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Special Event Highlight

TWRI 12th Annual Research Day

On May 16th, Toronto Western Research Institute (TWRI) hosted its 12th Annual Research Day, which featured a selection of basic and clinical research presentations highlighting the exciting work conducted by graduate students and post-doctoral fellows at the institute over the past year.

The day included a competitive poster and oral competition. In total, 58 research posters were on display touching upon all areas of research at TWRI, and 10 trainees were selected for a 15 minute oral presentation to a scientific panel. The following graduate students and postdoctoral fellows from the labs of Drs. Fehlings, Hudson, Hutchison, Schlichter, Skinner, Strafella, Urowitz and Wither received awards in the oral and poster presentation competitions:

Oral Presentation: Graduate Student

- 1st Prize - Sarah Figley
- 2nd Prize - Yuriy Baglaenko
- 3rd Prize - Leigh Christopher

Oral Presentation: Postdoctoral Fellow

- 1st Prize - Sunni Patel
- Runner-up - Amanda Steiman

Poster Presentation: Graduate Student

- 1st Prize - Tamjeed Siddiqui
- 2nd Prize - Nicholas Howell
- 3rd Prize - Katie Ferguson

Poster Presentation: Postdoctoral Fellow

- 1st Prize - Kajana Satkunendrarajah
- 2nd Prize - Ayda Shahidi
- 3rd Prize - Khalid Alnaqbi

June 2012

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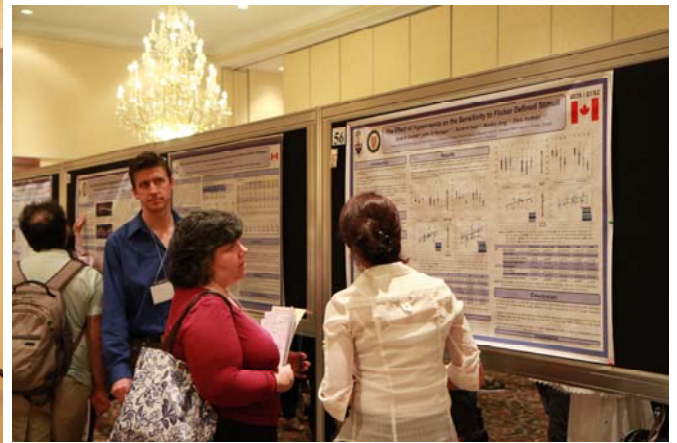
upcoming events

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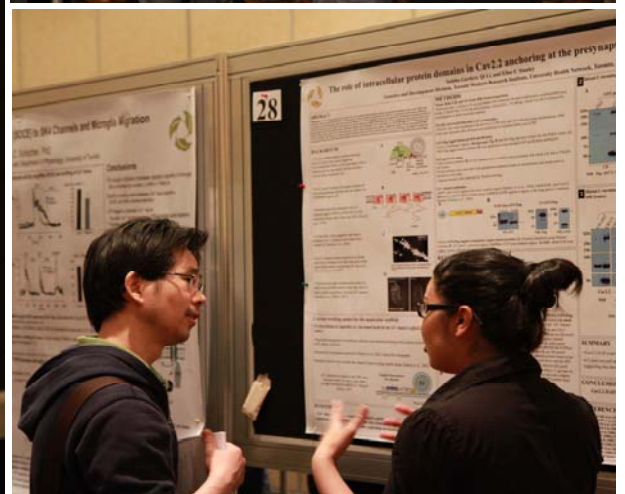
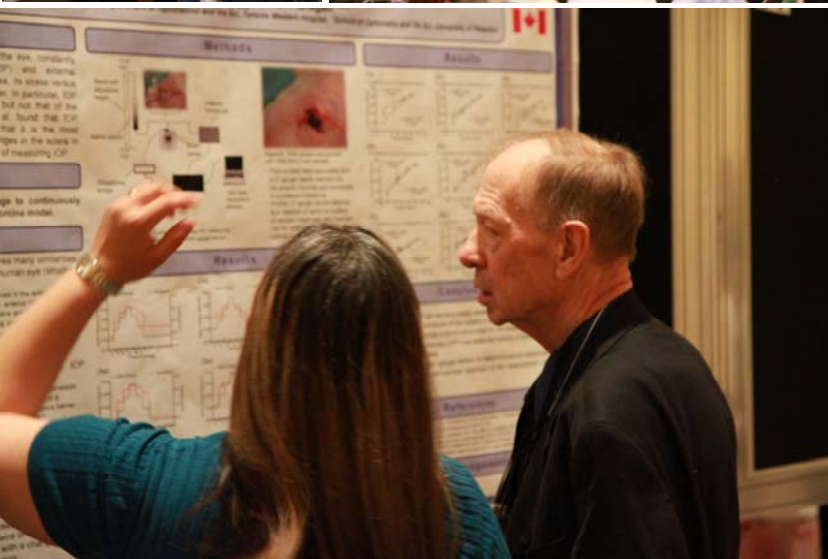
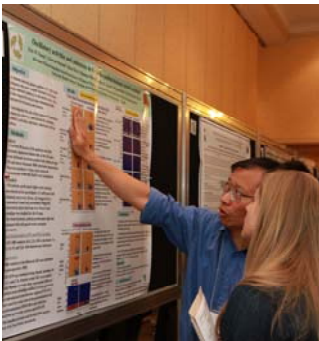
The day-long event concluded with a keynote address by Dr. Stanley M. Lemon, Professor in the Division of Infectious Diseases, School of Medicine at the University of North Carolina, who gave an insightful talk on "Hepatitis A and Hepatitis C: Divergent Infection Outcomes Marked by Similarities in Induction and Evasion of Interferon Responses".

Congratulations to all the winners and a special thanks to the 2012 TWRI Research Day judges and organizing committee!

Here are some pictures taken at the event:



TWRI 12th Annual Research Day



Spotlight on: The Spatio-Temporal Targeting and Amplification of Radiation Response (STTARR) Program

By Carolyn Goard

The end goal of most medical research is to eventually find ways to improve clinical outcomes, though at times that can be a long path to follow. To improve the efficiency at which research is translated into clinical applications there is a standing need for integrated resources and facilities to help discoveries move from bench to bedside quickly and smoothly. The unique Spatio-Temporal Targeting and Amplification of Radiation Response (STTARR) facility and research program at UHN is designed to directly address these needs.

Program Description:

The ultimate goal of STTARR is to promote advanced medical research and translate outcomes to clinical applications in terms of new diagnostics and therapies. STTARR provides a wide range of support from single cell analyses through preclinical animal models to clinical studies in humans. At the centre of this infrastructure is access to a multitude of imaging modalities such as CT, MR, PET, SPECT, Ultrasound, Photoacoustics and Optical, including a specialization in radiation therapy. The program includes the STTARR Innovation Centre located at the MaRS Toronto Medical Discovery Tower (TMDT) as well as the Radiation Medicine Program of Princess Margaret Hospital, which are specifically designed to facilitate the integration between preclinical and clinical research with greater efficacy compared to the traditional set-up in which laboratories work in isolation.

Facilities and Research:

The multidisciplinary resources of STTARR allow for a dynamic interplay among various fields of research through the integration of five research Cores. These include:

- ◆ *Core I: Cell and Tissue Imaging and Subcellular Radiation.* This Core investigates cell and tissue responses to radiotherapy and novel combined treatments.
- ◆ *Core II: Animal Imaging and Precision Radiation.* Research focus is on preclinical evaluation of novel radiotherapeutic approaches and targets using an extensive collection of state-of-the-art multimodal anatomical and functional imaging platforms designed for small animals (mice to small non-human primates).
- ◆ *Core III: Human Imaging and Precision Radiation.* This Core handles clinical trials designed to decrease treatment toxicity while increasing therapeutic efficacy and quality of life in patients.
- ◆ *Core IV: Computational.* This section supports the other research Cores with essential software and computational tools.
- ◆ *Core V: Pathology.* In collaboration with UHN's Pathology Research Program (PRP), this Core provides histopathology and molecular pathology resources to help determine the correlation of pathological features in tissue biopsies using *in vivo* imaging.



GE Locus Ultra microCT scanner suitable for dynamic preclinical CT imaging with 150 um resolution

Collaborations and Research Outcomes:

Complementing its multidisciplinary nature, the STTARR research program has over 230 collaborative projects. In addition to studying cancer, these projects include investigations in arthritis, cardiovascular disorders, spinal injury and diabetes. STTARR fosters local, national and international collaborations with both academic and industrial partnerships. For example, a partnership between Dr. David Jaffray and Dr. Richard Hill at UHN and Precision X-Ray Inc. (PXI) led to the successful commercialization of a pioneering image-guided radiation therapy unit (XRAD 225Cx) designed for small animals, with the most recent unit installed at the National Cancer Institute in March 2012. STTARR researchers have also launched Nanovista (www.nanovista.ca), a company that distributes preclinical nanoscale multimodal contrast agents.

UHN trainees and staff are fortunate to have access to world-class facilities at STTARR, enabling them to expedite translational research to clinical adaptation. To learn more about STTARR, including research advances in each Core, available equipment and how STTARR can complement your research, please visit www.sttarr.ca or email sttarr@rmp.uhn.on.ca to arrange a tour.

Spotlight on: The Spatio-Temporal Targeting and Amplification of Radiation Response (STTARR) Program

To get an insider's view on training in collaboration with STTARR, we sat down with Michael Dunne, a former UHN trainee and current Research Associate.



Mr. Michael Dunne is currently a Research Associate at STTARR.

ORT: What research and training path led you to your current position at STTARR?

MD: I completed my B.A.Sc. in Engineering Science, Biomedical Engineering at the University of Toronto in 2005. Following that, I obtained my M.Sc. in Pharmaceutical Sciences, also from the University of Toronto. During my graduate studies, I worked in both the Pharmacy building and, when it opened, the STTARR Innovation Centre. My research focused on developing novel contrast agents for cancer imaging and this prepared me to develop my career as a research associate at STTARR and UHN.

ORT: Having seen STTARR expand from its initial launch, what do you find are the most interesting advances in technology?

MD: STTARR is a service facility that allows outside users—whether they are graduate trainees in labs at the University of Toronto, or investigators from local hospitals or large pharmaceutical companies—access to advanced imaging equipment. We have researchers using the facility to study a broad range of diseases. I think the most exciting work being done now integrates multiple imaging modalities to better characterize the nature of the abnormality and the response to intervention.

ORT: What unique features of STTARR supported your research?

MD: STTARR's greatest strength is the ability to connect interested users with experts in the type of imaging they're planning to do. These relationships are beneficial both because they allow a trainee's research to progress more rapidly and because they allow the trainee to learn from STTARR staff members. Trainees are very involved in imaging studies at STTARR and, importantly, are always present when imaging is being done. Plans for the near future include intensive workshops focused on specific imaging modalities that are both theoretical and hands-on in nature. If users are unsure of how they can best incorporate imaging into their research, they can organize a general consultation with an imaging expert to assist in study design.

ORT: How have your experiences at STTARR helped you develop as a trainee, and further advance your career?

MD: I consider myself fortunate that I was able to complete a significant amount of my graduate studies at STTARR. I was able to meet and collaborate with other graduate students, scientists beginning their careers, physicians and professors. I was able to be in control of my own studies and learn to do everything in the projects I was involved in.

ORT: One of your publications included research completed at STTARR under the supervision of Dr. Christine Allen and Dr. David Jaffray and received the "Jorge Heller Journal of Controlled Release Outstanding Paper Award" in 2011. Can you walk us through the conclusions and impact of this project?

MD: This paper was the culmination of my graduate research and I'm very proud that the paper was selected for the award. This research focused on actively targeting liposome-based contrast agents to tumour neovasculature using peptides containing the NGR amino acid sequence. We found that varying the density of targeting moieties on the liposome surface and other formulation modifications could increase total tumour uptake two-fold as well as prolong residence time in the tumour. This research has ramifications for the drug delivery field where total accumulation and residence time are important design criteria, as well as for personalized medicine as imaging allows for patient stratification based on the kinetic differences between targeted and non-targeted contrast agents.

success

recent awardees

The AACR Annual Meeting Scholar-in-Training Award

Congratulations to Dr. Ines Lohse who received the AACR Annual Meeting Scholar-in-Training Award for the AACR Special Conference: Pancreatic Cancer: Progress and Challenges program held on June 18-21, 2012 in beautiful Lake Tahoe, Nevada.

Her award winning abstract is entitled "Targeting Tumor Initiating Cells in Patient-Derived Pancreatic Xenograft Models Using the Hypoxia-Activated Prodrug TH-302." Dr. Lohse summarizes her research: "Patient-derived pancreatic xenograft models show a positive correlation between tumor hypoxia and the number of tumor initiating cells (TICs). Targeting of tumor hypoxia using the hypoxia-activated prodrug TH-302 led to a reduction in TICs that correlated with the extent of tumor hypoxia. A combination of TH-302 and ionizing radiation further reduced the number of TIC in all the tested xenografts."



Postdoctoral Fellow: Dr. Ines Lohse

Supervisor: Dr. David W. Hedley
Ontario Cancer Institute



Postdoctoral Fellow: Dr. Crystal Ruff

Supervisor: Dr. Michael Fehlings
Toronto Western Research Institute

Ontario Stem Cell Fellowship

The 2012 Ontario Stem Cell Fellowship from the Ontario Stem Cell Initiative (OSCI) has been awarded to Dr. Crystal Ruff for her research project entitled "Stem Cell-Based Transplantation Strategies for Perinatal Sub-Cortical Remyelination."

Dr. Ruff provides her thoughts about her research: "Cerebral palsy (CP) is the most common developmental disability. Occurring in around 2.5/1000 live births, it has a combined economic impact of over 8 billion dollars per year in developed countries. In the most common CP subtype, there is specific death of supporting cells called oligodendrocytes. This experiment will investigate the ability of transplanted neural stem cells to differentiate into these oligodendrocytes and replace damaged cells, thus saving or restoring function. This will then be extended into CP animal models to determine whether it can be applied translationally to patient populations."

success

recent awardees

The Vanier Canada Graduate Scholarships (Vanier CGS)

Congratulations to Eric who recently won the Vanier CGS award for his research project entitled, “The role of the macrophage in *Chlamydia*-induced Reactive Arthritis.”

In summary of his research, Eric explains, “*Chlamydia* is a pathogenic bacterium which infects 1 in 10 young people. Around 5% of those infected will develop subsequent arthritis. Using animal models we have shown the early immune response to *Chlamydia* to be critical in determining resistance vs. susceptibility to *Chlamydia*-induced arthritis. I have identified a central role for the macrophage—a key player in host defense—in the progression of *Chlamydia*-induced arthritis and currently I am defining the molecular basis of *Chlamydia*-macrophage interactions.”



Graduate Student: Eric Gracey (PhD Program)

Supervisor: Dr. Robert Inman
Toronto Western Research Institute

The March 2012 ORT Conference Travel Awardees

The Awardees of the March 2012 competition are listed below. For full details, including the conference they will be participating in and the title of their research presentation, [click here](#).

Congratulations to our Awardees!

MSc Program:

Ms. Leigh Christopher (TWRI – Dr. Antonio Strafella)
Ms. Rania Chehade (OCI – Dr. Mona Gauthier)
Ms. Stephanie Hylmar (TGRI – Dr. Anna Gagliardi)

PhD Program:

Ms. Bahar Davoudi (OCI – Dr. Alex Vitkin)
Mr. Binu Jacob (TGRI – Dr. David R. Urbach)
Mr. Dylan Johnson (OCI/CFIBCR – Dr. Pam Ohashi)
Ms. Fei Zhao (TGRI – Dr. Shannon Dunn)
Mr. Gregory Costain (TGRI – Dr. Candice Silversides)
Mr. Hartland Jackson (OCI – Dr. Rama Khokha)
Ms. Katie Ferguson (TWRI – Dr. Frances K. Skinner)
Mr. Kenneth Ng (OCI – Dr. Gang Zheng)
Ms. Lee-Anne Khuu (TWRI – Dr. Christopher Hudson)
Ms. Leena Baker (OCI – Dr. Senthil Muthuswamy)
Ms. Lusía Sepiashvili (OCI – Dr. Thomas Kislinger)
Ms. Sakina Rizvi (TGRI – Dr. Sidney Kennedy)

Postdoctoral Fellow Program:

Dr. Ayda Moaven Shahidi (TWRI – Dr. John Flanagan)
Dr. Beatrice Filippi (TGRI – Dr. Tony Lam)
Dr. Elisa Laurenti (OCI – Dr. John E. Dick)
Dr. Izhar Livne-Bar (TWRI – Dr. Jeremy Sivak)
Dr. Kinga Szydłowska (TWRI – Dr. Michael Tymianski)
Dr. Megan Nelles (OCI – Dr. Christopher Paige)
Dr. Qi Wu (TWRI – Dr. Karen D. Davis)
Dr. Qing Chang (OCI – Dr. David W. Hedley)
Dr. Robin Cash (TWRI – Dr. Robert Chen)



Pictured above: R. Cash, M. Nelles, B. Jacob, G. Costain, L. Baker, A. Shahidi, E. Laurenti, Q. Wu, F. Zhao, B. M. Filippi, Q. Chang, L. Sepiashvili, S. Hylmar, and D. Johnson.
Missing: L. Christopher, R. Chehade, B. Davoudi, H. Jackson, K. Ferguson, K. Ng, L. Khuu, S. Rizvi, I. Livne-Bar, and K. Szydłowska

conference reports

ORT Conference Travel Awardees

This section of The ORT Times includes research highlights of recent ORT Conference Travel Awardees. In this issue, learn about the latest technologies advancing the treatment of heart and lung transplantation and discover the latest research on the role of the hippocampus in episodic memory. Read about the latest technologies and analytical tools in cancer research.

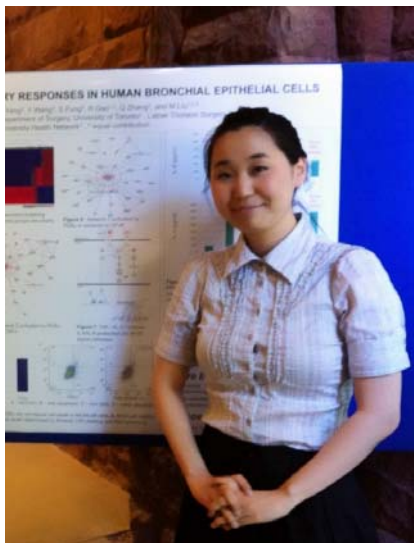
Ms. Cornelia McCormick is pursuing her PhD studies in Dr. Mary Pat McAndrews' laboratory. She recently attended the Cognitive Neuroscience Society Meeting in Chicago where she presented her project entitled, "The functional importance of fMRI resting state connectivity".

Click here to read what she finds interesting in episodic memory and hippocampal-neocortical interactions .



Ms. Hyunhee Kim, a PhD student in Dr. Mingyao Liu's laboratory, presented her abstract entitled, "Acute Inflammatory Response and Cell Death in Human Epithelial Cells Induced by Hypothermic Ischemia and Reperfusion" at the International Society for Heart and Lung Transplantation (ISHLT) Annual Meeting in Prague, Czech Republic.

Click here to read about recent key developments in heart and lung transplantation.



Mr. Shengqing Gu, a PhD student in Dr. Benjamin Neel's lab, recently attended the American Association for Cancer Research (AACR) Annual Meeting held in Chicago, IL. He was able to present his research entitled, "Shp2 is required for CML initiation and maintenance".

Find out what the latest high-throughput technologies is bringing in cancer research.





UPCOMING EVENTS CALENDAR:

06/14 MBP Annual James Lepock Memorial Student Symposium. The keynote address is presented by Dr. Lihong Wang of Gene K. Beare and Dr. Ben Neel of the OCI. For more info, email: ilm.symposium@gmail.com.

06/15 LSCDS 6th Annual Career Day. A full day conference featuring panel discussions on various non-academic career options, company information session and resume and cover letter workshop. Location: Medical Sciences Building, UofT.

06/20 IMS Career Seminar Series. The Institute of Medical Science Students' Association presents, "Science and Entrepreneurship." Click here to register.

06/21 Annual Grant Writing Workshop. The Faculty of Medicine will be hosting their annual Grant Writing with a special focus on grant writing for CIHR and NSERC opportunities. Click here for more info.

07/01 ORT Conference Travel Award. The Office of Research Trainees is pleased to offer a limited number of travel awards to enable graduate students and postdoctoral fellows to participate in national or international conferences. Click here for an application form.

Visit www.uhntrainees.ca for more information.

QUESTIONS?

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Acknowledgements: C. Goard, PhD Student and ORT Science Writer

A few UHN trainees had the opportunity to attend the prestigious Bochasanwasi Shri Akshar Purushottam Swaminarayan Sanstha (BAPS) Gala along with members of the Princess Margaret Hospital Foundation (PMHF). The Gala was hosted at the BAPS Mandir Temple and provided a great opportunity to network and interact with the BAPS community, and to showcase research projects underway at UHN.



BAPS & PMHF Gala



Top Photo: Standing from left to right: Arash Farhadi, Graduate Student in Dr. Gang Zheng's Lab/OCI; Paul Alofs, President and CEO, PMHF; Dr. Arun Chandrakumar, Postdoctoral Fellow from Dr. Rob Rottapel's Lab/OCI; Dr. Dharmesh Dingar, Postdoctoral Fellow from Dr. Linda Penn's Lab/OCI (Sitting from left to right: Purna Joshi, Graduate Student in Dr. Rama Khokha's Lab/OCI; Mariam Thomas, Graduate Student in Dr. Suzanne Kamel-Reid's Lab/OCI; Manpreet Kalkat, Graduate Student in Dr. Linda Penn's Lab/OCI).

Bottom Left Photo: Entertainment at the BAPS Gala. Bottom Right Photo: BAPS Mandir Temple.



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