

SELECTED MEDICINES IN DEVELOPMENT FOR HEART DISEASE AND STROKE

Alleviating Angina: Chronic angina, or attacks of cardiac pain that can lead to heart attacks, affects more than six million Americans. These attacks occur when the heart does not receive the oxygen it needs to function effectively. These attacks are typically triggered by physical exertion or emotional stress. A new class of medicines called pFOX (partial fatty acid oxidation) inhibitors may reduce episodes of pain and allow angina patients to be more active. The medicines work by shifting the heart's metabolism to a fuel source that requires less oxygen to generate the same amount of energy. The heart has two sources for the fuel it needs to function: fatty acids and glucose. A healthy heart uses fatty acids during times of stress. But a heart that is not receiving enough oxygen-rich blood, due to artery obstructions, can produce more energy per unit of oxygen when using glucose instead of fatty acids. By shifting the metabolism of the heart to use more glucose than fatty acids during periods of stress, pFOX inhibitors can help prevent angina attacks. In clinical trials, a pFOX inhibitor bolstered the exercise capacity of angina patients and reduced episodes of cardiac pain.

Bypassing Surgery: A medication in development may enable patients to grow their own bypasses, potentially reducing the need for coronary bypass surgery and providing effective treatment for a debilitating circular disease. The injectable medicine contains a gene that promotes new blood vessel growth. Clinical trials of the medicines are being conducted in patients with peripheral vascular disease, a progressive narrowing of the blood vessels in the legs that affects more than 10 million Americans, and in patients with advanced coronary artery disease.

Treating High Blood Pressure: Hypertension or high blood pressure is a leading risk factor for both heart disease and stroke. About 65 million Americans have high blood pressure, and more than 50 percent of those undergoing treatment do not reach targeted blood pressure levels. One potential medication in development is a first in class renin inhibitor. Renin is the key enzyme at the top of the renin-angiotensin system that regulates blood pressure. By inhibiting renin, it is believed that patients suffering from hypertension will not only lower their blood pressure, but will receive additional protection for the heart in congestive heart failure.

Reducing Heart Attack Deaths: Each year, about 200,000 Americans die of heart attacks. A new medication in development offers hope of reducing that statistic. It's a monoclonal antibody that targets the proteins that injure the heart after an attack. In clinical trials, the medicine reduced heart attack deaths.

Pulmonary Arterial Hypertension: A progressive and potentially life-threatening condition that involves high blood pressure and structural changes in the walls of the pulmonary arteries, the blood vessels that connect the heart to the lungs. About 100,000 patients worldwide have this condition, which causes shortness of breath, limits activity and shortens life-expectancy. A medication in development may be able to reduce these effects. It's an oral endothelin A receptor antagonist, designed to block a protein involved in constricting blood vessels and increasing pressure on the pulmonary arteries.

Preventing Strokes: According to the American Heart Association, two million Americans suffer from atrial fibrillation, in which the two small upper chambers of the heart quiver instead of beating effectively. Blood in these quivering chambers can clot, travel to an artery in the brain and cause a stroke. About 15 percent of strokes in the U.S. occur in people with atrial fibrillation. A new medication in development is designed to prevent strokes in people with this condition. It's an oral direct thrombin inhibitor that blocks the activity of a clot-forming enzyme called thrombin, which is critical to the formation of blood clots.

Managing Cholesterol: Low levels of high-density lipoprotein (HDL), or "good", cholesterol are thought to put patients at risk of coronary artery disease and heart attacks. A new vaccine in development is designed to prevent the transfer of "good" cholesterol to "bad" low-density lipoprotein (LDL) cholesterol, thus keeping "good" cholesterol levels high. The vaccine stimulates the body to produce antibodies to a protein responsible for the transfer process between HDL and LDL cholesterol. Another potential treatment for high cholesterol combines an experimental medication that has been shown to elevate levels of HDL (good) cholesterol with an already approved medicine that lowers the levels of LDL (bad) cholesterol.

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