

Arrhythmias affect the lives of tens of millions of people around the globe.

As many as one in four Americans over the age of 40 will develop a cardiac arrhythmia—an irregular heartbeat caused by abnormal electrical impulses. When the heart fails to contract or beat at the proper rate and in the proper rhythm, it restricts blood flow to the body's most vital organs, which can lead to serious illnesses. Worse, some arrhythmias can cause premature—and sometimes sudden—death.

The most common and serious arrhythmia is atrial fibrillation. Also known as AFib or AF, this quivering or irregular contraction of the upper heart chambers can lead to deadly blood clots. AFib affects more than 2.7 million Americans. It doubles the risk of heart-related death and more than quadruples the risk of stroke.

For many, sudden death is the first sign of an arrhythmia. Sometimes there are warning signals like palpitations, fainting, light-headedness, dizziness, shortness of breath, and chest pain—but not always. While there have been incredible medical advances, because of its often asymptomatic and fatal nature, we need better ways to predict and preempt arrhythmias before they start.

But our program is helping patients get their rhythm back. Each year, more than 5,000 patients from around the world come to Stanford to receive the most advanced care for cardiovascular diseases. Since Dr. Norman Shumway performed the nation's first successful heart transplant here almost 60 years ago, Stanford has pioneered the field of cardiology. Today, Stanford cardiologists continue to push the envelope in advancing research and treatment options for patients, including those suffering from arrhythmias.

We're revolutionizing arrhythmia treatment. For years, we've led the way in ablation, a nonsurgical treatment that's the gold standard for treating arrhythmias. Stanford cardiologists led in developing cutting-edge techniques, now used worldwide, that meticulously map and pinpoint the source of an arrhythmia. By either freezing it or using an electrical current, we can precisely eliminate the abnormal tissue that's causing the arrhythmia and restore the heart's proper rhythm.

Our faculty are also developing new imaging technologies to improve ablation procedures, including a tiny device that maneuvers on the inner surface of the heart like a moon rover.

The Stanford Arrhythmia Center is growing at a phenomenal rate and we're laying the foundation for the future. We've nearly tripled our new patient volume and more than doubled our grant and outside research support. And our faculty have dramatically increased their published research studies, presentations, and patent submissions.

We have a tremendous opportunity to be headquartered in Stanford's new state-of-the-art Biomedical Innovation Building. This cutting-edge research facility will open in 2020. But we need to recruit additional physician scientists, engineers, researchers, and trainees to take full advantage of this opportunity and meet the growing needs of our program.

We're in the right place at the right time. Our program leverages Stanford's unique atmosphere of interdisciplinary collaboration. We have some of the world's foremost experts in cardiology, bioengineering, data and computer science, electrical engineering, genomics, and regenerative medicine, all working together to improve options for arrhythmia patients. And, because we're located in the heart of Silicon Valley, we have unmatched access to the world's best tech talent. From developing apps that collect health data investigators are using in cardiac research, to creating small wearables that can detect arrhythmias, the opportunities for innovation at Stanford are endless.

We need your partnership. Your gift will help ensure we're able to recruit, nurture, and develop the future pioneers in cardiac research and medicine. Your support will help us bring the best talent to the Stanford Arrhythmia Center, where they'll have the opportunity to pursue their most exciting and promising work. We hope you'll join us as we revolutionize the diagnosis, treatment, and care of arrhythmia patients around the world.

FACULTY SPOTLIGHT



Paul Wang, MD

Co-Director of the Cardiac Arrhythmia Center

Dr. Paul Wang is a revered innovator and co-inventor of catheter cryoablation, a treatment used to seek out and destroy the abnormal tissue that causes cardiac arrhythmias.

A balloon catheter, a steerable flexible tube with an inflatable balloon at its tip, is inserted into a blood vessel, usually in the upper leg. The catheter is carefully threaded through the body until it reaches the heart. Once the balloon is at the opening of the pulmonary vein, liquid nitrous oxide flows through the catheter and vaporizes, absorbing heat from the surrounding faulty tissue, which freezes and disables the target tissue that triggers an irregular heartbeat.

This therapy is now a standard treatment option for arrhythmia and has been used in more than 200,000 patients worldwide.

Dr. Wang and his team were recently awarded a patent for a new ablation device that can walk on the inner surface of the heart like a moon rover. This device will provide unparalleled ability to precisely perform procedures inside the heart.

FACULTY SPOTLIGHT



Sanjiv Narayan, MD, PhD

Co-Director of the Cardiac Arrhythmia Center

Dr. Sanjiv Narayan has decades of experience in computational biology, computer science, and medicine. He invented an algorithm that is at the core of a mapping system that analyzes the flow of electricity in the heart called Focal Impulse and Rotor Modulation (FIRM) ablation.

A basket catheter is inserted into the heart and expands to conform to the shape of the left atrium to record any abnormal rhythms. The mapping technology locates rotors, the spinning and circular electrical atrial fibrillation anchor points in the heart tissue. The computer algorithm translates the electrical impulses into images. An electrophysiologist is then able to isolate and destroy the tiny area of tissue—the eye of the fibrillation storm—that's causing the rapid and irregular heartbeats.

Because FIRM ablation destroys less atrial tissue than traditional ablation techniques, we are able to use this treatment for routine clinical care. Thousands of patients with AFib throughout the world, including more than 300 who've come for treatment at Stanford, have experienced improved outcomes with this novel therapy.

Giving Opportunities

Professorships | \$4M each (endowed)

Endowed professorships are the highest honor the university can bestow upon a faculty member. Established as permanent funds that provide an annual payout, endowed professorships play a vital role in recruiting and retaining world-renowned scholars and educators while allowing the department to lead major advances in research and treatment. With this funding, investigators can pursue their most promising and creative ideas to improve patient outcomes.

Medical Directorship | \$3M (endowed)

An endowed directorship provides stability while allowing the director to drive the vision of the program, lead its clinical services, and identify new opportunities for growth and impact. It will provide resources for the director to pursue his or her own research and collaborate with other researchers and clinical subspecialists. This gift may be named to recognize the donor or someone the donor wishes to honor in perpetuity.

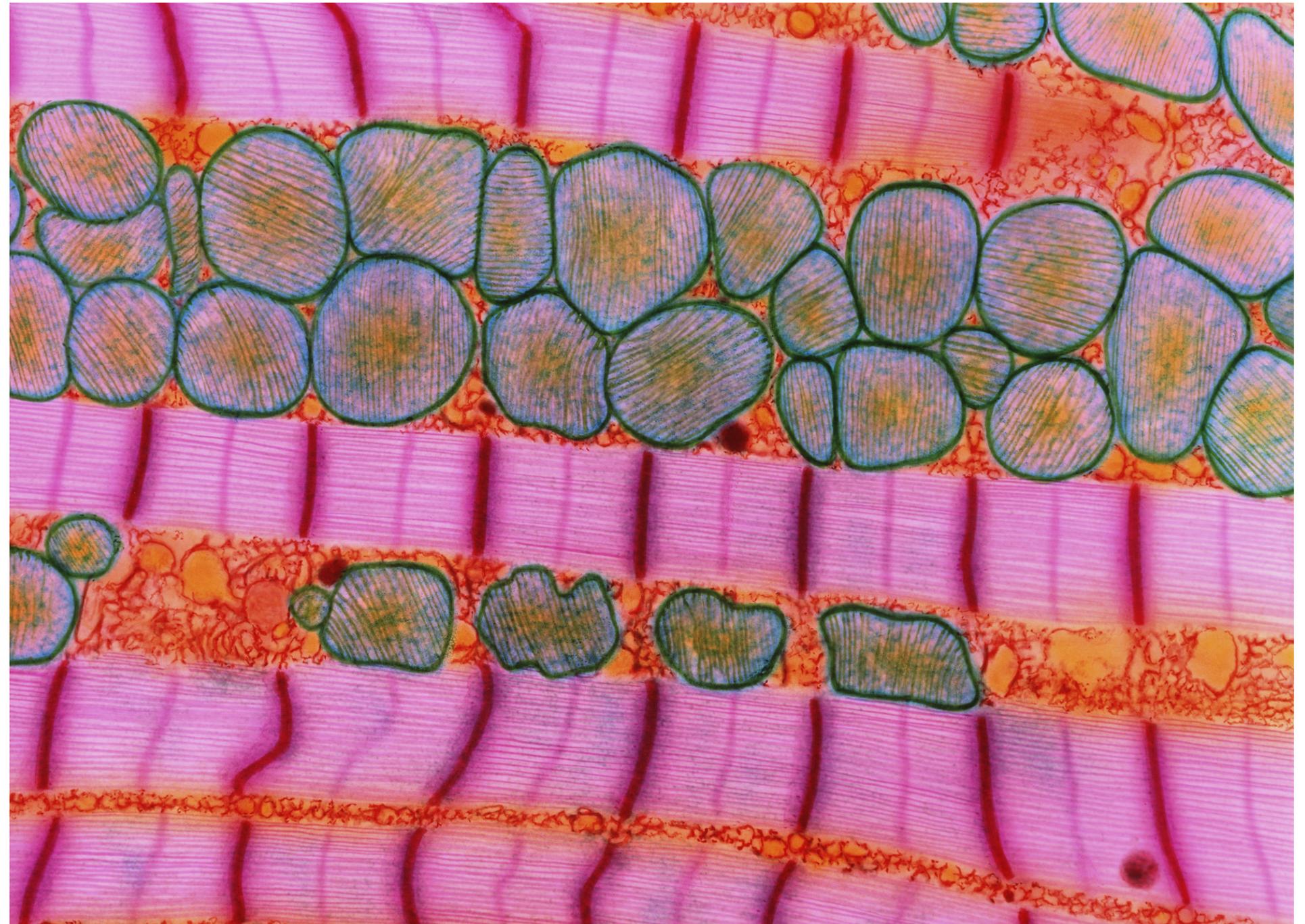
Arrhythmia Research Fund | \$100K per year (expendable) or \$2M (endowed)

Research funds can be earmarked to accelerate any of the multiple basic and translational research efforts currently underway, or to launch a novel line of inquiry. This fund aids in the recruitment of investigators and allows us to attract the most talented candidates in the field by providing opportunities to innovate, discover, and create. Research funds may be named for a donor or in honor of a person of the donor's choosing.

Fellowship Training Funds | \$100K each per year (expendable) or \$2M each (endowed)

Graduate and postdoctoral fellowship funds allow us to enroll the most gifted students and trainees in our program, regardless of their financial means. Fellowship funds may be named for a donor or in honor of a person of the donor's choosing.

Transmission electron micrograph of healthy heart muscle



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Stanford Arrhythmia Center

