Not all stem cells are created equal

Dr Mick Bhatia at McMaster University discovered that human stem cells made from adult donor cells remembered what cell types they came from. When reprogrammed in the lab, they preferentially reverted to their original cell type. Dr Bhatia’s discovery will have important implications for new stem cell therapies.

Lee et al., Nature Communications 2014.

Genetic test to predict prostate cancer relapse

Dr Robert Bristow at the Princess Margaret Cancer Centre was part of an international team that developed a genetic test to predict which men are at highest risk of their prostate cancers returning following treatment. This test provides a way to identify patients who need more aggressive treatments, while avoiding over-treatment for patients whose cancers are less likely to return.

Lalonde et al., Lancet Oncol. 2014.

Mapping the evolution of cancer cells

Dr Samuel Aparicio and Dr Sohrab Shah at the BC Cancer Agency made important discoveries that shed light on how cancer cells evolve in tumours. The researchers developed a new tool to group genetic mutations in a single tumour and used it to predict how cells in breast cancers evolve and grow over time. Understanding and predicting changes in complex cancers may provide new options for targeted treatments.


Gene mutations linked to lung cancer risk

Dr Rayjean Hung at Mount Sinai Hospital investigated the importance of over 100 genes commonly mutated in the early stages of leukemia. He found that a mutation in the gene DNMT3A plays a key role, making cells with this mutation resistant to chemotherapy and faster growing than normal stem cells. These findings identify a possible starting point for the disease, which could help doctors diagnose and treat patients earlier.


Gene mutation could be the trigger for leukemia

Dr John Dick at the Princess Margaret Cancer Centre investigated the importance of over 100 genes commonly mutated in the early stages of leukemia. He found that a mutation in the gene DNMT3A plays a key role, making cells with this mutation resistant to chemotherapy and faster growing than normal stem cells. These findings identify a possible starting point for the disease, which could help doctors diagnose and treat patients earlier.

Long-term effects of treatment for childhood brain cancer

A study led by Dr Donald Mabbott at the Hospital for Sick Children found that children treated for medulloblastoma, a childhood brain cancer, had smaller regions of the brain associated with learning and memory, which was also linked to impairment in these abilities. This study highlights the need for more targeted therapies that minimize the late effects of treatment on survivors.


The costs and benefits of lung cancer screening

A study led by Dr Stuart Peacock at the Canadian Centre for Applied Research in Cancer Control and the BC Cancer Agency showed that the average costs of screening individuals at high-risk for lung cancer and treating cancerous growths discovered through early detection were lower than the costs of treating advanced lung cancer. These findings provide important information to policy-makers considering the value of lung cancer screening programs in high-risk groups.


Carbs, gut microbes fuel colorectal cancer

Genetics, diet and gut microbes all contribute to the development of colorectal cancer, but how these factors work together to promote cancer is not well understood. Dr Alberto Martin at the University of Toronto investigated these connections in a mouse model of colorectal cancer and found that gut microbes resulting from a diet high in carbohydrates interacted with cancer-causing genes to fuel cancer development. These findings have important implications for reducing cancer risk by changing diet and the make-up of gut microbes.

Belcheva et al., *Cell* 2014.

Banning patio smoking helps smokers to quit

Dr Michael Chaiton at the University of Toronto led a survey of over 3,000 smokers about their exposure to smoke on patios and found that smokers were less likely to be successful in their quitting efforts after being exposed to tobacco smoke on a patio. These findings were used as evidence to support an Ontario government ban on smoking on patios and other outdoor public spaces.

Chaiton et al., *Tob. Control* 2014.

Making immunotherapies work for more people

Harnessing the immune system’s powerful ability to fight cancer, Dr Claude Perreault at the Université de Montréal has identified new molecules that attract T cells, the body’s natural killing machines that help fight off germs and diseases. Dr Perreault used a new approach to identify molecules that attract the T cell’s cancer-fighting abilities. These findings could help increase the number of cancer patients who could benefit from immunotherapies.