

**MEDIA RELEASE**

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**Researcher Discovers Key to Unlock Death Gene; Provides Exciting New Directions in Heart, Cancer Research**

A ground-breaking study led by Dr. Lorrie Kirshenbaum of the St. Boniface Hospital Research Centre and published in the journal *Proceedings of the National Academy of Sciences USA* has discovered a “master switch” for how a death gene is turned on and off in heart cells, with simultaneous application in cancer cell biology.

Heart disease and cancer are the biggest killers in North America, and though they appear to be on opposite sides of the spectrum, the study found a common link related to a death gene called Bnip3. When Bnip3 is “switched on” it causes the body’s cells to die. The study illustrates a genetic switching mechanism that turns Bnip3 on and off. During heart attack, when oxygen levels in the heart drop below a certain level, the Bnip3 gene is switched “on” and cells start to die. Damaged heart cells do not repair or regenerate and adversely affect the heart’s ability to pump blood - ultimately leading to heart failure. By switching off Bnip3 in the heart, Dr. Kirshenbaum and his team were able to prevent heart cells from dying.

The opposite occurs in cancer where cells grow uncontrollably, resulting in tumors because the cellular mechanisms that would otherwise stop cells from growing are damaged or defective. Cells that are predisposed to become cancer cells have developed a genetic resistance to dying and continue to grow. Dr. Kirshenbaum and his group have found that selectively “switching on” Bnip3 can prevent certain cancer cells from growing. This is a major leap forward in the basic understanding of how cells grow and die, with potential for developing new treatments for both heart disease and cancer.

“These studies represent a significant advancement in fundamental knowledge of mechanisms underlying the field of cell survival, growth, and programmed cell death, in both heart muscle and cancer, and provide a ‘bigger picture’ that may reconcile a number of previous apparently contradictory findings,” says Dr. Elissavet Kardami, Professor of human anatomy and cell science at the University of Manitoba.

Dr. Jim Davie, Director of the Manitoba Institute of Cell Biology, agrees. “Understanding the processes by which heart cells live or die following a heart attack is fundamental to providing new therapies in preventing damage to the heart. This exciting and significant study sheds light on how the Bnip3 death gene is “turned off” in cancer cells, allowing cancer cells to ignore death signals and continue to grow. Thus this research provides exciting new directions in the treatment of heart disease and cancer.”

Dr. Kirshenbaum’s research is supported by the St. Boniface Hospital & Research Foundation, the University of Manitoba, the Canadian Institutes of Health Research (CIHR), the Manitoba Health Research Council (MHRC) and the Heart and Stroke Foundation of Manitoba. Dr. Kirshenbaum holds a Canada Research Chair in Molecular Cardiology.

*About Dr. Kirshenbaum*

Dr. Lorrie Kirshenbaum is a Professor in the Departments of Physiology, Pharmacology & Therapeutics, Faculty of Medicine, University of Manitoba, and Principal Investigator at the Institute of Cardiovascular Sciences, St. Boniface Hospital Research Centre. He is also Director of Research Development for the Faculty of Medicine and Canada Research Chair in Molecular Cardiology. Dr. Kirshenbaum's research is directed toward understanding how the body regulates the growth of heart and cancer cells; he has published extensively in this area and has been an invited participant at several national and international scientific meetings. He has received several honors and awards and serves on many journal editorial boards and national and international grant review committees. The goal of Dr. Kirshenbaum's research is to develop new treatments that will help people with chronic diseases such as heart failure and cancer.

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