



## September 2017 (IMP-18) Competition Awarded Impact Grants

Listed in alphabetical order

### **Aparicio, Samuel**

University of British Columbia

*Decoding clonal dynamics and evolution in breast cancers at single cell resolution: improving diagnostics and expanding treatment approaches*

Cancers can be made up of cells with different characteristics that affect how likely they are to become resistant to treatment. These characteristics may even change over time, making diseases like triple-negative breast cancer hard to treat. Dr Samuel Aparicio and his team will use advanced techniques to study the genetic and molecular features of single tumour cells from people with TNBC, then predict how they will respond to different combinations of treatments. This research could help guide targeted treatment and diagnostic strategies for many hard-to-treat cancers.

### **Boutros, Paul**

Ontario Institute for Cancer Research

*The clinico-genomics of localized prostate cancer*

Some prostate cancers can be very aggressive and cannot be eliminated with surgery or radiation therapy. The ability to predict the aggressiveness of prostate cancer can be helpful for designing appropriate and effective treatments for men with prostate cancer. Dr Paul Boutros and his team will perform advanced genetic studies to identify patterns of mutations that could predict the aggressiveness of disease. They will also study mutations specifically in intraductal carcinoma, a common form of prostate cancer that is hard to treat. This project may help inform the design of effective personalized treatments for men with prostate cancer.

### **Durocher, Daniel**

Mount Sinai Hospital

*Targeting genome stability processes in cancer*

Cancer is caused by gene mutations that can affect the way cells function. Some mutations can affect how well cancer cells can protect their DNA from damage, a biological process that can be targeted by novel anticancer drugs. Using cutting-edge gene editing technologies, Dr Daniel Durocher and his team will investigate if certain mutations affecting this biological process will make the cancer cells vulnerable to cancer chemotherapies. This research could contribute to the development of effective personalized treatment approaches that match people to specific medicines based on the genetic profile of their tumour.

### **Huntsman, David**

University of British Columbia

*Molecular pathogenesis of clear cell carcinoma of the ovary: towards better prevention and management strategies*

Clear cell carcinoma, the second most common type of ovarian cancer, is poorly understood and there are no effective treatments for advanced disease. Improved understanding of this disease is critical to developing effective diagnosis, treatment and prevention strategies. Dr David Huntsman, a leading expert in ovarian cancer, and his team will use a variety of cellular and molecular techniques to examine the biology and behaviour of this disease. By understanding how this cancer starts and grows, and where there may be opportunities to stop it, the researchers plan to help shape clinical practice.

**Nielsen, Torsten**

University of British Columbia

*Adolescent & young adult sarcomas: translating basic science into clinical care*

Sarcomas are a group of over 50 types of cancer affecting the connective tissues of the body, especially in the limbs. Sarcomas most often affect adolescents and young adults, are particularly difficult to diagnose and treat, and have a relatively high mortality rate. Dr Torsten Nielsen and his team will address these issues by studying the DNA structure in sarcoma cells, by creating new animal models of sarcoma and by developing an improved diagnostic test. With this project, the team is poised to bring novel diagnostic and treatment strategies into clinical trials.

**Perreault, Claude**

Université de Montréal

*Precision therapeutic vaccines against lung cancer*

There are more new cases of lung cancer diagnosed each year than any other cancer type, and only 17% of people with lung cancer survive 5 years after diagnosis. One strategy to treat lung cancer is to design vaccines that target the specific proteins found on the surface of lung cancer cells, unique to each person's tumour. Dr Claude Perreault and his team hope to advance this type of personalized medicine by studying the genes that make these proteins, and how they relate to a person's immune response. From this research, effective cancer-fighting vaccines can be designed and tailored to different people with lung cancer.

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*Vaccins thérapeutiques de précision contre le cancer du poumon*

Chaque année, il y a plus de nouveaux cas de cancer du poumon que de tout autre type de cancer, et le taux de survie après cinq ans est de seulement 17 % pour le cancer du poumon. L'une des stratégies de traitement pour celui-ci consiste à créer des vaccins qui ciblent les protéines spécifiques, propres à chaque tumeur, présentes sur la surface des cellules pulmonaires cancéreuses. Le Dr Claude Perreault et son équipe espèrent faire avancer ce type de médecine personnalisée en étudiant les gènes qui fabriquent ces protéines de même que leur lien avec la réponse immunitaire d'une personne. À partir de cette recherche, il sera possible de créer des vaccins qui attaquent efficacement le cancer et de les adapter aux différentes personnes atteintes d'un cancer du poumon.

**Shah, Sohrab**

University of British Columbia

*The determinants of drug response in high grade serous ovarian cancer: a single cell population genetics approach*

Many ovarian cancers respond to chemotherapy, but some subtypes are resistant and the cancer often comes back. The molecular reason for why this occurs is unknown, and new and effective treatments are needed. Dr Sohrab Shah and his team will study the molecular processes and genetics that underlie why individual ovarian cancer cells are susceptible or resistant to standard and experimental treatments. They will also design a new diagnostic test that can match a woman's specific ovarian cancer subtype to an effective treatment, paving the way for precision medicine in the treatment of ovarian cancer.