

# **news** *THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT DALLAS*

**southwestern medical school ■ graduate school of biomedical sciences ■ school of allied health sciences**

Contact: Bob Fenley

DALLAS--Research into some basic mysteries of heart function is being conducted by 13 scientists at The University of Texas Southwestern Medical School under sponsorship of the Dallas County Chapter, American Heart Association.

The researchers and their projects are:

Dr. James Michael Atkins who is looking into the different ways in which the heart responds to exercise. The particular target is the parasympathetic nervous system which controls heart rate and stroke volume.

Questions of how cells specialize--that is, ways some grow into eye cells and some into liver cells--are being studied by Dr. Arthur P. Bollon. Suspecting the process is controlled by some genes' being turned on and others off, he will specifically look at the synthesis of a protein called myosin in cultured beating heart cells and in cells which stop beating after several weeks.

Dr. George C. Curry is studying some of the lesser understood actions of a drug called propranolol, an important agent used in treatment of angina pectoris--chest pains caused when the heart does not receive an adequate supply of blood. He is doing precise measurements of heart blood flow using radioactive Xenon and analyzing the results by computer.

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first add heart research

Dr. Robert M. Dowben is doing basic research on the way chemical energy is utilized by the heart in its process of beating. To test a theory that the process works something like a solenoid (or electrically activated magnet) Dr. Dowben is reconstructing a sophisticated apparatus of which there are only five or so others in the world.

Dr. H. Fred Downey is investigating certain drugs which are being used to control the irregular beating which accompanies a type of heart attack known as a myocardial infarction. Some of the drugs constrict and others dilate coronary vessels. Just what effect changes in blood flow may have on the damaged areas is the point of curiosity of the research, being conducted at the medical school and Methodist Hospital's Cardiopulmonary Institute.

The heart responds to rapid introduction of fluids into the blood by augmenting its rate and stroke volume. Dr. Lawrence D. Horwitz is trying to find the location of the sensors which signal the heart to do this, and how they work.

Dr. Arnold H. Israelit is looking into the processes by which fluid and salt retention get out of order. One result of this is swelling and it is found in heart, liver and kidney diseases. He is trying to more precisely define the relationship between kidney function and salt and water excretion.

Dr. William A. Pettinger is researching the processes leading from mild to severe high blood pressure. Some feedback control of the renin-angiotensin system, a major mechanism of regulating blood pressure, is lost as the disease becomes severe. Dr. Pettinger is performing experiments with rats in an effort to learn how it happens and to evaluate some new antihypertensive drugs.

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second add heart research

High blood cholesterol levels are associated with clogged arteries and heart trouble. Dr. Philip Raskin is studying the sophisticated process by which the body regulates the amount of cholesterol in the blood--balancing on one hand the amount consumed in food and, on the other, the amount actually produced by the liver. He is looking at the proposition that cyclic AMP--the so-called "second messenger" in a variety of hormone actions--plays a key role in liver production of cholesterol.

Several hormones strengthen the heart's contraction. One of these, a hormone from the pancreas called glucagon, seems to act upon cell membrane structures called receptors. Other hormones seem specific for other receptors. Dr. Thomas Cecil Smitherman is attempting to learn about the glucagon receptor--why it makes a heart beat more forcefully and why there seems to be changes in the receptor in chronic heart failure. He is doing part of the research at Veteran's Administration Hospital.

Dr. John Thomas Watson is examining the mechanics of blood flow in the use of heart-assist devices utilizing long thin balloons. These balloons, placed in an artery just outside the heart, assist in maintaining blood pressure and pumping blood to the coronary arteries of other vital organs after the heart has suffered an attack.

In order to understand factors controlling heart degeneration, as well as understanding the normal protein balance, Dr. Kern Wildenthal is looking at the activities of enzymes and in particular how one enzyme, cathepsin D, is affected by a variety of hormones.

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third add heart research

The majority of deaths following heart attacks can be attributed to heart muscle damage causing "pump failure." Some drugs, including one known as hypertonic mannitol, may have an effect in reducing the amount of damage. Dr. James T. Willerson is studying the effects of mannitol to see whether it would be a good candidate for testing in humans with heart attacks.

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