

Leukemia Program Newsletter

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Welcome— A New Venture

DEALING WITH LEUKEMIA, AND RELATED BLOOD CONDITIONS, CAN BE DIFFICULT, BOTH PHYSICALLY AND EMOTIONALLY, FOR PATIENTS, FAMILIES AND THEIR LOVED ONES. The leukemia team at the Princess Margaret Cancer Centre is here to help you by providing world-class care and access to the latest in cutting-edge research. We hope you find this newsletter informative and it is our goal to provide you with information regarding leukemia and related blood conditions, including important research breakthroughs that are being discovered right here at the Princess Margaret. We also hope that through this newsletter you learn about our excellent staff and get to know some of the smiling faces involved in your care.

Treatment of leukemia and its related blood disorders is a team-effort at the Princess Margaret. During your journey with us, you will meet many individuals involved in your care including physicians, nurse practitioners, nurses, pharmacists, social workers, occupation and physical therapists, spiritual care providers, just to name a few. Components of your care may also be delivered on an out-patient or in-patient basis. We work together to provide you with the best possible care experience. Always feel free to speak with any team member if you have any questions, comments, or concerns.

We are a large comprehensive program that treats acute and chronic leukemias, myelodysplastic syndromes and myeloproliferative neoplasms. Some of our patients are referred for bone marrow transplantation within Princess Margaret, as well. We are the largest leukemia program in Canada and the second largest in North America. We have 41 in-patient beds on the 14th and 15th floors of the hospital. Ambulatory patients are seen in clinics in the 2nd floor and the Transfusion Center in the blue pod on the 4th floor.



AARON SCHIMMER

We are seeing exciting new breakthroughs as we learn more about the causes of blood disorders and how best to treat these conditions. Through detailed studies of the DNA changes in - cells, we are personalizing the treatment of these diseases to ensure our patients receive the best treatment available. Often the best treatment involves clinical trials with new treatment approaches and your care team may discuss some of these options with you.

I am honored to be a part of the leukemia and related blood disorders program at the Princess Margaret, one of the top 5 leukemia and cancer treatment centres in the world. I am grateful for all of our team members who devote long hours to ensure you receive the best possible care. Finally, I am thankful for many supporters of our program for their generous contributions that allowed us to move the care of our patients to the next level. I hope you find this newsletter informative and helpful.

Sincerely yours,

AARON SCHIMMER, MD PHD, FRCPC
SITE LEAD
LEUKEMIA PROGRAM

Leukemia Tissue Bank

THE LEUKEMIA PROGRAM HAS BEEN STORING CELLS FROM CONSENTING LEUKEMIA PATIENTS AT THE PRINCESS MARGARET CANCER CENTRE SINCE 1996. Eighteen years later, specimens have been stored from more than 2500 patients at diagnosis, at the time of achieving remission and when relapse occurs. There are approximately 50,000 vials stored in the tissue bank; over 2000 vials are distributed annually to qualified investigators. The leukemia tissue bank is the beginning point for translational research that is being pursued by leukemia researchers at the Princess Margaret, the University of Toronto, and around the world.

What is the tissue bank?

The Princess Margaret Cancer Centre Leukemia Tissue Bank stores material from patients who have provided written consent after consultation with our co-ordinators. Generally, peripheral blood or bone marrow cells are isolated and stored in a viable state at -150°C . In addition serum samples and normal DNA are collected and stored for specific projects.

Why is a tissue bank important?

A large amount of leukemia research is performed using leukemia that develops in mice or with human cell lines derived from patient specimens. While mice are an excellent model system, there are species differences which make moving pre-clinical data into clinical trials challenging. In the case of cell lines, many have been grown in the laboratory for many years and their properties have changed over time. In addition only a few patient samples can form cell lines, and thus the lines do not fully represent the

wide variety of leukemias that exist in patients. In order to test new therapies, it is important to have leukemic cells available from patients.

What happens to a sample once it leaves the clinic?

The first and most important step is that the patient name is removed and the sample is given a unique identifier. This protects the privacy of



Vicky Cui (left) and Zui-Zhi Yang (right) removing a specimen from the liquid nitrogen tank



Narmin Ibrahim obtaining consent from a patient

the donating patient. The leukemic cells are then separated from contaminating red blood cells and stored in a suspended animation state in liquid nitrogen.

What types of experiments are performed with the cells?

The frozen leukemic cells can be used for a wide variety of studies aimed

at trying to understand what causes leukemia, what makes leukemia cells grow, and what can be done to stop the growth of these cells. These studies are carried out in test tubes, tissue culture flasks and in mice. The mouse studies in which human leukemic cells are grown in immune deficient animals allows us to identify the cells that are critical for reproducing the disease; these are the so called leukemic stem cells. The mouse also allows us to test new drugs and drug combinations in a setting that is closer to being in a human, than can be achieved when the cells are grown in flasks in an incubator.

Is there any risk to me if I choose to donate to the leukemia tissue bank?

All samples are taken at the time when blood or bone marrow is being drawn for routine testing. This ensures that there is no delay in treatment nor the need for extra blood draws or bone marrow testing. As mentioned above, the samples are all given a unique identifier number. The link to the patient is maintained on hospital servers, behind the hospital firewall. Investigators working with samples are not able to identify the patient sample except by a number that is different than the hospital number.

Will genetic testing be performed on my sample?

Tissue bank samples may undergo genetic testing aimed at identifying changes that may contribute to the development of disease or the response of leukemic cells to treatment. All genetic testing is focused on understanding leukemia.

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Acute Myeloid Leukemia (AML)

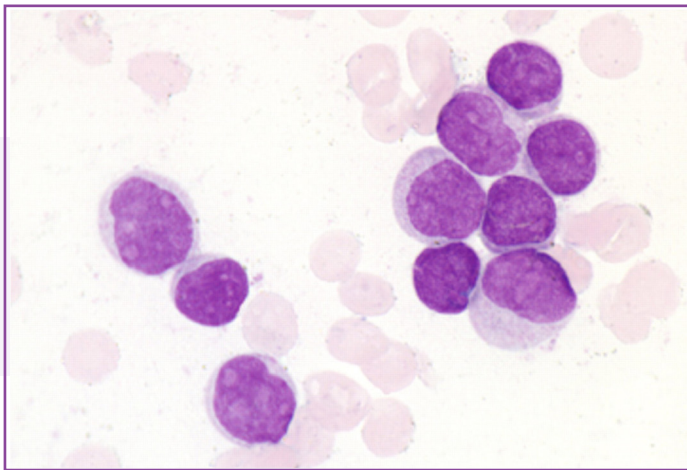
What is AML?

AML is a cancer of the blood system, specifically the bone marrow. AML affects white blood cells, red blood cells and/or platelets. White blood cell counts may be higher or lower than normal, but these cells don't function normally and patients have difficulty fighting infections.

The average age of diagnosis of AML is 67 and it is slightly more common in men than in women. AML is more common as people age.

What are the symptoms of AML?

Blood cell growth and maturation is affected in AML. The immature leukemic cells are called blasts and are blocked in their development. Symptoms of AML include fever, infection, easy bleeding or bruising, shortness of breath or weakness. Analysis of a blood sample will reveal abnormal counts of white blood cells, platelets, or red blood cells. Further analysis will be performed to determine the type of AML in order to optimize treatment for each patient.



How is AML diagnosed?

Once AML is suspected, it is important for the patient to have a bone marrow test. AML is now classified by the World Health Organization based on genetic abnormalities and divides AML into various subtypes. This classification helps guide treatment. A patient may also hear

French-American-British (FAB) classification, which divides AML into different types of cells based on their appearance under the microscope.

Other tests include a lumbar puncture and/or CT scan or MRI of the head if the patient is experiencing any neurologic symptoms at time of diagnosis. Patients will frequently receive a heart test called a MUGA (Multiple Gated Acquisition) to determine that heart function can tolerate chemotherapy and to establish a baseline measurement of heart function.

How is AML treated?

For patients choosing to receive induction chemotherapy, the typical treatment is a combination of cytarabine (for 7 days) and daunorubicin (for 3 days). This combination is referred to as "3 + 7". Once remission is achieved, chemotherapy is continued, frequently as an out-patient. This treatment is called "consolidation chemotherapy" and is designed to eliminate residual leukemic cells in the bone marrow remaining after induction chemotherapy.

For some patients, a bone marrow or stem cell transplant is beneficial. Your team may talk to you about this at some time during your care.

Bone marrow aspirate shows increased blasts. Some of these blasts have multiple nucleoli (MacNeal Tetrachrome 1000x).

This image was originally published in ASH Image Bank. Peter Maslak. AML without Maturation. The AML cells are visible with the purple nuclei. ASH Image Bank. 2011. Image Number 1736. © The American Society of Hematology.

What are the side effects of chemotherapy used to treat AML?

The chemicals used to kill leukemic cells also target normal cells as well. Common side effects of chemotherapy include mouth sores, diarrhea, nausea, hair loss, bleeding and infection. Your team will discuss these potential side effects as well as how to monitor and treat them.

Further information:

Canadian Cancer Society website
<https://www.cancer.ca/en/cancer-information/cancer-type/leukemia-acute-myelogenous-aml/acute-myelogenous-leukemia/>

The Leukemia and Lymphoma website
<http://www.lls.org/#/diseaseinformation/leukemia/acute-myeloid-leukemia/>



Dr. Dina Khalaf

New Staff

We welcome **DR. DINA KHALAF** as a clinical associate to the leukemia service. Dina originates from Cairo, Egypt where she completed her medical training, with a subspecialization in medical oncology and hematology. Dr. Khalaf has also completed a MSc in Non-Hodgkin's lymphoma and she also has research experience in cancer epidemiology. Welcome Dr. Khalaf!



Dr. Andre Schuh

Awards Corner

DR. SCHUH won a Gerald Kirsch Humanitarian Award. This is a Princess Margaret Cancer Centre award that is given out annually to clinical staff who provide exemplary clinical care to our patients. Congratulations Andre!



Dr. Liran Shlush

DR. SHLUSH is clinical fellow and an Assistant Scientist working in the laboratory of Dr John Dick. He published a high impact paper characterizing mutations that occur in pre-leukemic cells. Based on this and ongoing studies, he received a Scholar award from The American Society of Hematology. Well done Liran!

Leukemia Tissue Bank *continued from page 2*

Will I be discriminated against if I choose not to donate my sample to the tissue bank?

Absolutely not. Sample donation is entirely voluntary.

What if I change my mind after I provide consent? Can donated samples be removed?

A "Withdrawal of Consent" form must be signed. Your samples will be destroyed. We will keep records indicating that a sample was stored and subsequently removed from the tissue bank when consent was withdrawn.

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 a full suite of services at the community, regional, provincial 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:

Christina Lebesis
Director, Major Gifts
416-946-2138

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JOIN US FOR THE **3RD ANNUAL JOURNEY TO CONQUER CANCER - RUN OR WALK ON SUNDAY JUNE 21, 2015.**

Participants run or walk in support of any area of cancer research, clinic, lab or patient care programs at the Princess Margaret Cancer Centre. With no fundraising minimums participants raise as much as they can for the area that matters most to them. Our family friendly route passes by the Princess Margaret Cancer Centre in downtown Toronto with 5km, 3km or 1km options.

At the finish line, join us for a celebration filled with lots of food, entertainment and fun for the whole family!

We appreciate your consideration and look forward to seeing you on the morning of **Sunday June 21, 2015** at the Princess Margaret Cancer Centre as we run or walk To Conquer Cancer In Our Lifetime.

For further information, please contact:
Keith Clarke, Manager, Special Events
416.946.6584 Keith.clarke@thepmcf.ca
www.runorwalk.ca

Leukemia Program Newsletter

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