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Samuel Lunenfeld Research Institute

New role for sugars: Research shows connections between sugar modifications in cells and cancer

Toronto, ON (April 5, 2007) -- In a ground-breaking study published in the top journal, Cell, Dr. James Dennis, senior investigator at the Samuel Lunenfeld Research Institute at Mount Sinai Hospital, has discovered a new role for sugars on proteins.

Every cell in the human body is controlled by signaling networks that are responsive to external stimuli. The stimuli are received by protein receptors on the cell surface. These proteins act as interpreters for cells, receiving messages from the outside and then instructing the cells to divide or to move.

Most of the important proteins that decorate the outside of human cells have complex sugars attached to them. Researchers at the Samuel Lunenfeld Research Institute have known that changes in these sugars are often associated with diseases such as cancer, diabetes and autoimmune diseases such as Multiple Sclerosis.

"Our research shows that the sugar composition of these receptor proteins controlled the amount of time the protein was available to interact with the external messages, in effect, changing the likelihood that a receptor could be activated," states Dr. Dennis. "This explains how cells can adapt in their nutrient environment. However, when this normal adaptation becomes imbalanced, cancer cells can grow and promote metastasis."

Dr. Dennis' team continues to research the effects of changing the sugars associated with the key proteins that act as receptors for hormones and growth factors. These are the same types of proteins that are targeted by a new generation of anti-cancer drugs such as Herceptin (trastuzumab).

"These findings may lead to a new class of drug treatments as well as strategies to improve the effectiveness of existing anti-receptor drugs," states Dr. Jim Woodgett, Director of Research, Samuel Lunenfeld Research Institute.

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The research will be published in the April 6, 2007 edition of Cell.

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The Samuel Lunenfeld Research Institute of Mount Sinai Hospital, a University of Toronto affiliated research centre, established in 1985, is one of the world's leading centres in biomedical research. 32 principal investigators lead research in diabetes, cancer biology, epidemiology, stem cell research, women's and infants' health, neurobiology and systems biology. For more information on the Samuel Lunenfeld Research Institute, please visit www.mshri.on.ca

Mount Sinai Hospital

Mount Sinai Hospital is an internationally recognized, 472-bed acute care academic health centre, affiliated with the University of Toronto, known for the outstanding provision of compassionate patient care, innovative teaching and leading-edge research. Its Centres of Excellence include Women's and Infants' Health; Surgery and Oncology; Acute and Chronic Medicine; Laboratory Medicine and Infection Control; and the Samuel Lunenfeld Research Institute. For more information about Mount Sinai Hospital, please visit www.mtsinai.on.ca