Leukemia, like other cancers, often appears to have been eradicated after a series of chemotherapy treatments or bone marrow transplantation. However, months or even years later, the disease can reappear, and is often even more challenging to treat.

Leukemia researchers from Princess Margaret Cancer Centre led by Drs. John Dick, Mark Minden, Liran Shlush, and Jean Wang, together with scientific associate Dr. Amanda Mitchell, have discovered the origin of relapse in acute myeloid leukemia (AML). In a paper recently published in the prestigious journal *Nature*, they traced the precursors of AML to rare therapy-resistant leukemia stem cells. These cells are already present at the time the leukemia is first diagnosed, before chemotherapy treatment even begins.

In order to solve the puzzle of AML relapse, the researchers analyzed samples from leukemia patients at Princess Margaret who consented to donate their blood or bone marrow samples for research purposes to the Hematologic Malignancy Tissue Bank. The researchers, together with their collaborators, began by analyzing paired blood or bone marrow samples taken from patients at the time of diagnosis and at a later time after disease recurrence. By carrying out detailed analysis of the DNA of the leukemia cells at diagnosis and at relapse, they were able to identify the changes that occurred during the course of disease, and to pinpoint the specific blood cell types that were responsible for disease relapse.

“Our new discovery,” says Dr. Dick, “adds to our hope that we will soon have a new biomarker that will help to guide and personalize upfront chemotherapy. Our work will also enable the development of better methods to monitor disease, including during remission, potentially leading to improved clinical trials in which drug response can be tracked at a clonal level.”
The Leukemia Program at Princess Margaret is the largest program of its kind in Canada and one of the largest in North America. It is recognized for its ground-breaking research in basic leukemia research and its clinical trials activities are the most comprehensive in the country. It is no surprise that the Program attracts the best medical fellows around the world to come and expand their training in the treatment and management of acute and chronic leukemias, myelodysplastic syndromes and myeloproliferative neoplasms. Please meet our new G7 fellows from 7 countries around the world - Israel, Ireland, Australia, Canada, Mexico, India, and Saudi Arabia.

Dr. Dana Yehudai-Ofir graduated from the Technion institute in Israel in 2007 and trained as a hematologist at the Hematology and Stem Cell Transplant ward at the Rambam Health Care Campus in Haifa. To enrich her experience in management and treatment of leukemias and myelodysplastic syndrome, she joined the translational research and clinical fellowship program in 2016 to pursue her interests in the biology of AML and the development of new drugs.

Dr. Aisling Nee graduated from medical school in University College Dublin, Ireland in 2007. She completed training in internal medicine and specialist training in hematology through the Royal College of Physicians in Ireland and the Royal College of Pathologists in UK. She joined the Leukemia Fellowship Program in January 2017 to gain further expertise and participate in clinical research in acute myeloid leukemia and other myeloid neoplasms.

Dr. Simon Kavanagh graduated and trained as a hematologist in Perth, Australia. Having worked in all areas of hematology, he moved with his family to Toronto in 2016 to hone his research skills and develop expertise in the treatment and management of leukemias. He has a particular interest in targeted therapy of acute myeloid leukemia and the myelodysplastic syndromes.

Dr. Stephanie Lee grew up in Toronto and studied Molecular Biology at McGill University. After getting her degree, she moved to Vancouver to complete a M.Sc. in Pharmacology & Therapeutics, and MD at the University of British Columbia. She then moved back to Toronto to complete internal medicine and hematology residency at the University of Toronto.

Dr. Georgina S. Daher-Reyes completed her medical degree at ITESM, Escuela de Medicina Ignacio A. Santos at Monterrey, Mexico. She then went on to train in the Hematology and Hemostasis Residency Program at Hospital Universitario Vall d’Hebron in Barcelona, Spain in 2015. She has a particular interest in molecular biology in acute leukemia and myeloproliferative neoplasms.

Dr. Aniket Bankar received his MBBS and MD in Internal Medicine from the Maharashtra University of Health Science in India in 2013. He then joined the Hematology and Stem Cell Transplant program at Christian Medical College, Vellore, India and received his DM in Clinical Hematology in 2017. As a clinical fellow, he will pursue his research interests in the biology of AML, immuno-oncology, and the development of new drugs.

Dr. Reem Al-Kharras obtained her medical degree from King Saud University in Riyadh, Saudi Arabia in 2008. She completed her internal residency program under the Saudi Commission for Health Specialties at Security Forces Hospital in December 2013. She then went on to do a fellowship in adult hematology in King Abdul-Aziz Medical City. She joined the Leukemia Program in July 2017 with interest in targeted therapy and immunotherapy for AML and myelofibrosis.
A team of clinical and scientific investigators in Ontario led by scientists at Princess Margaret Cancer Centre were recently awarded a multi-institutional Translational Research Initiatives (TRI) in Acute Leukemia grant. With about 5M in funding committed for the first 2 years of a 4-year program by the Ontario Institute for Cancer Research (OICR), Dr. Aaron Schimmer, Clinical Lead, and Dr. John Dick, Scientific Lead, will co-lead the Acute Leukemia TRI. Researches from all over Ontario will work to improve patient outcomes by developing new biomarkers for better prediction of response to therapy and risk of relapse, and testing new therapies that will target leukemia stem cells (LSC).

One of the clinical objectives of the program is to build a province-wide integrated clinical trials infrastructure involving sites from Ottawa Hospital, Juravinski Cancer Centre in Hamilton, and Princess Margaret and SickKids in Toronto. Clinical investigators from these sites are working together in an Ontario-wide clinical trial headed by Dr. Steve Chan, Dr. Tracy Murphy, and Dr Jean Wang together with the specialized laboratories of Dr. Mark Minden and Suzanne-Kamel Reid at Princess Margaret called SMART-AML: (SteMness score and Residual Disease Assessment for Risk-Adapted Therapy in Acute Myeloid Leukemia Trial). This trial is designed to validate prospectively the prognostic and predictive value of the leukemia stem cell signature score (LSC17). The LSC17 score is a biomarker test derived by studying the patterns of gene expression in LSCs and is used to measure risk in newly diagnosed AML patients (refer to the Spring-Summer 2017 issue http://bit.ly/2ge2p98). If a patient has a score indicating a lower chance of being cured by standard therapy, the patient could be enrolled in a clinical trial testing alternative strategies to treat their leukemia. For example, Dr. Aaron Schimmer, together with Dr. Karen Yee, are spearheading several clinical trials at Princess Margaret evaluating novel therapies discovered by Ontario investigators for patients with acute leukemia.

Through this newly awarded grant, clinician scientists are hoping to do basic and clinical research to better predict relapse that would allow doctors to start new treatments earlier, and develop better and less toxic treatment options.

Visit this link to watch the video http://bit.ly/2korLWC or scan the QR code.

The Princess Margaret Cancer Foundation
The Princess Margaret Cancer Foundation raises and stewards funds to support the Princess Margaret Cancer Centre, one of the top 5 cancer research centres in the world. The Princess Margaret is a comprehensive cancer centre that offers full suite of services at the provincial, national and international levels, and is a key resource for complex cancer care spanning the continuum from diagnosis to palliation and survivorship across disease sites. Philanthropy is critical to making this possible.

For more information on how you can help support our leukemia program at the Princess Margaret, please contact:

Anthony Keating,
Campaign Director
e-mail: anthony.keating@thepmcf.ca
www.thepmcf.ca

The Princess Margaret Cancer Foundation
Recent Clinical and Scientific Discoveries to be Presented at ASH 2017

Every year over 25,000 clinicians and scientists around the world meet together to review and discuss thousands of scientific abstracts highlighting the most recent discoveries in every subspecialty of hematology. Staff hematologists, leukemia fellows, and research trainees from Princess Margaret and their collaborators from different institutions will be attending the meeting of the American Society of Hematology (ASH) on Dec 9-12 in Atlanta, Georgia to present hot-off-the-bench and bedside results of their research studies. In total, 7 abstracts were accepted for oral presentations and 7 for poster exhibitions.

Oral:


Alahmari A, Lipton JH, Kim D. Dasatinib induced reversible nephrotic range proteinuria occurs more frequently compared to other tyrosine kinase inhibitors in the treatment of chronic myeloid leukemia.


Poster:

Alahmari A, Lipton JH, Kim D. Dasatinib induced reversible nephrotic range proteinuria occurs more frequently compared to other tyrosine kinase inhibitors in the treatment of chronic myeloid leukemia.


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Leukemia Program Newsletter
Editor: Jaime O. Claudio
Editorial Committee: Sabrina Bennett, Cindy Murray, & Aaron Schimmer

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057x_VisualServices@uhn.on.ca