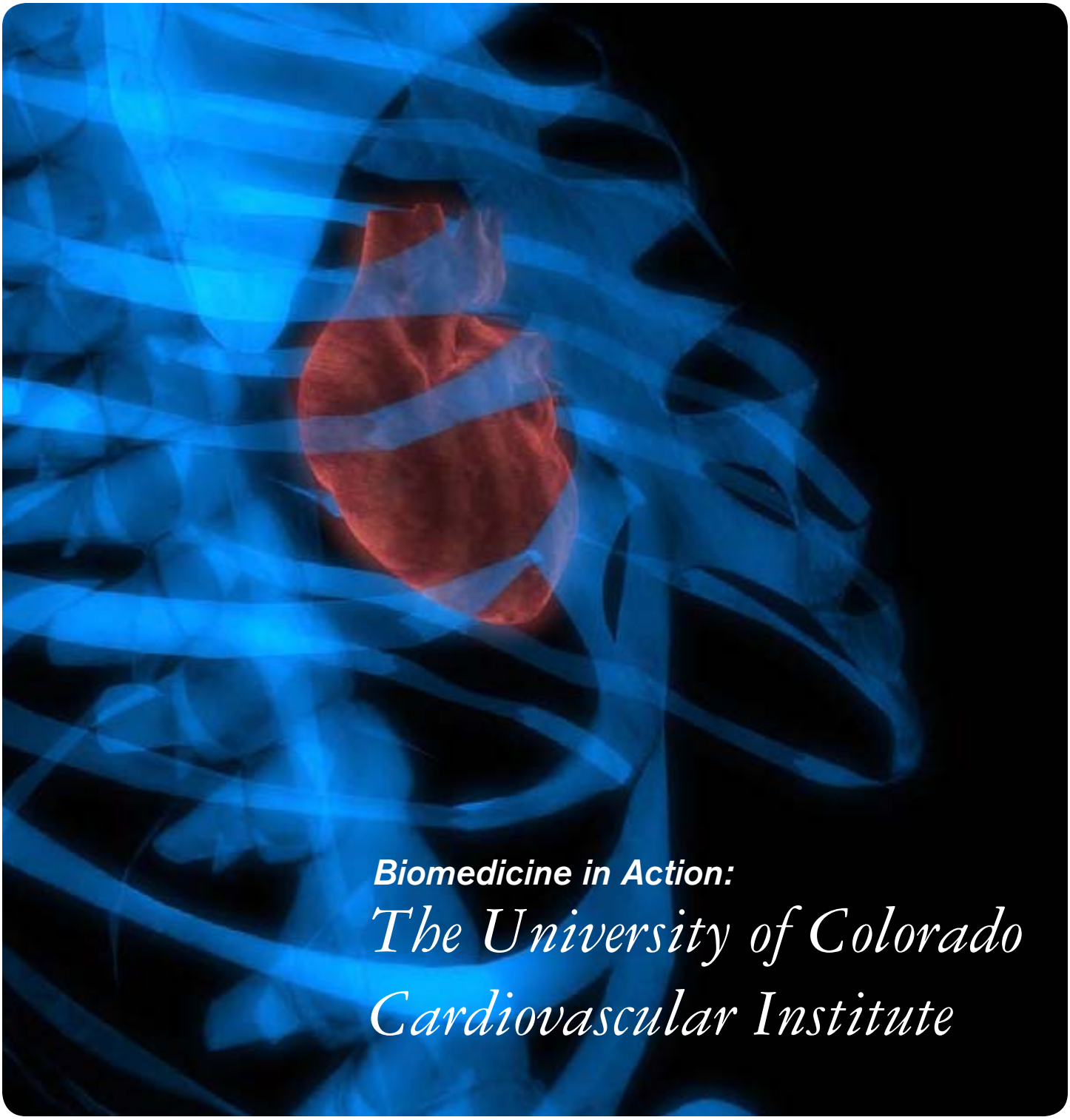
Creating Futures

University of Colorado *Denver*



Biomedicine in Action:

The University of Colorado Cardiovascular Institute

The Cardiovascular Institute has a powerful reputation, a history of success in introducing breakthrough medicines into the marketplace and a pipeline filled with some of the world's most promising molecular and genetic research.

Together, we can create a new future for people with heart disease

Heart disease affects everyone, either directly or by impacting a loved one. It is the leading cause of death in the United States among both women and men and is a major cause of disability. Almost 700,000 people die of heart disease in the U.S. each year, representing nearly 30 percent of all U.S. deaths. We also know heart disease in women is very different than the same condition in men, yet there are very few resources focused solely on the female population.

Combating the #1 killer in America requires innovation, collaboration and vision. The University of Colorado Cardiovascular Institute has all three. After a decade of success, the Cardiovascular Institute has a powerful reputation, a history of introducing breakthrough medicines into the marketplace and a pipeline filled with some of the world's most promising molecular and genetic research. Add to this Colorado's burgeoning biotechnology industry and we are ideally positioned to make even greater contributions to preventing, treating and curing heart disease.

Imagine a future in which:

- Women have new prevention and treatment options grounded in the most current research on how they are affected differently than men by cardiovascular disease.
- Personalized medicine is a reality, with patients receiving treatment plans that are customized to their individual genetic makeup, reducing side effects from medication and ensuring the appropriate level of intervention at the optimal time.
- Entire families discover the basis for their heart disease, opening the door for the ultimate dream: preventing this deadly disease in the next generation.

A total of $15.5 million is needed for the immediate allocation of more minds and more resources to take the groundbreaking work of the Cardiovascular Institute to the next level.

You can help us dramatically accelerate the rate of change in cardiovascular care in ways never before imagined.

"The University of Colorado has the potential to be among the top three or four preeminent cardiovascular programs in the world. Our expertise, which runs the gamut from basic to clinical research, is absolutely comprehensive. Our students are the most talented and curious in the country, and we are in partnership with other researchers across the world. And, to be on a campus with $2 billion in new construction, situated in a city and region that are in a growth mode… well, that's just extraordinary. We are poised to mobilize all of these assets for the benefit of heart patients for generations to come."

Peter Buttrick, MD
Head, Division of Cardiology

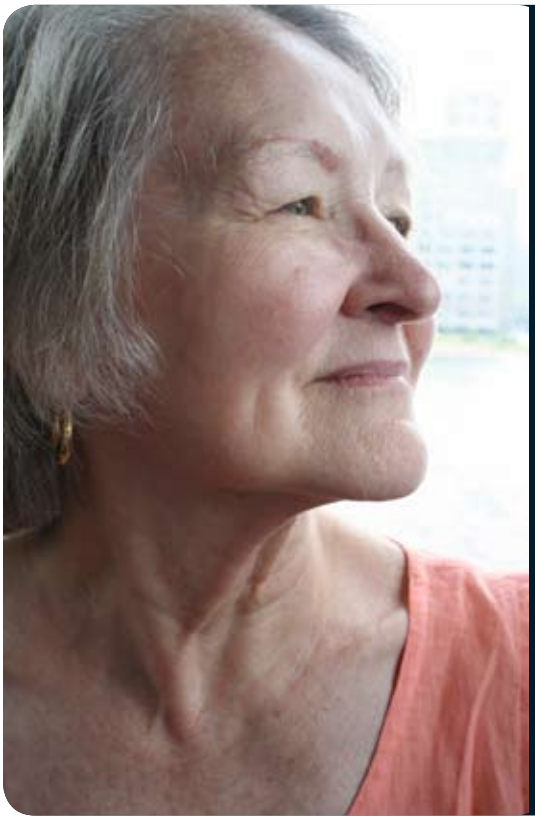
The University of Colorado Cardiovascular Institute:

A bold response to heart disease

Our research benefits from and informs our clinical work within one of the leading academic cardiovascular facilities in the world.

In 1998, a core team of faculty members from across the University of Colorado system came together to find better solutions for combating heart disease. They formed a shared vision and a joint strategy to integrate basic research with clinical studies. Thus, the Cardiovascular Institute was created in order to save lives and prevent disability for those suffering from heart muscle disease and heart failure. From it has emerged a model of how departments, campuses and institutions can work together to offer lifesaving new options to patients and families.

The Cardiovascular Institute promotes collaboration among scientists, allowing them to advance investigative potential by networking and collaborating on high-quality and large-scale cardiovascular research, training and education programs. The Cardiovascular Institute combines the best of the Boulder campus's outstanding research with the comprehensive research and patient care at the Anschutz Medical Campus. Our research benefits from and informs our clinical work within one of the leading academic cardiovascular facilities in the world. We offer access to investigational drug therapies and diagnostic techniques not available at other medical centers. We provide an extraordinary continuity of care from the initial referral for heart failure treatment to evaluation of transplant and post-transplant management. Since 1988, there have been more than 340 heart transplants performed at the University of Colorado with a 90 percent survival rate at the three-year benchmark. These statistics rank us among the best in the world.



Center for Women's Health Research

The Center for Women's Health Research (CWHR) plays an important role in the Cardiovascular Institute, focusing vital research on cardiovascular disease, which comprises an important part of the Center's research agenda.

After decades of neglect, much basic, clinical and translational research must be done to close the "knowledge gap" in women's health, to determine how gender influences health, disease and aging. The CWHR intends to be a leader in closing that gap, bringing research in women's health under one roof so scientists and physicians can work collaboratively across disciplines in order to coordinate and leverage resources. The center will accelerate research and speed the transfer of knowledge from the laboratory bench to the disease-prevention arena, as well as the patient's bedside.

Targeted research creates new possibilities for children with a devastating disease

Cardiomyopathy is a chronic disease of the heart muscle that, while typically an adult disease, affects more that 30,000 children in the United States every year. As in adults, heart failure in children has catastrophic consequences such as arrhythmias, need for heart transplantation and sudden cardiac death. Recently new information suggests there are important differences between children and adults with heart failure. Unfortunately, because most of the research on cardiomyopathy and heart failure has been performed on adults, the outcome for children with this disease is the same as it was 30 years ago. This is in stark contrast to the significant improvement in outcomes in adults with heart failure during this same time period. An essential part of managing the disease is reducing the pathological changes in heart cells. In adults, this can be accomplished with beta blockers. But recent studies suggest that beta blockers don't work well in children with heart failure. Drs. Brian Stauffer, Carmen "Kika" Sucharov and Shelley Miyamoto are leading efforts to understand the pathologic and molecular-level changes that occur in pediatric heart failure to identify new targets of therapy specific to children who suffer from this devastating disease.

Leveraging Colorado's biomedical leadership to improve the lives of heart patients

A central priority for the Cardiovascular Institute is to move discoveries quickly from the laboratory into the clinic. We have extraordinary resources for crossing the boundaries between the academic and commercial environments. And, we have demonstrated success in this "bench to bedside" approach.

Our resources include the University of Colorado Denver's newly established Colorado Clinical and Translational Sciences Institute (CCTSI), a collaborative enterprise between University of Colorado Denver, University of Colorado at Boulder, six affiliated hospitals and health care organizations and multiple community organizations. Funded by a $76 million grant from the National Institutes of Health, the CCTSI provides a unique research and training infrastructure as well as core technology resources to promote research excellence and train the next generation of clinical/translational scientists.

Our Technology Transfer Office is a further resource, with demonstrated success in moving discoveries successfully from our laboratories to the clinical setting. Colorado's burgeoning biotech industry completes the picture for an ideal environment in which to implement a comprehensive research strategy that moves quickly to commercially available treatments for individuals and families who suffer from heart disease.

Dr. Carmen "Kika" Sucharov, in the lab with Dr. Brian Stauffer, works at the molecular level to find the best possible treatment for children with cardiomyopathy. Her work is one small piece of UC Denver's comprehensive "bench to bedside" approach.

Leslie Leinwand, PhD, co-director of the Cardiovascular Institute and holder of the Marsico Endowed Chair of Excellence, works in the lab with Pete Mariner, PhD.

The Cardiovascular Institute is a proven innovator in translational medicine

Discoveries from the Cardiovascular Institute have already yielded extraordinary scientific results and exciting commercial success.

ARCA Biopharma

No more trial and error—A patient's genetic profile predicts their response to medication

The Cardiovascular Institute is at ground zero of the emerging field of pharmacogenomics–the science of using an individual's genetic profile to determine how they will respond to certain drugs. This field holds the promise that pharmaceuticals might one day be tailor-made for every individual. Drs. Michael Bristow and David Port have worked with ARCA Biopharma, a Colorado company, and colleagues at the University of Maryland to develop bucindolol, the first genetically targeted cardiovascular drug. Through a non-invasive DNA test, doctors can determine instantly whether or not patients with advanced chronic heart failure will benefit from the beta-blocking action of bucindolol, a timesaving and potentially lifesaving advantage. ARCA Biopharma is also working on a DNA-based anticoagulant using technology developed by Dr. Larry Gold of CU-Boulder's Molecular, Cellular and Developmental Biology Department.

Hiberna

Unlocking the secrets of heart disease by studying extraordinary animal adaptations

Dr. Leslie Leinwand, co-founder and co-director of the Cardiovascular Institute, is a leader in the start up drug discovery company Hiberna. With her colleagues, she is exploring unusual animals–ground squirrels and Burmese pythons–to see how extreme evolutionary adaptations, including hibernation, might help us understand how to preserve healthy hearts in humans.

Miragen

Harnessing the power of the human genome

Dr. Michael Bristow, Dr. Eric Olson of the University of Texas Southwestern, and Dr. Bill Marshall, a graduate of CU-Boulder, recently founded an innovative new Boulder-based company called Miragen, which is pursuing the therapeutic potential of a newly discovered gene regulatory family of RNAs, called microRNAs. Because they are individual molecular entities that determine fundamental processes in the body, microRNAs have the potential to lead us to new therapies of unprecedented power. Miragen expects that its first microRNA-based therapies will begin testing in humans within two to three years.

Myogen, Inc., now Gilead Sciences Colorado

Saving women's lives with molecular therapeutics

Dr. Bristow worked with the director of the Pulmonary Hypertension Clinic, Dr. David Badesch, and others to develop a drug called ambrisentan. Bristow calls it the "best drug in class for pulmonary arterial hypertension, a fatal disease in young women, with no toxicity and a great efficacy profile." This breakthrough drug was the creation of a biotechnology company called Myogen, Inc. founded by Drs. Bristow and Leinwand, which was acquired by Gilead Sciences Colorado for $2.5 billion in 2006. Ambrisentan has gone on to save the lives of women across the globe.

These are just a few examples of how the discoveries of Cardiovascular Institute doctors and researchers are making a real difference in the lives of millions of people. And its potential is just beginning to unfold.

Michael Bristow, MD, PhD, director of the CVI and professor of cardiology, examines genetic test results that will guide the treatment of a heart failure patient using a new drug, bucindolol.

Personalized medicine ensures the right treatment, for the right patient, at the right time.

Dr. Brian Lowes, associate professor of medicine in the Division of Cardiology, has developed a prognostic instrument called a "gene chip" that is now in a major, NIH-funded, multi-site clinical trial. This tiny hand held device assesses how 150 specific genes are expressed in patients who have experienced heart failure. With this information, Dr. Lowes and his team can predict with great accuracy which medicines will, or won't, work for each patient. In the future, similar devices will help us understand precisely what has caused heart failure and what treatments will be most beneficial. Imagine being able to predict every patient's response so that we know immediately whether medicine will be effective or if a heart transplant is the most advisable course of action.

Dr. Brian Lowes shows off his "gene chip" device.

"The diagnosis and treatment of heart disease has moved firmly into the realm of genetics, a field that is developing and applying new knowledge and technology across medicine. At the University of Colorado Denver we are creating a whole new generation of researchers and practitioners to lead the future of molecular genetics and transform the way we combat heart disease."

Matthew Taylor
PhD, Director, Adult Medical Genetics Clinic

Educating the innovators of tomorrow

One of the most exciting aspects of the Cardiovascular Institute is that we are training the next generation of cardiovascular scientists. We attract the best and brightest students who wish to participate in an intellectual environment that is free of boundaries between the most basic molecular mechanisms and clinical applications. We allow them to participate in projects at every point in the spectrum of biomedicine, from the laboratory into the clinic and into the commercial sector.

A family "blueprint" offers new hope for the next generation

Drs. Matthew Taylor and Luisa Mestroni are working to understand the complex interplay of behavior and genetics to establish the underlying genetic makeup of entire families. By tracking more than 300 families with inherited heart failure, they are helping us shift our treatment paradigm from a single patient model to a family-based model in which the entire family is at the core of our work. As their research advances, University of Colorado Denver doctors are increasingly able to determine whether someone in the family is high or low risk and thereby help them make decisions about lifestyle modification, screening plans and even preemptive treatment.

The groundbreaking work of doctors at the University of Colorado Denver are changing the diagnosis and treatment model of cardiovascular disease from individuals to multigenerational families.

With your help, the Cardiovascular Institute will bring basic science discoveries from the bench to the bedside faster than ever before

New investments totaling $15.5 million for additional world-class expertise, enhanced laboratories and research resources will enable us to accelerate our pace of discovery and offer new hope to patients. By putting more minds and more resources toward the problem of heart failure, we can fulfill our promise to make real change in how heart disease is diagnosed, treated and prevented.

Your gift will set an example for others to follow, enabling us to secure additional contributions from individuals and the foundation community. In addition, your contribution will be leveraged to attract new government grants for major research studies.

"Help us build on early support from generous individuals who want to save and improve the lives of those suffering from heart disease."

M. Roy Wilson
Chancellor, UC Denver

Donors make an impact

Martha and Tom Dillenberg's generous gift will make an impact on the work of Peter Buttrick, MD, Head, Divsion of Cardiology, shown here in his lab.

"We decided that kind of quality and caring needs funding."

Martha Frey Dillenberg

Patients don't care how much a doctor knows until they know how much a doctor cares. The old-fashioned bedside manner is more important to most of us than we realize until we experience it firsthand.

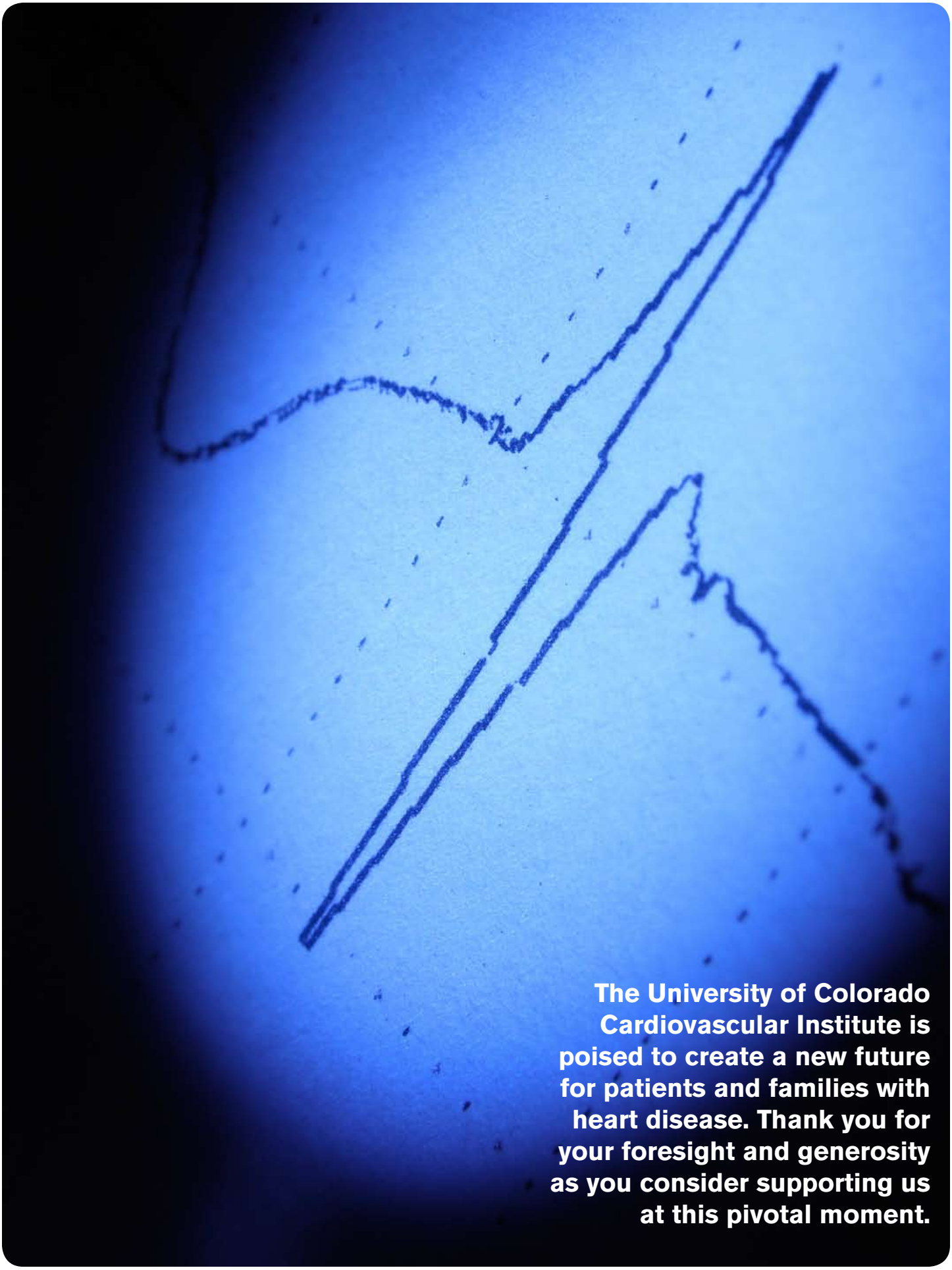
Martha Frey Dillenberg and her husband experienced outstanding technical care from cardiologist Peter Buttrick, but it was when he touched their hearts while caring for their hearts that inspired them to donate to him and the cardiology department.

"Dr. Buttrick took us under his wing, gave us personal care," said Martha, who has had two strokes and a heart attack. "He explained everything so well that I calmed down. He even called us at home later to see how we were doing." Buttrick also adjusted Tom's medications.

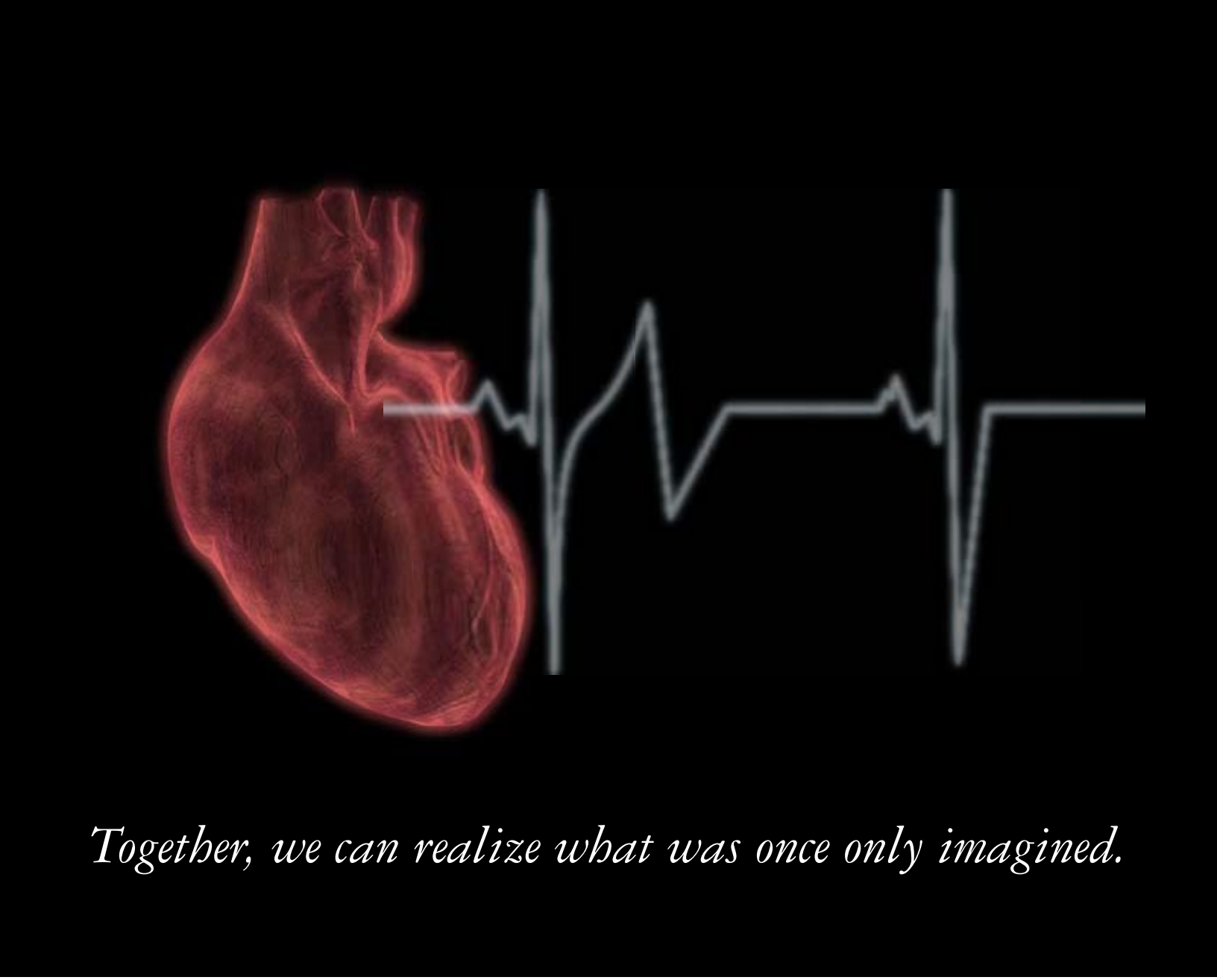
"We decided that kind of quality and caring needs funding," Martha said. As a result, she and Tom are giving a total of $1.875 million to support Buttrick's cardiology research, the cardiology department at the University of Colorado Denver and to establish a First Tee scholarship program.

As a 1967 graduate of the University of Colorado and later as the first director of major gifts at the University of Colorado Foundation, Martha understands the need for philanthropic support.

She and Tom feel confident that their gifts will have an impact on multiple levels, including advancements in research and education about the essential role that a compassionate bedside manner can play in a patient's recovery.



The University of Colorado Cardiovascular Institute is poised to create a new future for patients and families with heart disease. Thank you for your foresight and generosity as you consider supporting us at this pivotal moment.



Together, we can realize what was once only imagined.

To learn about the many ways you can make a gift:

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