PULSE

PHILANTHROPY IN ACTION

UVA Health

SUMMER 2023

Harald Sontheimer, PhD

Unlocking the Mysteries of Alzheimer's, Epilepsy, and Neurological Disease

Plus:

Precision Medicine for Public Health

Critical Support for Pancreatic Cancer Research

The Promise of Phase 1 Clinical Trials

HONOR *the* FUTURE

THE CAMPAIGN FOR THE UNIVERSITY OF VIRGINIA

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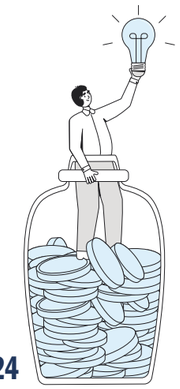

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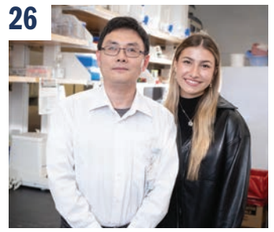
"With recent institutional investments and cutting-edge science, we could be where cancer research is now in a few decades—with a deeper understanding of neurogenerative diseases and more effective treatments."
–HARALD SONTHEIMER, PhD



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COE SWEET

UVA Health
SUMMER 2023

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TOP MARKS

UVA Medical Center is the No. 1 hospital in Virginia and in the top 50 hospitals nationally according to Newsweek's "World's Best Hospitals 2023." The news magazine rates UVA as the No. 42 hospital in the United States and among the top 250 hospitals in the world in this year's guide.

UVA HEALTH

A BEACON OF HOPE

To the UVA Health Community,

As I come to the end of my term as a member and Chair of the UVA Health Foundation Board of Trustees, I've been reflecting a great deal on the UVA Health system, its tremendous growth, and how it has become a true beacon of hope for patients and their families in the commonwealth and beyond. I initially connected with UVA Health on a personal level because of the life-saving treatments my son Matt received after a nearly fatal bicycle accident on the Blue Ridge Parkway near Charlottesville. The world-class care Matt received enabled him to regain his health and vitality and become a facial reconstructive surgeon specializing in facial paralysis and facial nerves. He now provides the same kind of care to his patients that he once received as a patient. This inspired me to expand my involvement and help ensure UVA Health continues advancing life-changing scientific research, offering outstanding patient care and treatment, extending community outreach, and providing the finest education possible for future nurses and medical professionals.

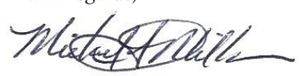
Serving and leading the Board has been a humbling experience. It has also been an absolute honor and has allowed me to "pay it forward," as they say. During my seven years on the Board, I have seen our national reputation evolve as a leading force in health care and research while overcoming the tragic and challenging circumstances of the COVID-19 pandemic. This includes being recognized as one of only 54 Comprehensive Cancer Centers nationwide and through our acquisition of three community hospitals in Northern Virginia. We are bringing hope to so many of our patients and their families, and nothing could be more important than this.

Under the leadership of EVP for Health Affairs Craig Kent, MD, UVA Health has created a bold vision for the future guided by our first-ever comprehensive strategic plan, *One Future Together: Health and Hope for All*. This detailed roadmap serves as a "unifying vision for UVA Health to become the nation's leading public academic health system and best place to work by transforming patient care, research, education, and engagement with the diverse communities we serve." Consider, for example, the recently announced $300 million Paul and Diane Manning Institute of Biotechnology. This institute will position UVA as a national leader in advanced medicine by assembling a team of pioneering researchers and clinicians and providing them with the resources needed to unlock the cures for many diseases. Furthermore, the strategic plan creates a robust and thoughtful framework for UVA Health to improve patients' health in our local communities, strengthen our foundation and research enterprise, and develop the next generation of medical leaders.

I am honored and thrilled to have served these past years with many great Board colleagues and the inspiring UVA Health leadership team Dr. Kent has assembled. I want to thank our clinicians, researchers, nurses, health care team, and students for their steadfast commitment to our patients and our critical mission. Importantly, I also want to extend my deepest appreciation to all UVA Health donors, as our successes would not be possible without your vision, passion, dedication, and generosity.

I value the years I have served the exceptional UVA Health family and look forward to seeing future accomplishments and successes. I'll end by saying that my family and I are, and will forever be, grateful to UVA Health.

Warm regards,



Michael S. Miller
Chair, UVA Health Foundation Board of Trustees

AMY JACKSON

NEWS BRIEFS

SHOES FOR HOOPS AND HOPE

UVA Children's oncology patients customized 27 pairs of donated Nike Air Force Ones.

UVA basketballers teamed up with UVA's youngest cancer patients to paint game-ready gear for a good cause.

THE PAINTING PARTY—a Shoes for Hope initiative organized by UVA fourth-year student Ben Herold—occurred in December. During the event, players and coaches from UVA's Women's and Men's Basketball teams helped some talented and courageous UVA Children's oncology patients customize 27 pairs of Nike Air Force Ones donated by the University's Nike coordinator.

UVA coaches later sported these works of art during Men's and Women's home basketball games in January. It was part of an annual Coaches vs. Cancer partnership between the National Association of Basketball Coaches and the American Cancer Society.

The customized hoops shoes were up for auction during UVA Children's annual Week of Giving, May 1-5. This included pairs worn and signed by UVA's Head Men's Basketball Coach Tony Bennett, Head Women's Basketball Coach Amaka "Mox" Agugua-Hamilton, President Jim Ryan, and Athletic Director Carla Williams. ■

UVA President Jim Ryan greeted some of the young cancer patients who attended the Men's Basketball game in January.

UVA's Women's and Men's Basketball players and coaches helped the talented UVA Children's oncology patients at the painting party in December.

UVA ATHLETICS; REILEY EMERSON PHOTOGRAPHY

UVA Children's, Sentara Martha Jefferson Hospital Partner to Expand Pediatric Neurodevelopmental and Behavioral Health Care

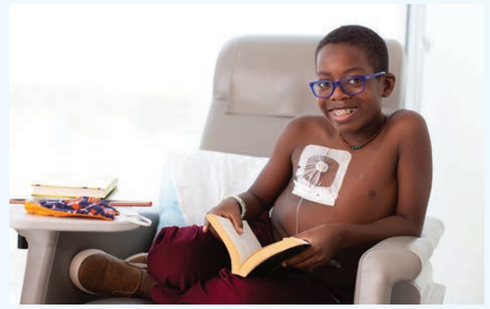
TO MEET THE GROWING NEED for pediatric neurodevelopmental and behavioral health care in Central Virginia, UVA Children's and Sentara Martha Jefferson Hospital are partnering to open a new outpatient clinic in Albemarle County. The **UVA Children's Neurodevelopmental and Behavioral Care** clinic will open at 2335 Seminole Lane in mid-2024, staffed by UVA Children's care providers and supported by a substantial investment from Sentara Martha Jefferson Hospital along with other generous gifts from private donors. The clinic will triple the number of pediatric mental health providers at UVA from 6 to 18, reducing wait times and expanding access by bringing together developmental pediatricians, pediatric psychologists, child psychiatrists, and integrative medicine specialists. "Community members have shared with us the need for easier access to mental and neurodevelopmental health care, and this clinic is designed to do that in a comforting and therapeutic setting," said Wendy Horton, chief executive officer of UVA Medical Center. ■

The new clinic will provide therapy and medication management for anxiety, depression, and other mental health concerns and support for patients on the autism spectrum and patients with developmental disabilities, ADHD, and learning or behavioral conditions.

COE SWEET

UVA Children's Patient is a CMNH National Champion

CHILDREN'S MIRACLE NETWORK HOSPITALS has named UVA Children's patient Kahmari Riedl one of 10 National Champions for 2023. The 13-year-old, who battles *gastroschisis*, credits UVA Children's for life-saving care. He will share his story throughout the year to help raise money and awareness for the 170 Children's Miracle Network Hospitals across the United States and Canada. As a Children's Miracle Network Hospital since 1988, UVA Children's has partnered with national and local organizations to raise more than $14 million for pediatric patients and their families. ■



COMMUNITY

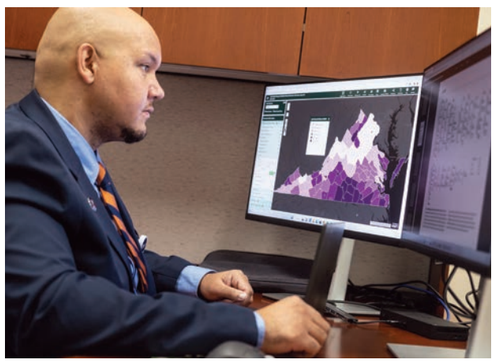
PRECISION PUBLIC HEALTH

UVA Health is using precision medicine to address health equity.

By Katherine Ludwig

IN THE LAST SEVERAL YEARS UVA Health has made tremendous strides in *precision medicine*—a revolutionary approach to patient care that takes into account the interplay of a person's biology, environment, and lifestyle. Using leading-edge tools and techniques such as *genetic* and *genomic sequencing*, *epigenetics*, and *bioinformatics*, our researchers are learning to better understand, measure, and target diseases on an individual level and making groundbreaking discoveries toward customized treatments for various cancers, diabetes, cardiovascular conditions, and more, including therapies that leverage a patient's immune system. They are giving physicians the ability to target the right treatments, in the right doses, to the right patients, at the right time for better outcomes.

Now UVA scholars and scientists are considering how those precision medicine tools and insights can be applied to further public health and equity, which is a primary focus of UVA Health's 2022–2032 strategic plan under the named priority "Cultivating Healthy Communities and Belonging for All." In addition, with a Grand Challenge Research Investment in Precision Medicine/Health under its 2030 'Great and Good' strategic plan, the University recently asked faculty to consider this research question: "How can we use the tools of precision health to improve outcomes and reduce disparities for communities and populations?"



UVA researchers like Keith Keene are investigating the interplay among biological, social, and environmental determinants of health disparities in Virginia.

In announcing support for this research opportunity, UVA Executive Vice President and Provost Ian Baucom said, "Grand Challenges provide an opportunity for faculty to come together across disciplines and schools to address some of society's most urgent questions. They let us build on our strengths and imagine a different future, one that directly helps communities."

The School of Medicine's new **Center for Health Equity and Precision Public Health (CHEPPH)** will be a major driver in turning that imagined future into reality.

DETERMINANTS OF HEALTH: FROM PROTEINS TO POLICIES

The new CHEPPH is led by Keith Keene, PhD, a geneticist and former postdoc at UVA's Center for Public Health Genomics who has returned to UVA from East Carolina University. Keene uses advanced DNA research techniques and genomics to understand increased risks for stroke, type 2 diabetes, and sudden infant death syndrome among minority populations. In addition to directing the CHEPPH, Keene is a professor in the UVA School of Medicine's Department of Public Health Sciences and resident faculty in the Center for Public Health Genomics.

Traditionally, people like Keene look at how a person's genetic makeup contributes to their increased risk for certain diseases, and that information may be used for targeted therapeutics. They use genetic association studies, DNA sequencing, and epigenetics. They also measure and study other molecular biomarkers including proteins and metabolites on individual and population levels to further analyze disease risk and treatment targets.

Keene says his position at the CHEPPH is to serve as a bridge between these biological approaches to precision medicine and the many other arts and sciences disciplines trying to understand why certain populations suffer a greater health burden than others and what can be done about it. Understanding and addressing the interplay between biological factors and the social and environmental determinants of health and disease is key to increasing health equity.

"We need to work together more than separately," says Keene. "For example, we can bring in engineers and architects to look into how access to sidewalks and trails relates to type 2 diabetes risk. We can have environmental experts assess pollution exposures. We can look into how insurance policies, Medicare, and Medicaid contribute to health inequities, and we can go a step further and look into issues of social justice, education, and institutional racism," he says. "There are so many avenues to take."

Keith Keene, PhD, directs UVA's new Center for Health Equity and Precision Public Health.

Keene says partnering with community outreach and engagement experts and developing strategies to increase diversity and inclusion in the health care workforce are also vital to improving health equity in the communities UVA Health serves.

"If you look at the data, individuals who receive their health care from people who look and talk like them have better outcomes," says Keene, "So let's figure out ways to get a more diverse public health and biomedical workforce. That includes a more diverse student population, which starts with exposing diverse students, as early as elementary and middle school, to these career paths. These are all opportunities."

BETTER HEALTH CARE FOR ALL

At the end of the day, UVA Health's efforts to advance precision medicine and precision public health are about pushing clinical care forward and giving patients everywhere equitable hope and opportunity for better health and disease prevention and treatment.

"I see a future where we have the ability not to treat individuals with a one-size-fits-all approach, but to tailor our care in ways that take multiple contributing factors—genetic, environmental, social—into account. It's a harder job. But it's a job worth doing and doing well," says Keene. ■

Key Terms in Precision Medicine

Biomarker
A biological characteristic objectively measured and indicative of normal biological processes, disease, or a therapeutic response

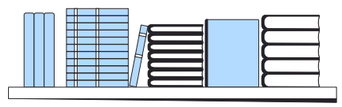
Bioinformatics
Computational methods and tools for understanding and analyzing large sets of complex biological data

DNA sequencing
Analyzing an entire gene, or set of genes, to identify variants (mutations) in an individual's genetic code

Epigenetics
The study of how behaviors and environment can modify the way a person's genes are expressed or work

Genetics
The study of how individual genes or groups of genes affect health and disease

Genomics
The study of a person's complete set of genes and genetic material



COE SWEET

COE SWEET

IMPACT

LINES OF HOPE

The Farrell family makes a $1.3 million gift to pancreatic cancer research in honor of the late Thomas F. Farrell II, a UVA alumnus and former rector of the Board of Visitors.

By William Cocke

PANCREATIC CANCER IS on course to become the second leading cause of cancer deaths in the U.S. Most pancreatic cancers develop without any detectable precancerous lesion. Due to aggressive growth and the lack of symptoms early on, 85% of patients are not treatable with surgery by the time their cancer is detected. Current chemotherapy options have limited success in these patients, and survival is typically 3–9 months. New treatments are greatly needed for all patients with pancreatic cancer.

Hope for a cure is the goal, but in the meantime, cancer programs that lead to novel research and therapies that add cherished months—time to spend with family, bounce a grandchild on a knee, or play a round of golf on a warm spring day—can be enough.

When Thomas F. Farrell II (Col '76, Law '79) was diagnosed with pancreatic cancer in 2020, he began treatment at other respected medical institutions but eventually decided to come to the UVA Cancer Center. Farrell, who lived in Richmond, was the executive chairman of Dominion Energy at the time of his death. He had a deep, years-long connection to UVA through service and family. He served on the Board of Visitors from 2001 to 2009 and was the rector from 2005 to 2007. His wife, Anne Garland (Ed '77), sons Peter (Col '06) and Stuart (McIntire '07), daughter-in-law, Mary Farrell (Col '07), and brother Timothy (Col '78) all attended the University.

Peter Farrell with Todd Bauer, MD, chief of the division of surgical oncology.

COE SWEET

"We're always going to be very thankful for the respect and dignity and care they gave him," said his son, Peter, of their family's experience at the Cancer Center. "And the best part about it is, it's the kind of care they give to everybody."

Exceptional patient care has long been a hallmark of UVA Cancer Center. In 2021, it earned a prestigious designation from the National Cancer Institute as a Comprehensive Cancer Center, moving it into an elite group of 54 of the most outstanding cancer programs in the nation. It is the first Comprehensive Cancer Center in Virginia. Part of that designation requires a robust, innovative research program. As the Farrell family discovered, UVA is conducting some of the most exciting and promising pancreatic cancer research in the country.

The Farrells decided to make a $1.3 million gift to support and expand that research.

"When you have a good foundation to begin with and you can help provide more resources, it only compounds," said Peter Farrell.

Peter worked with his uncle, Tim, to combine two family funds to maximize their giving potential.

Tim Farrell said, "I approached my nephews Peter and Stuart with the idea that if you guys gave a certain amount and I give a certain amount, we could pull the money together and do something much more meaningful," he said.

Peter added that when his uncle initially brought up the idea, the family investigated donating to other cancer centers before discovering the truly interesting pancreatic cancer research happening at UVA.

"Unfortunately, when you have a family member who has cancer, everybody in the family becomes an amateur cancer researcher almost overnight," Peter Farrell said. "We soon realized that UVA had some good pancreatic cancer research. We knew then that we wanted to do something for UVA, especially given how they were so good to dad at the end of his life."

Thomas F. Farrell II, a former rector and member of the UVA Board of Visitors.

"We knew then that we wanted to do something for UVA, especially given how they were so good to dad at the end of his life."

—Peter Farrell

The Farrell family will conduct a yearly review to fine tune the levels of support for the exciting research programs at UVA. A big portion of the initial funding from the Farrells' gift will support work in the lab of Todd Bauer, MD, chief of the division of surgical oncology and a leading researcher of pancreatic cancer. Two other investigators who are doing novel work in pancreatic cancer at UVA will be funded as well.

Kimberly A. Kelly, PhD, a biomedical engineering professor at UVA's School of Engineering and Applied Science, is developing a drug called ZB131, an antibody designed to target a protein called plectin found on the surface of multiple types of cancer cells. She and her team at ZeilBio, Inc, the corporate offshoot of her research, have moved this potential cure for pancreatic cancer into human clinical trials.

In the Cancer Center, Larry Lum, MD, and his colleagues are developing alternative treatments that empower human immune systems to recognize and destroy cancer. Dr. Lum's method of immunotherapy enlists T cells to attack cancers by redirecting their killing potential and linking two antibodies to create a bispecific antibody that binds to both T cells and tumor cells. Infusions of the targeted T cells kill tumors and release proteins that vaccinate patients against their own cancer.

As a surgeon and a researcher, Dr. Bauer is positioned to attack the disease from clinical and scientific angles. In 2013, he started the UVA High-Risk Pancreatic Cancer Clinic, a

DAN ADDISON, UNIVERSITY COMMUNICATIONS

unique clinic developed to identify patients at high risk for cancer and then carefully monitor them with MRI and endoscopic ultrasound. The clinic serves patients with a strong family history of pancreatic cancer and patients with a precancerous cyst called a neoplastic cyst.

"If we know they're at increased risk for developing pancreatic cancer and can identify it early, we can offer them potentially curative surgery," said Dr. Bauer.

In addition to his clinical duties, Dr. Bauer spends about half his time leading a research laboratory that studies pancreatic cancer to develop new treatments for patients. He's currently pursuing two promising lines of study.

"Since starting the lab 18 years ago, what became apparent to us was that we needed to study in the lab a model system that would closely translate to the patients we were taking care of," he said.

"Based on evidence that was out there in the scientific community, we decided that after we removed their cancer and finished studying the tumor in pathology, instead of discarding the tumor, with their consent, we would take that tumor and implant it into mice. This would allow us to study real human pancreatic cancers, and what we learned from those tumors would be much more translatable to patient care."

Dr. Bauer explained that every one of the patients he sees has a genetically unique cancer of the pancreas. What he's developed, using the mouse model, is a human pancreatic cancer tissue bank. By improving preclinical model systems, he's doing work that is crucial to identifying therapies that could translate into success in the clinic.

"There's the whole seed and soil hypothesis to cancer," he said. "If the cancer cells are the seeds, but the behavior of that seed, the cancer cell, is dependent upon the soil it's growing in or the organ or tissue it's growing in, the best way to study the behavior of pancreatic cancers is to put those cells into the mouse pancreas. Since we started that model, we have now collected about 30 different cancers from different patients, and we can study these genetically unique tumors and understand that they behave differently. The genes and the molecular pathways that drive tumor growth will differ from patient to patient. That's an incredibly powerful thing to be able to do."

Dr. Bauer, Lab Manager Sara Adair (seated), General Surgery Resident Michaela Cunningham, MD, and Research Scientist Tom Wei, PhD.

JENEENE CHATOWSKY

"Philanthropic support allows us to take a great idea, get started on the project, and get some exciting results that lead us towards something new."

—Todd Bauer, MD

Dr. Bauer is also busy identifying novel therapies with single-cell sequencing and another powerful genetic tool called CRISPR. Single-cell sequencing is cutting-edge technology that allows his lab to study the genes that are activated in individual cells in a tumor. "We can simultaneously study both the cancer cells and the other microenvironment cells surrounding the tumor, such as blood vessels, pancreatic cells, liver cells, and immune cells," he explained. "Integration of this highly technical work and analysis by data science experts at UVA provides us with a map of the interaction between the tumor cells and microenvironment cells that drives tumor growth and metastasis."

CRISPR technology enables researchers to turn off genes and identify the effect on pancreatic cancer growth. This can be done one gene at a time for all cells or by targeting up to 5,000 different genes simultaneously (one gene only per cell in millions of cells). "Using this CRISPR screening technique, we have identified several new genes that may play a critical role in pancreatic cancer growth and metastasis," said Dr. Bauer.

"We are currently testing the role of genes in tumor cells and in the microenvironment of the pancreas and the liver, which is the leading site of metastasis. We predict that the combination of single-cell sequencing and CRISPR screening and complex data analysis methods will identify novel treatments for pancreatic cancer," he said.

Dr. Bauer's lab was one of the first to conduct this type of research, and he believes it's uniquely positioned to advance understanding of pancreatic cancer. "We are one of a handful across the country that has the capability of doing this research," he said. "We've been able to recruit other researchers into different departments in engineering and microbiology so that we've started to build a community of researchers interested in pancreatic cancer. One person will be a metabolism expert, and another a bioengineering expert. Now that we've recruited more and more people, other researchers who had not historically studied pancreatic cancer, we have a sort of momentum. It's enabled us to grow the overarching pancreatic cancer program here at UVA in terms of different laboratories attacking the scientific question from different angles."

SUCCESS BREEDS SUCCESS

Dr. Bauer is grateful for support from the Farrell family, which provides a crucial bridge to other funding sources. "This type of philanthropic support allows us to take a great idea, get started on the project, and get some exciting results that lead us towards something new," he said. "Then we can apply for an NIH grant, and they can see that this is a great idea, and our preliminary findings support our hypothesis. Everybody wants to cheer for the winning team. It feels good to be part of a team that's going to make a difference."

Peter Farrell couldn't agree more. From 2012 to 2018, he served in the Virginia House of Delegates, representing the 56th district. "I was in the legislature for a while, so I know a bit about the ability of private dollars in helping to leverage public dollars," he said. "I hope that happens in this case. The biggest barrier to research is lack of money."

"I think dad would like what we're doing for a lot of reasons," he continued, "not only because it's UVA—and UVA meant the world to him—but also because it's good for people who live in Virginia, too. And I think he would have appreciated that. We want to help. We hope they can discover some new genetic information and new treatment options. That's what we're hoping for." ■

For more information on how to support pancreatic cancer research at UVA, please contact Corley Raileanu, Executive Director of Development, Cancer Programs, at corley@virginia.edu or 770.851.1904, or call 800.297.0102.

CLINICAL CARE

MARKING MILESTONES IN STEM CELL TRANSPLANTATION

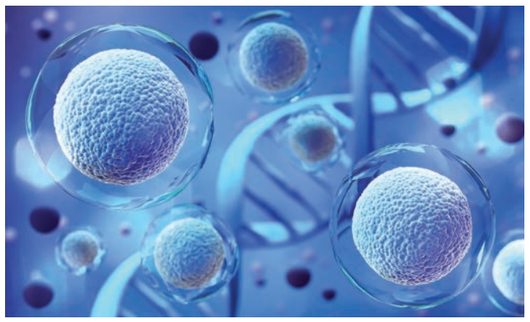
UVA Health celebrated its 1000th stem cell transplant and treatment advances.

By Katherine Ludwig

PERFORMING ITS 1000TH stem cell transplant is just one of many reasons to recognize UVA's Stem Cell Transplant Program and its world-class researchers and clinical teams, who have made stem cell transplantation safer, more accessible, and more effective in the treatment of deadly blood cancers and other diseases. Stem cell transplantation and cellular therapies are life-saving procedures for many children and adults in our community, and private philanthropy has played a critical role in UVA's leadership in this area.

WHEN A TRANSPLANT OFFERS HOPE

Stem cell transplantation is curative for many children and adults with blood-related cancers such as leukemia, multiple myeloma, and lymphoma. In a typical case, healthy stem cells harvested from a donor are transplanted to replace a patient's diseased bone marrow cells. The goal is for the transplanted cells to begin making new healthy blood cells. Donors need not be relatives but must be tested for immune system compatibility, and many patients rely on donor registries to find a match. For certain diseases and cases, UVA may perform an *autologous* transplant of stem cells harvested from the patient themselves before they were treated with high doses of chemotherapy or radiation.



Mike and Valerie Kirkman are donors to UVA's Stem Cell Transplant Program. Mike received a successful stem cell transplant at UVA in 2020.

Since UVA's Stem Cell Transplant Program began in 2012, one of its most significant achievements is the ability to find a donor for almost everyone today. That was not the case ten years ago when identifying a donor with common ancestry—a key to immune system compatibility—was particularly difficult due to the lack of diversity among donor registries. Expanding the pool of donors has been a focus of UVA's Chief of Hematology and Oncology Karen Ballen, MD, who has directed UVA's Stem Cell Transplant Program for the last several years and is an international expert in the field. By starting one of the first umbilical cord blood banks in the United States, Ballen helped significantly increase stem cell transplant accessibility. That's because cord blood cells are what Ballen calls "naïve" from an immune standpoint, meaning they don't have to be perfectly matched to a patient.

Karen Ballen, MD, Chief of Hematology and Oncology.

Other key developments of the program include using *haploidentical* or "half" transplantation—enabling more half-matched family members (parents and children) to donate to each other. More recently, UVA began collaborating with the Be The Match donor registry on a clinical trial to use volunteer donors that are not perfect matches. In addition, UVA Comprehensive Cancer Center's clinical trials are advancing efforts to prevent and treat infection following stem cell transplantation, reduce and treat a devastating complication called *graft-versus-host disease* (GVHD), and reduce relapse after the transplant.

It's because of UVA Cancer Center donors like Mike and Valerie Kirkman that UVA can push the boundaries of stem cell science and translate research discoveries into groundbreaking new treatments within a few years if not months. Mike received a stem cell transplant in 2020 under the direction of Dr. Ballen.

"I had developed a great deal of confidence in her and the transplant went well," said Kirkman. "Our gift was a pretty easy decision. I simply wanted to give back something to honor those that had saved my life."

In acknowledging the importance of support like the Kirkmans', UVA Cancer Center Director Tom Loughran, MD, said, "Private philanthropy helps our researchers speed the pace of their scientific studies and empowers them to compete more successfully for large federal grants and other funding."

WHAT'S NEXT?

UVA Cancer Center's researchers and health care professionals continue to prioritize increased patient access to stem cell transplant care, prevention and treatment of GVHD, reduced relapse, and further expansion of cellular therapies. The Stem Cell Transplant and Cellular Therapy team recently welcomed a new program director, John Wagner, MD, and is actively recruiting additional experts and faculty who can further build the Center's leadership in this area.

"I think the future is bright, both for our program and for the field as a whole," said Dr. Ballen. ■

To learn how you can support UVA Cancer Center's Stem Cell Transplantation and Cellular Therapy Program, please contact Ashley Hanel, Senior Associate Director of Development, Cancer Programs, at ahanel@virginia.edu or 704.796.2608, or call 800.297.0102.

JACKSON SMITH

UNLOCKING THE MYSTERIES OF NEUROLOGICAL DISEASE

Harald Sontheimer, PhD, discusses breakthrough, transformational research at UVA.

By Rick Kessel

COE SWEET

Our nation is at an inflection point in the battle against Alzheimer's, dementia, and related neurological disorders. With millions of patients and families impacted by these conditions, and an aging population, we urgently need new treatments and therapeutic options. UVA Health's 2022–2032 strategic plan, *One Future Together: Health and Hope for All*, addresses these issues by strengthening the university's translational research enterprise and becoming a hub for scientific discoveries that will ultimately lead to improved clinical care. Additionally, UVA's $75 million Grand Challenges Research Initiative in Neuroscience is providing extensive resources to understand the brain and improve outcomes for those dealing with neurodegenerative diseases.

Harald Sontheimer, PhD, the Harrison Distinguished Teaching Professor of Neuroscience, who joined UVA in 2021 as chair of the Department of Neuroscience, is leading UVA to the forefront of neuroscience discoveries and new treatments. His groundbreaking discoveries on the role of astrocytes in Alzheimer's pathology are bringing significant new understanding of the disease that may lead to novel treatments and therapies. We recently asked Sontheimer to discuss his transformational work and that of his fellow neuroscience researchers at UVA.

Q. Your pioneering work focuses on disorders and diseases of the brain, including epilepsy, Alzheimer's, tumors, and more. Could you summarize your research on brain function?

A. I work on *astrocytes*—a primary type of glial cell in the brain whose function is to support and maintain our neurons. I published my first paper on them in 1988 and have continued studying their role in several disorders. They're the cells that give rise to gliomas or primary brain tumors, and we have evidence to suggest glia may even drive seizures in the brain.

Importantly, in the last five or eight years, we've focused on the role of these cells in Alzheimer's disease. We hypothesize that the buildup of protein aggregates characteristic of Alzheimer's disease—either *amyloid beta* aggregates or *tau tangles*—is more toxic to astrocytes (specifically astrocytes that are in contact with blood vessels) than to neurons.

The role of blood flow in the brain is critical to healthy function. What we and others have discovered in the last 15 years is that regulating blood flow in the brain adjusts to meet the regional demands of neurons. For example, when reading a book in a quiet room, the visual cortex consumes more energy than the auditory cortex. So the brain shifts the blood flow to deliver energy as glucose and oxygen to the part of the brain that needs it most at that time. It was also discovered that astrocytes are instrumental as they touch the blood vessels and release specialized molecules that regionally dilate or constrict the blood vessel. They shunt blood flow to that brain region by constricting it and moving it to where it is needed most.

Where this connects to Alzheimer's is that as the amyloid protein builds up along blood vessels, the astrocytes become compromised and no longer regulate blood flow properly. Our laboratory has shown in animal models that this impairs blood flow, like in a stroke. The neurons don't get the energy they need and may die as a result. We can see that amyloid is toxic to the glial function, leading to neurotoxicity and neural death, which causes the hallmark symptoms of Alzheimer's, such as loss of memory and cognitive ability.

UVA is a scientific leader in neuroimmunology—harnessing the brain's immune function to defeat neurological diseases.

Q. UVA identified the brain and neuroscience as one of its Pathways to Research Preeminence in its 2030 strategic plan. Please tell us about the vision to grow and accelerate research in these areas.

A. Studying the biological and neuroimmunological causes of Alzheimer's and other neurodegenerative diseases is a strength here at UVA. Across UVA Grounds, we currently have about 20 NIH-funded researchers working in this area. Still, to accelerate our work and significantly impact patients in less time, we need to increase that number to at least 50 funded investigators—an achievable goal that will further enhance our outstanding reputation.

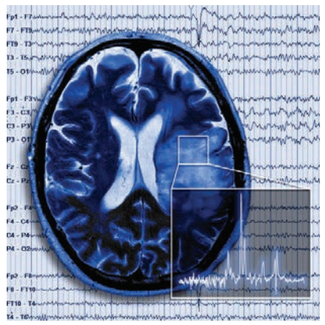
"We want UVA to become a destination—both for patients who suffer from Alzheimer's disease and for researchers who are dedicated to studying it."

—Harald Sontheimer, PhD

Neuroscience research is at a point today where cancer research was several decades ago. With recent institutional investments and cutting-edge science, we could be where cancer research is now in a few decades—with a deeper understanding of neurogenerative diseases and more effective treatments. Our neuroscientists look at the brain from many angles, whether it is on the cellular, molecular, developmental, behavioral, genetic, biochemical, immunological, or pharmacologic levels. That's what defines neuroscience. It is multidisciplinary by nature.

Furthermore, most neuroscientists aren't trained in neuroscience. I'm trained in biophysics, and others are trained in chemistry, biology, immunology, or psychology. It's game-changing to bring together the best neurochemists out of the chemistry department, immunologists and biochemists who study the brain, neuro-oncologists, and many others, and provide an effective structure for them to collaborate. We want UVA to become a destination—both for patients who suffer from Alzheimer's disease and for researchers who are dedicated to studying it. Those things go hand in hand.

The fabric that holds this together at UVA is our Neuroscience Graduate Program (NGP), which is part of our biomedical



Scientists at UVA are uncovering radical insights about brain function and pathology with wide-ranging implications for addressing disorders from dementia to Parkinson's disease and multiple sclerosis.

graduate program. It is different from others in that it genuinely lives across Grounds. NGP brings students together with their faculty mentors to create a gravitational pull of collaboration that has proven very effective. Additionally, with UVA launching the new Manning Institute of Biotechnology, we will have even greater research capability in the coming years.

Q. Your research is also relevant to epilepsy and brain tumors. What have you discovered in these areas?

A. I'm incredibly excited about our epilepsy research. We believe we have discovered some molecular changes that cause a brain to become epileptic. About 60% of all epilepsy cases are "acquired," in which the person develops epilepsy following a brain injury as a child or young adult—and 15 or 20 years later, they develop seizures. That injury might have caused a brain infection, which we know is one of the most common causes of epilepsy in developing countries. A person may get meningitis, and the virus clears, but years later, they develop epilepsy. Our laboratory has a model of this kind of viral infection to study these forms of acquired epilepsy. This provides a window into how a normal brain changes into one with the disease.

Our laboratory's recent research has identified a mechanism that could allow us to address not only acquired epilepsy but other forms as well. We observed a change in a brain structure called *perineuronal nets*, a type of protein that coats the outside of neurons when inflammation is present in the brain. We found that an essential part of the brain's anti-inflammatory response breaks down these perineuronal nets around the neurons. The result is that the brain cannot inhibit overactivity, and this leads to seizures. This knowledge of how the process works has us thinking about how we might treat epilepsy not with antiepileptic drugs but with enzyme inhibitors—drugs that are currently used for other indications.

I'm also working with a team of UVA Comprehensive Cancer Center (UVACCC) scientists, including Drs. Roger Abounader and Hui Zong from the Department of Microbiology, Immunology, & Cancer Biology and BJ Purow in Neurology to develop a novel approach to treating brain tumors. Rather than treating the tumor, we would treat the surrounding brain tissue. It turns out that the tumor can't grow unless it destroys the brain tissue that surrounds it. We each have come up with unique findings on how the tumor takes over the surrounding brain tissue. This team will focus its research on treating the surrounding healthy brain tissue to contain the tumor's growth. Our team approach will give us an edge when applying for funding from the National Cancer Institute for further research in this area.

Q. How is laboratory research translating to new clinical treatments in these disease areas?

A. Ultimately, our goal is to put our discoveries into the hands of clinicians to do human trials. This is where partnerships between clinicians and scientists are so important, and philanthropy helps facilitate those efforts.

One of the challenges for our clinical colleagues is they don't have the bandwidth to take time off to think about research or writing clinical trial protocols. They can more easily participate in our research teams when they have support to protect their time and dedicated resources. We must consider ways to incentivize these teams to work toward new treatments, and involving our clinicians is essential.

I fully expect that we will be treating Alzheimer's disease with immune therapies in the future, possibly by modulating the body's immune system. We will need to bring those trials in-house and have clinicians on board to enroll patients in trials here at UVA rather than elsewhere. I think philanthropy will be a catalyst for these things to happen.

Q. The idea that Alzheimer's will be treated with immunotherapy drugs is inspiring. What other promising discoveries do you envision at UVA?

A. The next ten years will be game changing as many brilliant people are working on this research here at UVA, and many discoveries will be forthcoming. There are exciting implications regarding the role of microglial cells and infiltrating peripheral immune cells as well as abnormal blood vessels in Alzheimer's pathology, the connection between cholesterol and the risk of Alzheimer's, and connections we've observed across patients with Alzheimer's and seizures. These new ideas are being rigorously tested in our neuroscience laboratories.

These new approaches are critical if we are going to make meaningful advances. I am convinced the lack of progress and disappointing results from the ongoing big pharma clinical trials are primarily because of the focus on the same protein, amyloid beta, as the cause of the disease. It was prematurely assumed that treatments clearing amyloid beta from the brain would clear the disease, but that has mostly failed. Even the approved drugs have minimal effects on a patient. We have to focus on sound fundamental science to study disease mechanisms before we jump to treatments. ■

"Ultimately, our goal is to put our discoveries into the hands of clinicians to do human trials. This is where partnerships between clinicians and scientists are so important, and philanthropy helps facilitate those efforts."

—Harald Sontheimer, PhD

To learn more about how you can support Harald Sontheimer's groundbreaking research and accelerate treatments for tomorrow's patients, please contact Kelly Reinhardt, Director of Development, Neurosciences, at ksr2h@uvahealth.org or 434.924.8432, or call us at 800.297.0102.

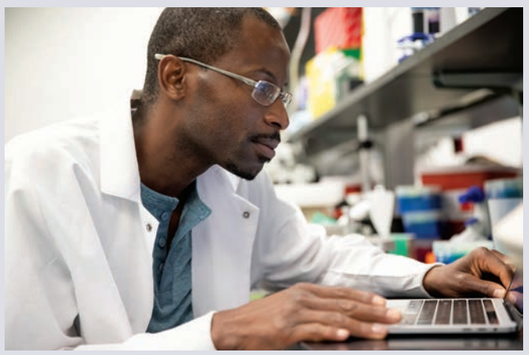
How Philanthropy is Mobilizing the Next Generation of UVA Neuroscientists

By Harald Sontheimer, PhD

I have seen the impact of private philanthropy in my prior academic experience and here at UVA in the last two years. Support from our donors is an essential catalyst if you want to do truly innovative research. As the chair and spokesperson for the younger generation of scientists, I have worked as a cheerleader and fundraiser to direct money to fund their research.

You typically can't get federal money to fund high-risk, high-reward projects. It's too big a gamble for the federal funders in the early stages of research. However, in many cases, we receive funding from a donor, and a year or two later, we receive an NIH grant. So seed funding from a donor could turn a $150,000 investment in research into a $3 million line of research that is genuinely groundbreaking.

One of our anonymous private family foundation supporters, led by visionary philanthropists who support this type of cutting-edge, early-stage research, has been one of the most steadfast and committed donors to neuroscience across the University over the past decade. Those at the foundation understood the vision and made early investments in the work of Drs. Heather Ferris, John Lukens, Alban Gaultier, Ukpong Eyo, Jung-Bum Shin, and many others. Their support funded new research for a year or two and acted as a catalyst for discovery. This has led to multiple large-scale grants for each of these investigators. That's the type of breakthrough we want to pursue in Alzheimer's research here at UVA. I think there are tremendous opportunities for our donors to make strategic gifts to enable our scientists to do pioneering work. ■



Private support has enabled UVA neuroscientists like Ukpong Eyo, PhD, to pursue groundbreaking discoveries in the study of neurodegenerative diseases.

CONTRIBUTED BY HARALD SONTHEIMER

DAN ADDISON, UNIVERSITY COMMUNICATIONS

RESEARCH

PHASE 1 CLINICAL TRIALS

Getting experimental treatments to cancer patients as soon as possible.

By Katherine Ludwig

CANCER CLINICAL TRIALS typically have four phases. Phase 1 trials are the earliest to establish a drug's safety and dosing and are often the first-in-human tests of new therapies after laboratory experiments on cells or animals. For many patients with advanced cancer, treatments tested in UVA's phase 1 clinical trials offer new, and sometimes last, hope. These are experimental drugs and therapies first discovered and developed at UVA or by industry partners with the potential to extend and improve the quality of current and future cancer patients' lives in Virginia and beyond. Because of their high risks and expense, however, UVA currently offers only a few phase 1 trials. Fortunately, that is poised to change.

In June 2022, Dr. Tom Loughran, director of UVA Cancer Center—one of only 54 in the country and the first in Virginia to be designated a Comprehensive Cancer Center by the National Cancer Institute—identified establishing a fully realized Phase 1 Clinical Trials Program as a natural progression and crucial next step in the Center's translational research goals. He then announced the appointment of Matthew Reilley, MD, as the program's inaugural director. Dr. Reilley is a GI medical oncologist and phase 1 clinical investigator who helped grow the Center's phase 1 clinical trials portfolio and significantly increased the Center's national presence as a phase 1 center.

Matthew J. Reilley, MD directs UVA's Phase 1 Clinical Trials Program.

In his announcement, Dr. Loughran said, "With the recent achievement of Comprehensive status, we believe this is an opportune time to formalize this program to further encourage and enable the translation of UVA science into the clinic and continue to develop our rapidly growing relationship with a variety of pharma and biotech partners."

UVA HEALTH

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IF YOU BUILD IT

Phase 1 clinical trials are labor- and resource-intensive. They require enrolling only small groups of patients at a time and awaiting sufficient safety intervals in between. They require investigations of multiple tumor types and much more flexible and dynamic scheduling and intensive monitoring of participants during treatment sessions that can last 8–12 hours. Because of this complexity, participation slots in phase 1 trials are few and fill up quickly. Dr. Reilley said he receives numerous calls each week from patients seeking access to experimental drugs and treatments.

"We want to get new therapies into the clinic and to patients as quickly and efficiently as possible, especially for patients who have exhausted other options," said Dr. Reilley.

Doing so at UVA will take more time, funding, and outreach. A successful Phase 1 Clinical Trials Program must have dedicated leadership (physicians, nurses, and research coordinators), and those leaders must have adequate time and funding to develop and manage the program. For example, in addition to seeing his own patients and overseeing the transition of the Center's current phase 1 trials to this new umbrella program, Reilley is busy building relationships with oncologists across Virginia to identify patients who could benefit from UVA's phase 1 trials. Cultivating these community partnerships will be key to establishing a fully realized Phase 1 Clinical Trials Program at UVA and helping even non-UVA providers care for their patients by matching those patients with the experimental trials and treatments that could extend or save their lives.

UVA Cancer Center is growing its Phase 1 Clinical Trials Program to advance translational research.

"We want to get new therapies into the clinic and to patients as quickly and efficiently as possible, especially for patients who have exhausted other options."

—Matthew J. Reilley, MD

Many peer institutions with strong phase 1 clinical trials programs also have committed infusion spaces for treating phase 1 patients—from dedicated infusion chairs to entire infusion units with their own support staff. Investing in staffing, infrastructure, and foundational programming is where private philanthropy can significantly impact the development of a successful Phase 1 Clinical Trials Program at UVA.

CRITICAL SUPPORT

Philanthropy is vital to establishing a Phase 1 Clinical Trial Program at UVA Cancer Center and ensuring its long-term success—something two recent donors immediately recognized. Both took advantage of the Cancer Center's gift-matching program to double the impact of their support.

"When Dr. Loughran identified establishing a Phase 1 Clinical Trials Program as a top priority for the Cancer Center, I knew I wanted to contribute," said Adele Hoffmeyer, who is a long-time supporter of UVA Cancer Center with her husband, Rich, and chair of the center's Advisory Board.

The importance and urgency of building phase 1 trials capacity similarly resonated with donor and Advisory Board member Colleen J. Grant. "With a Phase 1 Clinical Trials Program, the Cancer Center can offer hope to many more patients and speed UVA's development of new cancer treatments. It's incredibly exciting and inspiring," she said.

Another recent gift that is critically important to the Cancer Center's emerging Phase 1 Clinical Trials Program is Paul and Diane Manning's $100 million contribution toward UVA's building of an Institute of Biotechnology. This institute will advance UVA's development of new medicines and therapies, particularly cellular and gene therapies and treatments for cancers that are prominent in the Cancer Center's catchment area, such as colon, breast, and lung. The Cancer Center's Phase 1 Clinical Trials Program will offer the first step in validating these new cancer-related treatments and getting them into patients.

"We have an excellent track record with industry partners, but what we really want to grow is internally developed therapies," said Reilley. "This new biotech institute will enable the initial translational steps in manufacturing new treatments at UVA that we can test in Phase 1 trials. That's the real excitement."

"With a Phase 1 Clinical Trials Program, the Cancer Center can offer hope to many more patients and speed UVA's development of new cancer treatments. It's incredibly exciting and inspiring."

—Colleen J. Grant, UVA Cancer Center Advisory Board member

LOOKING TO THE FUTURE

As for growth targets, Reilley said the hope and intention are to double the size of the Center's Phase 1 Clinical Trials Program over the next three to five years.

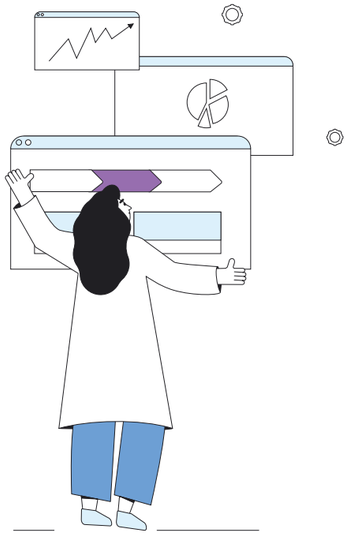
"We'd like to enroll 100 cancer patients annually in phase 1/early-phase trials," he said, "with at least half of those rooted in UVA-based science."

In many ways, Reilley says building a Phase 1 Clinical Trials Program epitomizes the notion of investing in hope.

"If we can push the limits to find better therapies and give patients the opportunity to receive them, even if it's not going to work for everyone, that's a success," he said. ■

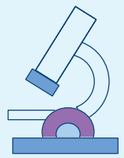
LEARN MORE

about UVA Cancer Center's Phase 1 Clinical Trials and how you can support this vital program by contacting Corley Raileanu, Executive Director of Development, Cancer Programs, at corley@virginia.edu or 770.851.1904, or call us at 800.297.0102.



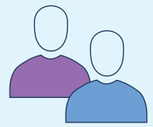
Phases of Clinical Trials

Preclinical
Cell or animal studies in the lab



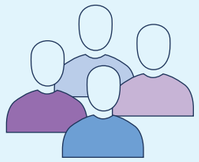
Phase I
Determines safety and proper dosing (15-50 people)

Phase II
Determines effectiveness and side effects (100 or fewer people)



Phase III
Compares new treatment to standard treatment (100s of people)

Phase IV
Monitors long-term effectiveness and side effects (1000s of people)



PHILANTHROPY

GIVING THAT BENEFITS UVA HEALTH AND YOUR FAMILY

By Erin Hughey-Commers

YOU'RE PASSIONATE ABOUT making a difference through life-changing patient care and research, but you don't have immediate resources to make a gift. You're also unsure what will happen with the economy and need to save for retirement. Your family comes first, and they may need everything. We hear these common concerns at UVA Health, but they are not insurmountable. There are ways to make a gift that can save lives, alleviate income and estate taxes, and, at the same time, help take care of your family. These **planned gifts** are philanthropic solutions that benefit everyone. They allow you to engage a tax-burdened asset or use a charitable gift vehicle that benefits you and UVA Health. A planned gift allows you to do one or more of the following:

- Retain assets you might need now or in retirement
- Engage illiquid assets in a tax-efficient way
- Pay you or loved ones an annual income
- Maintain the flexibility to modify your gift if your circumstances change

Planned gifts provide current and/or future support to UVA Health, sustaining the work of our health care providers and researchers and creating a positive ripple effect on thousands of patients and families in the years to come. Here are a few examples of how you can accomplish your personal and philanthropic goals with a planned gift.

GIVE WITH FLEXIBILITY

In times of economic uncertainty, there can be peace of mind in knowing that your gift is modifiable should your financial situation change. Bequests and beneficiary designations are among the most flexible ways to support UVA Health. To make a bequest, simply include a provision in your will or living trust giving UVA Health a specific amount or a percentage of your residuary estate. You can name UVA Health as a beneficiary of your life insurance policy, retirement plan, or bank account by completing a simple beneficiary designation form provided by your life insurance company, retirement plan administrator, or financial institution. This process can be done without assistance from an attorney. The amounts you leave to UVA Health will pass free of estate tax and, in the case of retirement assets, income tax.

GIVE FROM YOUR IRA

If you are at least 70½ years old, you are eligible to make **qualified charitable distributions** (QCDs) of up to $100,000 annually from your IRA.

QCDs that are used to make outright gifts are excluded from federal taxable income and count toward required minimum distributions. As of 2023, you can make a one-time-only QCD of up to $50,000 to fund a new charitable gift annuity or charitable remainder trust.

GIVE A GIFT OF PROPERTY

A gift of real estate may allow you to make a greater investment in the future of UVA Health and the patients we serve and may have tax and other financial benefits. Depending on your goals, there are several options for making a gift of real estate. Giving your property outright to UVA Health or using a gift of real estate to fund a trust will unburden you of the costs and other responsibilities of ownership.

Real estate can be used to fund a flip charitable remainder unitrust. Once funded with your property, the trust will make annual payments to you for life or a term you select for up to 20 years. At the end of the trust term, the remaining assets will pass to UVA. With a retained life estate, you make a gift of your residence, receive a charitable income tax deduction, and live in and maintain your home for the rest of your life.

All potential gifts of real estate to UVA Health are evaluated in partnership with the University of Virginia Foundation, which administers gifts of real estate to UVA.

GIVE AND RECEIVE

Would you like to supplement retirement income for you and your spouse or provide for a family member? Life income gifts provide annual payments for you or a loved one (or both) and tax deductions for you or your estate. They result in legacy gifts that benefit patients at UVA Health in the future. They can be funded with cash or securities and, in some cases, real estate. Starting in 2023, if you are at least 70½ years old, you may use a qualified charitable distribution from your IRA to create a charitable gift annuity or charitable remainder trust.

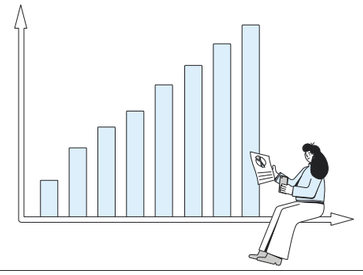
Advantages of a life income gift can include:

- Reducing exposure to market volatility
- Converting low-dividend-yielding stock to higher fixed or variable income
- Converting real estate or other illiquid assets into a reliable income stream
- Realizing tax advantages, such as avoiding a portion of the capital gain on appreciated securities and receiving a charitable income tax deduction in the year of the gift.

A **charitable gift annuity (CGA)** is a simple contract between you and the University of Virginia Foundation. In exchange for your gift of cash or stock, you or a loved one (or both) receive a fixed annuity for life. At the end of the contract term, the remainder goes to UVA Health for a purpose you designate.

CGA payment rates increased twice in the last year, so now is an excellent time to consider this gift option. Rates currently range from 4.5% to 9.7% and depend on the age(s) of the income beneficiary(ies) when income begins. Income may start immediately or be deferred for one or more years, increasing the payout rate. Income beneficiaries must be at least 55 years of age. (For an illustration of estimated benefits, including the gift annuity rates and income tax charitable deduction you are eligible to receive, please email me and provide your current age(s).)

A **charitable remainder trust** is created with a gift of stock, cash, or real estate. It pays you or other income beneficiaries you designate (or both) an income for life or a specified number of years. At the end of the trust term, the remainder will be used by UVA Health for the purpose you designate. Payments can be fixed or variable, and investment of the trust corpus alongside UVA's endowment is an option in some cases. ■



GET IN TOUCH

To learn more about ways to give that benefit UVA Health and your family, please reach out to me. After a conversation about your situation and goals, I can offer tailored options you can discuss with your financial and tax advisors.

The UVA Health Development team wants you to get the most out of your support of UVA Health! When considering a charitable donation that will change lives, why not enjoy the many advantages of a planned gift?

LET UVA HEALTH THANK YOU

The Cornerstone Society recognizes those who support the future of the University of Virginia—including UVA Health—through bequests, beneficiary designations, charitable gift annuities, and charitable trusts. When you make this type of gift, you will be invited to join the Cornerstone Society. Members receive invitations to special events and custom communications.

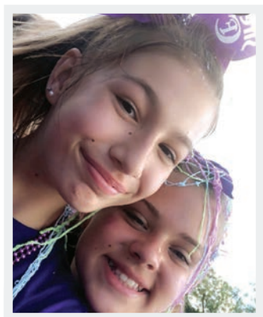
Erin Hughey-Commers is Senior Gift Planning Advisor for UVA Health Development. She can be reached at erinhc@virginia.edu or 434.760.3281.

SPOTLIGHT

A BEAUTIFUL FRIENDSHIP

A Florida teenager supports UVA's glioblastoma research and finds a mentor in Hui Li, PhD.

By Katherine Ludwig



Siena Guarini (top right) is pictured with her good friend and fellow competitive cheerleader Emma Sorensen. Guarini became an active proponent of cancer research after Sorensen passed away from stage four glioblastoma in 2020.

STAYING UP ON THE LATEST brain cancer research is an uncommon extracurricular activity for your average teenager, but for Siena Guarini, it's a calling. The ambitious high schooler from Fort Lauderdale, FL, is president of the Cancer Awareness Club at her school where she leads cancer-related community service projects, brings in speakers, and shares cancer-related news with her classmates.

Guarini says she's been interested in cancer research since her good friend Emma Sorensen passed away from stage four glioblastoma at the age of 13 in 2020.

"It's a really rare form of cancer for kids, and it happened quickly. She fought it for about a year, but it kept getting worse. She went into the hospital that last time and never came out. Two months later she passed away," says Guarini, "I became a lot more passionate about cancer research after that, knowing it can happen any day to anyone."

It's no surprise Guarini's curiosity was piqued by a story that appeared last summer in the UVA Today Daily Report—an email she's received since her uncle, who lives outside of Charlottesville, took her to visit the University last spring. The article described a radical glioblastoma discovery in the lab of Hui Li, PhD, a professor and scientist with UVA's Department of Pathology and Cancer Center.

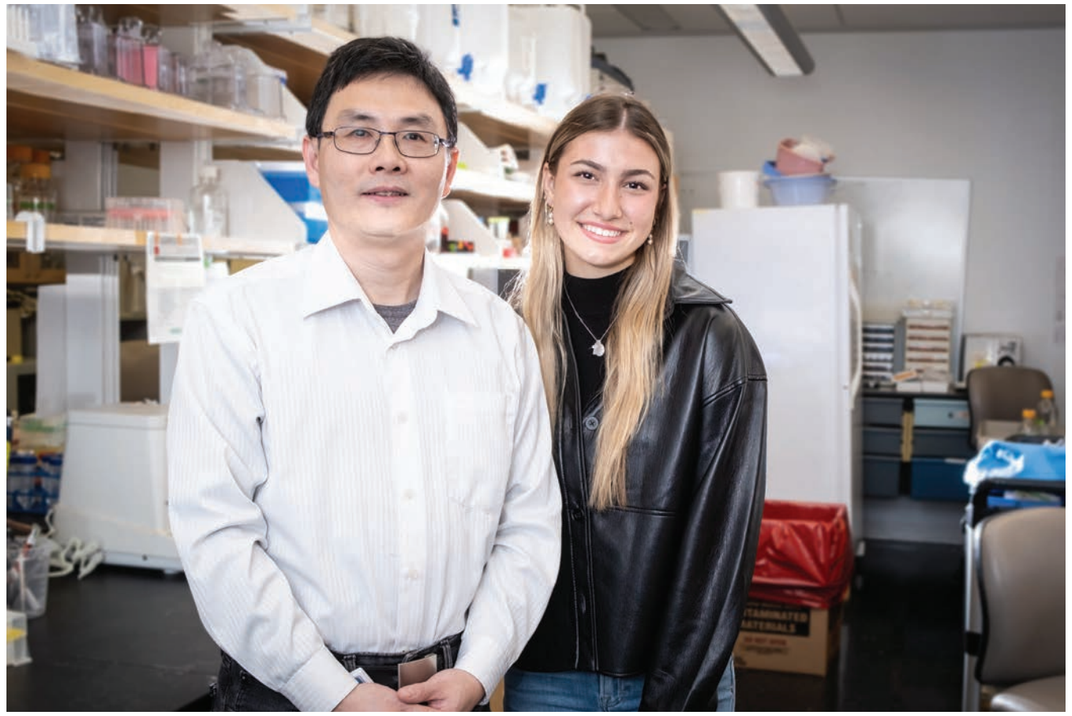
In 2020, Li and his team identified that a gene called AVIL is responsible for glioblastoma—the deadliest kind of brain cancer. This biomedical discovery was named one of the year's biggest by the editors of the health news site STAT. Li's lab has continued to build on this line of research, finding evidence that AVIL is also a major driver of two types of *rhabdomyosarcoma*, a cancer of the soft tissue that primarily strikes young children. These discoveries are offering hope for the development of new cancer treatments.

"It's pretty groundbreaking," says Guarini. She was so intrigued by Li's work and its potential to help glioblastoma patients that she emailed him, explaining her background and interest in his research. She also asked if she could send him a few follow-up questions.

Li says he was surprised and honored by Guarini's interest in his work. Rather than simply responding to her email, Li offered to have an online call.

"She'd read my research paper and asked good scientific questions. I was like, wow, this is a high school student? We had a nice conversation that lasted about an hour," he says.

CONTRIBUTED BY SIENA GUARINI



Following the call, Guarini used social media to launch a fundraiser for Li's lab. So far she's raised over $1,277; many of her classmates have contributed.

"It was really unexpected, but I truly appreciated it," says Li. "Here is a high school student who is really busy—I have a high school student, they are really busy! For her to do something like this, it's inspiring."

Private donations are critical to groundbreaking discoveries like that of Li and his colleagues. Funding from big government grantors like the National Institutes of Health is typically awarded based on completed work and leads to incremental research developments. Private support, on the other hand, is vital to making large scientific leaps forward.

"Financially we rely on private philanthropy and foundations for research that is high risk and high reward. Also, grants typically come with lots of stipulations, whereas private support gives us the freedom to follow the science where it leads," says Li.

Aside from the financial support, private donations are a morale boost for scientists toiling away in their labs, he says. "It reminds us how meaningful the work is, and it makes us want to work really hard because people are counting on us and supporting us," says Li.

Guarini has continued to stay in touch with Li and recently visited his lab in person. She is interested in attending UVA and pursuing a scientific field.

Li invited Guarini to visit his lab this spring. He says interest and support like hers is inspiring and reminds scientists how meaningful their work is.

"In the future, I'd like to potentially do something with cancer research that could help people like my friend," says Guarini.

Li hopes to remain a positive influence on Guarini's career goals. He recognizes the impact that early support and encouragement can have on young people and recalls a particular professor who took a chance by giving him research opportunities typically reserved for more senior students. Li says, "It changed my life, and it's how I ended up here."

"If Siena goes on to pursue a STEM field or someday becomes a professor and makes a big discovery to cure cancer," says Li, "I'd be so happy." ■

Your support makes breakthroughs possible. To discuss options for investing in leading-edge science at UVA Health, please contact Chrissy Gibbons, Director of Development for Research Departments and Centers, at chrissy@virginia.edu or 434.962.9045, or call 800.297.0102.

COE SWEET

EMPOWERED BY GENEROSITY

Dear Friends,

As you have seen in this exciting edition of *PULSE,* 2023 is already a year of significant accomplishments at UVA Health. Our donors have shown that philanthropy has the power to drive our research, clinical care, and discoveries to new heights. An example is the recently announced Paul and Diane Manning Institute of Biotechnology. This venture—an extraordinary collaboration among the Manning family, the Commonwealth of Virginia, and the University—will position UVA as a national leader in advancing research in cellular and gene therapies, nanotechnology, and targeted drug delivery. Furthermore, thanks to the generous support and vision of early donors and a new partnership with Sentara Martha Jefferson Hospital, we are set to launch the new UVA Children's Neurodevelopmental and Behavioral Care clinic—the only outpatient clinic of its kind in Virginia.

This first print issue of *PULSE* since before the pandemic contains many more examples of groundbreaking discoveries, innovative treatments, and compassionate clinical care our partners and supporters made possible. For individuals and families facing challenging neurological disorders, our cover story on the pioneering work of Harald Sontheimer, PhD, Harrison Distinguished Professor and Chair of the Department of Neuroscience, offers hope for the promise of research. Sontheimer's studies of neurological diseases are generating transformational knowledge that may lead to new treatments for devastating conditions such as epilepsy, brain tumors, stroke, and Alzheimer's. Our feature on Precision Public Health spotlights UVA Health's pioneering work in personalized medicine and how it will address health equity issues to improve outcomes in cancer, diabetes, heart disease and many other conditions.

I want to express my deepest thanks to Mike Miller, the outgoing UVA Health Foundation Board of Trustees chair. Mike has given so much of his time, energy, and support to UVA Health and helped launch our campaign with the inspiring story of the lifesaving care his son Matt received at UVA Health. Through the COVID pandemic, his leadership and partnership have been invaluable to our development team. Mike is retiring from the Health Foundation Board now that the campaign surpassed $700 million and as our trustees activate the new UVA Health Strategic Plan through philanthropic support.

I offer my sincerest gratitude to all of you on behalf of UVA Health. We are inspired by your dedication and grateful for your generosity, which is giving hope to our patients and families near and far. Thank you!

All the best,

Amy S. Karr
Executive Director,
UVA Health Foundation, and
Senior Associate Vice President,
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