Dear Friends,

Over the past 21 years, many of you may have met or worked with Karen Rendleman. This last month Karen began an exciting new leadership role for the University of Virginia as Senior Associate Vice President, Principal Gifts. Under Karen’s direction—and with your support and dedication—the Health System raised more than $675 million in the last campaign, advancing lifesaving breakthroughs in patient care, education, and research. We are grateful for her leadership and service.

I am assuming the role of interim executive director until Karen’s successor is hired. For 16 years I have worked closely with faculty, staff, alumni, and donors across the Health System. What I’ve come to appreciate is the tremendous expertise, determination, creativity, and vision that is on display everywhere you look. Our strength comes from our people—those who work on the frontlines of healthcare, and those who place their trust in our mission.

I look forward to meeting many of you in the coming months and sharing exciting stories about what’s possible here at UVA. Thank you for all you do.

Great times are ahead.

Best,

Amy S. Karr
Interim Executive Director, UVA Health Foundation
Interim Assistant Vice President, UVA Health System Development

Please let us know what you think about PULSE, or share your story with us at pulse@virginia.edu.
Researchers at the University of Virginia School of Medicine have identified an unexpected contributor to rheumatoid arthritis that may help explain the painful flare-ups associated with the disease. The discovery points to a potential new treatment for the autoimmune disorder, and it may also allow the use of a simple blood test to detect people at elevated risk for developing the condition.

The promising discovery is among the first to emerge from the School of Medicine’s new affiliation with Inova Health, a collaboration that aims to make medical breakthroughs and advance the battle against disease. In this case, the arthritis discovery originated in the lab of UVA’s Kodi Ravichandran and was facilitated by combining his team’s resources and expertise with that of Inova researcher Thomas Conrads through a THRIV UVA-Inova seed grant.

The new findings about rheumatoid arthritis came in an unexpected fashion. Sanja Arandjelovic, a research scientist in the Ravichandran group, was seeking to better understand what causes the inflammation associated with inflammatory arthritis when she noted that deleting a gene called ELMO1 alleviated arthritis symptoms in mice. This was particularly surprising because Arandjelovic and Ravichandran initially thought that the loss of ELMO1 would result in increased inflammation.

“This was a complete surprise to us initially,” recalls Ravichandran, chairman of UVA’s Department of Microbiology, Immunology and Cancer Biology. “I love those kinds of results, because they tell us that, first, we did not fully comprehend the scientific problem when we began exploring it, and, second, such unexpected results challenge us to think in a different way. Given that rheumatoid arthritis affects millions of people worldwide, we felt the need to understand this observation better.”

Digging deeper into the unusual outcome, the researchers determined that the gene promotes inflammation in white blood cells. Blocking the gene in lab mice alleviated arthritis inflammation without causing other problems.

“This is another example of how fundamental basic research can lead to novel discoveries on clinically relevant problems that affect a large number of people,” Ravichandran says.
IN 1950, a child with cancer was not likely to survive. But today, just three generations later, four out of every five children who receive a cancer diagnosis can expect a much better outcome. In fact, it’s a scientific milestone that Dr. Michael Engel ranks alongside landing on the moon or splitting the atom.

“This is one of the greatest success stories of all time,” says Engel, the recently-named chief of Pediatric Hematology and Oncology at UVA Children’s Hospital. “I’m proud and humbled to be able to do this work, and I’m grateful to the children and their families for their inspiration along the way.”

Engel comes to Charlottesville from the University of Utah School of Medicine, and the Huntsman Cancer Institute and Primary Children’s Hospital. His research focuses on developing the safest, most effective treatments possible for children with cancer—a disease that 1 in 300 young people will face before their 20th birthday.

TARGETING UNHEALTHY CELLS
The most common childhood cancer is acute lymphoblastic leukemia (ALL), and of the nearly 6,000 Americans who developed ALL in 2018, more than half were kids.

A cancer of the immune system, ALL cells are unable to function normally, and they take over bone marrow, preventing it from producing healthy cells that perform essential functions like carrying oxygen, fighting infections, and preventing bleeding.

“Think of the bone marrow as a garden where we grow flowers of different colors,” says Engel. “In leukemias such as ALL, the garden is overrun by weeds, so we administer chemotherapy to kill weeds, and we hope that we don’t harm the flowers.”

Unfortunately, most chemotherapies used to kill ALL cells also damage normal cells, which can cause negative side effects. Engel and his group aim to change that.

Engel is known nationally for his studies of the molecular partnerships that govern normal blood cell development, and how leukemia cells take advantage of these partnerships to survive. By discovering the molecular tools that leukemia cells depend upon to survive, he hopes to develop new drugs that target these dependencies without harming normal cells.
Recently, his team discovered a partnership between proteins that ALL cells need to survive. Blocking the partnership causes leukemia cells to self-destruct. A clinical trial of a new drug designed specifically to target and disrupt this partnership is on the horizon.

**FINDING AN ACHILLES’ HEEL**

Just as important, emerging evidence suggests this same partnership operates in medulloblastoma, an aggressive, and too-often-fatal, childhood brain tumor. Engel has early evidence that this new drug can trigger the death of medulloblastoma cells too, suggesting cancers that seem to be unrelated may leverage the same survival mechanisms—it’s kind of like finding an Achilles’ heel of cancer cells.

“It’s truly pediatric precision medicine,” Engel says, “and it’s the future of cancer therapy for children.”

These remarkable achievements for children with cancer, Engel says, can be attributed to his talented and determined colleagues around the world, who continually push the limits of discovery, and to the families who have had the courage to try what is new.

“Like this new therapeutic frontier, success has come from partnership,” Engel says, adding his hope that one day soon, children and their families won’t have to be afraid of a cancer diagnosis. “We each are pursuing distinct lines of investigation hoping to make a difference, but in the end we all share a singular goal of putting ourselves out of work.”

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**Main Event Gala**

**IN EARLY FEBRUARY** more than 400 community members came together to raise money in support of children who are battling cancer.

Held at Common House in downtown Charlottesville, VA, the event was planned by a committee of 25 engaged volunteers and raised $300,000 to support pediatric cancer programs at UVA.

The evening included a silent auction, food and drink, and an unforgettable night of dancing to a silent disco.

“The Main Event is something that I look forward to every year,” says Dr. Jim Nataro, who chairs the Department of Pediatrics. “It’s an effort to provide direct support to children who are fighting disease, and the energy this night produces fuels all of us at UVA Children’s Hospital to continue strive for excellence in service of kids.”

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WE EACH ARE PURSUING DISTINCT LINES OF INVESTIGATION HOPING TO MAKE A DIFFERENCE, BUT IN THE END WE ALL SHARE A SINGULAR GOAL OF PUTTING OURSELVES OUT OF WORK.

— DR. MICHAEL ENGEL
JAMES HITER IS A STREAK RUNNER, which means that every day, without exception, he runs at least one mile. In May 2016 his streak had climbed to 763 days, or just over two years. But that streak was about to end. After being diagnosed with the flu, a precautionary chest x-ray uncovered a tumor the size of a golf ball.

Hiter and his wife, Emily, knew it couldn’t be lung cancer because he was young, active, and had never smoked. But they were wrong, and within weeks James was having surgery.

James recovered, but the cancer returned a year later, so the Harrisonburg, VA, native began treatment under the care of UVA’s Dr. Richard Hall. And he started running again.

“I try to be physically active every day, even when I feel horrible,” Hiter says. “I just feel grateful that I am able to run.”

Today, Hiter’s running streak tops 600 consecutive days.

GIVING THE GIFT OF TIME
Every year, more people die from
lung cancer than from colon, breast, and prostate cancers combined. The reason? Eighty percent of patients are diagnosed at late stages, when survival rates are low.

Drs. Richard Hall and Ryan Gentzler lead UVA’s lung cancer team. The duo conducts clinical trials that combine immunotherapy—harnessing the body’s own immune system to fight cancer—with existing chemotherapy solutions. UVA participated in early clinical trials that led to FDA approval of the new combination therapy.

The team is working on a number of studies, including using immunotherapy for patients who are diagnosed with early-stage lung cancer, as well as studies to determine why immunotherapy fails to work in some patients.

“We are building a database to predict which patients will respond to immunotherapy and who will do well long-term,” Gentzler explains. “If you suffer from immune side effects, it might mean your chance of the cancer coming back is smaller.”

The team is also studying oral therapies designed for certain lung cancer patients who have never smoked.

“UVA is quickly becoming a destination for lung cancer research and care,” Hall says. “We’re passionate about giving patients the best options for treatment to improve their quality of life as well as their length of life, for as long as possible.”

Clinical trials give patients like James Hiter a chance to follow their passions while battling illness. In Hiter’s case, he has traded in his job as vice president of a financial services company to become a lung cancer advocate.

“Emily and I attended an international lung cancer conference. What I found were people who were diagnosed at the same time I was, and who had done so much already, while I had done nothing,” he remembers. “It hit me I could change that.”

Hiter and his wife recently launched Streak for a Cure, which raises awareness and support for lung cancer research.

“It’s time for the disease to be funded and treated like all other cancers,” Hiter says. “It’s time for the world to know that if you have lungs, you can get lung cancer.”
MEDICINE + EMPATHY
Ashley is a seventeen-year-old female with sickle cell anemia. A first-year student at UVA, she just arrived at the Emergency Department with the type of severe back and hip discomfort that is consistent with a sickle cell pain crisis.

All Ashley wants is for her pain to subside so she can go home and rest. And that’s all her doctors would want as well—if she were a real person. But Ashley isn’t real. She’s one of a handful of patient personas that Dr. Matthew Trowbridge is using to help first-year medical students gain empathy for patients seeking care and comfort in UVA’s Emergency Department.

What does the patient need from their visit? What would bring them comfort? Are they scared? How did the patient get to the emergency room? These are just a few of the questions Trowbridge’s students address as they huddle around one patient persona before moving on to the next.

The project? Trowbridge and his medical students are helping plan elements of the new Emergency Department at UVA Medical Center, which is set to serve its first patient in October 2019. The method? It’s called Design Thinking, and it’s a wildly popular methodology for innovating solutions to human-centered problems, like Ashley’s.
DIAGNOSIS, TREATMENT, AND CHANGE

“Design Thinking is a well-established methodology for creating new products and services within the business and consulting worlds,” says Trowbridge, an associate professor in the UVA Department of Emergency Medicine. “What’s new is applying it to healthcare and medical education.”

At its core, Design Thinking rests on developing empathy for individuals who are facing a common challenge or who are trying to accomplish a shared goal. By forming a more complete understanding of the motivations and unmet needs of each individual, and by following Design Thinking’s focused, iterative methodology, new approaches to complex problems can be revealed. Trowbridge argues that by offering opportunities to learn and apply Design Thinking, UVA School of Medicine will soon graduate a new kind of doctor.

“Training our students to be world-class clinicians remains our top priority—doctors with the ability to move quickly and decisively from patient intake to diagnosis to treatment,” says Trowbridge. “However, we’re entering an era where many of the biggest issues facing healthcare are complex system-based problems, like childhood obesity or social isolation. This will require a new, supplementary skillset for physicians.”

Preparing the doctors of tomorrow to have the confidence, knowledge, and experience to influence the systems that impact the health of their patients and surrounding community is among the main goals of the Medical Design Program—an initiative Trowbridge launched in 2015 to formally study Design Thinking in the medical school space.
An elective option for first-year medical students, the program has seen skyrocketing demand and has already received multiple grant awards from the School of Medicine’s curriculum committee, the Emergency Medicine Center for Education, Research, and Technology, and the Jefferson Trust.

A PRACTICAL APPLICATION
The Medical Design Program goes beyond theoretical personas as a vehicle for curriculum. As part of their course, students apply design thinking techniques to inform ongoing efforts to improve the experience of the 65,000 patients who visit UVA Emergency Department each year.

This year students in the Medical Design Program tallied more than 70 hours of formal observations focused on improving the design and operation of the Emergency Department waiting room—a space that is often overlooked, despite the important function it serves for patients and their loved ones.

After working with Trowbridge to harvest and refine the most significant insights through the Design Thinking process, students share their findings with Emergency Department leadership.

“The experience that this class provides our medical students will prove to be of great value, both to the students as they develop in their careers, and to the Health System, which, as a result of the insights students develop, will be better positioned to care for our patients,” says Dr. Deborah Vinton, medical director for the Emergency Department, who teaches alongside Trowbridge.

“One thing we hear from our patients is that they need better signage to navigate the Emergency Department, and a lot of the ideas coming from these students will inform how we improve that aspect of our space,” Vinton adds.

CONTINUOUS IMPROVEMENT
While the new Emergency Department opens in October, fully optimizing how patients interact with the waiting room will take a year or two to perfect, and the insights developed by the Medical Design Program students, Trowbridge says, will assist in that process.

That’s a scenario first-year medical student Katie Webb welcomes. So engaged with her current medical design course, she plans to partner with Trowbridge and several other medical students on further curriculum development for the Medical Design Program this summer.

WE’RE ENTERING AN ERA WHERE MANY OF THE BIGGEST ISSUES FACING HEALTHCARE ARE COMPLEX SYSTEM-BASED PROBLEMS, LIKE CHILDHOOD OBESITY OR SOCIAL ISOLATION. THIS WILL REQUIRE A NEW, SUPPLEMENTARY SKILLSET FOR PHYSICIANS.

— DR. MATTHEW TROWBRIDGE
“This work starts with empathy, and I think that, as a physician, feeling a sense of empathy for your patients is where you start,” Webb says. “In a larger sense, we spend so much time in classrooms learning facts, but the Medical Design program pushes you to learn things not as they are, but to learn how to make things better.”

As for the future of Design Thinking and the Medical Design Program, Trowbridge believes the effort is ripe for across-Grounds collaboration with architecture, engineering, computer science, and others because it reframes healthcare challenges as research and teaching opportunities.

“This program gives medical students a great educational experience, and teaches competencies that are highly relevant within modern medicine,” says Trowbridge. “In return, the students are creating troves of new data and highlighting opportunities to directly improve patient care and experience with the UVA Health System—they’re creating a lot of value.”

BUILDING A MODERN TRAUMA CENTER

EACH YEAR, UVA’s Emergency Department handles about 65,000 patient visits. As the only Level 1 Trauma Center in Central Virginia, demand for the department has exceeded capacity. UVA’s new Emergency Department will occupy the first floor of the Medical Center Hospital Tower that is nearing completion. This move will nearly double the amount of beds, from 43 to 80, including private rooms.

Additional improvements include dedicated space for mental health services, express care for minor emergencies, waiting rooms designed for adults and children, expanded radiology services, a chest pain center, and a women’s center for emergency care.

“Our current space was built in the 1980s, and it met our patients’ needs for many years,” says Dr. Robert O’Connor, who chairs the Department of Emergency Medicine. “But now we’re seeing an uptick in the severity of our patients’ injuries. This means that we are getting the most high-risk patients who need a much more sophisticated level of care.”
GAINING FDA APPROVAL for a new drug takes an average of 12 years and $2.6 billion. That’s a waiting game that consumes two precious resources critical for saving lives—time and money. It’s also a scenario that UVA ophthalmologist Dr. Jayakrishna Ambati believes he can improve.

By systematizing a process to repurpose existing medications, Ambati—professor and vice chair for research of ophthalmology, and the founding director of the Center for Advanced Vision Science—is poised to launch a new template for drug development in the 21st century.

Using a variety of novel approaches to mine Big Data sets, Ambati says his team can function as “high-tech detectives” or “data archeologists” to uncover what prescription medications are doing beyond their intended use.

“The old ways of developing drugs are simply not working, and I am proposing a fresh new way to attack these problems,” Ambati says, adding that drug repurposing can eliminate up to two-thirds of the current drug development process.

Ambati, the first ophthalmologist to receive the prestigious NIH Director’s Pioneer Award, proved the viability of this concept when he discovered that a medication designed for HIV patients could also protect against age-related blindness caused by macular degeneration—a disease that impacts 200 million people globally.

“Macular degeneration is a cruel disease because it robs you of your humanity, it steals one of the main ways, perhaps the main way in which we interact with the world,” Ambati says.

“In a sense, the study of sight has given us a new vision for developing drugs and improving human health,” Ambati adds. “Now we need to move from conception to systemization so we can unleash this method of discovery on diseases like diabetes, Parkinson’s, and Alzheimer’s.”

A low-risk, high-reward innovation—that’s how Ambati thinks of this effort.

“There’s sort of a mega-experiment currently underway: we have hundreds of millions of people taking prescription drugs, and their health records are telling us what works and what doesn’t,” Ambati says. “If we employ our medical expertise to ask the proper questions in the proper way, we could be the provider of information that otherwise wouldn’t be available.”

Chief among those questions is why not now? Ambati says the timing is right, and notes that ten different UVA schools and centers are prepared to collaborate across Grounds and to work with Big Data to repurpose existing drugs. The momentum behind this work also coincides with the University’s plan to launch a School of Data Science, which will mark the 12th school at UVA.

“Exploring drug development in this way is an effort that can have an extraordinary impact on the Commonwealth, the nation, and the world—and the University of Virginia can be the leader,” Ambati says. “Drug development can be yet another area in which UVA distinguishes itself as a pioneer in medicine.”
IMPACT
MEASURING THE POWER OF COMPASSION

ANYONE WHO HAS SPENT TIME in a hospital knows the difference a caring nurse can make. A warm smile or kind touch can turn frustration into shared understanding.

But does compassion translate into better patient care? And how do nurses maintain a compassionate presence in the face of mounting pressures like high-need patients and long work hours? These questions lie at the heart of research underway in the UVA School of Nursing.

It’s called the Compassionate Care Initiative, and Tim Cunningham, who directs the program, says the goal is to gauge how teaching self-care strategies like yoga and mindfulness to nurses improves patient care, diffuses stress, and builds resilience.

“We know that self-care practices work,” says Cunningham, “but they must be done consistently over time to maintain the benefits. Our students enjoy short-term benefits, but we need to study a large sample size over time to see how they sustain their practice and manage stress.”

The study will contribute to a growing body of evidence related to the importance of self-care and compassion in healthcare—a cause that Rebecca Ruegger (BSN ’73) and her husband, Philip, are happy to champion.

THE ANATOMY OF A BLENDED GIFT
To create their nursing research fund, the Rueggers are using a blended gift structure. Part of their gift is intended for current use, and part is a commitment in their estate plans. For the current funding, the Rueggers are using a qualified charitable distribution from an IRA that is paid directly to the School of Nursing.

Nursing students on retreat practicing self-care techniques

The couple recently made a significant commitment to create the Rebecca H. and Philip T. Ruegger Endowed Nursing Fund to advance research in resilience and compassion as part of the Compassionate Care Initiative.

“The idea of cultivating compassion in healthcare resonates with me,” says Ruegger. “When I was still working, I practiced yoga, and thanks to that self-care, I noticed a difference in how I felt and what I was able to give back in work and in life.”

She also sees an opportunity for the School of Nursing to make a broader impact.

“If we put the research behind it, the Compassionate Care Initiative has the potential to change healthcare, resulting in better quality of care, less burnout, and more fulfilled providers,” says Ruegger. “The School of Nursing has an opportunity to become a national leader in this arena.”

Cunningham believes the number of people positively impacted by the initiative will quickly soar into the hundreds, if not thousands.

“This work gives us something we can measure,” says Cunningham. “What we can never truly measure, however, is the impact this work will have on patients being cared for by providers who remain present and calm in moments of crisis, and the lives that will be saved by what we are doing to develop these skills.”
IMPACT
A LIFE-CHANGING TREATMENT FOR DIABETES

FOR MORE THAN TEN YEARS, UVA's LaunchPad for Diabetes Innovation has seeded novel ideas and fueled groundbreaking research. What started as one man's vision to help the 30 million Americans struggling to manage their diabetes has now sparked a total of 36 very promising research projects across 22 academic departments, from medicine to engineering.

Just ask Chloe Jarrat, an active nine-year-old who has type I diabetes. As part of a weeklong LaunchPad-funded clinical trial, researchers outfitted Chloe with a wearable device developed at UVA—called an artificial pancreas—which functions as an automated insulin pump.

Throughout the trial, the artificial pancreas regulated and stabilized Chloe's blood sugar, allowing her to play and eat like other children.

Her mom, Amanda Jarrat, was overwhelmed by the experience.

“What they’re working on at UVA is life-changing,” says Jarrat. “The trial was like having access to a miracle for a week.”

By focusing on early-stage research, LaunchPad helps the most innovative researchers develop and refine the ideas that will ultimately attract large-scale research funding in the years to come.

“Our goal with LaunchPad is to inspire these scientists,” says Paul Manning, the businessman and philanthropist whose vision created the fund. “If we can support them in their early science, we give them a chance to mature their research. Then, they can gain additional capital from NIH and other sources.”

Mark DeBoer, the pediatrician who designed Chloe's clinical trial, considers LaunchPad to be a lifeline.

“Receiving funding from NIH requires large preliminary data sets, and LaunchPad enables us to collect and understand the data we need for future grants,” says DeBoer.

For Manning and his wife, Diane, LaunchPad is a personal mission: two of their children have diabetes. To date, the couple’s overall investment of $3.3 million has led to 25 patent applications and a $17 million commitment from UVA's Strategic Investment Fund.

The resulting momentum opens doors to more projects, including the work of Dr. José Oberholzer, who directs the Charles O. Strickler Transplant Center at UVA, and whose innovations in islet cell therapy show great promise for treating diabetes.

When transplanted islet cells perform as planned, some patients with diabetes can live without insulin injections or medications.

“Through LaunchPad, projects can get funded quickly,” says Oberholzer. “You have a thorough and competitive peer review, but then it moves fast. LaunchPad accelerates research, and that's important for so many future patients.”
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