October 2016 (i2I17-1) Competition Awarded Innovation to Impact Grants

Listed by panel in alphabetical order

I1b Gene Regulation and Cell Biology

Pause, Arnim
McGill University
Haploinsufficient loss of ESCRT components as new drivers of cancer
Understanding how healthy cells protect themselves from uncontrolled growth could lead to new cancer treatments. Tumour suppressor genes put the brakes on cell growth, preventing tumour development. With the support of an Innovation Grant, Dr Arnim Pause discovered a new tumour suppressor gene that helps turn off cell growth signals. He will now expand his studies to 2 related genes and study how they all work together in mouse models of lung cancer and lymphoma. The insights gained could lead to new therapies and diagnostic tools.

I2 Imaging and Technology Development

Cypel, Marcelo
The Toronto Hospital (General Division) - UHN
In vivo lung perfusion (IVLP) as an adjuvant treatment for patients undergoing surgical resection of pulmonary metastases of bone and soft tissue sarcomas
Many cancers, including sarcomas, can spread to the lung. It can be difficult to treat these lung tumours with radiation or surgery, and the cancer often comes back. With the support of an Innovation Grant, Dr Marcelo Cypel developed a new technique for delivering chemotherapy straight into the lungs, limiting side effects to other organs. He is now performing the first clinical trial of the treatment in humans, studying its safety and potential effectiveness in people with sarcomas that have spread to the lungs. If successful, this could change how cancer in the lungs is treated, offering more options to patients with advanced cancer.

Stanisz, Greg
Sunnybrook Research Institute
Quantitative MRI as a biomarker of tumour resistance to radiation treatment in brain metastasis
Cancer that has spread to the brain can be treated with targeted high-dose radiation. However, it is difficult to tell early on if the tumour is responding to therapy. With the support of an Innovation Grant, Dr Greg Stanisz showed that new medical resonance imaging (MRI) techniques could detect tumour response as early as one week after treatment. He will now extend these MRI studies to differentiate between tumour progression and radiation side effects, which can look similar in medical scans but require very different treatments. These new techniques may help doctors adjust and improve treatment plans. This grant is funded in partnership with Brain Canada with the financial support of Health Canada.

I3 Immunology, Signalling and Stem Cells

Allen-Vercoe, Emma
University of Guelph
Determining the virulence factors of Fusobacterium nucleatum to define diagnostic and therapeutic targets for colorectal cancer
Infection with a type of bacteria called Fusobacterium nucleatum (Fn) can promote colorectal cancer. Understanding why this occurs could help us prevent colorectal cancers from starting or catch them early. Fn bacteria are difficult to grow in the lab, so very little is known about their biology. With the support of an Innovation Grant, Dr Emma Allen-Vercoe discovered which genes are activated in the bacteria and in colorectal cancer cells upon infection. She will now assess which of these genes play key roles in cancer growth and spread. These genes could be used in screening tests to detect colorectal cancer early or used to develop Fn vaccines.

Ursini-Siegel, Josie
Lady Davis Institute
Targeting tyrosine kinase signalling networks to reverse STAT family–driven breast cancer immune suppression

Cancer immunotherapies harness the power of the immune system to fight cancer throughout the body. However, cancers often learn to hide from the immune system. With the support of an Innovation Grant, Dr Josie Ursini-Siegel learned how aggressive breast cancer cells use specific proteins to become invisible to the immune system. She will now identify which types of breast cancer cells are most likely to use this approach and test strategies to make the cells visible again. This could improve immunotherapy for breast cancer.

I4 Novel Therapeutics

Bally, Marcel
BC Cancer Agency (Vancouver)
Copper-drug complexes for use in the treatment of aggressive cancers
When some drugs bind to copper, they have anticancer activity in the lab. However, these copper-drug complexes need to be reformulated for human use. With the support of an Innovation Grant, Dr Marcel Bally developed the first injectable formulation of an anticancer copper-drug molecule. He will now create additional injectable copper-drug treatments based on several other drugs. He will then study the effectiveness of these new treatments in lung and ovarian cancers that resist chemotherapy, selecting the most powerful candidates for further study. This could open the door to new treatment options, especially for hard-to-treat cancers.