



UNIVERSITY OF OTTAWA
HEART INSTITUTE
INSTITUT DE CARDIOLOGIE
DE L'UNIVERSITÉ D'OTTAWA

FOR IMMEDIATE RELEASE | POUR PUBLICATION IMMÉDIATE

University of Ottawa Heart Institute Scientists Successfully Develop Novel Biomaterial to Help Grow New Blood Vessels

OTTAWA – January 13, 2009 – Researchers at the University of Ottawa Heart Institute (UOHI) have successfully grown blood vessels in damaged muscle tissue by injecting a biomaterial developed specifically to attract new cells and support regeneration. Blood vessel regeneration suggests that the body's own cells might one day be used to repair heart damage and restore function.

Details of the regeneration process were published online in the Journal of the Federation of American Societies for Experimental Biology (<http://www.fasebj.org/cgi/content/abstract/fj.08-111054v1>). A UOHI cardiac surgery research team led by Erik Suuronen, PhD, in collaboration with Dr. Marc Ruel, showed that thigh muscles with ischemia (lack of blood flow and oxygen) grew a significant number of new blood vessels when treated with the biomaterial.

“Our goal is to develop safe and effective treatments for coronary artery disease by helping the body rebuild blood vessels and improve heart function. We see this is a breakthrough that may also positively impact diseases such as diabetes, some disorders of the liver and chronic brain ischemia,” said Suuronen, principal investigator of the study and research scientist in UOHI's division of cardiac surgery.

The novel biomaterial developed by the Heart Institute combines a collagen protein and a molecule known as sialyl Lewis^x. The biomaterial forms a biological platform, or ‘smart scaffold,’ which serves as a mechanism to support cell growth. When injected into damaged muscle, the scaffold attracts special types of cells in the bloodstream called progenitor cells. In turn, the progenitor cells send out homing signals that call other cells to join them in growing new blood vessels.

Until now, cell therapy has shown only modest improvement in helping to restore blood flow and functionality in a failing heart. The challenge has been to set up a natural magnet or ‘homing device’ to attract cells long enough for them to survive and grow. With the new biomaterial, the Heart Institute approach does just that by imitating and enhancing the natural process of blood vessel formation in the body.

“The concept of using cell therapy to rebuild blood vessels in and around the heart is proving to be the next frontier in cardiac medicine. This landmark development clearly represents a major step forward in adding to our ability to cure heart failure,” said Dr. Ruel, Director, Cardiac Surgery Research, UOHI.

Heart Institute research showed that when compared with scaffold made from the collagen alone, the hind thigh muscles in rats treated with the smart scaffolding had more new blood vessels and improved function after a two-week period.

This latest scientific result from the Heart Institute is part of an emerging global research effort known as regenerative medicine. Regenerative medicine is exploring revolutionary approaches to engineering the reversal of disease and damage in the human body. Scientists in a new collaboration with physicians are learning how to rebuild tissue the way the body does - one cell at a time. At the Heart Institute, regenerative therapies hold significant promise for reversing advanced heart failure.

Other UOHI scientists are exploring blood vessel formation at the molecular level. Researchers at the Heart Institute's Ruddy Canadian Cardiovascular Genetics Centre have discovered a genetic factor that plays a key role in how this process works within the body. Their goal is to identify genes that contribute to the formation of blood vessels.

Techniques to rebuild blood vessels are also part of a large, diverse UOHI program in cellular and molecular research. The research project in cardiac surgery was supported in part by the Heart and Stroke Foundation.

About UOHI

The University of Ottawa Heart Institute is Canada's largest and foremost cardiovascular health centre dedicated to understanding, treating and preventing heart disease. We deliver high-tech care with a personal touch, shape the way cardiovascular medicine is practiced, and revolutionize cardiac treatment and understanding. We build knowledge through research and translate discoveries into advanced care. We serve the local, national and international community, and are pioneering a new era in heart health. For more information, visit www.ottawaheart.ca

- 30 -

For further information please contact:

Marlene Orton
Senior Manager, Public Affairs
University of Ottawa Heart Institute
(613) 761-4427
morton@ottawaheart.ca