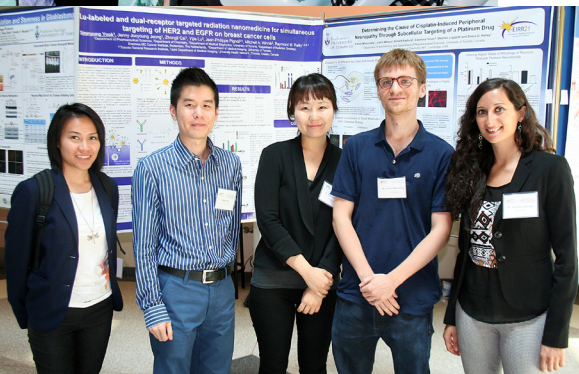


# DEPARTMENT OF RADIATION ONCOLOGY ANNUAL REPORT 2014 - 2015



Radiation Oncology  
UNIVERSITY OF TORONTO

BOUNDLESS  
VISIONS

# VISION

INTERNATIONAL LEADERSHIP IN RADIATION ONCOLOGY, RESEARCH,  
EDUCATION AND PRACTICE

# MISSION

WE PREPARE FUTURE RADIATION ONCOLOGY LEADERS,  
CONTRIBUTE TO OUR COMMUNITIES AND IMPROVE THE HEALTH  
OF INDIVIDUALS AND POPULATIONS THROUGH DISCOVERY,  
APPLICATION AND COMMUNICATION OF KNOWLEDGE

## ANNUAL REPORT 2014 - 2015

Images: Horst Herget Photography (cover, p.9-10, 12-13, 18-19), Donna Santos Studio (p.4, 8, 23), UHN PhotoGraphics (cover, p.6, 16, 20, 24), Terry Fox Research Institute (cover, p.20), Princess Margaret Cancer Foundation (cover, p.21)

Read our full-length report online at [www.uoft.me/annualreport](http://www.uoft.me/annualreport)

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## **DR. FEI-FEI LIU**

### **CHAIR'S WELCOME**

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**BOUNDLESS**LEADERSHIP



It is my pleasure to present the University of Toronto's Department of Radiation Oncology (UT-DRO) Annual Report for 2014-2015. It has been an exciting and eventful year at UT-DRO as we continue to achieve excellence in education, research and clinical practice.

We welcome seven new faculty members to UT-DRO – Drs. Scott Bratman, Irene Karam, Young Lee, Eric Leung, Arman Sarfehnia, William Song and Robert Weersink. I would also like to congratulate the faculty members who were successfully promoted this year – Drs. John Kim, Geordi Pang and John Waldron were promoted to the rank of Associate Professor, and Dr. David Hodgson was promoted to Full Professor. The high level of productivity and achievements of our faculty continue to be attested by the receipt of prestigious external awards, including Dr. Mary Gospodarowicz, who received the ASTRO Gold Medal; Drs. Gregory Czarnota, Bradly Wouters and Robert Bristow, who received a combined total of \$8.6 million research investment from the Terry Fox New Frontiers Program; and the AQUA team led by Drs. Daniel Létourneau and David Jaffray, which was awarded Honourable Mention for Innovation by the Cancer Quality Council of Ontario.

As always, UT-DRO continues to foster a culture of continuous learning by offering a broad range of educational programs and events on emerging best practices, technologies, and models of care in Radiation Medicine. The RTi3 Conference welcomed almost 200 delegates from across Canada and the United States. Similarly, Target Insight IX, which focused on applying information and technology to cancer care had over 100 attendees. Several of our faculty members were involved in the 2015 IUPESM World Congress on Medical Physics and Biomedical Engineering in Toronto as part of the Organizing Committee, hosting the largest gathering of medical physicists and biomedical engineers from 86 countries.

At last year's Annual Alumni Reception at ASTRO in San Francisco, we proudly announced the launch of the Dr. BJ Cummings Award for Research Excellence. I would like to thank our faculty and alumni who have supported this Award, for which there is now \$70,000 available to provide scholarship for outstanding UT-DRO trainees. We will announce the first recipient of the BJ Cummings Award at this year's ASTRO Alumni Reception

in San Antonio, Texas. As part of our Alumni Engagement plan, we have also established a new fund to honour the legacy of Dr. Pamela Catton. The Pamela Catton Award for Interprofessional Education and Care will acknowledge a faculty or trainee who has made significant contributions to interprofessional education and clinical care. We hope that you will continue to support our awards and our trainees in the years to come.

My sincere thanks to our Vice-Chairs, Drs. David Jaffray, Rebecca Wong and Shun Wong, for all of their counsel, assistance and dedication throughout the academic year. I am also grateful for all of the Executive team of UT-DRO for their continued commitment to excellence in our programs and support of our trainees. Finally, I would like to extend my sincerest appreciation to the diverse talents of the administrative team, under Mr. Evan Donohue's capable leadership in the UT-DRO office, for ensuring the seamless operations of our many programs and initiatives.

I invite you to browse through the 2014-2015 Annual Report, which highlights our Department's recent achievements and progress on our strategic plan, *The Road Map to 2017*, which has paved the foundation for our pursuit of "***Global leadership in Radiation Oncology by transforming practice through innovation, and excellence in research and education.***"

Thank you,

Dr. Fei-Fei Liu, MD, FRCPC  
Chair and Professor  
Department of Radiation Oncology

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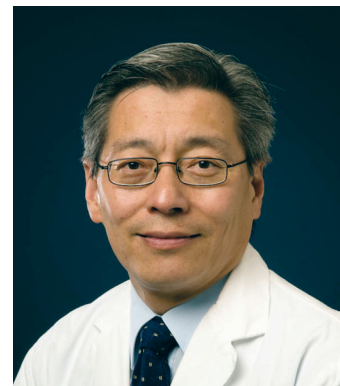
# VICE CHAIR REPORTS

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## CLINICAL AFFAIRS

**DR. SHUN WONG**

VICE CHAIR, CLINICAL AFFAIRS



## EDUCATION

**DR. REBECCA WONG**

VICE CHAIR, ACADEMIC AFFAIRS



## RESEARCH

**DR. DAVID JAFFRAY**

VICE CHAIR, RESEARCH



UT-DRO continued its regional leadership role in advancing radiation treatment and cancer care for the province of Ontario in 2014-2015. Staff at the Odette and Princess Margaret Cancer Centres, as well as our affiliated staff at Southlake Regional Health Care, Trillium Health Partners, Royal Victoria Hospital and Lakeridge Health continued their contributions in creative professional and teaching activities. Radiation oncologists in the Department continued to provide educational and multidisciplinary tumour board support, as well as outreach consultations to our community-affiliated and community hospitals.

Clinical volumes remained stable at the Princess Margaret and Odette with ongoing upgrades of radiation planning and treatment units, as well as information and imaging systems. Both radiation programs also benefited from strong philanthropic support by their respective hospital foundations.

UT-DRO offers professional training programs designed to train future leaders in radiation medicine. In 2014, over 107 trainees enrolled in our training programs, spanning the disciplines of radiation therapy (BSc, MHS), radiation oncology (residency, fellowship), medical physics (residency) and radiation research (EIRR21, MSc, PhD). Our faculty provided 2921 hours of medical undergraduate teaching within the academic year. We continued to attract candidates of the highest caliber. Our fellowship program, the largest in the world, welcomed 23 fellows representing 13 countries with 1 enrolled simultaneously in a graduate program.

Continuous professional education activities continued to build traditions, as well as expand into novel territories. RTi3 brought together almost 200 participants serving as a Canadian showcase for radiation therapy. Target Insight IX focused on applying information and technology to cancer care. This conference will be expecting a new format to serve our community in 2017.

The 2014-2015 academic year has been outstanding in terms of research growth. The combined research grant activity of the faculty (as measured by principal and co-principal grant funding) was \$37.2 million. The total number of publications in the academic year was 334 and the average publication rate per faculty was 2.04. This was higher than in the previous year, reflecting the increased research capacity amongst our faculty. A review of the percentage of publications in low (76% IF: 0-5), intermediate (15% IF: 5-10), and high (9% IF: >10) impact journals demonstrated an increase in the impact factor compared to last year; the 2013-2014 intermediate and high IF rates were 11% and 6%, respectively.

The growth in research activities of our faculty was also highlighted with the success of two Terry Fox New Frontiers Team grants,

New appointments in 2014-2015 included Drs. Scott Bratman, Irene Karam, Young Lee, Eric Leung, Arman Sarfehnia, William Song and Robert Weersink. Dr. Lee Manchul retired after many years of outstanding service at the Princess Margaret. UT-DRO witnessed the sad passing of Dr. Pamela Catton. Pam was an internationally renowned educator and mentor to an entire generation of radiation oncologists and therapists.

Many faculty members were honoured for their outstanding work. Dr. Mary Gospodarowicz was awarded the 2014 ASTRO Gold Medal and appointed as an Officer of the Order of Canada. Dr. Pdraig Warde was named an Honourary Fellow of the Faculty of Radiologists of the Royal College of Surgeons in Ireland. UT-DRO hosted a symposium to honour the career and legacy of Dr. Bernard Cummings. We also offered congratulations to Dr. David Hodgson who was promoted to the rank of Professor, and Drs. John Kim, Geordi Pang and John Waldron who were promoted to the rank of Associate Professor.

The Accelerated Education Program continued to offer a suite of learning opportunities that varies in breadth and depth. Its comprehensive interactive courses on new practices and technology implementation attracted 88 on-site participants, while 242 participated through synchronous webinars and 1000 asynchronous views.

Leveraging technology as a catalyst for radiation medicine learning is a theme that is particularly important in our field. High-fidelity simulation training for interprofessional teams, simulation of medical linear accelerator for teaching, and the development of electronic education modules were a few examples of successful innovations that attracted peer-reviewed funding in 2014-2015, and are actively enhancing our practices. Capacity building and faculty development are central goals for 2015-2016.

representing \$8.6M of a \$14M overall investment in research that will revolutionize cancer care and serve to highlight the research profile of UT-DRO on the national stage. Under the leadership of Dr. Gregory Czarnota, Odette was funded for their program entitled "Ultrasound and MRI for cancer therapy", and Drs. Bradley Wouters and Robert Bristow led the team developing "A research pipeline for hypoxia-directed precision cancer medicine" at the Princess Margaret. The two multicentre projects funded by UT-DRO's first collaborative research seed grant competition have made significant progress to date. These grants bring together a diverse portfolio of expertise across the disciplines of radiation oncology, radiation physics and radiation therapy, which serve to enhance the research capacity within the UT-DRO community and amplify collaborations with our partner institutions.



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# WELCOME NEW FACULTY

## STRENGTHENING THE UT-DRO COMMUNITY

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This 2014-2015 academic year, seven faculty members joined the UT-DRO family. Hailing from various disciplines, these new members bring with them years of clinical experience and research, covering a broad spectrum of topics within Radiation Medicine.



### **DR. SCOTT BRATMAN, ASSISTANT PROFESSOR**

Dr. Scott Bratman was appointed as Clinician Scientist at the Princess Margaret Cancer Centre in September 2014. Since joining UT-DRO, he has been conducting cutting-edge translational research on biomarkers for personalized cancer therapy. His research focuses on improving outcomes for patients with head and neck cancer (HNC), which is also the area of his clinical expertise. Dr. Bratman has developed a method for monitoring cancer burden in the bloodstream through the detection of cancer-derived cell-free DNA fragments. He is now applying this ultra-sensitive blood test to facilitate individualized risk-adapted management strategies. Through innovative clinical trials, the use of model systems, and laboratory-based studies, Dr. Bratman aims to bring this blood test to HNC patients throughout Canada, and the world.



### **DR. IRENE KARAM, ASSISTANT PROFESSOR**

Dr. Irene Karam was appointed as Clinician Investigator at Odette Cancer Centre (OCC) in November 2014. Her research focuses on the implementation of multimodality imaging (CT/MRI/hexaPOD) to improve treatment stratification, target delineation, treatment delivery and response, and toxicity assessment for patients with head and neck (HN) tumours. She is currently involved in the MR-Linac oropharynx strategy, which aims to develop a multi-institutional Phase II protocol using MR-guided adaptation and dose reduction to treat HN tumours. Dr. Karam's research vision is to improve current planning/treatment strategies, tailored for the individual patient, through the use of new imaging methodologies.



### **DR. YOUNG LEE, ASSISTANT PROFESSOR**

Dr. Young Lee is the Lead Medical Physicist for the Central Nervous System (CNS) site group at OCC. Since joining the team in May 2013, she has developed an innovative whole CNS IMRT technique, which has been introduced to the clinic, and she is also currently leading the OCC GammaKnife project. Her research interests range from whole CNS radiotherapy development, to relating outcomes to dosimetric data. She is currently co-supervising research associates in radiation planning developments, including inverse optimization and tumour visualization using CBCT in GammaKnife. Dr. Lee is also working on patient set-up corrections for the MRI-Linac.



### **DR. ERIC LEUNG, ASSISTANT PROFESSOR**

Dr. Eric Leung is a Clinician Investigator at OCC, specializing in gynecological and breast cancers. Since joining the department in July 2014, he has led the development of the new Interstitial Brachytherapy Program in the Gynecologic (GYN) site group. He is also helping to lead the Breast Brachytherapy Program at OCC. Dr. Leung's research interests range from brachytherapy to translational studies. His current work involves the transition of GYN and breast brachytherapy towards MRI-guidance and functional imaging.



### **DR. ARMAN SARFEHNIA, ASSISTANT PROFESSOR**

Dr. Arman Sarfehnia is a Medical Physicist and Scientist at OCC with academic appointments also at McGill and Ryerson University. His research interests lie in the design and development of detectors that can accurately and directly measure radiation dose or beam quality. He has developed a novel graphite probe calorimeter that allows clinical physicists to measure absolute radiation doses for the first time, thereby significantly reducing the probability of human errors. He is also developing a water calorimeter for use with MRI-Linac and GammaKnife, which aims to measure radiation doses directly with sub-percent accuracy.



### **DR. WILLIAM SONG, ASSOCIATE PROFESSOR**

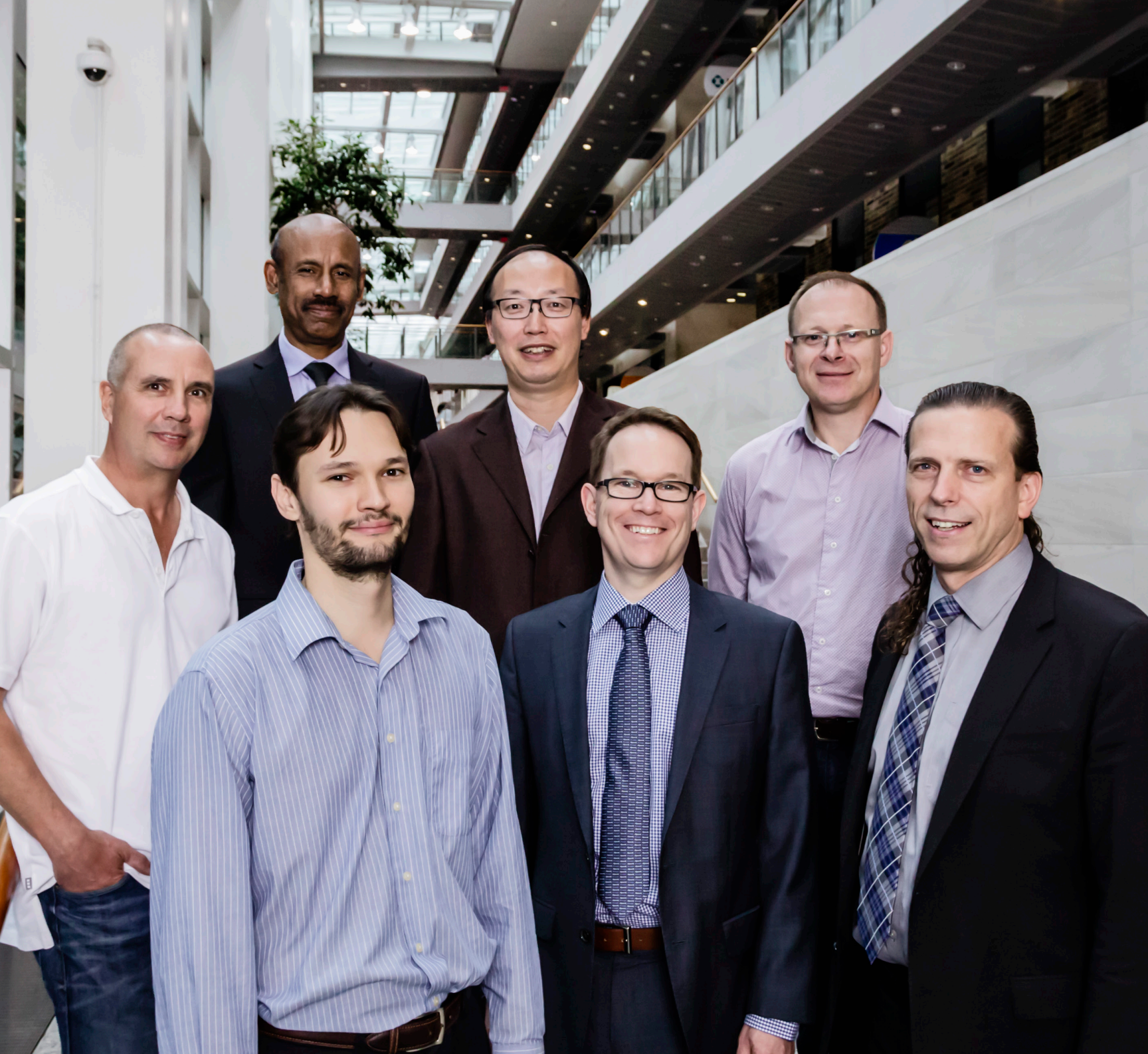
Dr. William Song was appointed as Head of the Department of Medical Physics at OCC in May 2014. He has established a research program focused on developing novel treatments and imaging technologies in the field of image-guided adaptive brachytherapy. He is currently developing a number of novel applicators based on direction-modulated brachytherapy (DMBT), which enables a high degree of intensity modulation that works synergistically with various state-of-the-art imaging modalities, such as MRI, CT and ultrasound. Dr. Song is also developing novel image reconstruction, sequence and post-processing techniques in MRI and CT to complement the DMBT technology.



### **DR. ROBERT WEERSINK, ASSISTANT PROFESSOR**

Dr. Robert Weersink is a Clinical Physicist at the Princess Margaret, working primarily in brachytherapy. He is also a Scientist within the Guided Therapeutics Program at the University Health Network, a program focused on bringing advances in imaging technology into the operating room to improve minimally invasive therapies. His research focuses on integrating radiation and surgical therapies through the development of tracking and image registration technologies. Dr. Weersink's other research interests include photodynamic and photothermal therapies for localized ablation of cancer, nanotechnology for early disease detection, and optical feedback mechanisms for surgical guidance.





**BOUNDLESS**INNOVATION

Top row (L to R): Mohammad Islam, Kevin Wang, Jim Pearce  
Bottom row (L to R): Gavin Disney, Igor Svistoun, Daniel Létourneau, David Jaffray



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# AQUA

## ENSURING HIGH QUALITY RADIATION DELIVERY AND SAFETY FOR CANCER PATIENTS

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In Radiation Oncology, quality and safety are of paramount importance to ensure that patients receive the prescribed treatment dose. Quality control (QC) tests are therefore, performed routinely on radiation therapy (RT) imaging and treatment units to maintain quality, performance and safety.

Centralized QC systems such as those used in the manufacturing industry, where the concept of quality management originated, do not yet exist in RT. Current commercial RT quality assurance (QA) and QC tools are highly fragmented and limited in scope, with many being only test-specific hardware and software. Furthermore, increasingly sophisticated RT techniques and equipment render imaging and treatment procedures highly complex, elevating the QA bar significantly; QA/QC of these intricate processes require tools more advanced than QA checklists as often used in other medical fields. Consequently, managing multiple software platforms and tools, and trying to integrate them into a dynamic clinical environment, is a difficult and time-consuming process. Innovative approaches to manage this complexity while achieving optimal performance are therefore required to guarantee the highest level of patient safety and quality care.

In response to this substantial clinical challenge, a multidisciplinary team led by Drs. Daniel Létourneau and David Jaffray developed AQUA (Automated Quality Assurance), an innovative end-to-end software platform that centralizes and manages all quality control activities related to RT equipment.

With the goal to improve safety, performance and efficiency of RT clinics worldwide, AQUA integrates the wealth of techniques available for imaging and treatment equipment, and provides a “one-stop-shop” for managing, analyzing, documenting and storing QA/QC tests and results in real-time.

AQUA streamlines QC activities using workflow tools, automation and reporting mechanisms, which can be tailored

to the installed base of existing and new QA tools/protocols. Thus, any RT clinic can modify this robust platform to their own specific QA/QC requirements.

Initially developed in January 2010, AQUA successfully unveiled its first clinical release at the Princess Margaret in 2012, and has been in use for more than 3 years as the centralized quality management tool for all equipment within the Radiation Medicine Program.

In 2014, the AQUA team (Daniel Létourneau, David Jaffray, Jim Pearce, Matthew Bergshoeff, Kevin Wang, Paul Homer, Phyliss Lee, Gavin Disney, Igor Svistoun, Bern Norrlinger, Jason Smale, Mohammad Islam, Robert Heaton, Stephen Breen) was awarded Honourable Mention for Innovation by the Cancer Quality Council of Ontario. This Award, sponsored by Cancer Care Ontario and the Ontario Division of the Canadian Cancer Society, recognizes initiatives that have made significant contributions to quality or innovation in the delivery of cancer care across the province.

Due to AQUA's clinical success as a quality management system, the software is being commercialized for worldwide market roll-out by the Princess Margaret and Acumyn Inc., its spin-off company, in collaboration with Elekta Inc.; ultimately benefiting RT clinics and cancer patients on a local, regional, national, and global scale.

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**INNOVATIVE APPROACHES  
TO MANAGE TREATMENT  
COMPLEXITY WHILE ACHIEVING  
OPTIMAL PERFORMANCE ARE  
REQUIRED TO GUARANTEE THE  
HIGHEST LEVEL OF PATIENT  
SAFETY AND QUALITY CARE**

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# COLLABORATIVE RESEARCH SEED GRANT PROGRAM

## STRENGTHENING RESEARCH CONNECTIVITY WITHIN THE COMMUNITY

The University of Toronto's Department of Radiation Oncology (UT-DRO) launched a new annual seed-funding initiative in 2013 as part of its strategy to encourage collaborative research and innovation in Radiation Medicine. The program provides seed grants to qualifying full-time faculty members, with one competition held each calendar year. The new initiative aims to enhance research capacity within the UT-DRO community by amplifying existing strengths at the Cancer Centres, and leveraging them through new collaborations amongst these partner institutions.

The recipients of the first UT-DRO seed grant competition were announced at the Annual General Meeting in November 2013. Two meritorious projects, which showcased multicentre research collaborations and have the potential to significantly impact the science of radiation medicine, and improve patient outcome were selected.

### **The Toronto Brief Neurocognitive Battery (BNB): Development of a Novel Brief Telephone Battery for Neurocognitive Assessment of Patients with Brain Metastases**

*Principal Investigators: Drs. Caroline Chung (Princess Margaret), May Tsao (Odette Cancer Centre), Jason Wong (Stronach Regional Cancer Centre)*

Neurocognition is an important determinant of quality of life for cancer patients. The acquisition of



neurocognitive outcomes is therefore critical for the meaningful interpretation of neurocognitive treatment effects in patients. Current neurocognitive assessment tools are burdensome as patients are required to attend in-person sessions for testing. This may contribute to both the low accrual and high drop-out rates observed in prior clinical trials that have attempted to evaluate neurocognitive outcomes in

patients with brain metastases.

The multicentre Toronto BNB clinical trial, led by Drs. Caroline Chung, May Tsao and Jason Wong, aims to evaluate an innovative brief telephone battery in facilitating an easier and more patient-centred approach to assessing neurocognitive function in brain metastases patients treated with radiation. Through the efforts of the multidisciplinary team spread

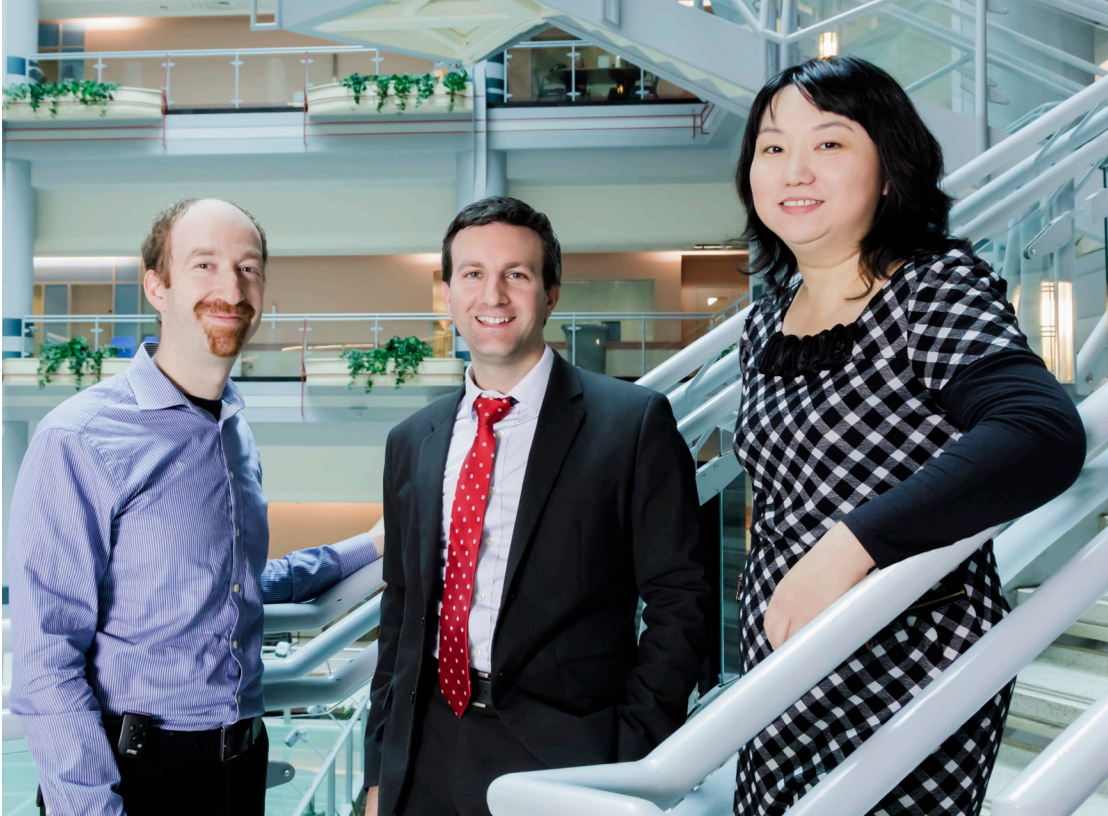


across the Princess Margaret, Odette and Southlake, 24 patients have been accrued to date. The team envisions this valuable tool will enable patients to complete a short validated neurocognitive battery over the phone, thereby reducing the burden for patients to return in person for otherwise lengthy neurocognitive testing.

### **Prospective Collection of Tolerance Outcomes in Women Receiving Breast Cancer Radiotherapy: A Multi-Institutional Initiative**

*Principal Investigators: Drs. Mark Ruschin (OCC), Danny Vesprini (OCC), Tom Purdie (Princess Margaret), Beibei Zhang (Southlake)*

Drs. Mark Ruschin, Tom Purdie, Beibei Zhang and Danny Vesprini are collaborating together to analyze radiotherapy plans from hundreds of patients to develop a model for predicting radiation-induced toxicity. The team proposes using the concept of “big data” to individualize patient care by building a comprehensive model for toxicity. The team hypothesizes that toxicity can be minimized if the model is applied prospectively for future patients. Dr. Ruschin has been interested in processes for systematically collecting toxicity information for all patients. Dr. Purdie and his group have been developing data mining tools and machine learning methods to automatically “learn” what features and combinations of features from CT simulation images, radiation dose distributions and delineated regions of interest can predict for associated toxicity. Dr. Zhang has been interested in treatment adaptation



to minimize toxicity and improve outcomes.

To date, the team has focused on breast cancer radiotherapy, which causes moist desquamation in roughly 30% of patients and is associated with pain, decreased quality of life and late toxicity. Drs. Ruschin and Vesprini have spearheaded the installation of a web-based toxicity application on all review workstations at OCC. Physicians are now able to populate toxicity data in less than a minute per patient, resulting in a standardized output that is easily entered into patient electronic charts. Arnjeet Sangha, a radiation therapist at OCC has been instrumental in following up with every patient after they complete their treatment. The data are stored on the Biomatrix, a big data initiative funded by Dr. Martin Yaffe (Sunnybrook) that

links multiple sources of data (e.g. imaging, pathology, toxicity) within the same database. At Southlake, Michael Bhatti, Drs. Louis Fenkell, Beibei Zhang and Erin Barnett have operationalized the toxicity tool within the RT clinic. Toxicity outcomes have been collected for over 350 women at OCC and 20 from Southlake.

Through these multicenter collaborations, the team has amassed all the necessary tools and infrastructure required to develop toxicity models. The long-term goals of the project are to expand the models to include late toxicity, as well as expanding the processes to all clinical sites – resulting in a simple and robust tool to capture toxicity data that will ultimately decrease radiation-induced toxicity for patients.

Left image (L to R): May Tsao, Caroline Chung, Jason Wong  
Right image (L to R): Mark Ruschin, Tom Purdie, Beibei Zhang





## BOUNDLESS OPPORTUNITY

Above: Natália Prado

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# MRS PROGRAM

## BUILDING RADIATION THERAPY CAPACITY ACROSS BORDERS

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The Ciência Sem Fronteiras (CsF) Program (formerly Science without Borders) is a joint initiative of Brazil's Ministry of Education and the Ministry of Science and Technology. The program was established in 2012 to encourage talented undergraduate and graduate students in the STEM (Science, Technology, Engineering and Math) fields to study in foreign countries.

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## THE CLASSES WERE AT THE APPROPRIATE LEVEL FOR ME, PARTICULARLY BECAUSE THE FACULTY WERE VERY DEDICATED AND CONSIDERATE, SO I WAS ABLE TO LEARN A LOT

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At the University of Toronto, the Centre for International Experience (CIE) coordinates the CsF program, admitting students to study at one of three campuses at the University.

Natália Prado, a radiation therapy student from Brazil, applied to study at the University of Toronto's Department of Radiation Oncology (UT-DRO) in 2014, rendering her as the first CsF student within the program. She fondly recalls why she decided to study in Canada. "It was my first choice because of all the great things I had heard about Canada since I was a kid: how beautiful it is, how the educational and health systems are among the best in the world, and how the population is welcoming to foreigners." She noted that she did a lot of research to find a top-ranking university offering an excellent program in her field of study – ultimately selecting the Medical Radiation Sciences (MRS) Program at the University of Toronto.

The three-year MRS program, a joint collaboration between UT-DRO and the Michener Institute for Applied Health Sciences, is the only undergraduate program of its kind in Canada, awarding a bachelor's degree and an advanced diploma to its graduates in one of three disciplines: Radiological Technology, Radiation Therapy, and Nuclear Medicine and Molecular Imaging Technology.

During her 10 months in Toronto, Natália was immersed in all aspects of the radiation therapy profession, ranging from treatment planning and simulation, interprofessional collaboration, patient care and healthcare ethics. "The classes were at the appropriate level for me, particularly because the faculty were very dedicated and considerate, so I was able to learn a lot." What she enjoyed the most were the practical classes in Radiation Therapy Methodology involving the use of linear accelerators (linacs).

She credits the MRS program with providing her with opportunities which she would not have had at her home institution in Brazil, the Federal University of Technology - Paraná (UTFPR). "At UTFPR, we do not have the resources to acquire radiation equipment for classes, so I would not have the chance to work with a linac until I graduated, so that was really cool." "Another favourite were the visits to the radiation therapy departments at the Princess Margaret and Odette Cancer Centres – this gave me the chance to see how Canadian hospitals are, and the day-to-day practice of radiation therapists," she added.

For CsF and other international students considering the MRS program, Natália advised: "If I learned more than I could have possibly imagined in 10 months, imagine what you could learn in 3 years – it would be amazing.

I definitely recommend all students in the radiation sciences field to have this experience or to do the full program if possible."

As a concluding note, Natália is grateful to everyone who made her studies in Canada possible: "Cathryne Palmer and Kieng Tan, who did more than they had to in accommodating me and making me feel special and welcomed in Canada; and to the UT-DRO and Michener faculty for the amazing learning experience. Thank you!"



## DR. JONATHAN LIVERGANT, RESIDENT FROM 2010-2015

As part of the most recent crop of UT-DRO graduates, Jonathan credits the “world-class faculty and broad clinical experience” for providing him with “immense perspective and true competency”, as well as preparing him “exceptionally well” for the Royal College exam. Although he has left, he still feels “a part of the community” and hopes “to return for more training and collaboration in the future.”

Jonathan is currently a locum Radiation Oncologist at the BC Cancer Agency in Victoria, British Columbia, treating primarily lung and breast cancer patients. When this concludes, he will return to McMaster University, where he is pursuing a second Royal College certification in palliative medicine. His research during this time will focus on oligometastases and oligoprogression, as well as attitudes, knowledge and barriers limiting referrals for palliative radiotherapy.

## DR. MEREDITH GIULIANI, RESIDENT FROM 2007-2012

Meredith recalls the “wonderful support system” UT-DRO provided during her residency, which she now sees as a “great peer network for clinical work and research.” During her 5 years at UT-DRO, Meredith worked extensively with the Lung site group, particularly in the field of SBRT. She is grateful for the opportunity to have trained with “a wonderful and diverse group of residents and fellows”, and to have run a longitudinal SBRT clinic during her PGY5 year under the supervision of Dr. Andrea Bezjak. Under the mentorship of Dr. Pamela Catton, Meredith also completed a Master of Education.

Meredith is now appointed as an Assistant Professor at UT-DRO and is a Radiation Oncologist at the Princess Margaret Cancer Centre in the Lung, Head & Neck, and Endocrine site groups in Toronto. She is also currently the Director of Undergraduate Medical Education, and Associate Director of Postgraduate Medical Education at UT-DRO, as well as the Acting Director of Cancer Education at the Princess Margaret.



## DR. GOLDIE KURTZ, RESIDENT FROM 2009-2014

Goldie is “extremely grateful for all of the excellent opportunities and faculty mentorship” she was fortunate to have enjoyed at UT-DRO, noting Dr. Caroline Chung as an “outstanding and supportive supervisor, who continues to be a generous mentor”, as well as Drs. Normand Laperriere, Arjun Sahgal and Warren Mason, who supervised her on several electives. She credits other faculty members, such as Dr. Barbara-Ann Millar, for her instrumental role in linking her interest in CNS with research opportunities, as well as Dr. Fei-Fei Liu for her development into a budding researcher and for her invaluable fellowship and career counseling.

Goldie now works in the Department of Radiation Oncology at the University of Pennsylvania as an attending staff. Her clinical practice focuses on CNS and Pediatrics, working closely with the Children's Hospital of Philadelphia. Her research focuses on brain and spinal cord metastases, radiosurgery, imaging surveillance for intracranial tumours, and proton radiotherapy.



## DR. AMANDA CAISSIE, RESIDENT FROM 2007-2012

As a resident at UT-DRO, Amanda experienced “extraordinary opportunities” that have imparted “vision beyond simple clinical skills”. She recalls receiving “tremendous support for maintaining basic science research skills” under the mentorship of Drs. Gregory Czarnota and Shun Wong. She also credits other faculty members, such as Drs. Camilla Zimmermann and Edward Chow for helping to build the foundation for her current research interests, which include improving the quality of radiotherapy and clinical care through interdepartmental and interdisciplinary research collaborations.

Since completing her residency, Amanda has been working at the Saint John Regional Hospital as a Radiation Oncologist and Assistant Professor at Dalhousie University’s Department of Radiation Oncology in Nova Scotia. She attributes her recent appointments as Chair of the Clinical Care Committee and Research Director at Dalhousie DRO to the “multicentre, multidisciplinary” training she received at UT-DRO, and remains grateful for having trained under “clinical world leaders”, such as Drs. Bernard Cummings, Pamela Catton, Padraig Warde and Mary Gospodarowicz, to name a few.



## DR. ALINA STURDZA, RESIDENT FROM 2002-2008

During her time at UT-DRO, Alina was involved in clinical research under the supervision of Dr. Andrea Bezjak. She appreciated the outstanding teaching conducted by all the Radiation Oncology staff at both the Princess Margaret and Odette Cancer Centres. She fondly remembers the “wonderful communication and team building amongst the residency trainees throughout the years”, as well as UT-DRO’s “family-friendly environment”.

Alina is now working in Vienna, Austria as a Radiation Oncologist at the General Hospital of Vienna, which is affiliated with the Medical University of Vienna. Her clinical practice focuses on gynecological oncology, including image-guided adaptive brachytherapy. She is also the Head of the Gynecological Radiation Oncology Group and a member of the Steering Committee for the Gynecological Subunit of the Comprehensive Cancer Care Vienna.

# PAST UT-DRO RESIDENTS WHERE ARE THEY NOW?

# MHSC IN MEDICAL RADIATION SCIENCES

## ADVANCING RADIATION THERAPY PRACTICE

Within the last decade, the role of the radiation therapist has rapidly evolved and grown within the field of Radiation Medicine. The Master of Health Science in Medical Radiation Sciences (MHScMRS) program was launched at the University of Toronto's Department of Radiation Oncology (UT-DRO) in 2009, designed specifically to develop the type of highly skilled therapist who is in demand in contemporary Radiation Medicine practice. Established in collaboration with the Institute of

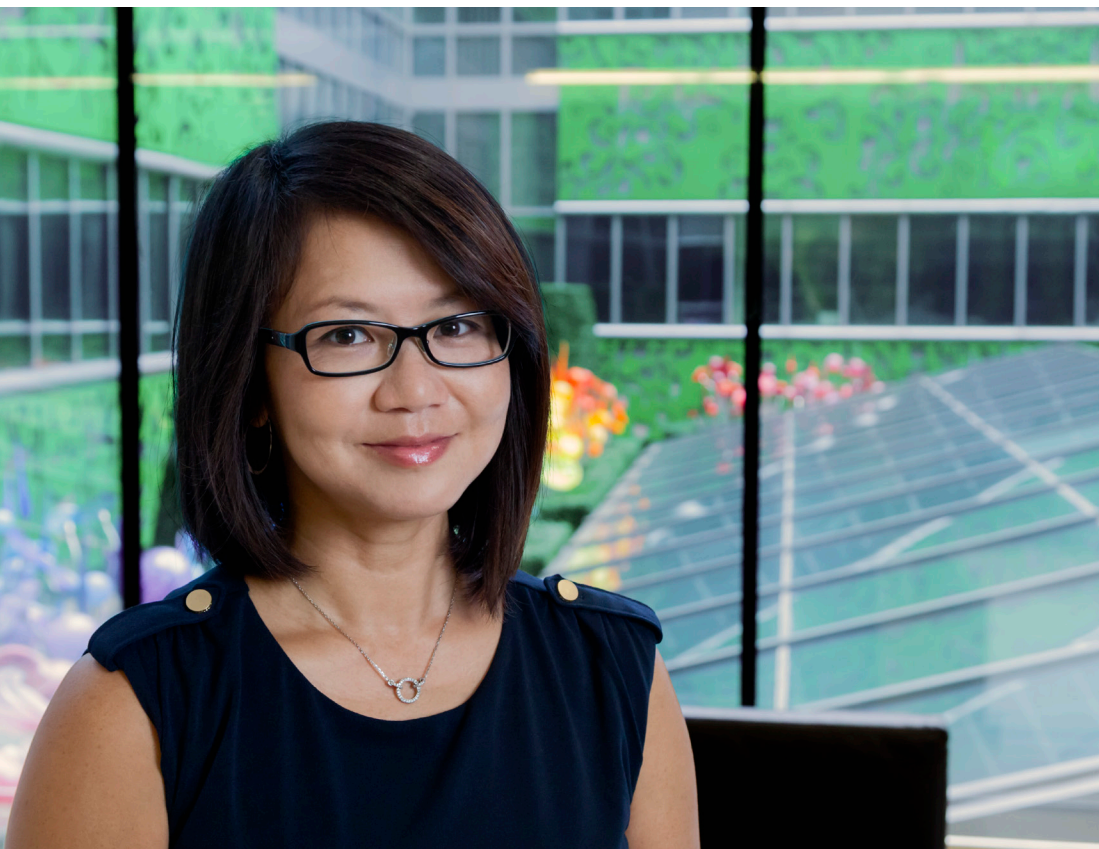
Medical Science, the MHScMRS program is the first professional master's program for radiation therapists in North America. Its unique blended learning format allows students to complete the majority of their studies online at their own schedule.

In addition to the perceived changing needs of the radiation therapy enterprise, the recent establishment of the new healthcare provider role, the Advanced Practice Radiation Therapist,

which combines expert clinical, technical and professional skills with a heightened academic acumen, has also allowed therapists to assume higher levels of responsibility within clinical and professional settings.

Both Michelle Lau and Angela Turner wanted to keep pace with the rapidly shifting sands of Radiation Medicine practice. They both aspired to enhance their academic competence and advance their clinical skills through higher education. Michelle had been working as a radiation therapist for several years before deciding to enroll in the MHScMRS program. She recognized that "in the last decade, the role of the radiation therapist has been going well beyond its traditional scope of practice. Radiation therapists are making impact internationally in the field of Radiation Medicine, with remarkable contributions in research and education." As such, she believed that she needed the right tools to develop a road map that could lead her to her career goals, and a clearer picture of the future. "I thought that earning a master's degree through the MHScMRS program could help me make that become reality."

Angela, currently a Clinical Specialist Radiation Therapist (CSRT) in Supportive Care and Sexual Health at the Odette Cancer Centre, speaks highly of her experience as a graduate of the MHScMRS program, which she completed in 2013. "I think one of the most useful aspects of the



program for me was recognizing the need to be able to identify gaps in care provision linked to unmet needs of patients, and then align radiation therapy practice with those service needs.” She explained that “such roles are about creative solutions to care delivery beyond traditional models and stereotypes – creating new spaces and new ways of working. During the program, we were able to listen to lectures and interact with professionals not just within healthcare, but also those who look at process and funding models. This demonstrated that with the necessary skills and judgment, radiation therapists can adapt their oncology knowledge and training to many different roles that can improve the quality of care for cancer patients.”

The MHScMRS program covers topics related to all aspects of the patient’s cancer journey, both from a personal and systems perspective, and how radiation therapists can align their constellation of competencies to the realities of contemporary radiation treatment and its impact on the patient. This awareness ultimately leads to responsible and autonomous practice that views the patient as a whole person, and not just a cancer patient. Michelle, currently a CSRT in the Palliative Radiation Oncology Program at the Princess Margaret Cancer Centre, credits the program for helping her to better decipher “patients’ goals, and



ensuring that there is a reasonable alignment with the treatment goals we have in mind for them.”

For Angela, she came to realize that “radiation therapists with additional knowledge, skills and judgment can bridge gaps in care that meet the needs of patients, not only to increase satisfaction and raise quality, but also to impact outcomes, improve long term quality of life for patients, and at the

same time, achieve these goals through maximal use of resources with minimal financial investments on the system.” She believes that this capacity is due in part to their unique skill sets acquired both on the job and through the preparation provided by programs such as MHScMRS. “I think courses like this program are a real investment for healthcare services in the long term.”

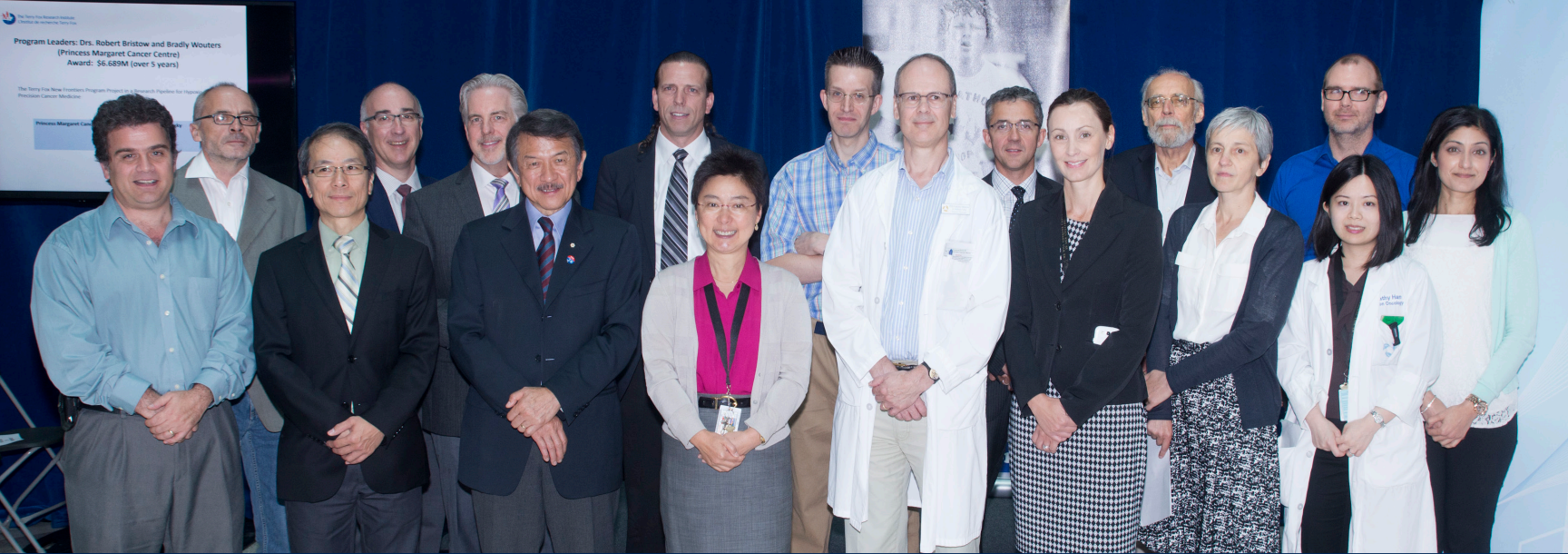
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**WITH THE NECESSARY SKILLS AND JUDGMENT, RADIATION THERAPISTS CAN ADAPT THEIR ONCOLOGY KNOWLEDGE AND TRAINING TO MANY DIFFERENT ROLES THAT CAN IMPROVE THE QUALITY OF CARE FOR CANCER PATIENTS**

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Left image: Michelle Lau  
Right image: Angela Turner





**BOUNDLESSRESEARCH**

Above: Terry Fox New Frontiers Program Project Grant recipients

## TERRY FOX NEW FRONTIERS PROJECT GRANTS LEADING THE WAY IN PERSONALIZED CANCER MEDICINE RESEARCH

The Terry Fox Research Institute, the research arm of the Terry Fox Foundation, seeks to advance our knowledge and understanding of cancer diagnosis and treatment with the goal of improving research outcomes by supporting highly collaborative, team-based research projects. The Terry Fox New Frontiers Program Project Grant in particular, provides funding to support a group of researchers with varying, yet complimentary skills that will facilitate the success of research projects, which ultimately come together to define a research program. The end result is a new paradigm for cancer research that can be rapidly and efficiently translated from the laboratory to the clinic.

The University of Toronto's Department of Radiation Oncology (UT-DRO) faculty continue to be leaders in this highly

impactful, personalized medicine focused research program. This past year, UT-DRO researchers based at Sunnybrook and the Princess Margaret Cancer Centre were awarded a new investment of \$8.6 million of a \$14 million overall investment in projects that will revolutionize care for cancer patients.

Dr. Gregory Czarnota, in collaboration with Dr. Greg Stanisz of the Sunnybrook Research Institute and Dr. Michael Kolios of Ryerson University, are using novel ultrasound and MRI-based techniques for treatment monitoring that will enable accurate and rapid evaluation of therapeutic effect; the results of which will guide management decisions during the course of treatment, to ensure the most effective treatments for the patient.

Drs. Bradly Wouters and Robert Bristow in collaboration with other UT-DRO faculty members, including Drs. Marianne Koritzinsky, Michael Milosevic, Anthony Fyles and David Jaffray, are leading the Hypoxia Program. It is designed to leverage the existing knowledge that low levels of oxygenation (hypoxia) in tumours are associated with resistance to treatment, metastatic spread and poor outcome following surgery, radiotherapy and chemotherapy, to facilitate the discovery of new therapeutic strategies in relevant animal model systems, as well as the rapid translation of hypoxia-directed therapies into the clinic, in a truly personalized treatment approach for the patient.



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# MARY GOSPODAROWICZ

## TRANSFORMING THE FUTURE OF RADIATION MEDICINE

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This past year, the American Society for Radiation Oncology (ASTRO) awarded its most prestigious honour, the ASTRO Gold Medal, to UT-DRO's previous Chair, Dr. Mary Gospodarowicz. The ASTRO Gold Medal recognizes individuals who have made exceptional contributions and impact within the field of Radiation Oncology through their research, clinical care, teaching and service. Dr. Gospodarowicz is only the fifth Canadian to have received the ASTRO Gold Medal.

During her 12-year tenure as the Chair of UT-DRO, Dr. Gospodarowicz transformed the Department into a "powerhouse" through her strong vision, leading the rapid pace of innovation within Radiation Oncology across the spectrum of education, research, clinical practice, as well as departmental strategy and operations.

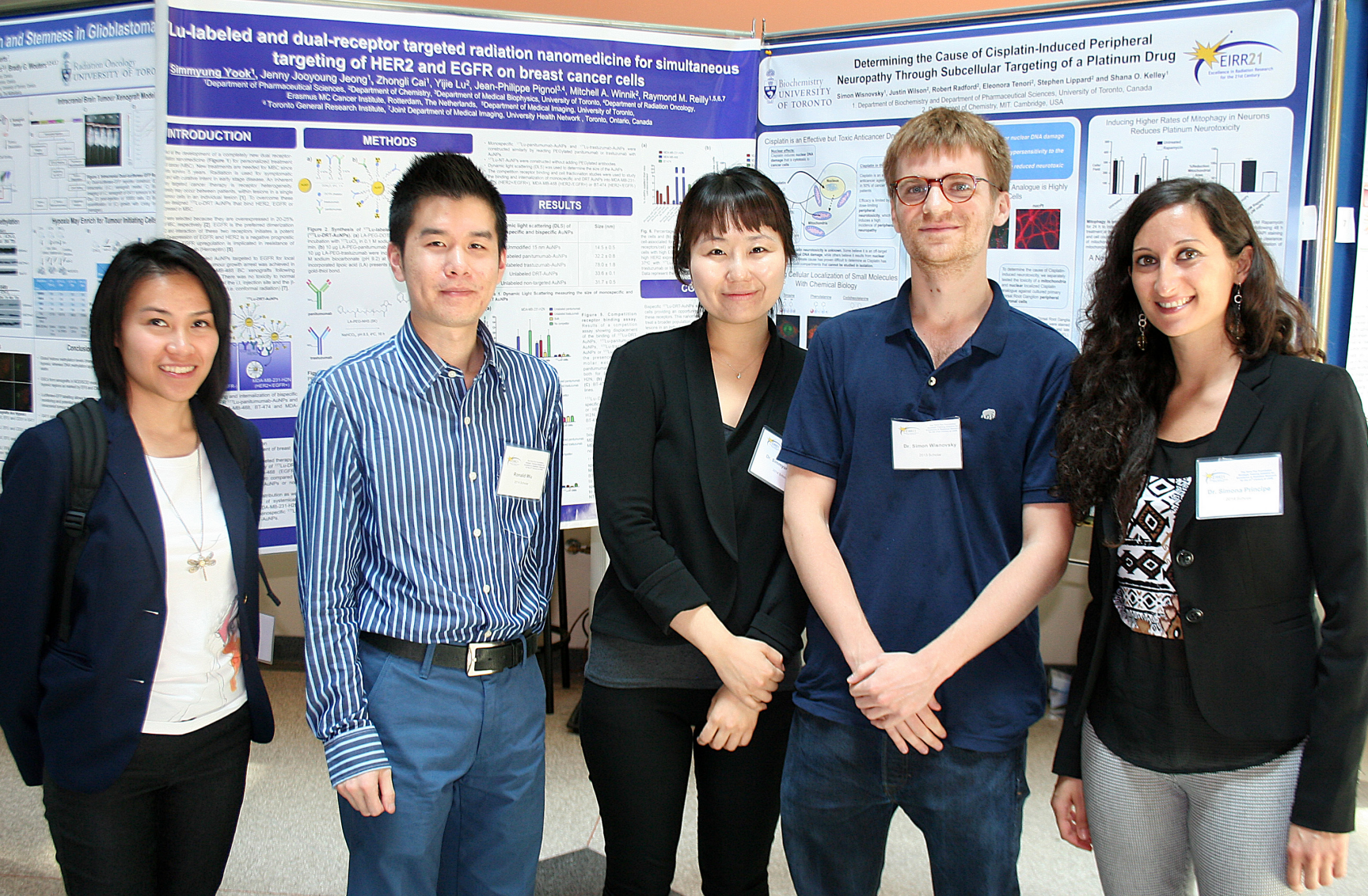
Dr. Gospodarowicz is a transformational leader and world-renowned clinician and researcher in the management of lymphoma and genitourinary cancers, and continues to influence the future of Radiation Medicine as the current Medical Director of the Princess Margaret Cancer Centre. To date, her passion for ensuring high quality care for cancer patients worldwide has directed the Princess Margaret to achieve global impact as one of the top 5 cancer research centres in the world; leading the way for personalized cancer medicine.



Right image: Mary Gospodarowicz

**BOUNDLESS**VISION





**BOUNDLESS**POTENTIAL

Above (L to R): Yvonne Lee, Ronald Wu, Simmyung Yook, Simon Wisnovsky, Simona Principe

# EIRR21

## TRAINING FUTURE LEADERS OF CANADA'S SCIENTIFIC COMMUNITY

The Terry Fox Foundation (TFF) Strategic Training Initiative for Excellence in Radiation Research for the 21<sup>st</sup> Century at the Canadian Institutes of Health Research (CIHR), also known as EIRR21, is designed to provide graduate students, postdoctoral fellows (PDF), residents and clinical fellows, the essential skills to conduct innovative translational and transdisciplinary research in Radiation Medicine, as well as the leadership and collaboration proficiencies necessary to define them as future leaders of Canada's biomedical community.



The program facilitates the integration of trainees in various fields such as biology, genomics, chemistry, pharmacology, informatics, health policy, medical physics, radiation oncology, imaging, biostatistics and clinical outcomes research, within a learning community that resembles the multidisciplinary nature of today's team-based science.

EIRR21 was created in 2003 by the founding Program Director, Dr. Fei-Fei Liu with support from CIHR. Since the appointment of Drs. Anne Koch and Marianne Koritzinsky as the new EIRR21 Co-Directors in 2012, the Authorization for Funding for 2013-2015 was updated by CIHR, wherein the program was selected for full funding by the TFF. This summer, they were awarded two years of transitional funding from the TFF to further develop and advance the program's impact across Canada. This funding was generously matched by the Princess Margaret Cancer Centre Research and Radiation Medicine Programs. Over the years, the EIRR21 program has also received support from other sources

and industry partners, including Cancer Care Ontario, the UT-DRO Gifford Fund, Canadian Cancer Society Research Institute, Novartis, Centocor Ortho Biotech Inc., Varian, Elekta and GlaxoSmithKline Inc. Moving forward, EIRR21 will continue to build on its successes and implement novel strategies for increased capacity and sustainability.

The program also welcomed two new EIRR21 mentors, Drs. Naomi Matsuura and Scott Bratman, in 2015. Twelve years since its launch, the EIRR21 program has supported nearly 90 scholars across Canada. The candidates are supervised by one of the 37 EIRR21 mentors from across 10 Canadian research institutions, and are selected through a competitive process.

As we move into the fall, the EIRR21 program looks forward to welcoming its new scholars, as well as continuing alumni to the 2015-2016 academic year.



#### **DR. NAOMI MATSUURA**

Dr. Matsuura is a Professional Engineer who leads a research program specializing in designing new materials that interact strongly and specifically with imaging radiation for cancer imaging and therapy at the Sunnybrook Research Institute. She is the Director of the Innovation, Translation and Attrition Program, and Assistant Professor at the University of Toronto's Department of Medical Imaging, with cross-appointment to the Department of Materials Science and Engineering. As a former PDF scholar of the EIRR21 program, Dr. Matsuura brings a unique perspective to her role as a mentor to the program.



#### **DR. SCOTT BRATMAN**

Dr. Bratman is a Clinical-Scientist and Staff Radiation Oncologist at the Princess Margaret Cancer Centre, and Assistant Professor in the University of Toronto's Department of Radiation Oncology. He has a background in translational research with an interest in utilizing novel cancer biomarkers for personalized delivery of radiotherapy.

A full list of mentors can be found at [www.eirr21.utoronto.ca](http://www.eirr21.utoronto.ca).





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## **PAMELA CATTON**

REMEMBERING A  
VISIONARY CANCER  
LEADER, EDUCATOR  
AND FRIEND

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**BOUNDLESS**COMPASSION

Left image: Pamela Catton

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# DR. CATTON'S WARMTH, CREATIVITY AND INSPIRING VIGOR, ALONG WITH HER SUPPORT TO PATIENTS, COLLEAGUES, STUDENTS AND THE MEDICAL COMMUNITY AS A WHOLE, WILL LEAVE A LASTING IMPACT FOR YEARS TO COME.

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Dr. Pamela Catton was an incredible clinician, mentor and leader, characterized by her strong vision, boundless energy and compassion. Admired by the medical community and public, she was devoted to extending positive opportunities to those she touched, ranging from patients, colleagues, students and friends. This enthusiasm garnered her recognition and respect amongst all who knew her.

Following in her father's footsteps as a Radiation Oncologist, Dr. Catton quickly established herself as a skilled and compassionate clinician, who consistently delivered exemplary care for her patients. As such, she was instrumental in the establishment of the ELLICSR: Health, Wellness and Cancer Survivorship Centre at the University Health Network; the first centre of its kind in Canada, focused on empowering cancer patients to enrich their health, well-being and overall delivery of their care.

In addition to her focus on the betterment of patient care and experience, Dr. Catton strived to encourage colleagues and trainees alike, to achieve excellence in education through talent development and interprofessional training. She contributed to the creation and review

of training programs within various Radiation Medicine disciplines, including the joint BSc Program in Medical Radiation Sciences between the University of Toronto and the Michener Institute, the Clinical Specialist Radiation Therapist Project with the Ontario Ministry of Health and Long-Term Care, and the CARO-CROF (Canadian Association of Radiation Oncology-Canadian Radiation Oncology Foundation) Summer Studentship for medical students. Her involvement with the Royal College of Physicians and Surgeons of Canada – most notably, as Co-Chair of the Working Group on CanMEDS roles, Chair of the Education Research and Development Committee, and reviewer for numerous residency training programs – has also stimulated the transformation of medical training in this country.

Dr. Catton was an inspiring and valuable mentor to countless trainees and colleagues. For this, she has received innumerable Teaching and Mentorship Awards within the Department of Radiation Oncology, the Mickles Fellowship Award for Postgraduate Medical Education from the Faculty of Medicine, and the Anderson Award for Excellence in Education from the Wightman-Berris Academy. She also

held the Inaugural Princess Margaret-University of Toronto Butterfield/Drew Chair in Breast Cancer Survivorship, and received the Excellence in Cancer Patient Education Award from the US National Cancer Institute-Cancer Patient Network, as well as the 2014 Margaret Hay Edwards Achievement Medal from the American Association for Cancer Education, in recognition for her immense contributions to cancer education.

Dr. Catton's warmth, creativity and inspiring vigor, along with her support to patients, colleagues, students and the medical community as a whole, will leave a lasting impact for years to come. Her legacy will continue through all the programs she has established, and all the people she has touched. She will be greatly missed.

# CLINICAL PARTNER UPDATE

## DR. GREGORY CZARNOTA, ODETTE CANCER CENTRE

The clinical, research and educational activities of the Radiation Treatment Program at Odette Cancer Centre, Sunnybrook Health Sciences Centre continued to expand in fiscal year 2014-2015. Odette continued to see high clinical volumes with over 6750 new radiation oncology consultations. Over 7800 courses of radiation treatment were delivered (101,283 fractions). Stereotactic radiation therapy (body and head) continued to grow with over 500 patients treated with SBRT. The program has expanded its use of hypofractionated brain stereotactic treatments in addition to its single fraction radiosurgery program. We have also continued to expand our SBRT expertise with a new head & neck, and pancreas SBRT program. Brachytherapy continues to be a priority program with 446 cases (902 insertions), representing the highest brachytherapy volume centre in the country. In addition, we have initiated a gynecologic interstitial brachytherapy program with over 20 patients already treated.

From the staffing perspective, two radiation oncologist positions were filled in 2014-2015. Dr. Irene Karam was recruited to replace Dr. Judith Balogh, who retired in January 2015, joining the Head & Neck and Breast site groups. Dr. Sten Myrehaug was recruited from the Durham Regional Cancer Centre and has joined our CNS and GI site groups where he will focus on SBRT/SRS. A position is currently being advertised to replace Dr. Phillip Davey who will be retiring in November 2015. Steve Russell, a long-term member of our radiation therapy leadership team has become the new Manager and Head of Radiotherapy after a competitive search.

The Odette Radiation Treatment Program continues to foster its regional leadership role in cancer care. Our radiation oncologists continued to participate in radiation oncology clinics and multidisciplinary cancer conferences at a large number of academic and community hospitals, including the North York General Hospital, MacKenzie Health, Royal Victoria Hospital, Scarborough Hospital, Rouge Valley Hospital (Centenary Site), Humber River Regional Hospital, Toronto East General Hospital and St. Michael's Hospital.

Despite the very competitive grant funding climate, faculty members continued to be successful at receiving funding, with over \$29.6 million in external peer-reviewed and industry supported grants to date. Faculty at Sunnybrook published 268 peer-reviewed scholarly articles in 2014, with 124 as primary or senior responsible author.



# CLINICAL PARTNER UPDATE

## DR. ANDREA BEZJAK, PRINCESS MARGARET CANCER CENTRE

The Princess Margaret Radiation Medicine Program (RMP) is one of the largest in the world with 36 radiation oncologists, 33 radiation physicists, 160 radiation therapists, 6 advanced practice radiation therapists, 3 nurse practitioners, 1 physician assistant and 80 support staff, offering comprehensive and state-of-the-art image-guided radiotherapy to our patients. In fiscal year 2014-2015, our clinical activities included more than 8,200 consultations and 10,383 courses of radiation therapy. There has been growth in several of our clinical programs, including gynecologic oncology/MR guided brachytherapy, multidisciplinary management of brain metastases and oligometastatic program. We are meeting Cancer Care Ontario (CCO) guidelines regarding the percentage of cases within the “referral to consult”, as well as the “ready-to-treat to treatment” wait time targets. Quality and safety continue to be a major emphasis in our program, with peer-review site-based rounds for all tumour types, and program-wide monthly rounds that focus on process issues, and dissemination of findings and actionable items. In the fall of 2014, RMP participated in Accreditation Canada’s Qmentum Accreditation Program, wherein the University Health Network was accredited with Exemplary Standing, with RMP being recognized as one of two key programs that contribute to the success of the Princess Margaret Cancer Program.

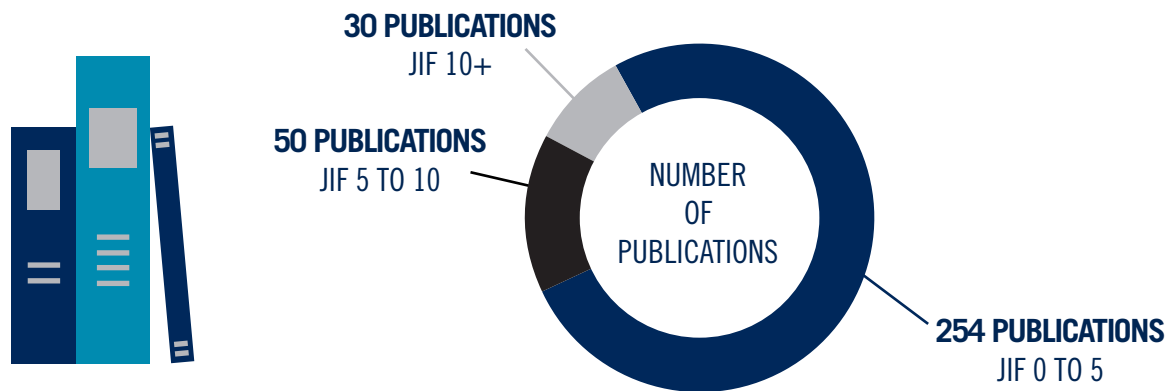
Staffing changes in the past year included the appointment of Ms. Elen Moyo as the Director of Radiation Therapy, and the arrival of Dr. Scott Bratman, who joined RMP in September 2014 as a Clinician Scientist with a clinical and research focus on head and neck cancer. RMP lost one of its finest radiation oncologists and visionary leaders, Dr. Pamela Catton, who passed away in December 2014. We bid farewell to Dr. Lee Manchul, who retired in January 2015, and Dr. Cynthia Menard who moved to Montreal in April 2015 to unfold the next chapter of her stellar career at the Centre Hospitalier de l’Université de Montréal. Increased clinical demands due to reduced staff numbers were alleviated by the presence of Dr. Tatiana Conrad, our locum who helped address the specific needs of the Breast and CNS site groups.

RMP members continued to hold leadership positions locally, nationally and internationally. Dr. Mary Gospodarowicz’s many achievements were recognized with the ASTRO Gold Medal in the fall of 2014. In the past year, Dr. John Kim was appointed as the inaugural CCO Lead for the Head and Neck Cancer Group; Dr. Pdraig Warde was re-appointed as the Provincial Head of the CCO Radiation Treatment Program; Dr. Michael Milosevic continued to serve as the Chair of the Canadian Partnership for Quality Radiotherapy, and Dr. Marco Carlone as the President of the Canadian Organization of Medical Physicists. Many other staff members hold Chair positions within various professional committees, as well as Principal Investigator positions on clinical trials. Amongst the many notable achievements within our Program, those worth highlighting include the first PhD radiation therapist graduates in Ontario, Drs. Michael Velec and Tara Rosewell, as well as the publication of a new textbook entitled *Research for the Radiation Therapist: From Question to Culture*, co-edited by Nicole Harnett and Caitlin Gillan.

RMP staff continued to be involved in a broad range of research activities, spanning clinical, translational, basic science, physics, radiobiology, education, health services research and beyond. Achievements in the past calendar year include obtaining over \$45 million in peer-reviewed funding and 146 peer-reviewed grants; publishing 206 peer-reviewed publications; having 190 prospective research protocols open; and accruing 11% of new patients onto prospective clinical research studies.

FUNDING

PUBLICATIONS



334  
TOTAL PUBLICATIONS

2.04  
PUBLICATIONS PER INVESTIGATOR

5.62  
AVERAGE JOURNAL IMPACT FACTOR

\$37.2M

TOTAL FUNDING

*Note: This total funding includes funding for Principal Investigators and Co-Principal Investigators only and excludes large infrastructure grants*



# DONOR RECOGNITION

APRIL 2010 TO OCTOBER 2015

## CHAMPIONS

(\$25,000 or more)

AstraZeneca Canada Inc.  
Eli Lilly Canada Inc.  
Fei-Fei Liu  
Hoffmann-La Roche Ltd.  
Merck Canada Ltd.  
Pfizer Canada Inc.  
Radiation Oncologists -  
Princess Margaret  
St. Michael's Hospital

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256

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(\$1,000 to \$4,999)

Evan Donohue  
Felicia Morrison  
Rebecca Wong

## FRIENDS

(Up to \$999)

Akua Nayo Joseph  
Alexander Pau  
Alexander Vincent Louie  
Alina-Emiliana Sturdza  
Almira Mun  
Amena Zafar  
Amy Chourzamanis  
Andrea Charlesworth  
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Kevin Paul Lowther  
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Li Min Eng  
Libni J Eapen  
Lihua Gui  
Luba Zisser  
Lue Ann Swanson  
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Madhuker Akula  
Maria Lucia Espenida  
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Monica Sharon Lewis  
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Steven Boyle  
Sulin Celina Cheng  
Susanna Sellman  
Tino Corsetti  
Trevor J Stiner  
Valerie Peticca  
Wilfred Fong  
Wing Hei Janet Chang



# UT-DRO FACULTY MEMBERS 2014 - 2015

(As of June 30, 2015)

## PROFESSORS

Andrea Bezjak  
James Brierley  
Robert Glen Bristow  
Charles Catton  
Edward Chow  
Bernard Cummings  
Laura Dawson  
Anthony Fyles  
Maria Gospodarowicz  
Masoom Haider  
Richard Hill  
David Jaffray  
Normand Laperriere  
Fei-Fei Liu  
Michael Milosevic  
Brian O'Sullivan  
A. Michael Rauth  
Jolie Ringash  
John Rowlands  
Gillian Thomas  
Richard Tsang  
Alex Vitkin  
Padraig Warde  
Rebecca Wong  
Chong Shun Wong  
Bradly Wouters

## ASSOCIATE PROFESSORS

Ida Ackerman  
Lisa Barbera  
Jean-Pierre Bissonnette  
Patrick Cheung  
Gregory Czarnota  
Cyril Danjoux  
Charles Hayter  
David Hodgson  
Andrew Loblaw  
Robert Mackenzie  
Gerard Morton  
Lawrence Paszat  
David Payne  
Eileen Rakovitch  
Tara Rosewall  
Arjun Sahgal  
Michael Sharpe  
William Song  
Ewa Szumacher  
May Tsao  
David Wiljer

## ASSISTANT PROFESSORS

Hamideh Alasti  
Ravi Ananth  
Elizabeth Barnes  
Andrew Bayley  
Anthony Brade  
Scott Bratman  
Stephen Breen  
Marco Carlone  
Lee Chin  
Young-Bin Cho  
John Cho  
James Chow  
William Chu  
Peter Chung  
Hans Chung  
Caroline Chung  
Catherine Coolens  
Tim Craig  
Phillip Davey  
Melanie Davidson  
Lisa Di Prospero  
Colleen Dickie  
Robert Dinniwell  
Mary Ann Doherty  
Warren Donald Foltz  
Caitlin Gillan  
Meredith Giuliani  
Kathy Han  
Nicole Harnett  
Mostafa Heydarian  
Lori Holden  
Andrew Hope  
Mohammad Islam  
Irene Karam  
Zahra Kassam  
Harald Keller  
Brian Keller  
John Kim  
Christine Anne Koch  
Marianne Koritzinsky  
Justin Wann-Yee Lee  
Daniel Letourneau  
Eric Leung  
Wilfred Levin  
Patricia Lindsay  
Stanley Liu  
Kathy Mah  
Claire McCann  
Thomas McGowan

Andrea McNiven  
Barbara-Ann Millar  
Douglas Moseley  
Cathryne Palmer  
Geordi Pang  
Ian Poon  
Thomas Purdie  
John Radwan  
J Alan Rawlinson  
Alexandra Rink  
Mark Ruschin  
Arman Sarfehnia  
Katharina Sixel  
Hany Soliman  
Jacqueline Spayne  
Teodor Stanescu  
Alexander Sun  
Kieng Tan  
Mojgan Taremi  
Danny Vesprini  
Douglass Vines  
John Waldron  
Robert Weersink  
Woodrow Wells  
Collins Yeboah  
Ivan Yeung  
Beibei Zhang

## LECTURERS

David Beachey  
Laura D'Alimonte  
Marisa Finlay  
Audrey Friedman  
Deborah Havill  
Robert Heaton  
Jane Higgins  
Sophie Huang  
Glenn Jones  
Juhu Kamra  
Valerie Kelly  
Dawn-Marie King  
Winnie Tsz Yan Li  
Jidong Lian  
Rosanna Macri  
Karen Moline  
Sarah Jane Rauth  
Raxa Sankrecha  
Senti Senthelal  
Anna Simeonov  
Emily Sinclair  
Henry Sinn  
Christiaan Stevens  
Jonathan Tsao  
Yongjin Wang  
Frederick Yoon  
Jasper Yuen  
Grace Zeng

## INSTRUCTORS

Renata Bradley  
Angela Cashell  
Martin Chai  
Patricia Charman  
Carina Feuz  
Wendy Flanagan  
Florencia Jon  
Nadiya Makhani  
Kari Osmar  
Marc Potvin  
Aisha Sheikh

# UT-DRO TRAINEES 2014 - 2015

(As of June 30, 2015)

## FELLOWS

Fatimah Alfaraj  
Moein Alizadeh  
Ibrahim Atean  
Aisling Barry  
Melvin Chua  
Patricia Daly  
Abdul Dayyat  
Ahmed Hassan Hashmi  
Joelle Helou  
Ali Hosni  
Rahul Krishnatry  
Lachlan McDowell  
Andrew McPartlin  
Tomas Merino  
Kavita Morarji  
Jure Murgic  
Hima Bindu Musunuru  
Satiavani Ramasamy  
Shrinivas Rathod  
Moises Russo  
Julia Skliarenko  
Claudio Sole  
Sarah Turner  
Reem Ujaimi

## PHYSICS RESIDENTS

Michael Balderson  
Alyaa Elzibak  
Dominique Fortin  
Tania Karan  
Anthony Lausch  
Derek Liu  
Shahram Mashouf  
Sandra Meyers  
Moti Paudel  
Mohammad Rezaee  
Manuel Rodriguez  
Cindy Tam

## RADIATION ONCOLOGY RESIDENTS

Jenna Adleman  
Yasir Alayed  
Mohammed Aldehaim  
Ahmad Bushehri  
Jay Detsky  
Salman Faruqi  
Alireza Fotouhi Ghiam  
Adam Gladwish  
Daniel Glick  
Ezra Hahn  
Yaser Hasan  
Mohammad Hasan  
Jonathan Klein  
Nafisha Lalani  
Pencilla Lang  
Laurence Lee  
Jonathan Livergant  
Sylvia Ng  
Mark Niglas  
Srinivas Raman  
Hamid-Reza Raziee  
Danielle Rodin  
Negin Shahid  
Jonathan So  
Robert Thompson  
Derek Tsang  
Eric Tseng  
Horia Vulpe  
Vivian Yau

## MASTERS STUDENTS

Jessy Abed  
Tassha Anwar  
Darby Erler

WWW.RADONC.UTORONTO.CA

 @UofTDRO



Radiation Oncology  
**UNIVERSITY OF TORONTO**

FOR INFORMATION, CONTACT UT-DRO:

SUITE 504, 149 COLLEGE STREET  
TORONTO ON M5T 1P5

RADIATION.ONCOLOGY@UTORONTO.CA

416.978.4516