

2022-2023  
Worthy Grand Matron Sister Betty MacDuff's  
Special Project

## Acute Myeloid Leukemia

Acute myeloid leukemia (AML) is an aggressive leukemia that leads to complications related to bone marrow failure and organ infiltration. Treatment resistance and relapse after remission are common and a large percentage of patients sadly die from leukemia-related complications. The 5-year overall survival is less than 25%.

This must change.

Genomics is helping to advance leukemia research at BC Cancer by re-classifying the disease and identifying new targets. This work shows immense promise for uncovering more effective, lasting treatment solutions.

One of the challenges in understanding AML is that the leukemic stem cells driving the cancer are heterogenous – for example, within one individual AML patients, there can be anywhere from 5 to 30 different genomic “clones” or independent versions of the leukemia. Recent studies also suggest there are changes at the epigenomic level which play a significant role in treatment resistance.

BC Cancer is home to one of the most advanced and tightly knit multidisciplinary communities of scientists in Canada. Dr Aly Karsan is a Distinguished Scientist within the Terry Fox Laboratory at BC Cancer, and is leading a research project to understand the complexity of what causes AML to be resistant to therapy, using state of the art sequencing techniques looking at the genomic and epigenomic changes happening in AML.

His study will examine both adult and pediatric AML cases. They will use the data to determine if they can predict up front which patients are more likely to relapse and thus require additional or alternative therapies. This study will also enable Dr Karsan's team to examine immune cells to understand how they might assist in suppressing AML, or conversely not function appropriately. The BC Cancer Foundation is currently seeking a philanthropic investment of \$500,000 which will enable Dr Karsan to sequence samples from 100 patients by funding costs such as sample acquisition, data generation, data analysis, consumables and specialized technicians.

The members of this team have national and international reputations as clinicians and scientists, and hope to be able to leverage Canadian and international clinical trial networks to build on these studies.