

Thyroid hormones reduce animal cardiac arrhythmias

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Rats that received thyroid hormones had a reduced risk for dangerous heart arrhythmias following a heart attack, according to a new study by a team of medical researchers at New York Institute of Technology.

In the NIH-funded study, published in the *Journal of Cardiac Failure*, the team found that thyroid [hormone replacement therapy](#) significantly reduced the incidence of atrial fibrillation - a specific kind of irregular heartbeat, or arrhythmia—in the rats, compared to a control group that did not receive the hormones.

The finding could have important implications for future treatment of human patients, says lead researcher Youhua Zhang, MD, Ph.D., noting that up to about half of the humans with [heart failure](#) also suffer from atrial fibrillation.

"Our data highlights the potential clinical importance of correcting [thyroid dysfunction](#) to prevent cardiac arrhythmias and [atrial fibrillation](#) in heart failure," Zhang and the researchers wrote in their study. "In other words, withholding thyroid hormone treatment in heart failure may do harm when cardiac hormone levels are below normal."

Zhang said researchers induced heart attacks in a group of 29 rats. Fourteen were treated with a form of thyroid hormone known as T4. After two months of treatment, the researchers measured cardiac function and then attempted to induce rapid and irregular heartbeats. Eleven of the 15 animals in the control group developed the arrhythmia but only four of the 14 animals treated with the thyroid hormone developed an arrhythmia.

"With T4 treatment of these animals with myocardial infarctions, they are more resistant to developing arrhythmias," Zhang said.

Zhang's study builds upon previous studies conducted at NYIT that demonstrate links between

thyroid hormones and heart health in animal models. Five months ago, Zhang's collaborator A. Martin Gerdes, Ph.D., published a study in *Molecular Medicine* that found administering low doses of the active form of the thyroid hormone known as T3 prevented the development of heart disease in rats with diabetes. Previously, Gerdes has published studies demonstrating that hypertension and heart attacks also trigger low cardiac thyroid hormone levels and contribute to heart disease.

Gerdes and Zhang believe that human clinical trials involving patients with heart failure may lead to findings that radically change [heart failure treatment](#) protocols.

The current study notes reluctance to use thyroid hormone replacement therapy in humans with heart diseases likely has its roots in several studies that used excessive doses of [thyroid hormones](#) or thyroid mimics.

Provided by New York Institute of Technology

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