, or any other, participants showed their commitment to making a difference at the HICCC. One rider—a Columbia medical student—even spent her summer biking across the country to show her support. But no matter how we moved, we all did it towards a common goal.

Thousands of people, from cancer patients to cancer doctors, have participated in Velocity, raising over $6 million. Money raised has funded cancer care at the HICCC, as well as 15 Velocity Fellows conducting cancer research at Columbia.

Thank you to all those who participated and donated to this year's virtual event. Your contributions will support an outstanding group of Velocity Fellows who are tackling innovative and ambitious projects to advance cancer research and care. Additionally, we'd like to thank the Crimson Lion/ Lavine Family Foundation, Velocity Heroes Circle, and all of our sponsors that motivated participants to go the extra mile. Together, 548 of us across 58 teams raised over $1.1 million for the HICCC, and for that, we can't say thank you enough.

We can't wait for Velocity 2022, and we hope we'll continue to grow the Velocity family together.

PAYING TRIBUTE TO OUR COVID-19 HEROES

Next time you're on the corner of W. 168th Street and Broadway, take a look up, and you'll notice a new street name.

In the spring, Columbia University Irving Medical Center and NewYork-Presbyterian employees, elected officials, and community members gathered to commemorate the co-naming of 168th Street, between Broadway and Fort Washington, as Healthcare Heroes Way. The co-naming honors health care workers who have served on the front lines of the COVID-19 pandemic.

The movement to co-name the street began in 2020, with a community-led effort spearheaded by Daryl Cochrane. Cochrane is in his third term on Community Board 12 serving Washington Heights and Inwood, where he has lived for more than 20 years.

"I hope co-naming this street Healthcare Heroes Way is the first of many recognitions for those who saved our city and our community from one of the worst crises of our lifetime," says Cochrane. "These real-life heroes continue to be professional and compassionate in the face of uncertainty."

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