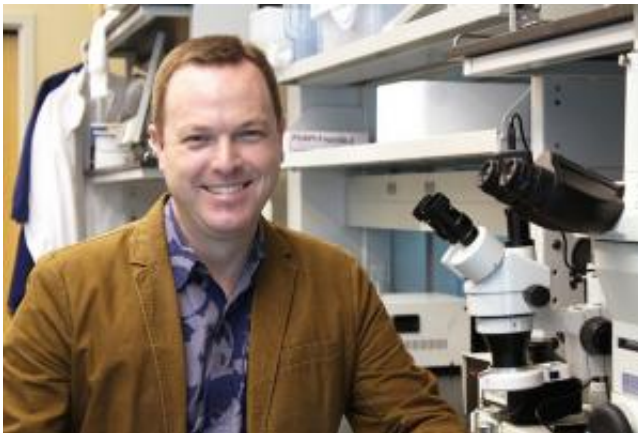


# Patent awarded to medical school scientist for new heart failure therapy

August 25 2015, by Tina Shelton

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Dr. Alexander Stokes in his laboratory.

A patent has been issued by the U.S. Patent and Trademark Office to a University of Hawai'i at Mānoa medical researcher who has developed a novel therapy to treat and prevent heart failure.

Alexander Stokes, PhD, an assistant professor of Cell and Molecular Biology at the John A. Burns School of Medicine (JABSOM), developed the science.

"Many types of diseases ultimately affect the heart by making it work harder. The heart muscle compensates by getting bigger ([cardiac hypertrophy](#)). The heart becomes stiffer and less functional, and eventually starts to fail," explained Dr. Stokes. "We have a way of

protecting the heart with a completely new therapeutic approach—a therapy that allows the heart to compensate for the extra work it needs to perform, without losing function and failing."

The new treatment method focuses on the regulation of the ion channel TRPV1. This ion channel is best known for being activated by capsaicin, the hot component of chili peppers. Stokes' lab at JABSOM recently published data revealing that, in pre-[clinical trials](#), inhibition of TRPV1 with a small molecule compound can protect the heart from the pathological and functional changes associated with cardiac hypertrophy, heart failure and associated pathologies.

"The development of a clinical formulation, and Phase II clinical trials, should be quite rapid, as many TRPV1 inhibitors have been already tested in multi-phase clinical trials for alternative indications," said Stokes.



Credit: Stokes laboratory

This "utility patent" suggests a unique purpose for a new, non-narcotic painkiller that is under development. For the drug to be marketed for heart failure, the drug maker must enter into a partnership with the utility patent holders.

Biotech startup Makai Biotechnology LLC licensed the technology from the UH Office of Technology Transfer and Economic Development, to develop new cardiovascular drugs aimed at treating and preventing heart failure. Dr. Stokes formed the company with David G. Watumull, who serves as senior advisor. Watumull is also the CEO of Cardax Inc., a publicly held life sciences company. The University of Hawai'i holds an interest in Makai Biotechnology LLC, and may receive future revenue derived from this intellectual property.

Heart failure is the fastest growing clinical cardiac disease in the United States, with 670,000 new cases of heart failure diagnosed each year, and accounts for 34 percent of all cardiovascular related deaths, according to the American Heart Association. Heart failure represents one to two percent of all health-care expenditures in the U.S., or approximately \$40 billion a year.

"Drugs used to treat cardiovascular diseases, especially those needed to treat [heart failure](#), are urgently needed, and represent a very large market worldwide," said Watumull.

"Obtaining this first patent represents a step forward in our plans to establish alliances with major pharmaceutical companies to develop and test compounds from pre-clinical through phase II human clinical trials, and make the treatment available as soon as possible," said Stokes.

Funding for the pre-clinical studies Stokes led at JABSOM was provided through grants awarded by the National Institutes of Health and the Hawai'i Community Foundation, totaling approximately \$1 million over

five years.

"Dr. Stokes' work, and the investment by Makai Biotechnology LLC, is an example of the university's commitment to building a research industry in our state in partnership with the community," said JABSOM Dean Jerris Hedges, MD. "And most of all, it demonstrates our overarching research goal—to provide new treatments that make a real difference in the lives of Hawai'i's people."

Provided by University of Hawaii at Manoa

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