The Microenvironment

THE CANADIAN HEMATOLOGY SOCIETY

SOCIÉTÉ CANADIENNE D'HÉMATOLOGIE

CHS SCH

May 2018

NEWSLETTER

Inside this Issue...

TO REGISTER: http://www.ish2018.com

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MICROENVIRONMENT

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MESSAGE FROM THE PRESIDENT

Dear Colleagues,

Dr. Nicole Laferriere
President, CHS

It is an honour to become the president of the Canadian Hematology Society. Your new CHS executive is featured in this issue of The Microenvironment. Thank you to the executive members who are departing for their valuable contributions and welcome to our new executive members.

As your national professional organization, The CHS continues to promote excellence in Hematology. The CHS meeting at ASH 2017 in Atlanta was well attended and several annual awards were presented. The **Research Abstract Awards** including the **John H. Crookston Award** for the best paper by a resident, acknowledge excellence and encourage the academic activities of Hematology trainees and Clinical Scientists.

This year, we presented the first **Lifetime Achievement Award** to celebrate the accomplished career and professional contribution of **Dr. Armand Keating**. Start planning now to submit your nomination for this new annual award.

The CHS is pleased to co-sponsor the **International Society of Hematology (ISH)**

meeting **September 13-16, 2018** in Vancouver. **Dr. Gail Rock** and **Dr. Tom Nevill** have brought considerable organizational skill and effort to planning this International event. Please consider joining us.

Information can be found on the CHS website at **www.canadianhematologysociety.org**

The CHS is also working with **Dr. Catherine Hayward** and Dr**. Ruth Padmore** as they plan the **International Society of Laboratory Hematology (ISLH)** meeting Vancouver May 9-11 2019. These CHS members are excellent ambassadors for our professional society and I thank them for this leadership.

A CHS executive retreat is planned for Ottawa in June 2018. There are many ways you can contribute to the CHS. Please continue your annual membership and promote CHS membership to trainees. Log in to the Portal for an Image Challenge or explore Continuing Medical Education modules. Think about ways in which we can further the original goals of the CHS founded in 1971 to 'maintain the integrity and vitality of the specialty of Hematology, encouraging and rewarding scholarly research and providing a forum for communication and mutual support for all of our colleagues in both community and academic settings'.

Dr. Nicole Laferriere,
President, CHS

Le message du Présidente

Chers collègues

C'est un honneur pour moi de devenir la présidente de la Société canadienne d'hématologie (SCH). Votre nouveau Comité exécutif de la SCH est présenté dans cette édition de The Microenvironnement. Merci aux membres du Comité sortants pour leurs précieuses contributions et bienvenue à nos nouveaux membres.

Dr. Nicole Laferriere,
Présidente, *CHS*

Comme votre organisation professionnelle nationale, la SCH continue à promouvoir l'excellence en hématologie. La réunion de la SCH à ASH 2017 à Atlanta a rassemblé de nombreux participants et plusieurs prix annuels ont été présentés. Le prix Research Abstracts et le prix John H. Crookson pour le document de l'année reconnaissent l'excellence et encouragent les activités universitaires des stagiaires en hématologie et des scientifiques cliniques.

Cette année, nous avons présenté le premier prix Lifetime Achievement (œuvre de toute une vie) pour célébrer la carrière accomplie et la contribution professionnelle du Dr Armand Keating. Commencez à projeter dès maintenant de soumettre votre nomination sur ce nouveau prix annuel.

La SCH a le plaisir de co-parrainer la réunion de la Société internationale d'hématologie qui aura lieu du 13 au 16 septembre 2018 à Vancouver. La Dre Gail Rock et le Dr Tom Neville ont fait preuve de beaucoup de compétence organisationnelle et fourni beaucoup d'effort pour la planification de cet événement international. Veuillez envisager de vous joindre à nous. Il est possible de trouver les renseignements pour cette réunion sur le site Web de la SCH à www.canadianhematologysociety.org.

La SCH collabore aussi avec la Dre Catherine Hayward et la Dre Ruth Padmore qui planifient la réunion de l'International Society of Laboratory Hematology qui doit se tenir à Vancouver du 9 au 11 mai 2019. Ces membres de la SCH sont d'excellentes ambassadrices pour notre société professionnelle et je les remercie de ce leadership. Une retraite du Comité exécutif est prévue pour Ottawa en juin 2018.

Vous pouvez contribuer à la SCH de nombreuses façons. Veuillez maintenir votre adhésion annuelle et faites la promotion de l'adhésion à la SCH auprès des stagiaires. Connectez-vous au Portal for an Image Challenge (portail pour un défi de l'image) ou explorez les modules Continuing Medical Education (éducation médicale permanente). Réfléchissez aux façons dont nous pouvons atteindre les buts originaux de la SCH fondée en 1971 pour « maintenir l'intégrité et la vitalité de la spécialité de l'hématologie, en encourageant et en récompensant la recherche universitaire et en fournissant un forum à la communication et un soutien réciproque en faveur de tous nos collègues à la fois dans les contextes communautaires et universitaires.

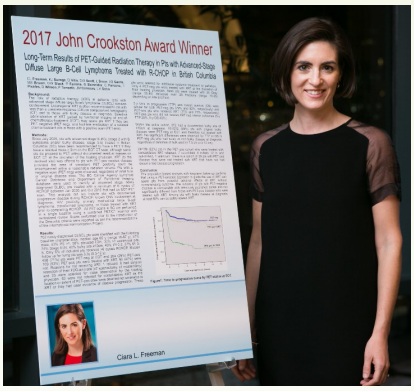
Dr. Nicole Laferriere,
Présidente, CHS

CHS 2017 RESEARCH ABSTRACT AWARDS

2017 John H. Crookston Award Winner

Long-term results of PET-guided radiation therapy in patients with advanced-stage diffuse large B-cell lymphoma treated with R-CHOP in British Columbia.

Dr. Ciara Freeman, Lymphoma Fellow BC Cancer Agency, Vancouver, BC
(Supervisor: Dr. Laurie Sehn)



Patients with DLBCL that have bulky disease at diagnosis or have less than a complete remission with initial chemotherapy are often treated with locoregional radiotherapy (RT) in an attempt to effect long-term disease control. The use of end-of-treatment (EOT) PET imaging to help decide the role of RT was evaluated in this retrospective review of 702 newly diagnosed de novo DLBCL patients treated in BC from 2005-2016. All patients were treated with ≥ 6 cycles of R-CHOP without clear evidence of progressive disease and then underwent EOT PET imaging.

In this study, PET-positive patients were offered RT (if the disease was deemed to be radioencompassable) while PET negative patients, regardless of original disease bulk, were observed. 71% of patients in the cohort were PET-negative at EOT and 29% were PET-positive. Of the latter group, 53% were treated with RT (typically 3500 cGy in 20 fractions) and 47% were not – most frequently because RT was not feasible due to the location and extent of disease. 5-year time-to-progression (TTP) and overall survival (OAS) were similar for PET-negative (79% and 82%) and PET-positive patients treated with RT (77% and 73%).

However, TTP and OAS were inferior in PET-positive patients not receiving RT (29% and 43%) although 29 patients (27%) in this group have not had documented progression to date. Of interest, 272 patients had bulky disease (≥ 10 cm at one site) at diagnosis and 59% were PET-negative at EOT. However, TTP and OAS were not significantly different for PET-negative patients with and without bulky disease.

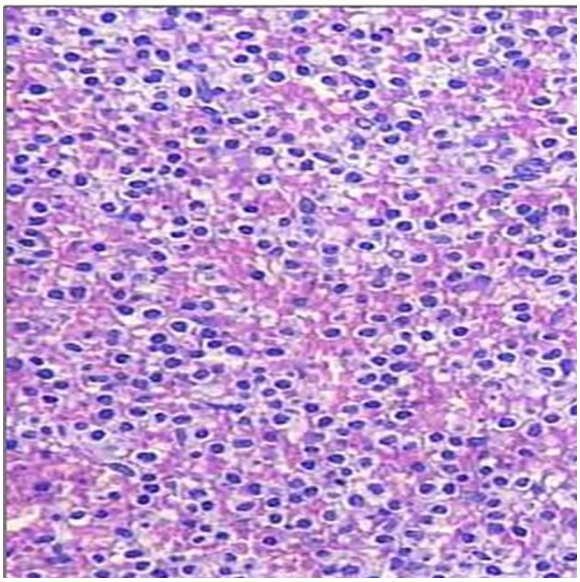
———

This population-based study provides a number of answers for a common clinical dilemma in the treatment of advanced-stage DLBCL. EOT RT does seem to improve outcome in PET-positive patients. More importantly, patients with EOT PET-negativity – even those with bulky disease at diagnosis -- can reasonably be spared the potential side effects of RT.

Do you know the diagnosis?

A 44-year-old man was referred with a pancytopenia that had been discovered on a routine health evaluation. He was feeling entirely well and his only recent health issue occurred four months previously when he suffered an abrasion on his arm that developed into a cellulitis requiring a 10-day course of oral antibiotics. He otherwise had a completely negative past medical history with no hospitalizations, no chronic medical conditions and was on no medications. He did admit to consuming 3 alcoholic drinks per day. Family history included an aunt who had multiple myeloma. Aside from mild conjunctival pallor, his physical examination was normal.

Blood work revealed hemoglobin 109 g/L (MCV 103), WBC 1.3 x 10^9/L and Platelets 54 x 10^9/L. Differential showed neutrophils 0.2, lymphocytes 0.9 and monocytes 0.1 with no morphologic abnormalities in any cell line. Reticulocytes were 41 x 10^9/L. Renal, hepatic and thyroid function tests were normal. Serum immunoglobulins and protein electrophoresis were also normal. A bone marrow aspirate and biopsy was performed with the latter shown in Figure 1. Do you know the diagnosis? ***Answer: Page 20***



CHS 2017 RESEARCH ABSTRACT AWARDS

2017 Clinical Research Award

Two cycles of consolidation chemotherapy are associated with similar clinical outcomes to three cycles in AML patients with favorable risk cytogenetics

Dr. Daniel Sawler,
Hematology Fellow
University of Alberta,
Edmonton, Alberta
(Supervisor: Dr. Lalit Saini)

Core-binding factor acute myelogenous leukemia (CBF AML) is associated with a high complete remission (CR) rate and a favorable overall survival (OAS) with consolidation chemotherapy (CC) alone although the number of CC cycles required is uncertain. The investigators used pooled outcome data for 108 CBF AML patients treated in Edmonton and Vancouver from 2003-2017 and performed an analysis according to number of high-dose Cytosine arabinoside (HIDAC) CC cycles intended. 74 patients (68.5%) were intended for 3 CC cycles and 34 patients (31.5%) for 2 CC cycles. Five patients in the former group and 6 patients in the latter group underwent stem cell transplantation in CR1 (p=0.09). Hospitalization rates, median length of hospital stay, episodes of bacteremia and deaths during consolidation did not differ between the two groups.

Median follow-up time from CR1 was longer for the 2 CC cycles group (85 months) versus the 3 CC cycles group (30 months; p <0.0001). 38.2% of patients in the 2 cycle cohort relapsed or died versus 41.9% in the 3 cycle group with corresponding 5-year OAS rates of 73% and 71%, respectively. In multivariate analysis, patient age, cytogenetics [t(8;21) versus inv(16)] or transplantation in CR1 did not influence OAS in the two cohorts.

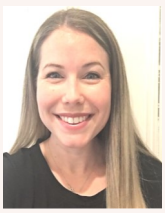
This comparison, limited by its retrospective nature, suggests that CBF AML patients may be adequately treated with two cycles of HIDAC CC. This conclusion could have significant economic benefits as well as improve quality of life for patients.

Your new 2018 CHS Executive Board







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CHS 2017 RESEARCH ABSTRACT AWARDS

2017 PhD and Post-Doctoral Awards

Feeding the fire: The comorbid and inflammatory backdrop of clonal hematopoiesis of indeterminate potential (CHIP) by mutation subtype

Elina K Cook, MSc
Department of Pathology and Molecular Medicine, Queen's University, Kingston, Ontario
(Supervisor: Dr. Michael Rauh)

Clonal hematopoiesis of indeterminate potential (CHIP) is an increasingly frequent finding with aging and is associated with a higher risk of hematologic malignancy and cardiometabolic diseases. The two most common CHIP mutations seen with aging involve the TET2 and DNMT3A genes. TET2-mutated cells contribute to and thrive in inflammatory environments that may be associated with inflammatory diseases of aging; less is known about the role of DNMT3A in inflammation.

The investigators analyzed leukocyte DNA for 48 myeloid gene mutations in 348 hematologically normal adults >65 years of age, measured serum cytokine levels and correlated findings with 32 comorbidities. CHIP was detected in 28% of participants with TET2 and DNMT3A being the most common.

CHIP was associated with higher monocyte counts and, in those with VAF >0.1, elevation in TNFα levels (p=0.01). Valvular heart disease [Hazard ratio (HR) 2.9; p=0.007] and chronic pulmonary disease (HR 2.8; p=0.003) were both more frequent in CHIP patients.

Patients with DNMT3A mutations were found to have significantly elevated levels of Eotoxin-1 (p=0.03), an eosinophil chemo-attractor, and had increased risk of chronic pulmonary disease (HR 4.2; p=0.001), valvular heart disease (HR 3.6; p=0.015) and gastroesophageal reflux disease (HR

Continued,

Continued, next page—see: Elina K Cook

TAK-243 is a selective UBA1 inhibitor that displays preclinical activity in acute myeloid leukemia

Samir Barghout, MSc, BPharm
Princess Margaret Cancer Centre, Toronto, Ontario
(Supervisor: Dr. Aaron Schimmer)

Ubiquitin-like Modifier Activating Enzyme 1 (UBA1) is the initiating enzyme in the ubiquitylation cascade. While AML cells and normal hematopoietic cells have equal levels of UBA1, AML cells have an increased requirement for this enzyme. TAK-243 is a potent and selective inhibitor of UBA1 and the investigators sought to determine the preclinical activity, biological effects and mechanisms of resistance to the drug in AML.

TAK-243 reduced growth and viability of human AML cell lines in a concentration- and time-dependent manner. 18/21 primary AML samples were sensitive to TAK-243, including patients with high-risk molecular and cytogenetic profiles and patients refractory to induction chemotherapy. TAK-243 preferentially inhibited the clonogenic growth of AML cells over normal hematopoietic cells by a factor of 19-fold ($p< 0.01$).

The investigators then evaluated the biological effects of UBA1 inhibition by TAK-243. At concentrations associated with cell death, TAK-243 decreased the abundance of poly- and mono-ubiquitylated proteins in AML samples and increased PERK phosphorylation, CHOP, XBP1s and ATF4 -- all markers of proteotoxic stress.

To determine the preclinical efficacy and toxicity of TAK-243, OCI-AML2 cells were injected into SCID mice and, when tumors were palpable, the mice were treated with TAK-243. TAK-243 significantly delayed tumor growth in mice and no toxicity was observed. In an additional model, primary AML

Continued, next page—see: Samir Barghout

2017 CHS PAPER OF THE YEAR

Stanley W.K. Ng: A 17-gene stemness score for rapid determination of risk in acute leukaemia

Dr. Stanley W.K. Ng, LEFT, and his colleague, **Dr. Jean Wang**, receive the CHS Paper of the Year Award, presented by **Dr. Vikas Gupta**, CHS Executive Secretary at the CHS Annual Gala and Awards evening at ASH in Atlanta, Ga., in December, 2017.

Dr. Ng's award-winning paper, **A 17-gene stemness score for rapid determination of risk in acute leukaemia,** was published in the renowned journal, ***Nature* 540:433-437, 2016.**

The current prognostic stratification of acute myelogenous leukemia (AML) patients is largely based upon cytogenetic and molecular profile in addition to initial response to induction chemotherapy. Post-remission therapy is usually decided by these prognostic factors but even those patients with favourable-risk AML not infrequently fail to enter complete remission (CR) or relapse despite consolidation chemotherapy. Refractoriness to induction and relapse following initial therapy has been attributed to persistence of leukemia stem cells (LSC) which possess properties that are linked to therapy resistance.

Ng and colleagues decided to generate a list of genes differentially expressed between LSC+ and LSC- cell fractions -- primarily identified by CD34 expression but confirmed by xenotransplantation -- in 78 AML patients. Using a sparse regression analysis, a 17-gene LSC score (LSC17) was developed that was highly prognostic for therapy resistance – even with stem cell transplantation – in five independent AML patient cohorts comprising over 900 patients.

The investigators began by analyzing gene expression profiles by microarray in 138 LSC+ fractions and 89 LSC- fractions. An LSC+ gene expression reference profile was developed, involving 104 differentially-expressed genes (≥ 2 fold of the expression in LSC- cells). This profile was strongly associated

Continued, next page—See: Stanley W.K. Ng

Continued, Elina K Cook

3.1; p=0.005). Patients with TET2 mutations had significant elevations in serum IL-6 levels (p=0.01) and increased risk of chronic pulmonary disease (HR 3.2; p=0.02).

There is increasing evidence that CHIP is a natural aging phenomenon. This study provides a better understanding of its link to the inflammatory milieu associated with a number of chronic medical conditions.

Continued, Samir Barghout

cells from 2 patients were injected into the femurs of NOD-SCID mice after which they were treated with TAK-243. TAK-243 reduced primary AML tumor burden in both tested samples, again, without toxicity.

To understand mechanisms of resistance to TAK-243, the research team selected a population of TAK-243-resistant OCI-AML2 cells and, by sequencing studies, were able to show reduced binding of TAK-243 to UBA1 in the resistant cells due to the acquisition of a missense mutation. This mutation occurred in exon 16 and invovled substitution of tyrosine with cysteine at codon 583 (Y583C).

The investigators have shown that TAK-243 is a potent and selective UBA1 inhibitor that displays preferential activity towards AML cells over normal hematopoietic cells without obvious toxicity in preclinical testing. These data support conducting a clinical trial of TAK-243 in patients with AML. However, it does appear that AML cells develop resistance to this novel agent by acquiring mutations that affect the drug's ability to bind to the UBA1 enzyme.

Canadian Hematology Society Chief Resident Recognized

Dr. Zach Liederman, SECOND RIGHT, **CHS Chief Resident** for 2016-17, receives a certificate of appreciation for his success and contributions to the Society during his term as Chief Resident. Making the presentation at the CHS Gala Awards evening at ASH in Atlanta, in December 2017, are the current Co-Chief Residents for 2017-18, **Dr. Cindy Hickey** and **Dr. Siraj Mithoowani**. Looking on, is **Dr. Lynn Savoie**, CHS President.

The position of Chief Resident is for one year, beginning on July 1st and running through to June 30th of the following year. Chief Residents are physicians enrolled in a Canadian hematology training program. The Chief Resident represents Canadian trainees at the CHS executive, working with the executive to develop novel educational material for residents and CHS members. They develop hematology cases for the CHS web portal, are invited to write articles for the *Microenvironment* and are encouraged to develop and implement educational initiatives. The Chief Resident also aids in selecting the annual "Best in Canadian Hematology" paper of the year and the RK Smiley pilot grants. A primary role for the CHS Chief Hematology Resident is to help raise awareness about the Society among Canadian trainees.

Continued, Stanley W.K. Ng

with the expression profile seen in normal hematopoietic stem cells and umbilical cord blood cells and anti-correlated with expression profiles in mature myeloid cells. Ng and colleagues then interrogated a set of 495 patients for these differentially expressed genes, narrowed the number of genes to 43 and finally decided upon an optimal 17-gene signature. This allowed for the calculation of a weighted sum termed the "LSC17 score". In this patient cohort, a high LSC score (defined as > the median) was significantly associated with a (1) higher marrow blast percentage, (2) higher incidence of adverse cytogenetic/molecular profile, (3) higher rate of induction failure and (4) higher rate of relapse. In multivariate analysis, the LSC17 score added prognostic significance to all known outcome predictors including cytogenetic risk group and molecular mutation profile. In fact, a high LSC17 score was also found to be predictive of survival in three separate normal karyotype AML cohorts.

The performance of the LSC17 score was further compared with a recently described genomic classification in AML (Papaemmanuil et al, *N Engl J Med*, 2016) and with previously published LSC gene expression signatures in populations defined by phenotype, mass cytometry and epigenetic profiles. In these comparisons, the LSC17 score remained the best predictor of overall survival (OAS).

Next, the investigators sought to develop a clinically applicable gene expression-based diagnostic test and decided upon the NanoString platform. This test is cost-effective with a 24-48 hour turnaround time and was used to generate gene expression data on 307 AML patients treated at Princess Margaret Cancer Centre (PMCC). This analysis essentially mirrored the findings of the microarray technique – the LSC17 score retained prognostic significance in OAS in multivariate analysis in the entire cohort and in the normal karyotype (NK) subgroup. Further analysis of this group regarding the value of allogeneic stem cell transplantation (SCT) showed that SCT had no effect on OAS regardless of LSC17 score. In fact, despite a clear reduction in relapse risk in SCT patients, OAS showed a trend toward inferiority compared to consolidation chemotherapy (p=0.06) in patients with low LSC17 scores.

The authors specifically analyzed the NK AML patient subgroup with a favourable molecular profile (NPM1+, FLT3-). In this cohort (n=44), a modified 3-gene signature ("LSC3") was employed using the microarray platform. In this group of patients, a low LSC3 score was found to have an outstanding OAS (>90%) while those with a low LSC3 score had an abysmal outcome (~10%). The analysis was repeated with the NanoString platform with similar, although less striking, survival differences.

In analyzing the entire 307 PMCC AML cohort, LSC17 was shown to be independently predictive of refractoriness to initial chemotherapy. In fact, using the Wald chi-square statistic, LSC17 outperformed age, presenting white count, cytogenetic risk group and de novo versus secondary AML in predicting refractory disease. Finally, the investigators evaluated the LSC17 score in participants of the ALFA-0701 study that involved randomization of patients to standard therapy with or without Gemtuzumab ozogamicin (GO). This showed that patients with high LSC17 score did not benefit from the addition of GO but that those with a low LSC17 score had a superior OAS when receiving GO.

The LSC17 score has strong prognostic value in AML with respect to primary chemotherapy refractoriness and OAS across a wide variety of AML cohorts. This testing may be done with rapid, cost-effective NanoString technology and may help to refine the future management of AML patients.

HISTORY CORNER

Dr. Sheldon Naiman (1937-2016)
Dr. Linda Vickars (1951-2014)

By Dr Tom Nevill
Editor
The Microenvironment

Sheldon Naiman was born in Toronto on October 2, 1937 to Jewish immigrants from Poland.

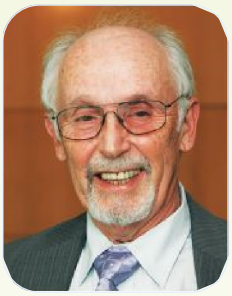
An avid baseball player and fan as a youth, he nevertheless spent enough time with his studies to gain acceptance into medical school at the University of Toronto in 1958. After his graduation in 1962, he did an internship in Los Angeles, California where he became interested in hematology through his experience caring for women with disseminated intravascular coagulation on the obstetrics ward. Upon returning to Toronto for further hematology training, Shelly – as he was known to many – was encouraged by Dr. Mac Whitelaw from the Ontario Cancer Agency (who was taking a position at Shaughnessy Hospital in Vancouver) to pursue a hematology practice in British Columbia.

Dr. Wally Thomas

However, it was Dr. Wally Thomas, the Head of the Hematology Laboratory at Vancouver General Hospital -- who had trained under the legendary Dr. John Dacie in the UK – who ultimately recruited Shelly Naiman to Vancouver.

As there was no full-time position available in the Department of Medicine – and no Division of Hematology – he was hired to work in the Department of Pathology by another eminent BC pathologist, Dr. Herbert Fidler. Shelly's position allowed for him to do clinical medicine and hematology and he eventually became the first Clinical Hematologist in the province of British Columbia. He was named the first UBC Head of Clinical Hematology in 1976 and his expertise was nationally recognized by his inclusion on the first Royal College examining board for Clinical Hematology in Canada.

Wally Thomas was a close friend of E. Donnall Thomas, who developed the bone marrow transplantation program in Seattle in the late 1960s and Shelly Naiman became increasingly disappointed with outcomes in adults with acute leukemia. This led him to develop a proposal for a bone marrow transplantation program in BC and his efforts led to the first adult bone marrow transplant at VGH in August 1981.



Dr. Sheldon Naiman (1937-2016)

Dr. Naiman was one of the last remaining examples of a hybrid clinical and laboratory hematologist but eventually settled into the laboratory in 1983 where he modernized the coagulation section at the same time as he became the "go to" person for difficult blood films. He was regarded by trainees and physicians around the province as a master teacher and won numerous medical student and resident teaching awards. For this he was recognized by the Dr. Cam Coady Foundation – Dr. Coady was the first pathologist in BC to receive Royal College certification – and the Doctors of BC with the Medal of Excellence in 2009 for his distinguished work in the field of medicine.

Dr. Linda Vickars was born in Vancouver on August 25, 1951 and initially studied physiology at UBC before completing her MD in 1976. She pursued post-graduate studies in critical care in New Zealand but took time off to travel in Southeast Asia before returning to Vancouver to train in Internal Medicine and Hematology. She completed her hematology fellowship in 1984 and took a staff position at Vancouver General Hospital where her professional interactions and personal relationship with Shelly Naiman – who she married in 1997 -- grew.

In 1987, Linda moved to St. Paul's Hospital where she spent 25 years, including 12 years as the Hematology Division Head. In 2004, Dr. Vickars assumed the role of Medical Director of the Provincial Hemophilia and Inherited Bleeding Disorders Program following the retirement of Dr. Gerry Growe. She helped establish provincial programs for hemoglobinopathies and iron chelation therapy that was often required in this patient population.

Dr. Vickars was also recognized as an excellent morphologist and was an avid and highly respected teacher, for which she received the UBC Clinical Faculty Award for Career Excellence in Clinical Teaching in 2008, ultimately being given the title of Clinical Professor Emeritus.

Shelly Naiman had five children – including a set of triplets in

continued, page 13

CHS LIFETIME ACHIEVEMENT AWARD: Dr. Armand KEATING

The Canadian Hematology Society introduced this new award to recognize individuals who have made outstanding contributions to the national and international hematology community over an extended period of time. The inaugural winner of the CHS Lifetime Achievement Award is Dr. Armand Keating from the Princess Margaret Cancer Centre and University Health Network in Toronto, Ontario.

Dr. Armand Keating is a professor in the Department of Medicine and Senior Scientist at the Institute of Biomaterials and Biomedical Engineering at the University of Toronto. He acted as the Director, Division of Hematology and the Epstein Chair in Cell Therapy and Transplantation at UHN for over two decades and is a Past Director of the Cell Therapy Program and the Orsino Cell Therapy Translational Research Laboratory at the Princess Margaret Cancer Centre. He was the Chief of Medical Services and the Head of the Department of Medical Oncology and Hematology at Princess Margaret Hospital/ Ontario Cancer Institute for 10 years. Dr. Keating was appointed the first Chief of Medical Services at the Princess Margaret Hospital and was instrumental in organizing the merger of cancer programs at PMH and the Toronto General Hospital in an effort to improve the care of patients with cancer in Ontario.

Dr. Keating transformed the care of patients with blood cancers in Canada by establishing the largest autologous stem cell transplantation program in Toronto. This program has shown national and international leadership in the field through the performance of over 4000 autologous procedures. He has been a valuable mentor for numerous graduate students and clinical trainees who have become prominent members of the national and international hematology community in their own right.

Dr. Keating has published almost 400 peer-reviewed papers and is a past president of both the Canadian Hematology Society and the American Society of Hematology. He is a co-editor of *Bone Marrow Transplantation* and an associate editor of the *Biology of Blood and Marrow Transplantation.*

The Canadian Hematology Society is extremely proud to recognize Dr. Armand Keating for his career contributions in the field of Hematology with the 2017 CHS Lifetime Achievement Award.

Dr. Armand Keating, LEFT, accepts the inaugural Canadian Hematology Society Lifetime Achievement Award, presented by **Dr. Aaron Schimmer**, CHS Past-President, at the CHS Awards Gala evening at ASH, December 2017 in Atlanta, Ga.

History Corner... continued from previous page

1973 -- with his first wife Marcia and worked with his second wife Linda at St. Paul's Hospital for over 20 years before retiring in 2007. His vision had begun to fail in 2002 when he had a retinal vein thrombosis and he ultimately was blinded by macular degeneration – sadly ironic for one of British Columbia's best hematopathologists.

Together, Shelly and Linda created an endowment at the Centre for Blood Research at UBC; the multipurpose laboratory in the Life Sciences Centre has been named after them. In their time together, they visited all seven continents and, during these travels, spent time teaching physicians in China and India.

In July 2011, Linda Vickars experienced a generalized seizure and was found to have an inoperable malignant brain tumour. She had to withdraw from clinical practice but she noted that she gained some solace in being able to spend more time at home caring for her visually-impaired husband. Linda Vickars died on April 18, 2014 at the age of 62; Shelly Naiman died on July 24, 2016 at the age of 78. In March 2018, Sheldon Naiman was one of five physicians honoured as inaugural inductees in the Vancouver General Hospital Medical Staff Hall of Honour recognizing exceptional leadership, clinical and academic service benefitting the residents of British Columbia.

Dr. Sheldon Naiman and Dr Linda Vickars

Message from the Congress Co-Chairs

Dear CHS Colleagues,

With great pleasure we invite you to the 37th World Congress of the International Society of Hematology (ISH), hosted by the Canadian Hematology Society in **Vancouver, BC, from September 13 to 16, 2018**.

This is the second ISH World Congress to be held in Canada: the CHS hosted an ISH World Congress in 2000, in Toronto. *Your attendance can help us make this one even better!*

Since the first ISH World Congress, held in Buffalo, New York in 1948, the ISH World Congress has earned an esteemed reputation as a forum for new ideas, treatment guidelines and it has become one of the best hematology networking opportunities that the world has to offer!

Buffalo, New York: the first city to host ISH—1948

In addition to plenary sessions and topic symposia, the ISH World Congress features interactive sessions with presentations on cutting-edge research developments and the latest advances in clinical management by world-renowned scientists.

Check out our "**Speaker Snapshots**" on pages 18—20 of this newsletter and Program Details on pages 16—17. We urge you to visit **www.ish2018.com** for full congress details including housing, registration and some **pre and post congress events, features and tours that you won't want to miss**!

We look forward to welcoming all of our CHS colleagues to Vancouver in September!

Dr. Tom Nevill
Chair, Scientific Program Committee

Dr. Gail Rock
Chair, Organizing Committee

Some of the world-class cities that have hosted Previous ISH World Congresses

FIVE THINGS YOU MUST DO IN VANCOUVER IN SEPTEMBER

1. Explore the North Shore Mountains

September is prime hiking season with moderate temperatures and few bugs to detract from your enjoyment. The north shore mountains are 20 minutes away and offer a number of scenic hiking trails that range from 1 to 6 hours. Mount Seymour is the least taxing of the trails with a panoramic view. The West Lion is the most challenging to scale and, for a relaxing time, one can ride the Gondola to the top of Grouse Mountain.

2. Walk or Cycle the Beaches

English Bay beaches can be accessed through the West End, within walking distance of the Convention Centre. On the other side of False Creek, on Vancouver's West Side, Kitsilano has a spectacular beach (and a public swimming pool) with more beaches – and volleyball courts – spreading out to the west towards the University of British Columbia.

3. Circle Stanley Park on the Seawall

This is one of the most popular year-round activities and the entrance to Stanley Park is a short distance west of the Convention Centre. There is much to see and enjoy in the park, whether you opt to drive, bicycle or walk.

4. Spend Some Time in Granville Island

A trip to Vancouver would not be complete without a visit to Granville Island where an unforgettable experience awaits at its market. However, there is much more to do with restaurants, bars, shops and, for the adventurous, kayak rentals that allow you to paddle in False Creek.

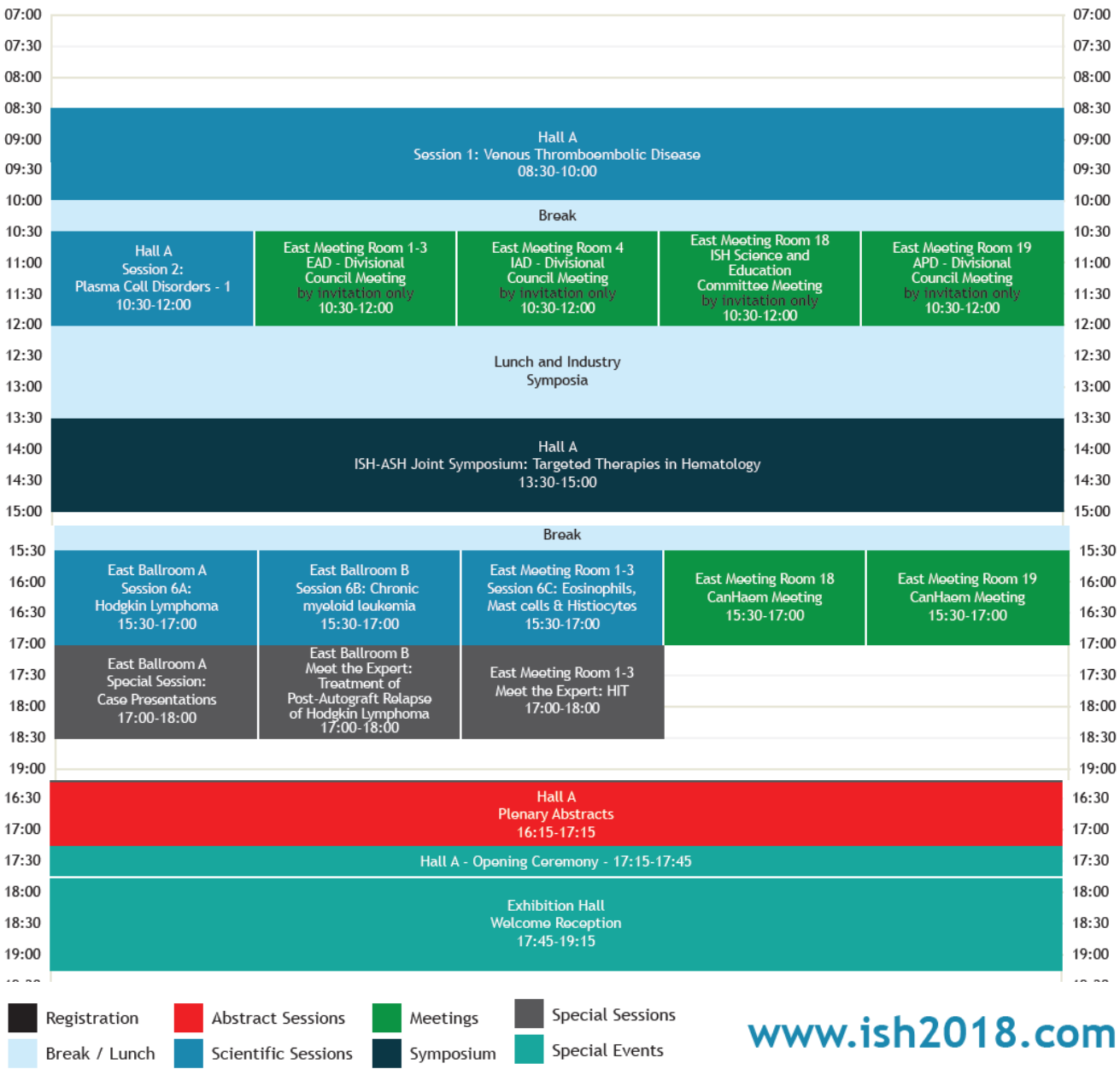
5. Find a Scenic Restaurant for Dinner

Vancouver is blessed with beautiful views and September is one of the better weather months. There are many possibilities for those that want to have dinner with a view – Seasons in Queen Elizabeth Park, The Boathouse at either Kitsilano or English Bay Beach, Five Sails Restaurant in the Pan Pacific Hotel or The Teahouse in Stanley Park are just a few examples.

XXXVII WORLD CONGRESS
International Society of Hematology
Vancouver BC, Canada | September 13-16, 2018

CONGRESS PROGRAM

Thursday, September 13, 2018



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XXXVII WORLD CONGRESS
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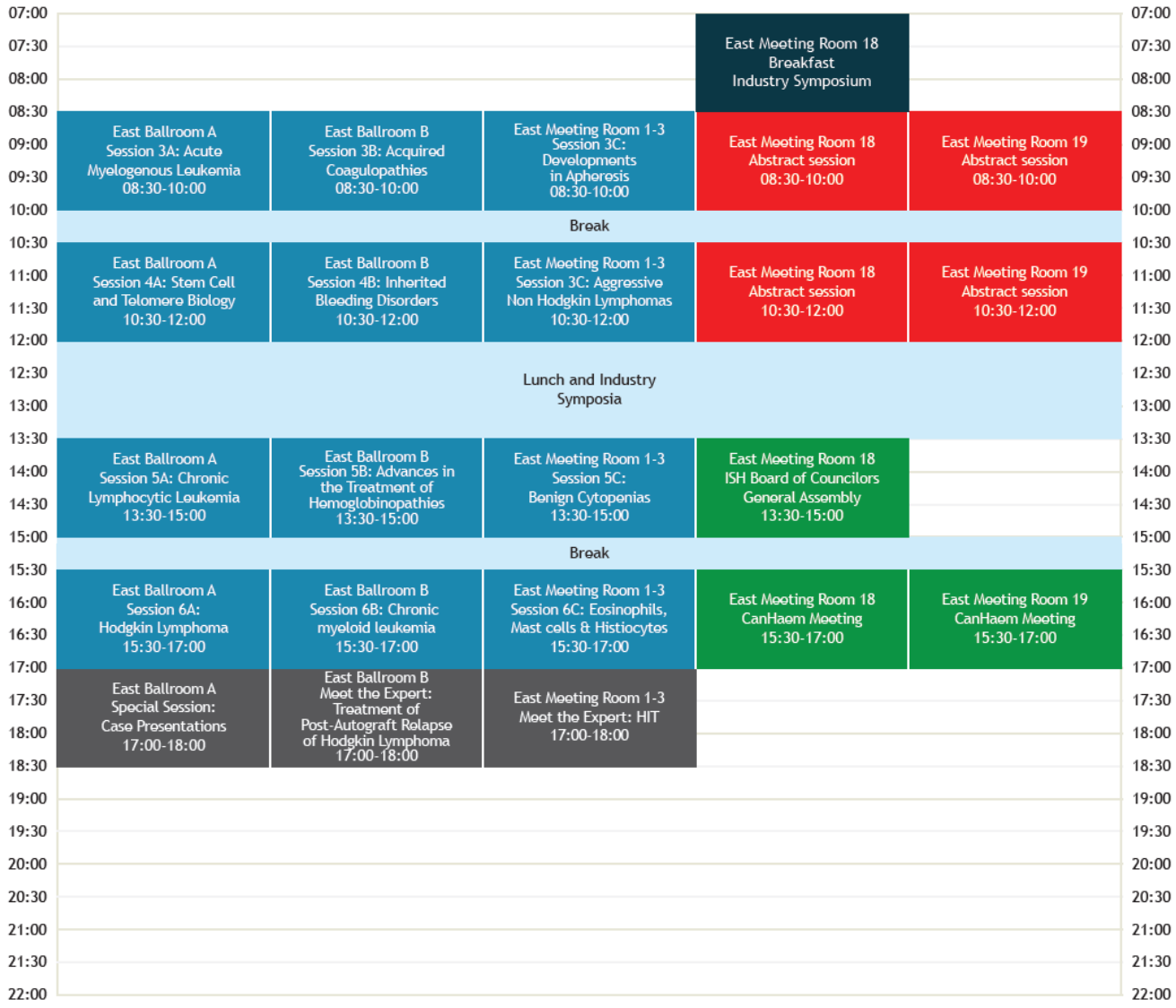
CONGRESS PROGRAM

Friday, September 14, 2018



Registration | Abstract Sessions | Meetings | Special Sessions
Break / Lunch | Scientific Sessions | Symposium | Special Events

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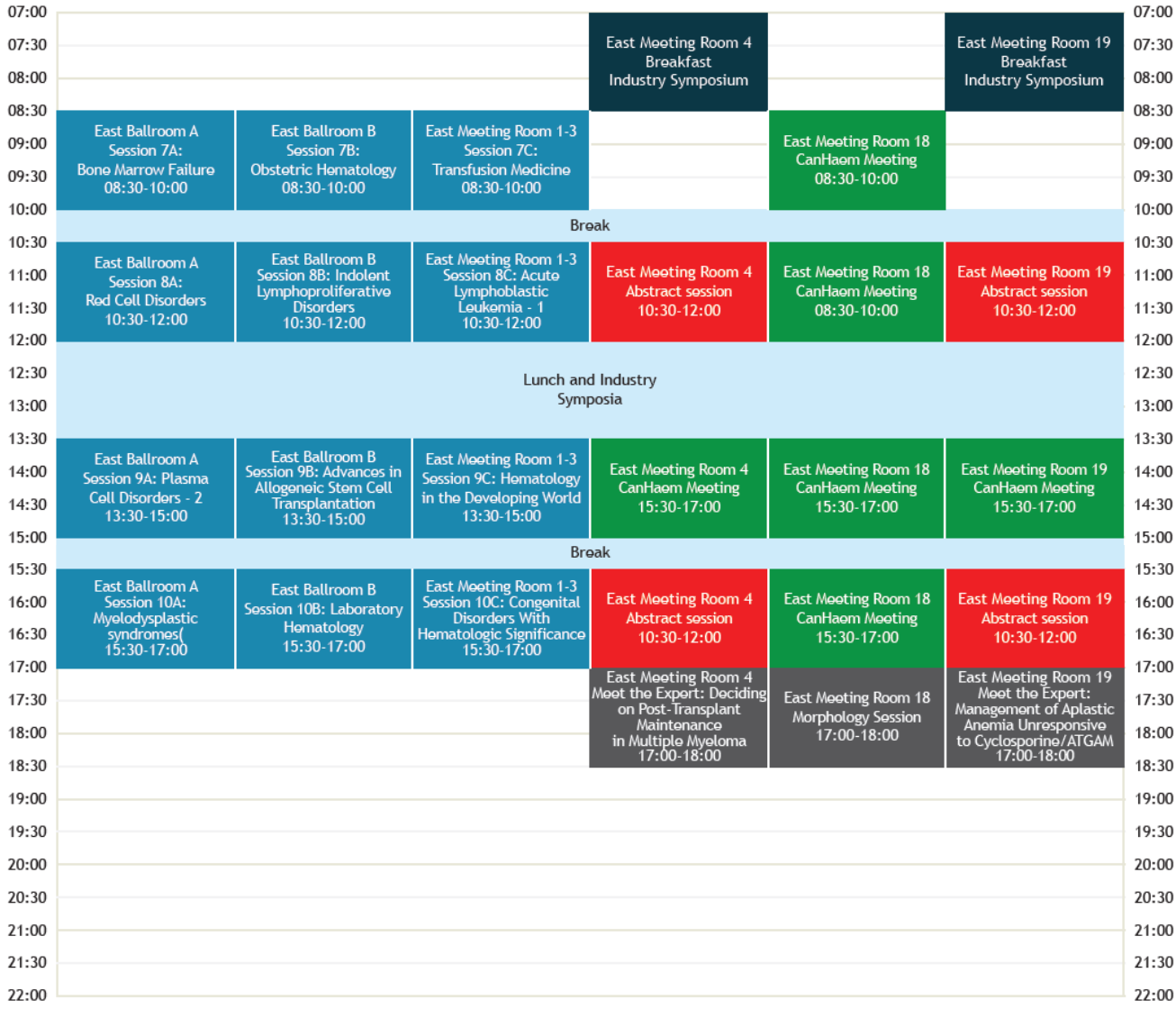
XXXVII WORLD CONGRESS
International Society of Hematology
Vancouver BC, Canada | September 13-16, 2018

CONGRESS PROGRAM

Saturday, September 15, 2018



Registration | Abstract Sessions | Meetings | Special Sessions
Break / Lunch | Scientific Sessions | Symposium | Special Events

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XXXVII WORLD CONGRESS
International Society of Hematology
Vancouver BC, Canada | September 13-16, 2018

CONGRESS PROGRAM

Sunday, September 16, 2018

	East Ballroom A	East Ballroom B	East Meeting Room 1-3	East Meeting Room 4	East Meeting Room 18
07:00 – 08:30			East Meeting Room 1-3 Meet the Expert: The Problematic ITP patient 07:30-08:30	East Meeting Room 4 Meet the Expert: Treatment of MDS with a High-risk Molecular 07:30-08:30	
08:30 – 10:00	East Ballroom A Session 11A: Complement Disorders 08:30-10:00	East Ballroom B Session 11B: Myeloproliferative Disorders 08:30-10:00	Session 11C: Organizing a BMT Unit in Underprivileged Circumstances 08:30-10:00	East Meeting Room 4 Abstract session 10:30-12:00	East Meeting Room 18 Abstract session 10:30-12:00
10:00 – 10:30	Break				
10:30 – 12:00	East Ballroom A Session 12A: Disorders of Platelet Number and Function 10:30-12:00	East Ballroom B Session 12B: Autologous Stem Cell Transplantation 10:30-12:00	East Meeting Room 1-3 Session 12C: Acute lymphoblastic leukemia - 2 10:30-12:00	East Meeting Room 4 Abstract session 10:30-12:00	
12:00 – 13:00	East Ballroom A Closing Session: Key Take-Home Messages 12:00-13:15				

Registration | Abstract Sessions | Meetings | Special Sessions
Break / Lunch | Scientific Sessions | Symposium | Special Events

www.ish2018.com

Program Details

Sept 13, 2018

1 08:30 - 10:00 Venous Thromboembolic Disease

HIT and DIC: Unraveling Ischemic Limb Injury Causes
Ted Warkentin, Canada
Management of Cancer-Associated Thrombosis
Cynthia Wu, Canada

2 10:30 - 12:00 Plasma Cell Disorders - 1

Antibody Therapies in Multiple Myeloma
Kevin Song, Canada
Understanding the Genetic Changes in Myeloma
Brian Walker, USA
Modern Management of AL-Amyloidosis
Kevin Song, Canada

SS1 13:30 - 15:00 ISH-ASH Joint Symposium: Targeted Therapies in Hematology

Gene Inhibitor Therapy in AML
Donna Hogge, Canada
JAK inhibition in chronic MPDs
Ruben Mesa, USA
CRISPR/Cas9 Genome Editing in Hemoglobinopathies
Fabien Touzot, Canada

SS2 15:15 - 16:15 Special Hematology Session: Nuclear Terrorism

Nuclear Terrorism
Robert Gale, USA

17:15 OC 17:15 - 17:45 Opening Ceremony

Dr. Tom Nevill

Scientific Program Committee Chair

September 14, 2018

08:30 - 10:00	**3A Acute Myelogenous Leukemia** Prognostic Stratification in AML Roland Walter, USA Germline Mutations Associated with Myeloid Neoplasms Akiko Shimamura, USA Determining Optimal Treatment for AML Patients Andre Schuh, Canada	**3B Acquired Coagulopathies** Treatment of Acquired Hemophilia A Rebecca Kruse-Jarres, USA Managing the Hemostatic Defects of Massive Transfusion Syndrome Andrew Shih, Canada Controlling Hemorrhage in a Patient with Liver Disease Jody Kujovich, USA	**3C Developments in Apheresis** One TMA: Current Approaches & Management of TTP Gail Rock, Canada Stem Cell Mobilization Strategies Gayatri Sreenivasan, Canada Extracorporeal Photopheresis for Treatment of Graft-versus-Host Disease Raewyn Broady, Canada
10:30 - 12:00	**4A Stem Cell and Telomere Biology** What We Know About AML Stem Cells Donna Hogge, Canada Telomeres and telomerase in normal and malignant hematopoiesis Peter Lansdorp, Canada	**4B Inherited Bleeding Disorders** Antibody Therapy in Hemophilia Guy Young, USA Molecular Genetics of Von Willebrand's Disease David Lillicrap, Canada Management of the Undefined Bleeding Disorder Shannon Jackson, Canada	**4C Aggressive Non Hodgkin Lymphoma** Checkpoint Inhibitors in Lymphoma Kerry Savage, Canada The Role of Autologous Stem Cell Transplantation in Management of Primary CNS Lymphoma Doug Stewart, Canada Management of Double and Triple-Hit Lymphomas David Scott, Canada
13:30 - 15:00	**5A Chronic Lymphocytic Leukemia** Pathogenesis & Risk Factors for CLL Cynthia Toze, Canada Which therapy is Best for del(17p) CLL: Ibrutinib or Ventoclax Alina Gerrie, Canada Where Does Allogeneic Transplantation Fit in the Management of CLL? Cynthia Toze, Canada	**5B Advances in Hemoglobinopathies Treatment** Hydroxyurea, Transfusions & Supportive Care in Sickle Cell Anemia Nancy Robitaille, Canada Allogeneic Stem Cell Transplant Hemoglobinopathies Christina Peters, Austria New therapies in ß Thalassemia Richard Ward, Canada	**5C Benign Cytopenias** Controversies in the Management of ITP Adrian Newland, USA Clonal Hematopoiesis in Congenital Neutropenia/G-CSF in Cyclic Neutropenia David Dale, USA
15:30 - 17:00	**6A Hodgkin Lymphoma** Will Brentuximab Vedotin & Nivolumab Improve Survival in Relapsed/Refractory Hodgkin Lymphoma? Alina Gerrie, Canada Treatment of Grey Zone Lymphomas Joseph Connors, Canada Is There a Role for Allogeneic Stem Cell Transplantation in Hodgkin Lymphoma? John Kuruvilla, Canada	**6B Chronic myeloid leukemia** Choosing the Best Frontline Agent in CML Jeff Lipton, Canada Molecular Mechanisms in CML: From Transformation to TKI Discontinuation Pierre Laneuville, Canada When is it Safe to Discontinue TKIs? Donna Forrest, Canada	**6C Eosinophils, Mast cells & Histiocytes** New Insights into the Molecular Genetics of Non-Langerhans Histiocytosis Julien Haroche, France Management of Mast cell Disease: Indolent, Smoldering & Aggressive Animesh Pardanani, USA Eosinophilic diseases Luke Chen, Canada
17:00 - 18:00	**SS3 Special Session: Case Presentations** Case Presentations Thomas Nevill, Canada Case Presentations Monika Hudoba, Canada	**MTE1 Meet-the-Expert Session** **• Treatment of Post-Autograft Relapse of Hodgkin Lymphoma** Treatment of Post-Autograft Relapse of Hodgkin Lymphoma Joseph Connors, Canada	**MTE2 Meet-the-Expert Session** **• HIT** Heparin-induced thrombocytopenia (HIT) Ted Warkentin, Canada

September 15, 2018

08:30 - 10:00	**7A Advances in Allogeneic Stem Cell Transplantation** Post-transplantation Cyclophosphamide in Unrelated Donor SCT Marco Mielcarek, USA Is Haploidentical Transplantation the Way of the Future? Robert Gale, USA	**7B Obstetric Hematology** Treatment of Lymphoma in Pregnancy Joseph Connors, Canada Management of Thrombocytopenia in Pregnancy Leslie Zypchen, Canada Navigating Pregnancy in a Woman with Von Willebrands Disease Jody Kujovich, USA	**7C Transfusion Medicine** Transfusion Outcomes After Short and Long-Term Blood Storage Ted Warkentin, Canada Thresholds for Red Cell and Platelet Transfusions in Acute Leukemia Patients Andrew Shih, Canada Transfusion-Related Acute Lung Injury: Risk factors, Management & Prevention Tanya Petraszko, Canada
10:30 - 12:00	**8A / Red Cell Disorders** Management of Pure Red Cell Aplasia Robert Means, USA Megaloblastic Anemias: Why Are They Still Important? Ralph Green, USA A Practical Approach to Hyperferritinemia Luke Chen, Canada	**8B / Indolent Lymphoproliferative Disorders** Novel Therapies for Follicular Lymphoma Laurie Sehn, Canada Can We Agree on Optimal Management of Mantle Cell Lymphoma John Kuruvilla, Canada BRAF Inhibitors in Hairy Cell Leukemia Michael Grever, USA	**8C / Acute Lymphoblastic Leukemia - 1** New Insights into the Genetics of Childhood ALL Kirk Schultz, Canada CAR T-cell Therapy in ALL Shannon Maude, USA
13:30 - 15:00	**9A Plasma Cell Disorders - 2** Developing a Rational Approach to the Treatment of Multiple Myeloma Joseph Mikhael, USA Overview of IgG-4 Disease Mollie Carruthers, Canada Monoclonal Gammopathy with Renal Significance Joseph Mikhael, USA	**9B Bone Marrow Failure** GATA2 mutation disorders/Telomeropathies Thomas Nevill, Canada Therapeutic Options for LGL Leukemia Thomas Loughran, USA Etiology, Pathogenesis & Initial Therapy of Aplastic Anemia Phillip Scheinberg, Brazil	**9C Hematology in the Developing World** Improving the Outcomes for Leukemia & Lymphoma in Developing Countries David Gómez-Almaguer, Mexico Helminthic Disease of the Lungs in Immunocompromised Patients Alissa Wright, Canada Systematic Analysis of Global Anemia & Global Epidemiology of Hemglobinopathies Nicholas Kassebaum, USA
15:30 - 17:00	**10A Myelodysplastic syndromes** The role of next generation sequencing in prognosis Rafael Bejar, USA Novel therapies in low and high-risk MDS Mikkael Sekeres, USA Management of Iron Overload in MDS Heather Leitch, Canada	**10B Laboratory Hematology** Laboratory Investigation of Disorders of Platelet Function Catherine Hayward, Canada MRD Testing by Flow Cytometry in AML Roland Walter, USA Hemoglobinopathies - Screening and Diagnostics Nicholas Au, Canada	**10C Congenital Hematological Disorders** Diagnosis and Management of Gaucher Disease Dominick Amato, Canada Familial Hemophagocytic Lymphohistiocytosis David Dix, Canada Fanconi Anemia: Genetics and Clinical Implications Şule Unal, Turkey
17:00 - 18:00	**MTE3 Meet-the-Expert Session: Deciding on Post-Transplant Maintenance in Multiple Myeloma** Deciding Post-Transplant Maintenance in Multiple Myeloma Joseph Mikhael, USA	**SS4 Morphology Session** Sample Cases of Newly Defined Entities in the WHO 2016 Classification of Hematological Malignancies Aysegul Uner, Turkey	**MTE4 Meet-the-Expert: Management of Aplastic Anemia Unresponsive to Cyclosporine/ATGAM** Management of Aplastic Anemia Unresponsive to Cyclosporine/ATGAM Phillip Scheinberg, Brazil

September 16, 2018

07:30 - 08:30	**MTE5 Meet-the-Expert : The Problematic ITP patient - Current management and future treatment options** The Problematic ITP patient - Current management and future treatment options Adrian Newland, USA	**MTE6 Meet-the-Expert Session: Treatment of MDS with a High-risk Molecular Profile** Treatment of MDS with a High-risk Molecular Profile Mikkael Sekeres, USA	
08:30 - 10:00	**11A Complement Disorders** New Genetic Insights and Evolving Therapies for Paroxysmal Nocturnal Hemoglobinuria Christopher Patriquin, Canada Diagnosis and Management of aHUS Gayatri Sreenivasan, Canada Complement Activation in Anti-Phospholipid antibody Syndrome Christopher Patriquin, Canada	**11B Myeloproliferative Disorders** Polycythemia Vera: Approach to Treatment Lynda Foltz, Canada Prognostic Factors in Myelofibrosis and Essential Thrombocytosis Ruben Mesa, USA	**11C Organizing a BMT Unit in Underprivileged Circumstances** General Guidelines Robert Gale, USA Experience in Turkey Emin Kansu, Turkey Organizing a BMT unit in underprivileged circumstances: Experience in Mexico Guillermo Ruiz-Argüelles, Mexico
10:30 - 12:00	**12A Disorders of Platelet Number and Function** Genomics to Uncover Novel Inherited Platelet Disorders Jacob Rozmus, Canada Causes and Consequences of ConstitutionalPplatelet Dysfunction Catherine Hayward, Canada	**12B Autologous Stem Cell Transplantation** Autologous SCT for Multiple Sclerosis Natasha Kekre, Canada Cell Dose Thresholds for Autologous SCT Maryse Power, Canada	**12C Acute Lymphoblastic Leukemia - 2** Antibody Therapies in ALL Elias Jabbour, USA
10:30 - 12:00	**Closing Session: Key Take-Home Messages** Key Take-Home Messages		

XXXVII WORLD CONGRESS
International Society of Hematology

Hosted by the Canadian Hematology Society Vancouver BC, Canada | September 13 - 16, 2018

Speaker Snapshots

Thursday September 13

Dr. Ted Warkentin is a Professor in the Department of Medicine at McMaster University and the Regional Director of Transfusion Medicine in the Hamilton Regional Laboratory Medicine Program. He was the Winner of the 2015 Prix Galien Canada, awarded to Canadian scientists who have made significant advances in pharmaceutical research, for his work in heparin-induced thrombocytopenia.

Dr. Kevin Song is an Associate Professor of Medicine at the University of British Columbia and a Member of the Leukemia/BMT Program of BC. He is the Provincial Lead for multiple myeloma, amyloidosis and other plasma cell dyscrasias; his research focus is on new treatment strategies for these disorders.

Dr. Ruben Mesa has been a leading MPN specialist for more than 20 years and is chair of the NCCN panel that published US guidelines on diagnosis and treatment of myelofibrosis. He has been principal or co-principal investigator in 70 clinical trials that have led to FDA approval of numerous cancer drugs.

Dr. Robert Gale developed the bone marrow transplant program at UCLA in the 1970s and was the Chair of the Scientific Advisory Committee of the IBMTR for 17 years. He was involved in the medical response to the Chernobyl Nuclear accident in 1986 and became the President of the Armand Center for Advanced Studies in Nuclear Energy and Health from 1986-1993. He has worked as a consultant to pharmaceutical companies over the past two decades and is visiting Professor at Imperial College of London in the UK.

Friday September 14

Dr. Roland Walter is a Member of the Clinical Research Division at Fred Hutchison Cancer Research Center with a focus on translational research in AML. His main areas of interest are the study of molecular and phenotypic characteristics of AML progenitors, detection of minimal residual disease and novel immunotherapies in AML.

Dr. Rebecca Kruse-Jarres is the Director of the Washington Center for Bleeding Disorders and is on the Board of Directors of the Hemostasis and Thrombosis Research Society. Her research interest is coagulation inhibitor development and treatment in congenital and acquired hemophilia.

Dr. Peter Lansdorp is one of the world's experts in telomere biology. His lab developed the technique for measuring telomere length by peripheral blood fluorescence in-situ hybridization. His research focus is the role of telomeres and the telomerase complex in normal aging, tumour progression and genetic hematological diseases.

Dr. David Lillicrap a Professor at Queens University in Kingston, ON is a Canada Research Chair in Molecular Hemostasis. His interests are directed at better understanding the coagulation system through the use of molecular genetics and molecular biology. He has added extensively to the literature on von Willebrand Factor biology and has a keen interest in hemophiliagene therapy.

Dr. Christina Peters is a Professor of Pediatrics in the Department of Stem Cell Transplantation at St. Anna Children's Hospital in Vienna, Austria. She is the Chair of the EBMT Pediatric Diseases Working Group and Principal Investigator of active EBMT and IBFM studies directed at the treatment of pediatric leukemias and hemoglobinopathies.

Professor Adrian Newland developed the Leukaemia and BMT Unit in the early 1980s at Barts and London NHS Trust where he became the Head of Haematology in 1995. Beyond hematologic malignancies, his research interests involve the study of the molecular basis of autoimmune thrombocytopenia and novel treatments for this condition.

Dr. Joseph Connors, after 37 years at the British Columbia Cancer Agency, is retiring in 2018. He became the Head of the Lymphoma Tumour Group at the BCCA in 1986 and the Clinical Director of the Centre for Lymphoid Cancer in 2000. He has pioneered therapies for Hodgkin and non-Hodgkin lymphoma over the past three decades and has been

recognized as one of the World's Most Influential Scientific Minds by Clarivate Analytics.

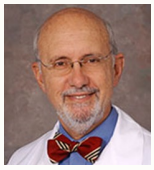
Dr. Jeffrey Lipton is Professor of Medicine at University of Toronto and former Director of the Allogeneic Blood and Marrow Transplant Service at Princess Margaret Hospital. He remains the Lead of the Chronic Myeloid Leukemia Group, and has had extensive involvement in phase I, II and III studies evaluating therapies in CML.

Dr. Julien Haroche is a Professor of Medicine at Pitié-Salpêtrière Hospital in Paris and a recognized world expert in Erdheim-Chesterman disease (ECD) as well as other histiocytoses. He was instrumental in delineating the characteristic gene mutations found in these disorders and was a driving force for the studies evaluating BRAF inhibitors in ECD.

Saturday September 15

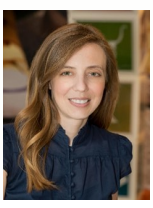
Dr. Phillip Scheinberg is the Head of the Division of Hematology at Hospital A Beneficência Portuguesa de São Paulo in Brazil. He had extensive experience with ground-breaking studies evaluating immunosuppressive therapies in aplastic anemia during his decade at the NIH in Bethesda, Maryland.

Dr. Thomas Loughran is the Director of the University of Virginia Cancer Center. He did his Hematology/Oncology Fellowship and then became a Faculty Member at the Fred Hutchison Cancer Research Center where, in 1985, he discovered Large Granular Lymphocyte (LGL) leukemia. He has published extensively on diagnosis and management of the condition and is acknowledged as the world expert on LGL leukemia.



Dr. Ralph Green is the Director of UC Davis Diagnostics and a recognized expert in the diagnosis and treatment of nutritional deficiency anemia. In this capacity, he has been a consultant to the World Health Organization and to the US National Institute of Health Working Groups on the Microbiome and Biomarkers of Nutritional Development.

Dr. Michael Grever is Co-Leader of the Experimental Therapeutics Program at Ohio State University Cancer Center. His research has focused on drug development in CLL and Hairy cell leukemia, including the initial phase I and II studies of purine analogues, histone deacetylase inhibitors, cyclin-dependent kinase inhibitors and BRAF inhibitors.



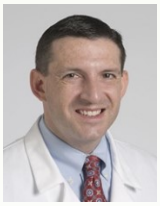
Dr. Shannon Maude is a Pediatric Oncologist in the Cancer Center at the Children's Hospital of Philadelphia (CHOP). She is the Lead of the Shannon Maude Research Program that is focused on developing new immunotherapies and targeted cancer therapies – including CAR T-cell treatment – in acute lymphoblastic leukemia.

Dr. Joseph Mikhael moved from the Mayo Clinic in Scottsdale, Arizona in 2018 to become the Chief Medical Officer of the International Myeloma Foundation. His research interests include medical education and pharmacoeconomics but he is best known for his work in multiple myeloma and related plasma cell disorders. He has been Principal Investigator in a number of clinical trials in multiple myeloma that have influenced treatment paradigms for both newly diagnosed and relapsed/refractory myeloma.

Dr. Marco Mielcarek is the Medical Director of the Adult Blood and Marrow Transplant Program of the Seattle Cancer Care Alliance. His research is focused on new strategies for the prevention and treatment of graft-versus-host disease. His most recent studies have examined the value of pre-treatment of donors with Atorvastatin and the use of timed post-transplantation high-dose Cyclophosphamide.

Dr. Nicholas Kassebaum is a member of the Institute for Health Metrics and Evaluation at the University of Washington. He is a lead investigator in the landmark Global Burden of Disease study that is examining the burden of anemia, hemoglobinopathies and other diseases as well as evaluating the effectiveness and cost of interventions.

Dr. Rafael Bejar is an Assistant Professor at UC San Diego with a laboratory that is focused on understanding genetic changes that cause hematologic malignancies and ultimately lead to their progression. He is the Principal Investigator on an NIH study that is characterizing the genetic alterations in myelodysplastic syndrome.



Dr. Mikkael Sekares is the Director of the Leukemia Program and Vice Chair for Clinical Research at the Cleveland Clinic. He was the Chair of the Oncologic Drugs Advisory Committee of the FDA and his research interests focus on the treatment of myelodysplastic syndrome and elderly AML. He has been the national Principal Investigator on multiple phase I and II studies evaluating novel treatments in these disorders.

Dr. Dominick Amato is the Director of the Centre for Gaucher Disease at Mt. Sinai Hospital in Toronto. He is a leading specialist in this rare disorder and has been an investigator in studies evaluating both intravenous enzyme replacement and oral substrate reduction therapy.

Speaker Snapshots—continued, next page...

Don't miss out! Come and hear these speakers, support your CHS, network with colleagues from Canada and abroad and enjoy one of the world's most spectacular cities!

ISH 2018 / Vancouver, BC / Sept. 13—16, 2018

hosted by your own Canadian Hematology Society!

REGISTER NOW **@http://www.ish2018.com**

Speaker Snapshots

Sunday September 16

Dr. Christopher Patriquin is a Hematologist at University Health Network in Toronto, Ontario and co-Chair of the Canadian PNH Network. He is the National Coordinator of the global PNH Registry and a member of the Canadian Apheresis Group's Thrombotic Microangiopathy Working Group.

Dr. Lynda Foltz is the Head of the Division of Hematology at St. Paul's Hospital in Vancouver, BC. She has been the site's Principal Investigator on multiple MPN clinical trials and is a founding Executive Member of the Canadian MPN Group.

Dr. Catherine Hayward is a Professor at McMaster University in Hamilton, Ontario. Her research focuses on the molecular aspects of hemostasis and platelet function. Her laboratory's central theme is the study of stored proteins, in particular Multimerin 1, in order to understand their role in bleeding and thrombosis in health and disease.

Dr. Elias Jabbour is an Associate Professor at MD Anderson Cancer Center. His research focuses on novel therapies in acute lymphoblastic leukemia (ALL). He has been the Section Chief of ALL in the Department of Leukemia since 2015 and was an investigator in the pivotal trials evaluating Blinatumomab and Inotuzumab in relapsed/refractory ALL.

CHS at ASH 2017

Dr. Armand Keating, BACK ROW, CENTRE celebrates with his colleagues and friends after receiving the CHS **Lifetime Achievement Award**, December 10, 2017 at the CHS Annual Awards Gala at ASH.

Dr. Nicole Laferriere, LEFT, incoming CHS President, shares a laugh as she is introduced by **Dr. Lynn Savoie**, outgoing president, December 10, 2017 at CHS at the ASH Gala.

ANSWER ...the diagnosis *(FROM PAGE 3)*

This bone marrow biopsy shows a diffuse infiltrate of small lymphoid cells with abundant cytoplasm, many with indented nuclei, and spaces among them -- giving the cells a classic "fried-egg" appearance. These cells were shown to express CD19, CD20, lambda light chain, CD11c, CD25 and CD103 – a classic hairy cell leukemia immunophenotype. Immunohistochemical staining confirmed the cells to be positive for tartrate-resistant acid phosphatase (TRAP) – a test that has been shown to be 100% sensitive and 98% specific for HCL (Akkaya et al, *APMIS*, 2005). Virtually all cases of HCL have a somatic V600E mutation in the BRAF gene; HCL "variant" is CD25 negative and lacks a BRAF mutation, which has now led to it being considered a biologically distinct entity.

HCL is an uncommon B-cell malignancy of pre-plasma cells (3 cases/million/year) with a median age of 50-55 years and a strong male predominance (4:1). Historically, splenomegaly – which can be massive – is present in ~90% of HCL patients at presentation although its incidence appears to be decreasing with improved diagnostic techniques. One-quarter of patients present with symptoms relating to splenomegaly, 25% with symptomatic thrombocytopenia, neutropenia or monocytopenia, 25% with constitutional symptoms and 25% are diagnosed through incidental discovery of cytopenias or splenic enlargement.

Not all patients with HCL require therapy; asymptomatic patients can be observed for months to years. However, when symptoms or significant cytopenias develop, the current standard of care is a purine analogue. Durable responses are seen in over 90% of patients with a median progression-free survival of over 10 years. Interferon-alpha and/or splenectomy may benefit individual patients and Vemurafenib, a BRAF inhibitor, holds considerable promise in relapsed/refractory HCL. This patient was treated with five days of bolus intravenous Cladribine through the outpatient clinic and within three months had a normal hemoglobin and platelet count with a mild residual neutropenia (1.7 x 10^9/L). He remains alive and

35th International Congress of the International Society of Blood Transfusion (ISBT)
...in conjunction with the
Annual Conference of the Canadian Society for Transfusion Medicine (CSTM)
June 2 – 7, 2018
Toronto, Ontario
Contact: http://www.transfusion.ca/Events/

Canadian Blood & Marrow Transplant Grp (CBMTG)
2018 Annual Meeting & Conference
June 7—9, 2018
Ottawa, Ontario
Contact: http://www.cbmtg.org/

European Hematology Association (EHA)
23rd Congress
June 14—17, 2018
Stockholm, Sweden
Contact: www.ehaweb.org/ or eha@mci-group.com

37th World Congress of the International Society of Hematology (ISH) *...hosted by the*
Canadian Hematology Society (CHS)
Sept 13-16, 2018
Vancouver Convention Centre
Contact: http://www.ish2018.com/

Don't miss ISH 2018!

Canadian Apheresis Group (CAG), with Canadian Association of Apheresis Nurses (CAAN) Annual Meeting & Scientific Sessions
November 2—4, 2018
Montreal, Quebec
Contact: cag@cagcanada.ca

Canadian Hematology Society (CHS) Annual Reception, Dinner & Awards Evening
December 2, 2018
San Diego, California, USA
Contact: chs@uniserve.com

International Society of Laboratory Hematology (ISLH)
International Congress
May 9—11, 2019
Vancouver, BC
Contact: www.islh.org

American Society for Apheresis (ASFA)
2019 Annual Meeting
May 15—18, 2019
Portland, OR, USA
Contact: http://www.apheresis.org/page/ASFA2018

Pictured at the CHS Annual Awards Gala at ASH in Atlanta, Ga., December 2017, are: FROM LEFT, Dr. Ciara Freeman, winner of the Crookston Award for the best paper by a resident, Samir Barghout, CHS Abstract Award winner in the PhD & Post Doctoral category, Lynn Savoie, CHS President, Dr. Jean Wong, representing Dr. Stanley Ng's winning CHS Paper of the Year, published in the renowned journal, *Nature* in 2016, Dr. Daniel Sawler, CHS Abstract Award winner in the Residents and Fellows category, and Elina K Cook, CHS Abstract Award winner in the PhD & Post Doctoral category.

JOB POSTINGS

MEDICAL ONCOLOGY, APP – BELLEVILLE, ONTARIO

The Dr Douglas A MacIntosh Cancer Clinic in partnership with The Cancer Centre of South-eastern Ontario (CCSEO) are searching for a Medical Oncologist. This 1.0 FTE position is fully funded by MOH as a ONT MOA APP position with competitive salary. The successful applicant will possess Royal College Certification in Internal Medicine, or equivalent and will have completed sub-speciality training in Medical Oncology with eligibility for APP under the ONT MOA agreement.

To apply, please send a letter of intent and a CV to: Dr Roger Lévesque, Head Medial Oncology, Quinte Health Care, 265 Dundas Street East, Belleville, Ontario, K8N 5A9.; Tel: 613-969-7400 ext. 2371; Fax 613-969-0486; email: **rlevesque@qhc.on.ca**

BENIGN HEMATOLOGIST—RICHMOND HILL, ONTARIO

Mackenzie Health is a major regional healthcare organization that is rapidly expanding to meet the needs of the growing community of Southwest York region. The current Mackenzie Richmond Hill Hospital is a 515 bed community hospital in Richmond Hill. Training and interest in thromboembolic disease and management would be an asset.

Interested applicants should send a CV and letter of intent to:

Dr. Matilda Ng MD, RCPC, Head, Division of Medical Oncology/ Hematology, Mackenzie Richmond Hill Hospital
10 Trench Street, Richmond Hill, ON L4C 4Z3
Phone: (905)883-2153
Email: **matilda.ng@mackenziehealth.ca**

MULTIPLE POSITIONS / NIAGRA HEALTH & WALKER FAMILY CANCER CENTRE

Niagara Health is seeking a physician to join the Department of Oncology, Service of Hematology and Thrombosis. The successful applicant would practice malignant hematology at the Walker Family Cancer Centre. Click here for full details.

Niagara Health is also seeking a benign hematologist to join the Department of Oncology, Service of Hematology and Thrombosis. This includes both In-Patients consultations and Ambulatory clinics with appropriate nursing support in Niagara Health. Click here for full details.
Contact: **MedicalAffairs@niagarahealth.on.ca**
Phone: 905-378-4647 ext. 44224

HEMATOLOGIST - MARKHAM STOUFFVILLE HOSPITAL

The Department of Medicine is seeking a Hematologist to help support the existing general benign and malignant hematology service. The current requirement is for a part time Hematologist to support our benign hematology service with the intent to expand with APP funding to a full time complement. The successful candidate will join a service that provides high-quality, patient-centered cardiac care within the Markham Stouffville community and MSH catchment area. The successful candidate will also be collegial and committed to providing an exceptional caliber of patient care at MSH. Contact: **Jaclyn Bell,** Director, Medical Administration: **jbell@msh.on.ca** Tel: 905-472-7619

Fellowships

McGill University Thrombosis Fellowship 2018-19

McGill University Thrombosis Fellowship 2018-19 at Jewish General Hospital in Montreal, Quebec.

The JGH Thrombosis Program is currently accepting applications for a one year fellowship (July 1, 2019 - June 30, 2020) to acquire and consolidate expertise in Thrombosis.
Specific areas of clinical activity include the Thrombosis Clinic, Anticoagulation Clinic and In-patient Thrombosis Consultation Service.

Our Thrombosis Program also encompasses a broad range of research activities that relate to diagnosis, risk factors and treatment of venous and arterial thromboembolic disease.

For more information and complete details, please contact:

Dr. Susan Kahn
Director, Thrombosis Fellowship
Jewish General Hospital
3755 Cote St Catherine Rm B.304.24
Montreal, Quebec CANADA H3T 1E2
c/o Maureen Morganstein 514-340-7587.

FELLOWSHIPS

Multiple Myeloma & Malignant Hematology Fellowship - Toronto, Ontario

St. Michael's
Inspired Care.
Inspiring Science.

JAMES DREWRY STEWART FELLOWSHIP

The James Drewry Stewart Fellowship in Multiple Myeloma and Malignant Hematology will provide financial assistance in the form of fellowship grants to oncology trainees at St. Michael's Hospital who have completed their core training in oncology and are seeking additional clinical training in myeloma and other blood cancers.

Application Procedure

Applicant must submit the following:

1. Completed James Drewry Stewart Fellowship in Multiple Myeloma and Malignant Hematology form
2. CV
3. Statement of intent
4. Applications will be reviewed by the Stewart Fellowship Committee

CONTACT: Maryana Ghazula
ROLE: Administrator
TELEPHONE: 416-864-5632
EMAIL: **gazhulam@smh.ca**
MAILING ADDRESS: St. Michael's Hospital, 30 Bond Street, Room 2 – 084,Toronto ON M5B 1W8

Leukemia/Bone Marrow Transplantation Fellowship, Vancouver, BC

BC Cancer Agency
CARE + RESEARCH
An agency of the Provincial Health Services Authority

The Leukemia/Bone Marrow Transplantation Program of British Columbia offers 1 or 2 Year fellowships to provide advanced training in the management of adults with hematological malignancies including all aspects of allogeneic and autologous hematopoietic stem cell transplantation (HSCT).

Candidates should be registered in, or completed a recognized hematology or oncology training program.

For more information: leukemiabmtprogram.org

Interested candidates should submit a CV and names of three references to:

Dr. Sujaath Narayanan, Fellowship Director Leukemia/ BMT Program, BC Cancer Agency
& Vancouver General Hospital
Phone: (604) 875-4089
FAX: (604) 875-4763
Email: SNarayanan@bccancer.bc.ca

Two-year Fellowship Program, Princess Margaret Cancer Centre, Toronto

Princess Margaret Cancer Centre UHN

Allogeneic Blood and Marrow Transplantation – Clinical Research Fellowship

The 2-year Fellowship Program at Princess Margaret Cancer Centre/University of Toronto is designed to provide the opportunity for trainees in hematology and medical oncology to define and refine career goals, enhance their ability to pursue a successful career as consultants, clinical researchers and clinician scientists.

Both funded and unfunded opportunities are available. For further information, please contact:

Auro Viswabandya
Fellowship Director, Allotransplant
Telephone: +1-416-946-4501 x 3256
E-mail: Auro.Viswabandya@uhn.ca

Mailing Address:
Princess Margaret Cancer Center
Division of Medical Oncology and Hematology
610 University Avenue, Rm 5-110
Toronto, ON, Canada M5G 2M9

Your Canadian Hematology Society
Société Canadienne d' Hématologie Newsletter

Membership Matters

The Canadian Hematology Society has represented all physicians and scientists with an interest in the discipline in Canada since it was founded in 1971, and currently has over 500 members.

Active Membership

- Physicians in the practice of clinical or laboratory hematology in Canada
- Scientists with PhD degrees making continuing contributions to research related to hematology in Canada
- Allied Health Professionals making sustained contributions to clinical or laboratory hematology practice or hematology research in Canada.

Only active members shall:

- **vote**
- **hold office**
- **receive CHS grants, and**
- **pay dues.**

Associate Members

- Residents and fellows engaged in hematology training
- Masters and PhD graduate students
- Post-doctoral fellows engaged in hematology research
- ***Associate members will not be required to pay dues until completion of their training.***

Emeritus Members

- All individuals who have retired from full time hematology practice or research, or those who were active members and request a transfer of status with adequate reason.

Honorary Membership

- Non-members may be invited to become Honorary Members of the corporation by virtue of their outstanding contributions to any discipline which is of importance to hematology.

CHS members are reminded ... that dues for the year 2018 are now past due.

Your $75.00 annual dues payment may be made online at the CHS website: **www.canadianhematologysociety.org**

Or by mail to: **Canadian Hematology Society, 199-435 St. Laurent Blvd., Ottawa, Ontario K1K 2Z8**
Please provide the following information with your payment:

2018 Membership Renewal / Address Change: Canadian Hematology Society

Membership Status
Active ☐
Associate ☐
Emeritus ☐

Has your status changed?
Yes ☐
No ☐

Name: _____
Title: _____
Email: _____
Work Address: _____
_____
Work Phone: _____
Work Fax: _____