



DEPARTMENT OF RADIATION ONCOLOGY ANNUAL REPORT 2018 - 2019



Radiation Oncology
UNIVERSITY OF TORONTO



VISION

Global leadership in Radiation Oncology by transforming practice through innovation and excellence in Research and Education.

MISSION

We prepare future radiation medicine leaders, contribute to our communities, and improve the health of individuals and populations through discovery, application, and communication of knowledge.

ANNUAL REPORT 2018–2019

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DR. FEI-FEI LIU
CHAIR'S WELCOME

It is my pleasure to present the University of Toronto's Department of Radiation Oncology (UTDRO) Annual Report for 2018 – 2019. It has been another exciting and eventful year for UTDRO.

We welcome eight newly appointed faculty members – Drs. Hossein Afsharpour, Jay Detsky, Elysia Donovan, Ezra Hahn, Zain Husain, Alexander Louie, Srinivas Raman, and Danielle Rodin. Congratulations to the following faculty members on their promotions – Dr. Gregory Czarnota who was promoted to Full Professor, Drs. James Chow, Hans Chung, Peter Chung, Meredith Giuliani, Barbara-Ann Millar, and Ananth Ravi, who were all promoted to Associate Professors.

A few highlights illustrating the achievements of our UTDRO faculty in 2019 include Dr. John Waldron, who became the second Bartley-Smith Wharton Chair in Head & Neck Radiation Oncology at the Princess Margaret. Several faculty members received prestigious international awards and recognition, including Dr. Laura Dawson, who became the President-Elect of ASTRO. This is the first time in the history of ASTRO where the President will be a Canadian and only the fourth time a woman has held this position. Dr. Gerard Morton was appointed a Fellow of the American Brachytherapy Society. Dr. Rodin was the first elected Young Leader to the UICC Board of Directors. Dr. Ewa Szumacher, who was selected as the President Elect of the American Association for Cancer, and will be starting her term as President in September 2019. Quite a year for recognition of our high-achieving faculty!

The Medical Radiation Sciences (MRS) Program led by Cathryne Palmer completed its accreditation; conducted for the first time by Accreditation Canada. After a four-day onsite visit by ten evaluators, the MRS program received a perfect score; having fulfilled all of the requirements, and securing approval status until April 30, 2025. The accreditors highlighted the satisfaction of the MRS students with their experience, the progressive curriculum, and the deep commitment of the faculty.

In September 2019, we were proud to host our 10th Annual Alumni Reception at ASTRO in Chicago, Illinois. Over a hundred alumni, friends, and faculty members from across the globe attended to celebrate this milestone. It was a lively and engaging evening, and everyone enjoyed renewing old friendships and establishing

new relationships. We announced the following award winners, Dr. Benjamin Lok for the Rising Star Award, Dr. Tim Craig for the Pamela Catton Award for Inter-Professional Education and Care, Dr. Leigh Conroy for the Bernard J. Cummings Award for Research Excellence, and Dr. Matthew Foote for the UTDRO Alumni Award.

My sincere thanks to Dr. Gregory Czarnota, Executive Vice Chair of UTDRO, and the three Vice Chairs Drs. Michael Milosevic, Rebecca Wong, and Shun Wong for their counsel, assistance, and dedication throughout the academic year. I am also deeply grateful to our Executive Team for their commitment and hard work in deploying our programs and supporting our trainees. Finally, I would like to thank our faculty members, trainees, and UTDRO staff who have all played a vital role in maintaining our department's position as a global leader in radiation medicine.

I hope you enjoy reading through the 2018 - 2019 Annual Report that highlights our Department's recent achievements as we continue to strive for excellence in radiation medicine research, education, and clinical practice.

Thank you,

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

DR. GREGORY CZARNOTA EXECUTIVE VICE CHAIR



Over the past year, UTDR0 has achieved significant milestones; we continue to be leaders in education, innovation and clinical practice. I am proud to be part of a dynamic group. Together, we continue to make significant advances within the radiation oncology landscape for which patient-focused care is the cornerstone of our achievements.

In reflecting on our many successes, it is apparent that our strength is also deeply rooted in our diversity as a department. Our aim moving forward includes building a department that mirrors the community that we serve. Our faculty, which includes radiation oncologists, physicists, radiation therapists and scientists, comprises diverse backgrounds and brings unique perspectives, ultimately enriching the UTDR0 community. We hope to continue fostering a culture of diversity and inclusion that is embedded in our everyday practice, as well as being integral to our department's ethos.

Throughout the previous year, we are observing stronger collaborations between all UTDR0-affiliated centres. Indeed, we are stronger when unified; particularly, when we draw upon the expertise across all centres. Our collaborative spirit has led to major achievements, including game-changing treatments using a fully integrated MR-LINAC system. Through our teamwork, we continue to make significant developments in computational radiation oncology, personalized medicine and precision oncology. It is apparent that the future is looking bright for UTDR0 and I would like to commend the incredible efforts made by our faculty. Congratulations on a successful year, and we look forward to celebrating many more achievements to come.



EDUCATION
DR. REBECCA WONG
VICE CHAIR, ACADEMIC AFFAIRS

UTDRO offers a rich and dynamic environment for the training of our next generation of radiation medicine professionals. In 2018, we were home to 292 undergraduate Medical Radiation Sciences students (124 RTT, 116 radiological technology, and 52 nuclear medicine), 14 physics residents, 22 radiation oncology residents, 30 radiation oncology fellows and 29 STARS21 scholars. Our faculty collectively provided 2,366 hours of classroom and clinical teaching for the U of T Undergraduate Medical Education Program.

Our trainees continue to be highly successful, garnering multiple national and international awards including the Roetgen Research Award (RSNA 2018, Fabio Moraes), CARO Sanofi Awards (2018, Ning-Ning Lu, Michael Tjong), CARO Acura Award (2019, Michael Tjong, Rachael Glicksman), Jean Roy Award (2018, Rachael Glicksman), Book Prize in Clinical Care & Epidemiology (2018, Liang Zeng), Book Prize in Biology and Technology (2018, Pencilla Lang), and Best Fellow Presentation Award (2018, Fabio Moraes).

Our faculty are also distinguished in their supervision and mentorship, many of whom we honour with our internal teaching awards. Still others are further decorated by external awards acknowledging their broad impact on our community. Among these external awards are

the AAPM Education Innovation Award (2019, Andrea McNiven), Colin Woolf Excellence in Teaching of CPD (2018, Barbara-Ann Millar), PARO Excellence in Clinical Teaching Award (2019, Jennifer Croke), Wightman-Berris Anderson Award in Program Innovation and Development Award (2019, Meredith Giuliani), Sunnybrook Education Advisory Council (SEAC) Allan Knight Life Time Achievement in Teaching Award (2018, Edward Chow) and SEAC Educating Beyond Sunnybrook Awards (2018, Ewa Szumacher).

Our training program directors are the life force of our programs, taking each sector to new heights:

The Medical Radiation Sciences Program led by Cathryne Palmer completed its accreditation conducted for the first time by Accreditation Canada. After a four-day onsite visit by 10 evaluators, the team achieved a perfect score fulfilling all of the requirements, and securing program approval status until April 30, 2025.

Meredith Giuliani led the development and launch in May 2018 of “Cancer Week” (week 70) for all undergraduate medical students, providing an important foundation for the management of cancer.

Andrea Bezjak and her team have been busy on multiple fronts, leading the many changes required towards full implementation of competency by design for our PGY1s in July 2019, while simultaneously integrating many elements of CBD into the learning structure for our PGY2-5 residents, while preparing for our October 2019 submission for the upcoming 2020 External Review, and laying the groundwork for two new initiatives. The Wellness Committee led by Ida Ackerman was formally launched in 2018, shining a spotlight on the importance of wellness, advocacy, and personal support.

Andrea McNiven implemented “Residency Days” allowing residents to learn together across the clinical sites; capitalizing on the expertise across our university programs. For her innovative work on professional competency evaluation for medical physics trainees, Andrea was honoured at the 2019 AAPM with the Education Innovation Award.

Our fellowship program led by Peter Chung completed the only evaluation of the impact of fellowship training to date, exploring the academic and lived experiences through a survey of its alumni since 1991; results have been submitted for publication.

STARS21 also performed a formal program impact evaluation in 2018. Over 95% of respondents said the program met or exceeded their expectations, scholars acknowledged the value in learning in an inter-disciplinary group, and alumni displayed enhanced leadership and communication skills in group projects.

Faculty Development and Continuous Medical Education co-led by Barbara-Ann Millar and Ewa Szumacher offered faculty-wide events in the form of workshops, rounds, and conferences on key topics such as “Competency by Design” and “Learner in Difficulty.” Another successful year of RTi3, led by co-chairs Laura Alimonte and Mike Velec (2019) saw a greater expansion of the development of our junior Radiation Therapists. The UTDRO Evening Journal Club, co-chaired by Eric Leung and Jennifer Croke, continues to engage and highlight the multidisciplinary and multi-site nature of our department. New in 2018, an inter-professional workshop entitled “Technological Innovations in Prostate Cancer Radiotherapy” drew a full house with Keynote Speakers Drs. Robert Timmerman and Glenn Bauman, hands-on workshops, and an opportunity for our participants to visit both our “uptown & downtown” locations during the best time of the year in June.

Finally, experiencing our environment is perhaps an aspiration for many around the world. Our observership programs at Odette Cancer Center and Princess Margaret Cancer Centre under the direction of Hany Soliman and Jennifer Croke lead our “gateway”, whereby visitors can observe our internationally renowned faculty in action. Collectively, we hosted 145 observers with 73 international observers (36 Odette, 37 Princess Margaret) in our programs in 2018.

In sum, UTDRO continues to embody the spirit of “Inspiring, Learning, and Sharing” in all of our educational endeavours.



CLINICAL AFFAIRS

DR. SHUN WONG

VICE CHAIR, CLINICAL AFFAIRS

The 2018–2019 academic cycle marked another year during which UTDRO continued its regional leadership role in advancing radiation treatment and cancer care for the province of Ontario. Staff at the Odette Cancer Centre and Princess Margaret Cancer Centre, as well as our affiliated staff at Southlake Regional Health Care, Trillium Health Partners, Royal Victoria Hospital and Lakeridge Health 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. Both clinical sites continued significant strategic investments with new treatment and research facilities and upgrades. Both radiation programs also benefited from strong philanthropic support by their respective hospital foundations. The Department of Radiation Oncology at Sunnybrook underwent its 5-year review, and Dr. Czarnota was re-appointed for another five years as Chief.

In 2019, Dr. Fei-Fei Liu was appointed the inaugural Peter and Shelagh Godsoe Chair in Radiation Medicine and Dr. John Waldron was named the Bartley-Smith Wharton Chair in Head & Neck Radiation Oncology. A number of faculty members received prestigious international awards and recognition. Dr. Laura Dawson became the President-Elect of ASTRO. This is the first time in the history of ASTRO, where the President will be a Canadian and a woman. Our Chair, Dr. Fei-Fei Liu, was named a Fellow of ASTRO, an honour that recognized her significant contributions to radiation oncology and the Society. Dr. Gerard Morton was appointed Fellow of the American Brachytherapy Society. Dr. Rodin was elected to the UICC Board of Directors. Dr. Szumacher is the President-Elect of the American Association for Cancer and will begin her term as President in September 2019.

UTDRO bid farewell to Dr. David Jaffrey after two decades of outstanding contributions. In addition to being Head of Medical Physics at Princess Margaret, he was also Executive Vice President for Technology and Innovation at UHN. Dr. Jaffrey recently joined the University of Texas MD Anderson Cancer Center as a Senior VP and its first Chief Technology and Digital Officer.

UTDRO welcomed the following newly appointed faculty members: Drs. Hossein Afsharpour, Jay Detsky, Elysia Donovan, Ezra Hahn, Zain Husain, Alexander Louie, Srinivas Raman, and Danielle Rodin.

There were an unprecedented number of academic promotions in 2018-19. We offer congratulations to Drs. Gregory Czarnota, who was promoted to Full Professor, and Drs. James Chow, Hans Chung, Peter Chung, Meredith Giuliani, Barbara-Ann Millar and

Ananth Ravi, who were appointed Associate Professors.

Regrettably, results in the “Voice of the Faculty” survey conducted in the Faculty of Medicine in 2018 indicated that UTDRO faculty experienced harassment and incivility at their workplace. A UTDRO Respect and Civility Working Group was established to identify areas for improvement and implement solutions to improve the culture of respect and civility. The work is ongoing, but we remain dedicated to ensuring that our department is one of support, inclusivity, and engagement across all our portfolios.



RESEARCH

DR. MICHAEL MILOSEVIC
VICE CHAIR, RESEARCH

The University of Toronto's Department of Radiation Oncology (UTDRO) and its affiliated radiation treatment programs, academic hospitals and research institutes comprise one of the largest and most productive academic radiation medicine programs worldwide. UTDRO investigators continue to innovate along the entire patient journey from diagnosis through treatment to end-of-life care and long-term survivorship. Key research themes that span the UTDRO community include MR-guided radiation treatment to target cancer more precisely, adaptive radiation oncology to ensure the right treatment at the right time for every patient, and the evaluation of patient-reported outcomes to provide important insights regarding the effectiveness of our treatments. UTDRO is disrupting the global radiation treatment landscape through these and many other innovative approaches that integrate clinical care and research to learn from all of our patients, while focusing on the outcomes that matter most.

As described elsewhere in this annual report, UTDRO is a leader in MR-guided adaptive external radiotherapy and brachytherapy (internal radiotherapy delivered *via* devices implanted into the cancer). Investigators at the Odette and Princess Margaret Cancer Centres are pushing the boundaries of discovery to develop innovative radiation treatment approaches using MR-guidance. Through strategic industry partnerships, UTDRO investigators have made key contributions to the development of a next-generation MRI-LINAC (MRL) radiotherapy system that fully integrates an MR scanner and a radiation treatment machine as one device. This transformative technology was installed at Odette and Princess Margaret in 2018-19, creating a globally unique environment to examine real-time MR image guidance in specific patient populations, and translating the findings to everyday clinical practice.

UTDRO investigators continued to be very productive in 2018-19, with numerous influential publications and continued growth in the number and breadth of collaborative programs locally, nationally and internationally. The total research funding available to UTDRO investigators last year was \$57M. Several new peer-reviewed operating and infrastructure grants were awarded despite the highly competitive funding environment, including a prestigious Terry Fox New Frontiers Program Project Grant. Two UTDRO Collaborative Research Seed Grants were awarded to teams led by Tatiana Conrad, and by Jessica Conway and Jennifer Croke.

There were a total of 440 peer-reviewed research publications by UTDRO faculty in 2018-19, many in high impact journals.

A high proportion of these papers were authored by inter-disciplinary research teams of radiation oncologists, medical physicists, and radiation therapists, with an increasing proportion included co-authors from more than one UTDRO affiliated hospital. These accomplishments reflect the overall excellence, richness, and diversity of research in UTDRO, and the importance of collaboration as a key enabler of success.

I would like to express my sincere thanks to everyone in the UTDRO community who contributed to our research successes in 2018-19, including those who committed time and energy to ensure the academic growth of our trainees, and those who served as grant and abstract reviewers. In particular, I would like to thank Marianne Koritzinsky for her continued insights and support as UTDRO Director of Research, as well as her co-leadership with Anne Koch for the STARS21 research training program. UTDRO Research Day in May 2019 showcased the outstanding research being conducted by our trainees, and was among the most successful events of the year thanks to the commitment and enthusiasm of William Tran. Finally, I am grateful to the members of the UTDRO Research Committee, including Jean-Pierre Bissonnette, Lee Chin, Tony Fyles, Adam Gladwish, Eric Leung, Marianne Koritzinsky, William Tran and Mike Velec. I look forward to working with them on a continuing basis to harness the full academic potential of our program, and shape the future of collaborative radiation medicine research.

RESEARCH HIGHLIGHTS

REPORTING PERIOD: JULY 1, 2018 TO JUNE 30, 2019

PUBLICATIONS



440

TOTAL PUBLICATIONS



2.97

PUBLICATIONS PER
INVESTIGATOR

FUNDING



\$57 M

TOTAL FUNDING

Note: These figures include data for faculty at fully-affiliated hospitals and research institutes. The total funding includes funding for Principal Investigators and Co-Principal Investigators only and excludes large infrastructure grants.

WELCOME NEW FACULTY

ACADEMIC YEAR 2018-2019 (JULY 1, 2018 TO JUNE 30, 2019)



DR. HOSSEIN AFSHARPOUR, LECTURER

Dr. Hossein Afsharpour is a Medical Physicist at the Credit Valley Hospital. His clinical interests include brachytherapy, thoracic SBRT, and genitourinary EBRT. His research focuses on adaptive radiation therapy, deformable image registration, 3D printing for superficial treatments, and Monte Carlo methods for radiation transport. He is also an Associate Editor of the *Journal of Applied Clinical Medical Physics*.



DR. ZAIN HUSAIN, ASSOCIATE PROFESSOR

Dr. Zain Husain is a Clinician Investigator at the Odette Cancer Centre. He has joined UTDRO from Yale School of Medicine in New Haven. His research interests include the treatment of head and neck cancers, and more particularly on oropharyngeal cancer.



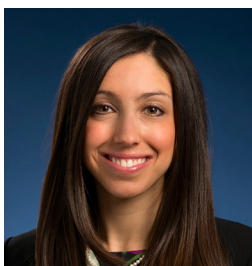
DR. ALEXANDER LOUIE, ASSISTANT PROFESSOR

Dr. Alexander Louie is a Clinician Scientist at the Odette Cancer Centre. His research focuses on the use of comparative effectiveness in the context of lung, kidney cancers, and oligometastatic disease.



DR. SRINIVAS RAMAN, ASSISTANT PROFESSOR

Dr. Srinivas Raman is a Clinician Investigator at the Princess Margaret Cancer Centre. His clinical interests cover lung, prostate, and bladder cancers. His research focuses on an automated planning and quality assurance, artificial intelligence, and radiomics.



DR. DANIELLE RODIN, ASSISTANT PROFESSOR

Dr. Danielle Rodin is Clinician Investigator at the Princess Margaret Cancer Centre. Her clinical interests are breast cancer and hematologic malignancies. She also serves on the Board of Directors of the UICC.

WELCOME NEW FACULTY

CURRENT ACADEMIC YEAR (JULY 1, 2019 TO OCTOBER 1, 2019)



DR. JAY DETSKY, ASSISTANT PROFESSOR

Dr. Jay Detsky is a Clinician Investigator at Odette Cancer Centre. His clinical interest are prostate SABR, radiosurgery for brain metastases, spine SBRT. His research focuses on imaging biomarkers for prostate cancer; imaging response for brain metastases; adaptive radiation using the MR-Linac; and spine SBRT outcomes.



DR. ELYSIA DONOVAN, ASSISTANT PROFESSOR

Dr. Elysia Donovan is a Clinician Investigator at the Odette Cancer Centre. Her clinical interests are SBRT for breast and gynecological cancers, and gynecologic brachytherapy. Her research focuses on SBRT for treatment of oligometastasis and oligoprogression in breast and gynecologic malignancies, MR-guided breast brachytherapy, and quality of life research in patients with oligometastatic cancer.



DR. EZRA HAHN, ASSISTANT PROFESSOR

Dr. Ezra Hahn is a Clinician Investigator at the Princess Margaret Cancer Centre. His research focuses on machine learning and radiomics. His work should improve mathematical modeling for radiation medicine research, and playing a key role in establishing new frontiers in artificial intelligence.

MR IN RT *AT UTDRO*



Introduction

Owing to its superior soft tissue visualization, Magnetic Resonance Imaging (MRI) is increasingly being integrated into routine radiation oncology practice; playing a critical role in the diagnosis, staging and treatment of cancer. The incorporation of MRI into Radiation Therapy (RT) practice comes with its challenges; however, industry partners and researchers recognize the value of MRI in RT such that they have and will continue to develop technologies to meet clinical needs. These advances in technologies represent a paradigm shift to high precision, personalized MR-guided radiotherapy (MRgRT), and with these technologic advances, an inter-professional team, consisting of radiation oncologists, medical physicists, radiation therapists, and imaging scientists, which must be leveraged to ensure safe practice and successful implementation.

UTDRO is an internationally recognized leader in the development, implementation, and evaluation of practice-changing technologies, which continues to hold true in the emerging field of MRgRT. Our success is attributed not only to our clinical and research expertise in technology advancements, but also in our ability to successfully translate knowledge into practice. UTDRO's education programs and professional development offerings continue to be key components enabling the synthesis, exchange and application of knowledge for inter-professional teams to accelerate the benefits of innovative, game-changing technologies. In the era of MRgRT, inter-professional education and collaboration is essential to create an environment that closely links research with education and practice, and UTDRO will continue to embrace the significant opportunities for role expansion and advancement of the professions within our dynamic inter-disciplinary teams to define the next standard of care for cancer patients. With the implementation of the MR-LINAC, UTDRO continues to be at the forefront for these developments.



Ananth Ravi and Eric Leung (Odette Cancer Centre)

MRgRT in Action at the Odette Cancer Centre

The Odette Cancer Centre is one of the leading centres in brachytherapy with the highest volume of gynecological and genitourinary procedures in Canada. The focus of the brachytherapy team has always been to improve patients' experience and outcome. With the addition of the MRI Brachytherapy suite and the capability of intraoperative planning and treatment, all gynecological patients receiving brachytherapy are now treated as outpatients and asleep throughout the entire procedure. This eliminates the stress and discomfort patients may experience when staying overnight in a hospital for brachytherapy.

The intraoperative program has only been made possible through the strong collaborations amongst all members

of the brachytherapy team at Odette. Radiation therapy, physics, nursing and radiation oncologists are all important members in facilitating the patient's journey for intraoperative brachytherapy. As patients are under general anesthesia (GA) throughout the procedure, it is essential that the insertion, planning, and treatment be conducted efficiently yet with the highest quality. This involves detailed MRI safety while the patient is being scanned under GA, and high-quality MR images transported efficiently to our planning system. Planning involves parallel work from physics, therapy, and oncology working together side-by-side. The result is patients being treated under 3 hours, and discharged on the same day.

The success of the intraoperative program has been a proud achievement of the Odette brachytherapy multi-disciplinary team. Witnessing the satisfaction of the patients undergoing this treatment program has been very rewarding, and builds on the

continued team work towards innovations in brachytherapy.

The first patient to be treated in this innovative space was impressed by how the designed-in-Sunnybrook super-suite reduced her time in the hospital from an entire day to around two hours, which led to a significantly improved experience for her.

"You have those moments to think about what you're going through and it feels very scary," said the patient, who learned last year she had cervical cancer just nine months after her first child was born. "And there are parts of the procedure that are just unpleasant. When they remove the applicator, that's the most uncomfortable part for me." After experiencing the treatment as an outpatient completely under GA however, she stated: "It was literally night and day, I woke up and that was it."

MRgRT in Action at the Princess Margaret Cancer Centre

At the Princess Margaret Cancer Centre, a specialized operating room with a ceiling-mounted mobile magnetic resonance imaging (MRI) device designed to guide a linear accelerator for external beam radiation treatments or state of the art brachytherapy treatments was designed and built in 2014. The MRgRT facility has become an integral component in the brachytherapy program for both cervix and prostate cancer patients. This unique space utilizes the advanced image resolution of MRI throughout the brachytherapy implant and planning phases: flexible plastic needles inserted directly into the MRI-visualized tumour, which are then connected to a high intensity radiation source to deliver the treatment to the MRI-defined tumour. Ultimately, the team at Princess Margaret is working on this discovery platform to unravel novel brachytherapy approaches aimed at normal tissue avoidance, maximizing curative dose delivery, with the objective to further improve the therapeutic ratio.

Multi-parametric MRI is the most accurate noninvasive technique to characterize and localize prostate cancer. Studies have shown that using MRI for guidance during prostate biopsies increases the yield of prostate biopsies and the detection of clinically relevant disease. In addition, specific MRI sequences correlate with tumour Gleason score, enhancing the identification of aggressive disease. This enables “focal dose-escalated brachytherapy” to such regions while maintaining or even reducing the dose to the remaining prostate gland. Such a strategy supports the overarching goal of “cure with no cost”. Similarly, by providing unparalleled resolution of the prostate, surrounding organs, and brachytherapy catheters, the MRgRT platform enabled the incorporation of hydrogel rectal spacers

to our brachytherapy treatment paradigm. Rectal spacers are a compelling technology for dose avoidance, but its presence hampers visualization and delineation of boundaries with the prostate and rectum when using traditional imaging technologies such as ultrasound or computed tomography. The Princess Margaret was the first centre in Canada to use this device, and one of first worldwide to apply it across different brachytherapy scenarios.

The suite design had to address the complexity of adapting an old brachytherapy treatment room with existing radiation shielding, while fluidly accommodating the various phases of a brachytherapy procedure: from an operating room-like procedure area to an MR-safe space, to an external beam radiation treatment room,

whilst attaining the highest standards for safety and efficiency. For example, MRI devices have a strong surrounding magnetic field, which requires significant precautions to prevent ferrous metallic objects from becoming dangerous projectiles. Special MR-safe brachytherapy equipment has to be utilized to maintain a safe environment for both patients and staff alike. Fortunately, the radiation therapy team already has extensive MRI experience including MRI certifications specific to working in this environment, and know that maintaining a culture of safety is a top priority.



Alejandro Berlin performing MRI-guided prostate brachytherapy at the Princess Margaret Cancer Centre

The Next Phase of MRgRT

Modern adaptive brachytherapy requires an inter-disciplinary team, with seamless collaboration between physicians, radiation therapists, and medical physicists to create the most effective brachytherapy implants and radiation plans, uniquely tailored to each individual patient's anatomy and disease characteristics. Both teams at the Odette and Princess Margaret embody the dedication to inter-professional efforts to improve patient care, as well as growing these clinical research efforts. On-going projects involving other sites in addition to gynecologic and genitourinary malignancies are showing great promise, but require the same inter-professional dedication to quality and care. UTDRO will continue to drive the MRgRT concepts forward in conjunction with other areas of MR research, leading the way we deliver care for the future generation of patients.

The future however, is now. Both the Odette and Princess Margaret have invested in the next generation of technology: an MRI-

LINAC (MRL) radiotherapy system that fully integrates an MR scanner and a LINAC as one device. The use of high precision MRI guided radiotherapy holds the promise for dose escalation and further margin reduction, leading to higher cure rates with reduced toxicity. This should ultimately lead to a significant improvement to quality of patient outcomes through direct integration of imaging at the point of treatment on the linear accelerator, enabling daily monitoring of patient positioning, and real-time adaptation to the daily changes in tumour positioning, and patient anatomy.

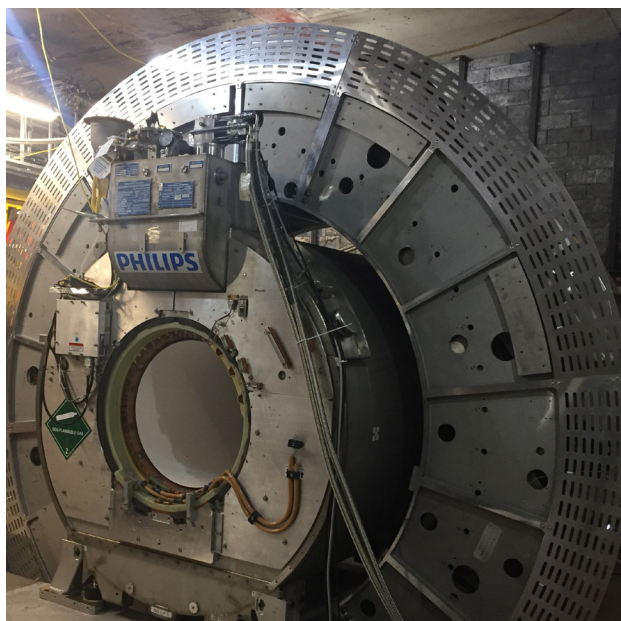
This year marked the first MRL patient treatments in Canada for Odette in August, and the Princess Margaret in September 2019.

Odette patients participate in the MOMENTUM study, an international, multi-institutional prospective registry that allows for the collection of imaging and technical data as well as clinical information. MOMENTUM will also facilitate the development of these adaptive protocols between the academic partners within the

MR-Linac consortium while capturing the data required for the future evaluation of evidence-based outcomes.

The successful clinical introduction of the MRLs at both Odette and Princess Margaret is a testament to the pioneering efforts of the teams. This has been the result of significant efforts, expertise and multidisciplinary collaboration from many areas, including radiation oncologists, therapists, physicists, imaging scientists, IT, researchers and clinical research associates.

While much has been accomplished, there is still so much more to be done. We are only at the beginning in the understanding how best to leverage all of these new technologies, data and workflows to guide new clinical care pathways, novel education models, and the most advanced clinical research in this sector, with the ultimate goal of improving patient outcomes and redefining the future of radiotherapy practice.



MRL Facility at the Odette Cancer Centre: under construction (left), after completion (right)

The successful clinical introduction of the MRLs at both Odette and Princess Margaret is a testament to the pioneering efforts of the teams.

This has been the result of significant efforts, expertise & multidisciplinary collaboration from many areas.



Princess Margaret Cancer Centre MR-Linac Team: Robert DeSimone, Colleen Dickie, Dave Niven, Andrei Damyanovich, Raina Park, Angela Cashell, Anna Simeonov, Tim Craig, Michael Velec (back), Michael Milosevic, Catarina Lam, Daniel Letourneau, Fei-Fei Liu, Grace Lee, Cathy Rocca, Andrea Shessel, Harald Keller, Robert Heaton (middle), Teo Stanescu, Vickie Kong, Jennifer Dang, Winnie Li, Matt Filletti (front)



Odette Cancer Centre MR-Linac Team: Alex Louie, Mark Ruschin, Jay Detsky, Danny Yu, Danny Vesprini, Brian Keller, Anthony Kim (back), Brige Chugh, Max Thibodeau (Elekta), Aimee Theriault, Anne Carty, Sten Myrehaug, Shawn Binda, Susana Sabaratram, Mikki Campbell, Claire McCann, Katie Wong, Darby Erler, Arjun Sahgal (front)

UTDRO *BEYOND BORDERS*

Introduction

Beyond our “walls”, our faculty and alumni continue to play prominent roles globally to drive change and build capacity in radiation medicine. This is inspired by the examples set by our past Chairs, Drs. Bernard Cummings and Mary Gospodarowicz, as well as our present Chair Dr. Fei-Fei Liu.

Dr. Rebecca Wong continues her efforts in building capacity through collaboration with organizations such as African Organization Research Training in Cancer (AORTIC), International Cancer Expert Corps (ICEC), while strengthening our own UTDRO global oncology network here in Toronto and beyond through our alumni. Drs. Barbara-Ann Millar and Meredith Giuliani created the inter-disciplinary Foundation of Leadership Course offered jointly with ESTRO/CARO/RANZR. In collaboration with IAEA, Ms. Colleen Dickie provides “training for the trainer” to build training capacity in radiation therapy, while Dr. Millar serves in an advisory capacity for the development of competency-based curriculum for radiation oncology residency from Africa to China. In collaboration with the Academic Model Providing Access to Healthcare (AMPATH), Drs. Michael Milosevic and Monique van Prooijen are enabling training for gynecologic radiation oncologists and medical physicists. Dr. Brian O’Sullivan has led the Sanming (Three Famous) Project since 2017; a collaborative project with the University of Hong Kong - Shenzhen Hospital with many education objectives designed to nurture collaboration and accelerate academic excellence. This Sanming project is also significantly supported by Ms. Sophie Huang, Drs. Fei-Fei Liu, Laura Dawson, Kathy Han and Rebecca Wong. Dr. Danielle Rodin is the co-chair of the CARO Global Oncology Committee, and several of our UTDRO fellows and residents, including physics resident Dr. Iakovenko, lead and collaborate in many global oncology initiatives with CARO and UICC, as highlighted below.




Trainees Taking Action



Dr. Viktor Iakovenko is a medical physics resident in UTDRO, who is passionate about contributing to the global field of radiation medicine. His background is in high-energy physics, and he has conducted fundamental physics research within Large Hadron Collider (LHC) in the European Organization for Nuclear Research (CERN). He shared that one of the main challenges that scientists at LHC are facing is the high doses of radiation required for these colliders, which can damage the detector systems, which are the eyes and ears of a physicist. During his PhD at CERN, he developed a radiation monitoring system in order to prevent damage from radiation.

In 2012, Viktor transitioned to the medical physics field and was very excited to realize that his expertise can be useful to advance the frontiers of radiation treatment with high precision, and prevent damage from radiation to human organs at risk. He started his training with the University Health Network (UHN) in 2015, mostly involved in complex projects within the Princess Margaret Cancer Centre, before joining the Physics Residency Program at UTDRO. Viktor is currently a resident at the Odette Cancer Centre.



Viktor joined the Canadian Association of Radiation Oncology (CARO) Global Oncology Committee survey project in 2018. The mission of this Committee is to promote the work of the multidisciplinary Radiation Oncology team in developing countries, and provide an information portal for CARO members. A national survey was created to develop a collective voice for CARO, and distributed to communicate with other international agencies in support of cancer control in low and middle income countries (LMICs). This survey will help gauge the current level of engagement of Canadian radiation medicine professionals in these activities. The committee reached out to the community via CARO and Canadian Organization of Medical Physicists (COMP). The information gained from this survey will provide an aggregated statistics on involvement and opportunities for further involvement of Canadian radiation oncology professionals in LMIC activities, which ultimately may improve the health of individuals in these countries through the effective engagement of more Canadians to address the global burden of cancer.

We are excited to see UTDRO Trainees, such as Dr. Iakovenko, involved in the global cancer conversation and contributing to greater access and care for all.

UTDRO Global Outreach

The Union for International Cancer Control (UICC) is a non-governmental organization based in Geneva, Switzerland, which leads our international community in convening, capacity building, and advocacy initiatives to reduce the global cancer burden, promote greater equity, and ensure that cancer control continues to be a priority in the world's health and development agenda. It has a membership base of over 1,100 organization in over 170 countries, as well as representations from major cancer organizations. The membership is very diverse and includes cancer societies, professional organizations, cancer centres, patient organizations, cancer researcher institutes, and other cancer prevention and control organizations.

The UTDRO has had a long and rich history of engagement with the UICC, including scientific contributions and global leadership. This began with our faculty's leadership in the UICC TNM project. Originating in 1950, the UICC TNM classification is the internationally accepted standard for cancer staging, and represents a global collaborative effort to define the anatomical extent of disease, promote global standards for reporting, and collaborations with cancer registries, cancer control systems and clinicians. Drs. Ray Bush and Bob Ginsberg started to represent Canada on the TNM Project, and now, Drs. Mary Gospodarowicz and Jim Brierley are its current co-Chairs. Dr. Brian O'Sullivan serves as a member of the Core Committee and Dr. Meredith Giuliani as the Education lead and a Core Committee member. In addition to the publication of the staging manuals, this group produces multi-modality knowledge translation products including videos and eLearning, and contributes to a number of CMEs to advance skills in cancer staging globally.

Contribution to these and other global public goods are an essential component of collective action on cancer control, and serve to set standards of care for international cooperation. They also have the advantage of benefitting our own patients, caregivers, and providers as well as providing the same opportunities for high-quality care to patients globally. The UICC Manual of Clinical Oncology, currently in its ninth edition, is another important public good produced by UICC with leadership from UTDRO. Drs. Brian O'Sullivan and Jim Brierley are the editors of this manual, which contains authoritative and up-to-date information on cancer detection, diagnosis, and treatment, alongside topics such as survivorship, special populations, and palliative care for professionals around the world.

From 2012-2014, Dr. Mary Gospodarowicz was the President of the UICC. Under her leadership, the UICC led the Global Task Force on Radiotherapy for Cancer Control, which was published as a *Lancet Commission on Radiotherapy* in a dedicated issue of the journal, and provided the foundational work in demonstrating the value of investing in radiotherapy globally. The Commission was a multi-institutional collaboration chaired by Dr. David Jaffray, with analytic work led by Dr. Danielle Rodin. During Dr. Gospodarowicz's tenure, UICC established the Young Leaders Program, which now has an impressive international alumni network. Building on this commitment to leadership development, Dr. Rodin is the first Young Leader to be elected to the UICC's Board of Directors.

Demand Outpacing Trained Professionals

Ethiopia has a population of 105.8M, and one of the lowest gross national incomes in the world. With a population of 105.8M, it is estimated that 60,960 patients needed radiotherapy in 2012, and this will rise to 129,210 patients by 2025. In reality, the waiting list for treatment is over 6 months and many never had the opportunity to be assessed, let alone being treated. To adequately serve the existing and growing demand, it is estimated that Ethiopia will require a total of 74 linear accelerators. This a far cry from its current capacity, which is one cobalt unit and one newly installed Linear Accelerator. Although solid plans are in place for five additional cancer centers in other regions of Harar, Mek'ele, Jima, Hawasa, and Gondar, this positive effort by its policymakers highlights the urgent need to build its training capacity in order to have a sustainable workforce of oncologists, medical physicists and radiation therapists. This is unfortunately a story that is all too familiar.

The University of Toronto and Addis Ababa Academic Collaboration (TAAAC) represents a successful collaboration between two institutions across diverse economic settings; sharing and shaping a common goal, and transforming it into impact from the bedside to the system level, with tangible benefits for all involved. This effort began in 2003 with two inspiring clinician-teachers, Dr. Clair Pain (Toronto) and Dr. Alem (Ethiopia), who executed on the visionary commitments of the two respective University Deans. Since then, Dr. Dawit Wondeimagegn, one of TAAAC's first graduates, and now Vice President of Addis Ababa University, and Chief Executive Director of College of Health Sciences, with Dr. Brian Hodges, VP, Education at UHN continue to build TAAAC into its current flagship status. The goal of the TAAAC model is to build capacity and sustainability across the health sciences as well as supporting domains such as engineering and library sciences for Ethiopia. From its beginnings in psychiatry, it has now expanded to 24 collaborative programs including medicine and its many subspecialties, pharmacy, dentistry, engineering and others. At the core of the collaboration are one-month immersive teaching trips sponsored by collaborating programs, guided by a training model that employs the principle of "train the trainer", and "building world class education by bringing world class expert teachers to Ethiopia". More than 100 one-month education trips take place annually between our institutions.

In 2016, University of Addis Ababa had a vision - to build the necessary professional degree program in oncology, radiation therapy, and medical physics in order to create a sustainable workforce to complement its long-term cancer plan. While collaboration in radiation oncology training is already in place with the University of Oslo, radiation therapy and medical physics programs do not yet exist.

UTDRO responded to this call for action and laid out a clear action plan for the global community to narrow the radiation oncology gap. Inspired by the demonstrated power of relational collaborative partnerships that TAAAC has come to exemplify, compelled to act as one of the leading radiation oncology university departments, and guided by the data put forth by the *Lancet Oncology* Commission on global radiation oncology, UTDRO entered into an agreement to support the University of Addis Ababa's vision.

The program is now approved, and students are being recruited. It is envisaged that through month-long teaching service trips three times a year, delivered by a pair (or trio) of teachers in medical physics, radiation therapy and radiation oncology, the foundations for an undergraduate degree program for radiation therapists, and in time, a MSc degree for medical physics will be built. Volunteers anyone?

Addis Ababa,
Ethiopia

105.8 M
TOTAL
POPULATION

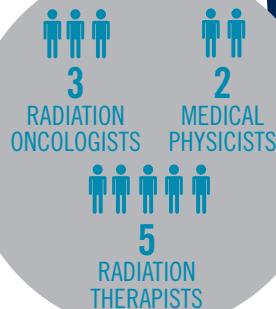
estimated
129,210
PATIENTS
will need
radiotherapy
by 2025



Current Available Technology vs.
Aspirational Population Needs

TARGET
74 LINEAR ACCELERATORS

CURRENT
1 LINEAR
ACCELERATOR &
2 COBALT UNITS



148
RADIATION
ONCOLOGISTS



148
MEDICAL
PHYSICISTS



296
RADIATION
THERAPISTS

Congratulations to Dr. Laura Dawson, the 61st President-Elect of the American Society for Radiation Oncology (ASTRO). Dr. Dawson is a Professor in the Department of Radiation Oncology and leads a multidisciplinary team of cancer specialists in managing upper gastrointestinal (GI) cancers at the Princess Margaret Cancer Centre.

“I am honoured to be in this prestigious position where I can help contribute to raising the profile for radiation oncology and to highlight the value it has to help patients. I am particularly proud that I will be the fourth woman and first Canadian in this role,” said Dr. Dawson. She has previously served on the ASTRO Board of Directors as Chair of the Education Council. When asked recently to consider taking on the Presidency, she was thrilled at the opportunity. In her tenure as President, Dr. Dawson plans to address key challenges facing both radiation oncology and the larger field of medicine, including physician burnout, restrictive prior authorization practices, and workforce diversity.

Dr. Dawson’s expertise is developing innovative approaches in radiation oncology for cancers for whereby standard radiation is insufficient. She has an international reputation in conducting clinical trials in the delivery of stereotactic body radiation therapy (SBRT) for primary and secondary liver cancers, and oligometastasis. She believes in the value of radiation and has observed patients benefit when they have been previously told there were no more options for them.

While this is an exciting time for the field of radiation medicine, there have also been challenges with healthcare cuts, at a time when there is an increasing number of cancer patients. Professional response to some of these challenges has helped to develop strategies that establish new paradigms in healthcare. Initiatives such as telemedicine or diversification in the healthcare team

should address part of the challenges related to physician burnout. The field needs leadership guidance, she says, “and I am appreciative that I am considered one of the stakeholders who can help influence change.”

Dr. Dawson says there are many bright and underrepresented junior radiation medicine professionals, who have much to offer. It is important that we establish a path for them to effectively help patients and support radiation medicine professionals. There are fewer clinician scientists who do basic research in the field of radiation medicine, but our community needs their scientific contributions. Dr. Dawson intends to be a strong advocate for this group of professionals also.

Her position as a Canadian leader in ASTRO will foster and enable international collaborations. Dr. Dawson mentions that having a Canadian in leadership is a strength for ASTRO, saying, “In any leadership role having a slightly different perspective is a good thing, so I’m very proud to bring a Canadian perspective to all aspects of decision making and the role moving forward. UTDRO is fantastic in many ways and ahead of many other departments; for example, its multidisciplinary faculty, recognition of teamwork, and expertise in global oncology. I would love to share many of the departments’ strengths and values with ASTRO. I hope to involve UTDRO faculty members with ASTRO activities and hope that ASTRO will also learn from many of the leaders in our department, so hopefully that will be a win-win situation on many different endeavours.”

In Dr. Dawson’s new role as ASTRO’s President-Elect, UTDRO looks forward to her continued leadership, passion and support to help facilitate opportunities for radiation medicine professionals to increase the recognition of contributors in this field.

AMERICAN SOCIETY FOR RADIATION ONCOLOGY (ASTRO) PRESIDENT-ELECT

Dr. Laura Dawson



AMERICAN ASSOCIATION FOR CANCER EDUCATION PRESIDENT-ELECT

Dr. Ewa Szumacher



We are pleased to announce that Dr. Ewa Szumacher has been elected the President of the American Association for Cancer Education (AACE). Dr. Szumacher is an Associate Professor in the Department of Radiation Oncology and Staff Radiation Oncologist at the Odette Cancer Centre, specializing in radiation treatment of breast and genitourinary malignancies.

“I am very proud and humbled to be recognized as a Canadian, to be selected for this great honour, to serve as the President for this prominent cancer education organization,” says Dr. Szumacher. She has been a member of AACE since 2009 and has served for several years as an AACE Executive Council Member.

As President, Dr. Szumacher expressed her enthusiasm to collaborate with her American and global colleagues. She also hopes to develop a more global connection with the European Association for Cancer Education (EACE) and the African Organization for Research and Training in Cancer (AORTIC). Current UTDRo collaborations include American Society for Radiation Oncology (ASTRO), ESTRO Cancer Foundation (ECF), Union for International Cancer Control (UICC), and the European Association of Cancer Education (EACE), and Dr. Szumacher foresees many more opportunities for further partnerships.

“Education is very important and education matters,” she says. “I hope that this honour will increase inter-professional interest in medical education amongst our trainees in radiation oncology, radiation therapy, medical physics, and other health care providers.”

One of Dr. Szumacher’s top priorities includes partnerships with her colleagues from another organization to develop an Essential Skills in Cancer Education course. The goal is to offer this pre-conference leadership course to international leaders with participation from AACE members in Krakow, Poland in March 2020. This will help to enhance the relationship between European and American centres.

Dr. Szumacher hopes that her role will also encourage more collaboration between UTDRo with the AACE, working together as an inter-professional team in radiation oncology, perhaps with UTDRo members mentoring junior AACE members.

Dr. Szumacher emphasizes that it is very important that UTDRo has a collaborative environment, and for mentors to support the department. She has a personal experience of the importance of mentorship: “I was very privileged that I had so many mentors within UTDRo to support me in my education interests and roles,” she explains. “I particularly would like to thank Dr. Pamela Catton, who was the Professor and Vice Chair, Education when I started as a member of UTDRo, because she was a true role model for me, and she sparked this interest in higher education.”

Dr. Szumacher’s advice to new radiation medicine professionals is to be passionate, to work hard, and to be sensitive and open-minded to other people’s ideas while believing in your own interests. In her new role as President, AACE, UTDRo looks forward to Dr. Szumacher’s continued leadership and guidance of education within radiation medicine.

ALUMNI FEATURE

Dr. Tomas Merino

Dr. Tomas Merino was a Clinical Fellow at UTDRO from 2014 to 2015. He currently works as a Staff Specialist Radiation Oncologist, and Assistant Professor at the Pontificia Universidad Católica de Chile, in Santiago, Chile. “Those two years at UTDRO were a radical change, and an eye opening experience to an unknown academic world with an environment prepared to give all the opportunities,” said Dr. Merino.

His clinical interests are in genitourinary (GU) and breast cancers; his areas of training during his fellowship at Odette Cancer Centre. He is currently undertaking a master’s degree in medical and health science education at the Pontificia Universidad Católica de Chile. His project focus is on barriers and facilitators for clinical research by medical residents of different programs in developing countries.

Dr. Merino is fully active in training radiation oncologist residents, medical oncology, the specialties, and the undergraduate students at the Pontificia Universidad Católica de Chile. He has been nominated as the academic delegate of the Chilean Radiation Oncology Society for his work in developing consensus guidelines for radiation treatment of different cancer sites, and will reorganize the Chilean Radiotherapy Board to certify radiation oncologists who have been trained abroad.

Most recently, Dr. Merino has been tapped to work with the Chilean health ministry on the implementation of a recently presented national cancer plan. Chile is facing a major shift in epidemiology with longer life expectancies, associated with an increasing cancer incidence, which will be challenged by limited resources and training capacity in the country.

Dr. Merino shared, “My major challenge today is to be able to provide the human resources for the national cancer plan and to develop an effective strategy.” He will aim to continue working with local Chilean universities, hospitals, non-governmental organizations, and the health ministry to maximize training capacity.

Dr. Merino has also been working to improve access to radiotherapy through the country as most of the radiotherapy departments are located in Santiago, the capital of Chile, and he has started a multi-centered prospective hypofractionated radiotherapy trial for patients with locally advanced breast cancer. His clinical research focuses on developing strategies to improve early detection of cardiac damage from thoracic radiotherapy for breast, lung and other primaries. “We have established collaborations with the faculties of engineering and physics, and the cardiology department, and are expecting good news for joint cardio-oncology in the near future.”

UTDRO and the experience in Toronto continue to shape Dr. Merino’s approach in Chile, and his UTDRO supervisors look forward to monitoring his career successes.



UTDRO FACULTY MEMBERS 2018 - 2019

(As of September 30, 2019)

PROFESSORS

Lisa Barbera
Andrea Bezjak
James Brierley
Charles Catton
Edward Chow
Bernard Cummings
Gregory Czarnota
Laura Dawson
Anthony Fyles
Maria Gospodarowicz
(University Professor)
Richard Hill (Emeritus)
David Hodgson
David Jaffray
Normand Laperriere
Fei-Fei Liu
Andrew Loblaw
Michael Milosevic
Brian O'Sullivan
Eileen Rakovitch
A Michael Rauth (Emeritus)
Jolie Ringash
Arjun Sahgal
Gillian Thomas (Emeritus)
Richard Tsang
Alex Vitkin
Padraig Warde
Chong Shun Wong
Rebecca Wong
Bradly Wouters

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Patrick Cheung
James Chow
Peter Chung
Hans Chung
Catherine Coolens
Meredith Giuliani
Zain Husain
John Kim
Marianne Koritzinsky
Stanley Liu
Barbara-Ann Millar
Gerard Morton
Geordi Pang
Lawrence Paszat
David Payne
Thomas Purdie
Ananth Ravi
Tara Rosewall
Alexander Sun
Ewa Szumacher
May Tsao
Yee Ung
John Waldron
David Wiljer

ASSISTANT PROFESSORS

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Steven Babic
Elizabeth Barnes
Aisling Barry
Andrew Bayley
Alejandro Berlin
Anthony Brade
Scott Bratman
Stephen Breen
Lee Chin
John Cho
Young-Bin Cho
William Chu
Brige Chugh
Lorraine Courneyea
Tim Craig
Jennifer Croke
Melanie Davidson
Jay Detsky
Lisa Di Prospero
Colleen Dickie
Elysia Donovan
Matthew Follwell
Warren Foltz
Caitlin Gillan
Adam Gladwish
Ezra Hahn
Kathy Han
Nicole Harnett
Joelle Helou
Lori Holden
Andrew Hope
Sophie Huang
Mohammad Islam
Irene Karam
Fatma-Zahra Kassam
Brian Keller
Harald Keller
Luluel Khan
Anthony Kim
Anne Koch
Renee Korol
Grace Lee
Young Lee
Daniel Letourneau
Eric Leung
Wilfred Levin
Winnie Li

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Brian Liszewski
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Andrea McNiven
Douglas Moseley
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Moti Paudel
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Alexandra Rink
Danielle Rodin
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Arman Sarfehnia
David Shultz
Katharina Sixel
Hany Soliman
Teodor Stanescu
Tony Tadic
Amandeep Taggar
Kieng Tan
Mojgan Taremi
William Tran
Derek Tsang
Eric (Chia-Lin) Tseng
Michael Velec
Danny Vesprini
Douglass Vines
Robert Weersink
Woodrow Wells
Matthew Wronski
Collins Yeboah
Ivan Yeung
Beibei Zhang

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Jette Borg
Renate Bradley
Angela Cashell
Kitty Chan
Charles Cho
Daria Comsa
Tatiana Conrad
Laura D'Alimonte
Jane DeRocchis
Louis Fenkell
Carina Feuz
Marisa Finlay
Robert Heaton
Juhu Kamra
Valerie Kelly
Vickie Kong
Jidong Lian
Rosanna Macri
Merrylee McGuffin
Karen Moline
Sarah Jane Rauth
Raxa Sankreacha
Senti Senthelal
Anna Simeonov
Julia Skliarenko
Christiaan Stevens
Tiffany Tam
Jonathan Tsao
Angela Turner
Yongjin Wang
Jason Wong
Frederick Yoon
Jasper Yuen
Grace Zeng

INSTRUCTORS

Martin Chai
Krista Dawdy
Darby Erler
Wendy Flanagan
Marc Potvin
Joe Presutti
Aisha Sheikh

UTDRO TRAINEES 2018 - 2019

(July 1, 2018 to June 30, 2019)

FELLOWS

Lulwah Abduljabbar
 Yasir Alayed
 Soha Atallah
 Andrew Bang
 Astrid Billfalk-Kelly
 Ahmad Bushehri
 Gemma Corey
 Archya Dasgupta
 Jay Detsky
 Ahmed Elamir
 Chin Heng Fong
 Hamza Ghatasheh
 Meetakshi Gupta
 Farimah Hadjilooei
 Ezra Hahn
 Yaser Hasan
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 Lisa Joseph
 Laurence Kim
 Pernille Lassen
 Ning Ning Lu
 Jelena Lukovic
 Kevin Martell
 Lucas Mendez
 Fabio Moraes
 Timothy Nguyen
 Avinash Pilar
 Hamid Raziee
 Noelia Salgado
 Nasim Sarhan
 Ananthan Thangaroopan
 Raymond Wu

PHYSICS RESIDENTS

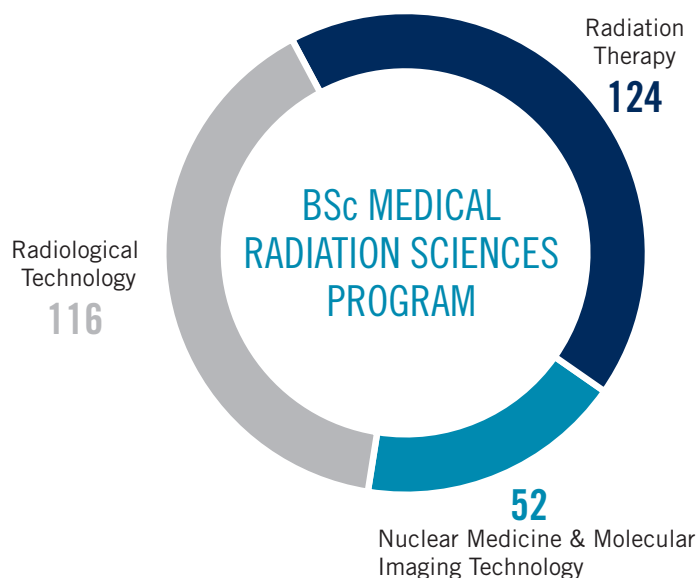
Syed Bilal Ahmad
 Joel Beaudry
 Leigh Conroy
 Eric Da Silva
 Viktor Iakovenko
 Lee MacDonald
 Victor Malkov
 Daniel Markel
 Kelly McPhee
 Edward Taylor
 Jason Vickress
 Jeffrey Winter
 Shima Yaghoobpour Tari
 Roja Zakariaee

RADIATION ONCOLOGY RESIDENTS

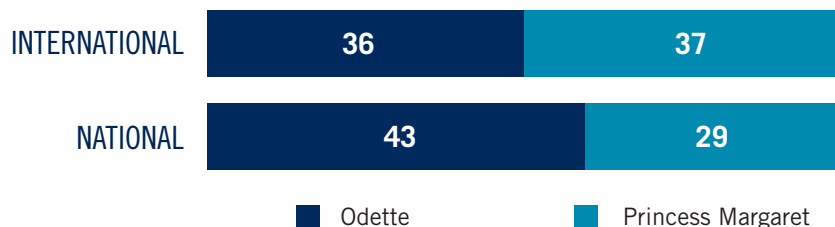
Aishah Alqaderi
 Abeer Alsuwailem
 Adrian Cozma
 Rachel Glicksman
 John Hudson
 Dana Keilty
 Lama Khoja
 Jennifer Kwan
 Minha Lee
 Gordon Locke
 David Mak
 Nauman Malik
 Aruz Mesci
 Amir Safavi
 Badr Id Said
 Marissa Sherwood
 Michael Tjong
 Indu Voruganti
 Yonatan Weiss
 Kang Liang Zeng

MHSc MRS STUDENTS

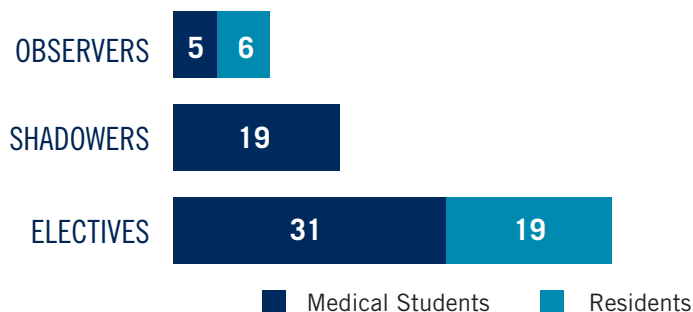
Joanna Javor
 Natasha McMaster
 Winter Spence



TOTAL OBSERVERS



TRAINEE OBSERVERS



*Princess Margaret Cancer Centre & Odette Cancer Centre

DONOR RECOGNITION

(Last five years as of September 30, 2019)

CHAMPIONS

(\$25,000 or more)

AstraZeneca Canada Inc.
Bristol-Myers Squibb
Pharmaceutical Group
Elekta
Fei-Fei Liu & Richard Wong
Merck Canada Inc.
Radiation Oncologists - Princess
Margaret Cancer Centre
Royal Victoria Regional Health
Centre
Southlake Regional Health Centre
Stronach Regional Cancer Centre-
Radiation Oncology
Sunnybrook Radiation Oncology
Association
Trillium Health Partners
Varian Medical Systems

PARTNERS

(\$5,000 to \$24,999)

abbvie
AMGEN
Apobiologix
Apotex Incorporated
Astellas Pharma Canada Inc.
Bayer
Boehringer Ingelheim (Canada)
Ltd.
CAMRT
Bernard J. Cummings
Ferring Pharmaceuticals
Michener Institute of Education at
UHN
Pfizer Canada Inc.
Raysearch
Sanofi
Takeda Canada Inc.

TerSera Canada
Vision RT
Rebecca Wong
Shun Wong

SUPPORTERS

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

Evan Donohue
Hoffmann-La Roche Ltd.
Michael Milosevic
Felicia Morrison
The Royal Canadian Legion -
General Wingate Branch 256
Jacqueline A. Spayne
Padraig R. Warde

FRIENDS

(Up to \$999)

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Madhuker Akula
Dorothy Olano Andres
Cynthia Bettcher
Marilynn G. Booth
Steven Boyle
Edward Carson
Nattaya Chaimahawong
Philip Chan
Andrea Charlesworth
Sulin C. Cheng
Patrick Cheung
Christopher Chipman
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Lee Gowan
Ciaran Graham
Lihua Gui
Kathy C. Han
Denise Hansen
David C. Hodgson
Sidduarth Jolly

Akua N. Joseph
Gabrielle M. Kane
Fatma-zahra A. Kassam
Sheikh Sadi Khan
John Kim
Srivindhya Kolluru
Salman Kureishy
Christopher Leighton
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Simon S. Lo
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Eva Lum
Hasan Mahbub
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Julie Mauti
Samantha Mihalj
Ecaterina Minstreau
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Almira Mun
Alan M. Nichol
Mark R. Niglas
Marianne Patterson
Barbara Petersen
Valerie Peticca
Mircea Pilaf
Daniele Pinese
Srinivas Raman
Hanna Rashid
Sarah Rauth
Rachit Rohan
Stuart M. Rose
Seemein Saquib
Philip Schalm
Susanna Sellman
Mark G. Shaw
Pritan Shrestha
Nory Sibbery
Rebecca R. Smith

Luis Souhami
Christiaan M. Stevens
Trevor J. Stiner
Alina-Emiliana Sturdza
Lue Ann Swanson
Richard Tsang
Danny Vesprini
Roxana Vlad
Horia Vulpe
Carmen Wong
Hsin-Li S. Yuan Hunter
Amena Zafar
Rena R. Zhang
Emily Zhou
Peggy X. Zhu
Luba Zisser

SAVE THE DATE

RTi3 CONFERENCE 2020



May 29th & 30th, 2020 from 8:00 a.m. until 5:00 p.m.

RTi3 is Canada's premier annual meeting for the Radiation Therapy community hosted by the University of Toronto's Department of Radiation Oncology. RTi3 is committed to advancing the science and practice of Radiation Therapy, showcasing the latest research and clinical innovations.

TARGET INSIGHT 2020



Big Data: A Paradigm For Change

June 11th & 12th, 2020 from 8:00 a.m. until 5:00 p.m.

Target Insight is an annual conference for Radiation Medicine teams including oncologists, physicists, therapists, nurses, radiation scientists and trainees. As radiation medicine becomes increasingly specialized, critical learnings and breakthrough in one area may go unrecognized in a different area. Target Insight will highlight some recent innovations in Radiation Medicine. Participants will explore the most recent evidence driving change, and the barriers and enablers in translating evidence into practice.

For more information visit: radonc.utoronto.ca/continuing-education

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Radiation Oncology
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