

BOUNDEDLESSVISION

DEPARTMENT OF RADIATION ONCOLOGY ANNUAL REPORT 2012 -2013



Radiation Oncology
UNIVERSITY OF TORONTO

VISION

EXCELLENCE AND LEADERSHIP IN RADIATION MEDICINE RESEARCH
EDUCATION AND CLINICAL PRACTICE

MISSION

TO ADVANCE THE SCIENCE AND PRACTICE OF RADIATION MEDICINE

ANNUAL REPORT 2012 - 2013

Images: Donna Santos

(Chris Parker Image: Royal Marsden Hospital)

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CHAIR'S WELCOME

DR. FEI-FEI LIU

It is my pleasure to the present the University of Toronto's Department of Radiation Oncology (UT DRO) Annual Report for 2012 - 2013. It has been a great year at UT DRO, and we have continued our path of excellence in education, research, and clinical practice.

We welcome three new members to our faculty - Dr. Meredith Giuliani, Dr. Sarah Rauth, and Dr. Hany Soliman - and congratulate two faculty members on their promotion. Dr. Ewa Szumacher was promoted to the rank of Associate Professor, and Dr. Jolie Ringash was promoted to Full Professor. Our faculty has continued to contribute to research and education, receiving major peer-reviewed funding, and being honored with several national and international awards, such as Dr. Mary Gospodarowicz receiving both a Lifetime Achievement Award from ESTRO, and delivering the Janeway Lecture for RSNA.

Congratulations to Dr. Gregory Czarnota as the new Chief of Radiation Medicine at the Odette Cancer Centre, and Dr. Andrea Bezjak as the new Director of Clinical Programs in Radiation Medicine at the Princess Margaret Cancer Centre.

Our UT DRO continues to offer a broad range of education programs and events. Specifically, the RTi3 Conference welcomed a record number of 195 attendees from all around the globe; similarly, Target Insight VII had 181 attendees.

For our Master of Health Science in Medical Radiation Sciences, this was the first year to implement a distributed learning format, or distance learning, which has proven to be successful. In addition, our faculty has been working diligently at redesigning the Nuclear Medicine and Molecular Imaging Technology stream in our undergraduate MRS program, aiming to execute this new and innovative program for the fall of 2014.

This year, we also started to execute our Alumni Engagement; the first initiative was the establishment of the Dr. B. J. Cummings Award for Research Excellence by a UT DRO Trainee, in honour of our Inaugural Chair. In the years to come, we hope to be able to engage as many members of our alumni community as possible.

My sincere thanks to my Vice-Chairs: Drs. Pamela Catton, David Jaffray, and Shun Wong for their invaluable assistance during my first year. With their continued commitment and dedication, they have been tremendously helpful in advising me in leading our Department to success. I am also deeply grateful to our new Business Manager, Evan Donohue, who has ably re-located our UT DRO Office, in addition to streamlining many of the processes within our office.

I encourage you all to browse through this Annual Report. In the coming year, I plan to refresh and execute our Strategic Plan with everyone's engagement in our UT DRO community, to help us all in achieving our Vision of global leadership in radiation oncology by transforming practice through innovation and excellence in research and education.

Thank you,

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

VICE CHAIR REPORTS

CLINICAL AFFAIRS

DR. SHUN WONG

VICE CHAIR, CLINICAL AFFAIRS



EDUCATION

DR. PAMELA CATTON

VICE CHAIR, ACADEMIC AFFAIRS



RESEARCH

DR. DAVID JAFFRAY

VICE CHAIR, RESEARCH



The Vice-Chair for Clinical Affairs is responsible for policy and program issues related to relations with clinical sites and faculty. In this portfolio, he oversees appointments, three-year reviews, and academic promotions of members of UT DRO, and ensures that the recruitment and clinical manpower plan at the clinical sites is aligned with the academic plan of UT DRO.

New appointments between June 30, 2012 and July 1, 2013 included Dr. Meredith Giuliani, Dr. Sarah Rauth, and Dr. Hany Soliman. Radiation oncologists at Southlake, Credit Valley and Royal Victoria Hospital have been offered adjunct appointments to support their teaching and educational activities at their respective community affiliate hospitals.

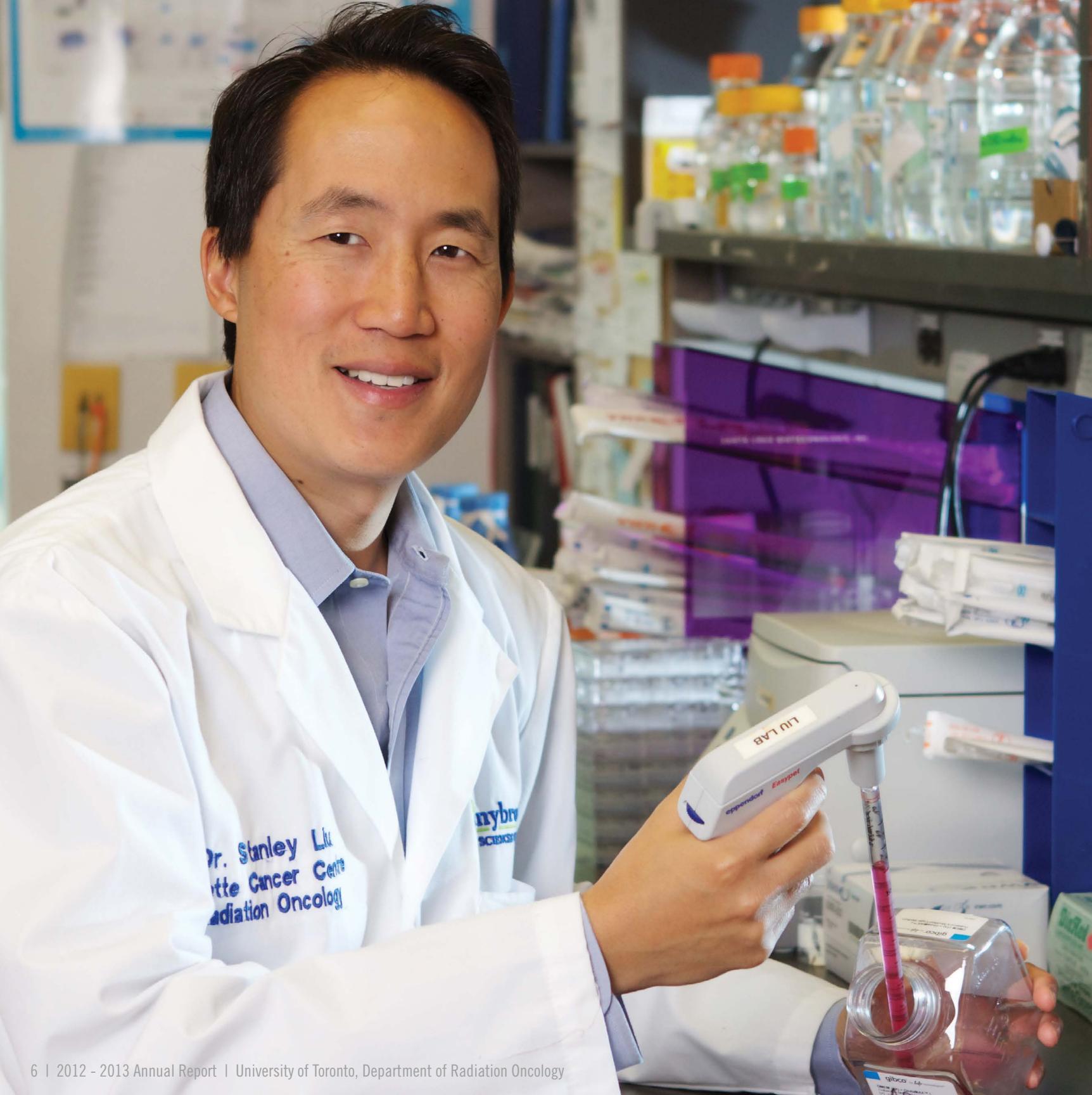
Congratulations are in order to Dr. Ewa Szumacher who was promoted to the rank of Associate Professor, and Dr. Jolie Ringash who was promoted to the rank of Professor.

The Vice-Chair for Academic Affairs is responsible for the oversight of all education activities in the Department. During 2012 - 2013, UT DRO education portfolios remained active and committed to quality education for radiation professionals and scientists alike.

- Dr. May Tsao completed her term as Director of Undergraduate Medical Education and a search was initiated for her replacement.
- Six different Transition-to-Residency Year-4 electives were added to the University of Toronto catalogue. These experiences target the interprofessional oncology needs of medical students who are seeking careers in surgery, family medicine as well as oncology. In 2012 - 2013, 27 medical students availed themselves of these opportunities.
- The Nuclear Medicine Program has been redesigned under a new name: Nuclear Medicine and Molecular Imaging Technology. This newly redesigned program will open in the fall of 2014.
- The core curriculum for the Radiation Oncology Residency Program was enhanced by the development and implementation of an imaging curriculum designed by an interprofessional faculty of therapists, physicists and radiation oncologists.
- The Radiation Oncology Physics Residency Program underwent successful re-accreditation through the Committee of Accreditation of Medical Physics Education Programs (CAMPEP).
- The MHScMRS developed a blended delivery format, harnessing the functionality of the Blackboard Collaborate platform that now includes distance education formats. The new extended full-time program will add maximum flexibility and encourage national and international applications.
- Dr. David Wiljer stepped down as Director of Continuing Education and Knowledge Translation, and Dr. Douglas Moseley assumed the leadership of this portfolio.

The UT DRO research program continues to strengthen in its performance as the premiere radiation oncology/medicine enterprise in Canada, and one of the major radiation research programs in the world. Research activities of the UT DRO faculty are distributed across multiple sites and have remarkable epicenters of strength – with leading programs in physics, basic biology, and translational science for clinical care. While, the Odette Cancer Centre (OCC) and Princess Margaret Cancer Centre are the two clinical sites that form the anchors for this work, it is evident that our smaller programs are also engaging in research activities. The recent UT DRO internal seed-grant competition highlighted the interest and capacity for a research topic to link institutions and challenge the faculty to propose research that will advance the field. This year's awardees were from an amazingly deep field of applications and should be very proud to have been chosen among the quality of applications submitted. It is also very exciting to see the youth involved in the grant submissions – clearly young faculty are the most collaborative!

The strategic plan of the Department provides a backbone upon which we can build our vision for the Radiation Oncology program of the future. Progress can be seen in the many domains of the plan with new funding coming from various sources. Overall, I am proud to be part of such a strong, dynamic Department with continued gains in academic achievement. This coming year will be exciting with many new collaborations emerging across the institutions that promise to take us to the next level.



STANLEY LIU

THRIVING IN THE WORLD OF CANCER RESEARCH

Dr. Stanley Liu, Clinician-Scientist at Sunnybrook Research Institute (SRI), and Assistant Professor in the Department of Radiation Oncology at the University of Toronto (UT DRO), is no stranger to the world of research. After receiving his PhD from the Department of Medical Biophysics at the University of Toronto (U of T), he commenced medical school at U of T. Following his residency, Stanley joined University of Oxford's Gray Institute for a post-doctoral research fellowship in radiation oncology.

Stanley is always quick to credit his mentors for guiding him into the world of radiation oncology. Dr. Pamela Catton, Vice-Chair of Academic Affairs and Professor with UT DRO, and Dr. Woodrow Wells, Assistant Professor at UT DRO, were the key influences who helped demystify the world of radiation oncology for him. Furthermore, he found role models in Clinician-Scientists including Dr. Robert Bristow, Professor of Medical Biophysics and Radiation Oncology at the University of Toronto, as well as Dr. Fei-Fei Liu, Professor and Chair of UT DRO. "My ultimate career path and development was unclear before my residency," Stanley recalls. "With Rob Bristow's mentorship, I found my path. It was Rob who suggested that I do a post-doc in England at the Gray Institute."

At Sunnybrook, Stanley and his colleagues are focused on two areas of research, both with the potential to strongly affect cancer treatment. The first area of his research involves microRNAs, small bits of genetic material that can regulate the expression of downstream genes. Stanley's team is identifying novel microRNAs and examining how they promote radiation resistance in cancer cells. By studying cells that have survived after being exposed to long periods of radiation, Stanley has been able to deduce that microRNAs not only increase radiation resistance in the cells, but also trigger aggressive behaviour. Branching out from this research, Stanley is collaborating with another Assistant Professor at UT DRO, Dr. Danny Vesprini, to evaluate microRNAs, and their ability to help with detecting aggressive or radiation-resistant prostate cancers. Therefore, by using microRNAs as predictive biomarkers for radiation-resistant or aggressive cancers, Stanley's research will allow patients to receive personalized care.

Left: Stanley Liu

"I think this is very exciting. It shows that indeed, we can use radiation-resistant cells to identify these microRNAs," explains Stanley. "And even a single microRNA can have a profound effect on a cancer cell's ability to resist radiation." He adds that this research is still in its infancy, and there is much more work to be done. Ultimately, his aim is to be able to neutralize different microRNAs in cancer cells in order to re-sensitize them to radiation. Although this may be technically challenging today, Stanley feels that it is a promising area of research.

The second area of research focus for Stanley is the Tie2 pathway, a receptor which has been proven to be important in maintaining the integrity of blood vessels. Through a partnership with Dr. Dan Dumont, a senior scientist at the SRI, Stanley's team is hoping to use a Tie2 pathway drug to decrease skin toxicity from radiation. This drug has been proven to effectively repair diabetic wounds in mice. Stanley and his graduate student Elina Cook are investigating whether this drug can be used to prevent certain late effects of radiation.

Like the microRNA research, Stanley's Tie2 pathway research also has far-reaching potential to impact many patients world-wide. Stanley notes, "So far, decreasing radiation toxicity has largely been through technology and not biology. If we can target the Tie2 pathway, we may achieve further improvements in survivorship by minimizing toxicity."

Stanley adds that his mentors have helped immensely. "It was very helpful to have mentorship and support from clinician-scientists and clinicians in UT DRO. This continues to be an essential factor today." As an Assistant Professor, he adds, "One of the great things about radiation oncology at U of T is that it is a highly academic program that promotes the training of residents and graduate students – we are driving ahead the development of effective translational researchers."

BOUNLESS DISCOVERY



ALEJANDRO BERLIN

PASSING THROUGH AND LEAVING AN IMPACT

Few people can claim to have worked on three different continents; fortunately for Dr. Alejandro Berlin, he is one of them. Alejandro moved to Toronto in January of 2013 to begin his clinician-scientist fellowship training in radiation oncology at the University of Toronto and Princess Margaret Cancer Centre. He is also doing graduate work with the Institute of Medical Science.

Born and raised in Chile, Alejandro graduated medical school with high honors and was elected valedictorian of the year. After training in radiation oncology at Clinical Alemana de Santiago, he moved to Israel for a two-year fellowship. During his fellowship at Tel HaShomer Hospital, his father was diagnosed with cancer, motivating him to move back to Chile in 2009 and take up a staff position at the same centre at which he completed his residency.

As he found himself at a professional cross-road, Alejandro decided to take a leap-of-faith and moved to Toronto with his family. Settling into a new country was a challenging and interesting experience for Alejandro, his wife, and his two children. It took some time to adapt to the city, and to learn its dynamics, but now they are enjoying their time here. Being away from their extended family in Chile has

Left: Alejandro Berlin

been tough. Therefore, Alejandro has been ensuring that he spends quality time with his family, especially after work when he is able to spend time with his two children until their bedtime.

Moving to Toronto was a self-imposed challenge for Alejandro. Having already been to Toronto in 2009 for an observership at the Department of Radiation Oncology, he was impressed with the work being done at the Princess Margaret Cancer Centre, and felt that this centre would be the right place to help him with the next step in his career. “Most of my training until now was clinical,” he explained. “Since medical school, I was involved in research projects, but I never had protected time to devote to research. In coming here, my vision was to focus on research.” He wanted to test himself and see if he could be a good researcher or clinician-scientist.

These two years he will spend as a Clinician-Scientist Fellow will be his tipping-point, and help him decide what he will do in the future. Alejandro is not rushed to take a decision: “Like wine, my Chilean bias, you have to allow it to breathe before tasting its real flavor. In the same way, the decision I take will be different depending on when I make it. So I will wait to experience this for a period, and only then will I decide my future career-path.” Having recently won a Canadian Urological Oncology Group (CUOG) Research Award and The Terry Fox Foundation Strategic Training Initiative for Excellence in Radiation Research for the 21st Century (EIRR21) at CIHR Award, Alejandro already has confirmation that this was a good move.

FOR REACHING THE BEST RESULTS IN A HOMOGENOUS FASHION, THERE IS A NEED AND BEAUTY IN APPRECIATING THE HETEROGENEITY OF THE PATH

For his MSc degree, Alejandro is focusing on translational research. As part of his main project, he is examining DNA damage response and repair as a prognostic or predictive markers for prostate cancer. This research is part of the International Cancer Genome Consortium (ICGC), a large global collaboration led by Dr. Robert

Bristow from UT DRO. As part of this group, Alejandro is characterizing prostatic tumor samples from patients treated with radiotherapy, in order to develop a DNA-based signature which will help predict how the patient will do after treatment. “In a nutshell,” explains Alejandro, “the goal is to have more accurate prognostication of treatment results, and potentially exploit defects in DNA repair using targeted therapies to overcome negative prognostic features, and improve treatment outcomes for the patients.”

For this research, Alejandro is working under the mentorship of Dr. Bristow, Professor in the Department of Radiation Oncology at the University of Toronto, Radiation Oncologist at the Princess Margaret Cancer Centre, and Clinician-Scientist at Ontario Cancer Institute. “Rob is extremely energetic and fully devoted to his role as a Clinician-Scientist and as a mentor,” Alejandro says. “There is a lot to learn from him, and I am in a privileged position as I am exposed to infinite amounts of knowledge, opportunities, and challenges.”

Similarly, he has been enjoying the company of the other fellows. “We are all struggling with professional and personal challenges, and are in the same situation more or less. We are like a family,” he explains. In the future, Alejandro is sure he will maintain contact with his fellow trainees, and establish a network for future cooperative research efforts.

In addition to the breadth of knowledge at the Princess Margaret Cancer Centre, Alejandro observes an inherent heterogeneity that is unique to the centre. He chose radiation oncology because of its multidisciplinary and collaborative nature, and finds Princess Margaret Cancer Centre to possess similar qualities on account of its multidisciplinary nature, and its practice of welcoming staff from all over the world. Alejandro explains further:

“There is a tendency nowadays to push for homogeneity. A close example is how we strive to give every patient the same best results in personalized medicine. But I think part of the paradox is to embrace the heterogeneity in the different parts and processes. For reaching the best results in a homogenous fashion, there is a need and beauty in appreciating the heterogeneity of the path. I see that at Princess Margaret, and will embrace it for the rest of my life.”



Above: Fei-Fei Liu

FEI-FEI LIU SHAPING THE FUTURE OF THE DEPARTMENT

If the University of Toronto is searching for a model alumnus, Dr. Fei-Fei Liu fits the bill. A brilliant researcher within radiation oncology, an engaged and passionate faculty member, and a strong leader as the Chair of University of Toronto's Department of Radiation Oncology (UT DRO), Fei-Fei has added many achievements to her name since graduating from U of T medical school in 1980.

Prior to accepting a staff position as a Clinical Radiation Oncologist at the Princess Margaret Hospital in 1988, Fei-Fei trained in internal medicine and radiation oncology in Toronto, and attended Stanford University for a clinical research fellowship. At Stanford, Dr. George Hahn, the grandfather of hyperthermia biology, introduced Fei-Fei to lab research, and kick-started her lifelong passion for research.

Not having a PhD, Fei-Fei learned how to do research on the job. She explains how she picked up invaluable skills: "I was very

fortunate to have had really kind, patient, and inspiring mentors who took me under their wings and mentored me on everything ranging from doing the research to writing the papers and applying for grants." These mentors, Drs. Richard Hill, Michael Rauth, Gordon Whitmore, Victor Ling and Ian Tannock, have all helped Fei-Fei form a strong foundation upon which to build her research career.

In addition, UT DRO's Inaugural Chair, Dr. Bernard Cummings, was also instrumental in guiding Fei-Fei's career. In the late 1980s, Clinician-Scientists in radiation oncology were unheard of; as Fei-Fei explains, "I was a clinician who did research in the evenings and on weekends. Bernard Cummings recognized the value and importance of basic research and guided me in terms of making sure that I had protected time to do research."

Dr. Shun Wong, Professor and Vice-Chair of Clinical Affairs at UT DRO, was also an important person in Fei-Fei's career trajectory. Lab partners for 12 years, they provided each other with mutual

BOUNLESS LEADERSHIP

moral support, along with intellectual and financial help. “Our research was complimentary, but not a direct overlap or a competition,” Fei-Fei recalls. “And that mutual support – going through this together – was our saving grace. It was a hard road to go on, especially on your own. So this partnership was really important for me.”

Fei-Fei’s research has spanned from hyperthermia to gene therapy; from biomarker discoveries to novel therapeutics. She is glad to have been able to contribute to the world of cancer biology:

“I feel that cancer research is like a pointillism picture where every single dot is a piece of important knowledge. Initially, you may not know what the dots represent, but as the dots increase and the colours begin to define themselves, a shape takes place and you realize what the whole picture is. I like to think of cancer as a canvas, and I believe that this canvas is now 80% full.”

Breast cancer research has been a focus of collaboration between Fei-Fei and UT DRO Professor Dr. Anthony Fyles; specifically a subtype of breast cancer called luminal A which constitutes approximately 25% of all newly-diagnosed breast cancers in North America every year. Fei-Fei explains that over a decade ago, Anthony asked an important, high-impact question that did not have an answer at the time: “Does everybody need breast radiation?” Over the last decade, technological advances coupled with new knowledge about luminal A have helped reveal the answer. Through simple immunohistochemistry (IHC) tests, her team was able to identify which patients could potentially avoid unnecessary treatment and toxicity. Fei-Fei estimates that the results of research will save the province and its medical systems between \$8M and \$10M annually. Needless to say, this research will have a significant impact on research and treatment globally.

Fei-Fei has also played a leading role in biomarker research in head and neck cancer. Through a partnership with The Cancer Genome Atlas (TCGA), Fei-Fei and a team of researchers are conducting next-generation sequencing for patients with head and neck cancer, and proposing to examine whether these molecular aberrations have predictive value in radiation therapy. “Taking the top molecular aberrations identified from the next-generation sequencing, we will look at the clinical impact of these molecular markers,” explains Fei-Fei. “If we are able to identify the top 20 molecular aberrations and find that the pattern of these 20 genes will predict the outcome after head and neck radiation, then we can look at how to utilize those 20 molecular signals and categorize risk for our patients.” The impact of this research, once completed,

may help personalize treatment for patients, identifying those that will do well after treatment and those that will require additional therapy.

On the novel therapeutics side, Fei-Fei’s research began with a PhD student she was supervising. “Emma Ito had discovered a new target, uroporphyrinogen decarboxylase (UROD), that we think is potentially useful to combine with radiation to sensitize cancer cells to the effects of radiation.” Her team has filed a patent for UROD, and her lab is currently designing drugs that can target UROD. However, Fei-Fei admits, being a lab, developing such a drug is an uphill challenge.

Having seen radiation oncology grow as a profession over the past 25 years, Fei-Fei predicts that the future of radiation medicine is going to create hybrid radiation oncologists with multi-disciplinary backgrounds:

“They will be integrating the human patient and all of their complexities, and merge that human information with what I call the ‘-omic’ information, which is a combination of genomic and proteomic information, then integrate that further with imaging data, to develop personalized algorithms for our future cancer patients, who will be cured, with reduced toxicities. For this, we will need physicians who can understand the languages of each of those fields.”

Having been Chair of UT DRO for a year, Fei-Fei has successfully engaged UT DRO’s partners, stakeholders, and the University community. “The first year is learning about the landscape and the operations within the department, and then engaging the community,” she explains. “The coming year will be about strengthening a sense of purpose in the community as a whole.”

Fei-Fei recognizes that UT DRO is a small department with a wide reach, and acknowledges that “both Dr. Mary Gospodarowicz and Dr. Bernard Cummings, previous Chairs of our department, have laid a solid foundation as a community, and built a powerhouse of innovation.” In the next nine years as Chair, Fei-Fei plans to achieve that vision of producing hybrid radiation oncologists who will be able to integrate information from multiple disciplines. She sees opportunities in clinical practice to increase collaboration within all of UT DRO’s partners through initiatives like a recently launched internal collaborative seed-grant. In the research and innovation realms, she hopes to guide UT DRO and its current faculty to develop novel algorithms that can be applied clinically. As a department, Fei-Fei strongly believes in the ability of UT DRO to continue to make a significant impact, and produce leaders in radiation medicine for the world.



Above: Chris Parker

UT DRO ALUMNUS PROFILE

CHRIS PARKER

KEEPING THE CANADIAN CONNECTION ALIVE THROUGH INNOVATIVE RESEARCH IN PROSTATE CANCER TREATMENT

Growing up in Cheshire, UK, Dr. Chris Parker had no idea that one day, he would be known as one of the world's leaders in oncology, or that this journey would begin in Canada. Chris studied medicine at world-renowned institutions including the University of Cambridge and the University of Oxford. After training in oncology at the Royal Marsden Hospital, Chris completed his clinical research fellowship at University of Toronto's Department of Radiation Oncology (UT DRO). He feels that his fellowship was a defining period of time in his career, as it directly flowed into the main areas of research that he is conducting today.

YOU NEED INTERNATIONAL COLLABORATION, AND THE PERSONAL FRIENDSHIPS THAT I BUILT IN TORONTO REALLY FACILITATED THAT COLLABORATION

It was during his time in Toronto that Chris discovered a path that has brought him many accolades and shaped his research in the UK: active surveillance for prostate cancer. In 2001, when he was completing his fellowship under the direction of UT DRO Professors Dr. Charles Catton and Dr. Padraig Warde, active surveillance of localized prostate cancer was a novel approach. It had become evident that not all patients diagnosed with localized prostate cancer needed treatment; active monitoring would ensure that those who did not require treatment would be able to avoid the procedures and their attendant side-effects. After returning to the UK, Chris pioneered this strategy as a method of targeting treatment to only those patients who required it. “This was a key direction for me, and it would not have happened had I not gone to Toronto.” The impact of this research has been immense. Today, this strategy is in the UK National Prostate Cancer Guidelines. According to data from the British Association of Urologic Surgeons, half of all men diagnosed with low-risk cancer in the UK choose active surveillance.

Keeping the Canadian connection alive, Chris is the chief investigator of RADICALS, a fitting acronym for Radiotherapy and Androgen Deprivation In Combination After Local Surgery. This is a 3000-patient international trial of post-operative radiotherapy after surgery to treat prostate cancer. Chris is collaborating with the National Cancer Institute of Canada on this research. He explains that trials of this nature are so large, they cannot be conducted in a single country. “You need international collaboration, and the personal friendships that I built

in Toronto really facilitated that collaboration.” On the Canadian side, Charles Catton, Professor and Director of the Fellowship Program at UT DRO, is the Canadian Principal Investigator. This collaboration is particularly appropriate, given that they worked together during Chris’s fellowship at the University of Toronto.

Possibly the most significant research of Chris’s career involves the use of radium-223 for the treatment of bone metastases. Over the last nine years, Chris has been leading the clinical development of radium-223 (an alpha particle-emitter) culminating in a 900 patient International Phase III Trial, including Canada of course. His research has confirmed that “radium-223 improves survival in prostate cancer; it is more effective and is extremely well tolerated with much less toxicity to the bone marrow as compared to the previously-utililized beta-emitter strontium-89.” This significant finding for prostate cancer treatment has been published this year in the *New England Journal of Medicine*, and has already led to FDA approval of the compound drug which is currently being utilized in the clinic.

Chris remembers his time in Toronto fondly, and feels that his career evolution would not have been possible without the exposure to the innovative research and world-renowned faculty at UT DRO. “I enjoyed my time in Toronto enormously. It was a very valuable experience; I developed some wonderful friendships and I would recommend this program to anybody.”



Above: Lori Holden

LORI HOLDEN PAVING THE WAY FOR RADIATION THERAPISTS

When Ms. Lori Holden first heard about radiation therapy at a job fair in Waterloo, Ontario, she could not have imagined the unique road this profession would take her on. Today, she is an Assistant Professor at University of Toronto's Department of Radiation Oncology (UT DRO), Associate Faculty Member at the Institute of Medical Science, and an Advanced Practice Radiation Therapist at Odette Cancer Center.

After completing her Bachelor of Science at the University of Waterloo, Lori headed to the Juravinski Cancer Centre (previously the Hamilton Regional Cancer Centre) for radiation therapy training. Following this program, she started working at Odette Cancer Centre initially as a floor therapist, and then specialized as a palliative radiation therapist.

At that time, patients with metastatic disease would often have to wait for weeks to receive treatment. In order to address this, in 1996, Sunnybrook Health Sciences Centre pioneered the Rapid Response Radiotherapy Program (RRRP), which allowed patients to receive expedited treatment. Lori was one of the first radiation therapists to work as an RRRP therapist. This program proved to be highly successful, and Sunnybrook has become a model for cancer centres around the world that wish to implement this approach in their hospitals.

This transition to RRRP was only the beginning for Lori's career. In an era when radiation therapy was not a research intensive discipline, Lori successfully defined a new research radiation therapist role for herself. In addition to clinical activities, her days now also included research. Because this was a new role,

MY ROLES WERE NEW AND I HAD NO DIRECTION IN ANY OF THE ROLES. IN THIS SITUATION, YOU HAVE TO BE OPEN TO FEEDBACK AND NOT TAKE THINGS PERSONALLY. YOU HAVE TO BE A SELF-STARTER, A SELF-MOTIVATOR, A 'GO-GETTER'

she felt that it would be challenging for the community to accept a therapist as a researcher leading international clinical trials. Therefore, Lori undertook further training via a Certified Clinical Research Professional (CCRP) designation, as it would provide greater depth for her research. To date, Lori is the only radiation therapist to carry the CCRP designation.

A decade after launching the Rapid Response Radiotherapy Program, Sunnybrook piloted yet another new program in Ontario: the Advanced Practice Radiation Therapist (APRT). This role allowed therapists to share in the responsibilities of physicians and nurses, in order to improve the patient experience. Lori was involved in the development of this program from its earliest days. As an integral participant in the RRRP, she was able to assess the feasibility, sustainability, and educational requirements of the new Advanced Practice role. With a team of researchers, Lori's research was collectively submitted to the Ministry of Health and Long Term Care, which funded the APRT pilot. Soon after, Lori was amongst the first therapists to become an Advanced Practice Radiation Therapist in Ontario.

As an APRT, Lori's responsibilities increased, and she was faced with a knowledge gap in the clinical setting.

"In the early stages, all I could do was shadow and learn from everyone that was around me. I tried to find necessary advanced level courses like imaging, image interpretation, patient communication, and patient assessment. In the beginning, it was about absorbing information and learning. And I found that the more knowledge I gained, the more responsibility and autonomy I was given."

Taking on the APRT role was not without its challenges. Being a new role, it had the potential to encroach on the different roles held by nurses and physicians. Lori found that "by developing a good relationship with them and making sure that they knew that we were all there to make sure the patient had the best experience," she was able to clarify the APRT role for the health care team. In addition, she faced the challenges of a scarcity of

advanced-level courses. Fortunately for future APRTs, the new Master of Health Science in Medical Radiation Sciences fills that gap and highlights advanced-level learning for practicing therapists.

Despite some challenges, the APRT role has been accepted and implemented at several centres across the province. Lori explains that the APRT role benefits all of the stakeholders:

"For therapists, it provides another avenue to strive for and improves job satisfaction and retention. For the department, there are numerous benefits. By giving the therapists more autonomy, you free up the physicians' time allowing them to focus on other aspects of patient care. Also, this results in cost savings for the department. Lastly, this role benefits the patients because they have direct contact with the APRTs, and can ask questions and find information directly."

Since the inception of the advanced practice role, the responsibilities for therapists in APRT roles have evolved, and this role requires Lori to adapt to the changing needs of the program. "The more knowledge that I have gained and the more that I have learned, the more confidence the doctors have had in me and given me more independence. This is very rewarding." With this independence, she has been able to take on further responsibilities including triaging patient referrals to the RRRP, handling patient histories and assessments, planning treatments, placing treatment volumes and fields. Furthermore, Lori will be initiating "last day reviews" starting this fall, as well as an outreach program.

Since 2006 when the APRT program was piloted, the department has continued to implement evidence-based practices, and the many new technologies. As a result, radiation therapists have also evolved and adapted. "The APRT role is exciting because you can tailor the role to best fit patients and the department's needs. You are able to emphasize your own strengths while being constantly challenged. It's very exciting."

Like Lori, therapists can take any direction they want provided that they are willing to adapt to the new roles. "You can't be afraid to jump into the fire. My roles were new and I had no predefined direction in any of the roles. In this situation, you have to be open to feedback and not take things personally. You have to be a self-starter, a self-motivator, a go-getter. You can't wait for people to tell you how to do things. There are always key mentors available to help and guide you, and you have to find them."

Lori is excited to continue her APRT journey, working tirelessly to improve the treatment experience for palliative patients.



Left to Right: Residents Jonathan Livergant and Jenna King

RM SLICE AN INTERPROFESSIONAL AND MULTIDISCIPLINARY WAY OF LEARNING

When you close a hospital for a day, and invite radiation therapists, radiation oncologists, medical physicists, and standardized patients to collaborate, the result is ingenious. In June of 2013, amidst the racket of a brachytherapy alarm, conversation about treatment plans, patient experience, and tumour contouring filled the otherwise quiet halls of Stronach Regional Cancer Centre in Newmarket, Ontario.

A team of researchers from University of Toronto's Department of Radiation Oncology (UT DRO) including Dr. Jean-Pierre Bissonnette, Dr. Meredith Giuliani, Ms. Nicole Harnett, Dr. Pamela Catton, Dr. Douglas Moseley, and Ms. Caitlin Gillan

THIS IS AN EDUCATIONAL TOOL THAT REALLY ENGAGED BOTH THE LEARNERS AND FACULTY TO VERY HIGH LEVELS, AND THAT OPENS UP NEW WAYS OF THINKING AND APPROACHING HUMAN BEHAVIOURAL EDUCATION

recognized the importance of interprofessional collaboration in radiation medicine, and the lack of such collaborations in current radiation medicine training. Therefore, with the goal of introducing “a team simulation experience which used technological, psychological and emotional fidelity,” they created RM SLICE. This event, the first of its kind world-wide, aimed to expose residents to high-fidelity, high impact, low acuity clinical situations.

Twenty-one residents from UT DRO participated in this unique event. These trainees were divided into five groups; each team comprised of radiation oncologists, radiation therapists and medical physicists. The groups were introduced to various simulations of real cases ranging from 4D CT scans of a lung tumour to dealing with a “stuck source” in brachytherapy.

Jean-Pierre Bissonnette, Associate Professor and Director of the Physics Education program at UT DRO, shared his vision for RM SLICE: “I was hoping to put to practice a high-fidelity simulation environment as a method to engage learners, and acquire and practice these skills in order to use this method for more advanced applications and research focusing on quality and patient safety.” The goal of this exercise was not to evaluate the participants on their knowledge or judgment, but to evaluate their interactions and interprofessional collaboration, in order to explore the feasibility and effectiveness of using high-fidelity simulations in radiation medicine training.

“From a more practical perspective as educators,” adds Caitlin Gillan, Assistant Professor at UT DRO and

Radiation Therapist at Princess Margaret Cancer Centre. “We felt that it would be interesting and valuable to bring together the trainees in our different UT DRO disciplines and clinical sites and engage them in ways that they do not get to experience in the course of their regular curricula.”

The researchers felt that there were some interesting and valuable outcomes from the study. Meredith Giuliani, Assistant Professor at UT DRO and Radiation Oncologist at Princess Margaret Cancer Centre explains, “We were able to conclude that interprofessional simulation in the radiation medicine context is feasible. We conducted a series of cases which were high fidelity, not only in their technological aspects, but also with respect to medical and sociological likeness to real cases.”

At the end of the day, the trainees felt that their communication with others in their team was improving with each new case. “We really benefitted from learning as a team because there are skills and knowledge that we get from other professions in radiation medicine,” explained Radiation Oncology Resident Jonathan Livergant. “This is one of the things that attracted me to oncology in the first place – it is a team effort”.

Jean-Pierre further explains, “This is an educational tool that really engaged both the learners and faculty to very high levels, and that opens up new ways of thinking and approaching human behavioural education.”



Left to Right: Residents Andrew Chiang, Tatiana Conrad, Eugene Hong, and Luluel Khan

PGY5 RESIDENTS GROWING AND LEARNING TOGETHER

Family, closest friends, colleagues, and fellow residents – these are the words that this year's outgoing Radiation Oncology Residents use to describe each other. Although all of the cohorts in the residency program grow to be good friends, Chief Resident Tatiana Conrad says, "We are an exceptionally unique year. They could not have found four personalities that fit better." The four outgoing residents, Tatiana Conrad, Andrew Chiang, Eugene Hong, and Luluel Khan, all came from different academic and professional backgrounds, yet they functioned as a tight-knit unit during their residency at the University of Toronto's Department of Radiation Oncology (UT DRO).

Eugene completed his undergraduate degree at Baylor University, and followed that with a joint medicine and law degree at The Ohio State University in Columbus, Ohio. His uncle, who also

trained as a resident at UT DRO, encouraged Eugene's decision to move to Toronto. Tatiana's undergraduate degree was in French studies. After spending a year in France, she switched gears and studied medicine at the University of Western Ontario.

Luluel and Andrew both completed their undergraduate degrees at the University of Toronto; Luluel in molecular biology, and Andrew in lab medicine paired with pathobiology. For medical school, Luluel went to St. George's University in Grenada, and Andrew went to McMaster University. After medical school, Andrew came to UT DRO because the residency program had a good reputation, and it was close to home. Coming from an international medical school, Luluel faced the biggest challenge out of the group in coming to UT DRO. She had to compete for the sole spot in all of Canada available to students of

THERE IS SOMETHING UNIQUE ABOUT THE PROCESS OF BEING HERE FOR FIVE YEARS, BECAUSE OF WHICH I FEEL CONFIDENT THAT THIS PROGRAM HAS TRAINED US TO BE EXCELLENT AT WHAT WE DO

international schools who wished to do a residency in radiation oncology. Despite their different academic backgrounds, each of the four residents arrived in Toronto having trained in medicine elsewhere.

Residency presents challenges on personal and professional fronts, especially the first few years when residents struggle to find a balance between their long hours and their personal lives. Tatiana, who was also busy raising two children under the age of two in her first year, had difficulty finding time to spend with them during their early years. Luluel, who also has children, agrees. “Commitment to your family and your spouse makes you constantly feel guilty,” she explains. “If you are a female with a child during residency, you feel that you are not doing enough and you are missing out on things, and so you try to over-extend yourself.”

On the other hand, Eugene, who moved to Toronto from Ohio, felt isolated during his first year. “The transition to residency was very difficult. We were working a lot of hours to begin with, and having my family far away, it was not an easy process to go through by myself.” He also found it challenging to spend time away from work. “When I am at home, I feel like I constantly need to be at work, or to be doing work, because I can’t come up with a good excuse not to be doing work.” Fortunately, Eugene’s fellow residents included him in their get-togethers and helped him step away from work. He jokes that “we are probably more involved with each other’s personal lives than we need to be.”

Over the five years of their residency, these trainees learned to adapt to the challenges and focus on their strengths with the help of a supportive group of friends, colleagues, and families. “A supportive spouse behind the scenes has been key for all of us,” Tatiana explained. “And the staff here is all very flexible and understanding.” Andrew found that in addition to a supportive family, playing sports like hockey and baseball helped him to take a mental break and focus on his priorities.

These residents form a close-knit support group. “We are our own little family in ourselves,” notes Tatiana. To illustrate how close they are, the group recounted a week in February where they travelled to Ottawa for a conference, and opted to stay in the same suite. They spent seven days together and enjoyed every bit of it. As Tatiana says, they came out “laughing and unscathed.”

Eugene adds that it is not always advisable to confide in coworkers, “but these are the people who see you every day and know you best, and only they can relate to you on certain levels like stresses at work. If we didn’t have each other, it would have been impossible to stay sane.”

Although all four of the residents are in the same year of their residency, their professional focii have been very different. Luluel has been interested in research since her second year. Her focus has been on palliative care and quality of life, and she has published several manuscripts and presented at national and international conferences. She adds, “It is really important to make a connection with the staff early on, so that you have a support system. They do care about the residents and they are there to help us navigate through the five years.”

Andrew found it challenging to enter the residency program with very little exposure to radiation oncology, and become an expert on the subject matter during his residency. In these five years, he not only mastered radiation oncology, but also developed research focusing on stereotactic radiation in spinal metastases and active surveillance of men with prostate cancer, and presented his findings nationally and internationally.

Similarly, Tatiana also pursued research, and has presented on the national and international stage. This helped her to find her focus, and after leaving UT DRO, she intends to work on quality of life research. Her training and her research have come together to define how she approaches the doctor-patient relationship. “When I look at a patient, it is not a textbook patient. It is an individual and that individual’s details are exceptionally important, but it is only through having a

solid foundation and understanding the principles that I can individualize the treatment to the patient. So learning the basics and the foundation are really important.”

Eugene, who will return to the United States for clinical practice after his fifth year, explains that they have all matured academically because the support of the program and its faculty. “There is something unique about the process of being here for five years, because of which I feel confident that this program has trained us to be excellent at what we do. We have great role models to show us what to do to become excellent in our field.”

Each of the four residents echoed that they feel very fortunate to train with some of the world’s most renowned faculty members. Luluel notes that “they take their time and invest their energy towards mentoring us, helping us grow, and navigating through the program.”

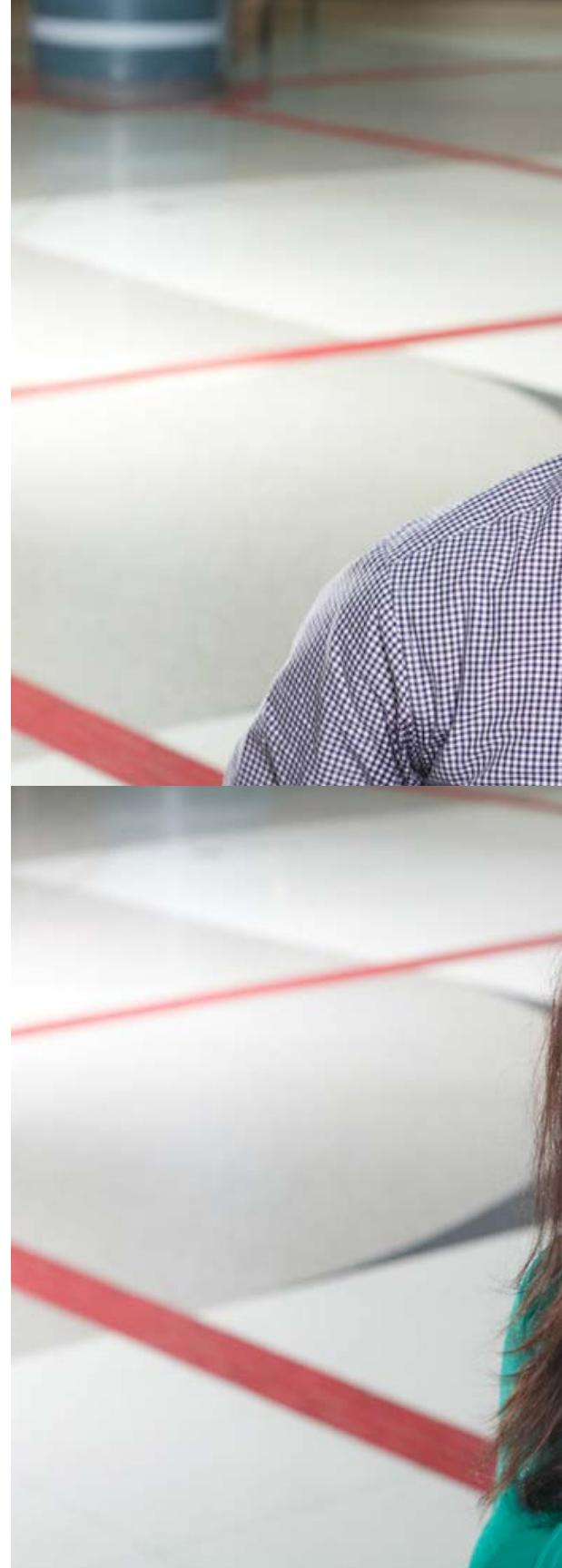
Andrew agrees with Luluel’s point, and adds that one of the best aspects of the UT DRO faculty is its size, which ensures that it is a diverse group of individuals with different personal backgrounds and different approaches to life. This makes it easier for residents to find mentors that they can relate to and connect with on various levels. He notes that it is easy to take the caliber of the faculty and the amount of resources available to them for granted, but “if you realize this from the beginning, it is easier to realize your potential and meet your goals.”

These four residents have enjoyed their time at UT DRO, and they have also left an impact on the faculty and administrative staff, not the least of which is their legacy helping to launch the annual, interdepartmental softball tournament. Although they are headed in different directions – Eugene has accepted a staff position in Washington, Tatiana is pursuing a fellowship at Princess Margaret Cancer Centre, and Andrew and Luluel will be doing fellowships at Odette Cancer Centre – they will be staying in touch.

For incoming residents, Tatiana advised: “In this program, you are going to get out of it as much as you put into it.” Eugene agreed and explained that there are no shortcuts in radiation oncology; the only way to learn is by putting in hard work, observing, interacting with mentors, and making the most of the depth and breadth of the program and faculty.

As an ending note, Luluel recalled a piece of advice from Dr. Fei-Fei Liu, current UT DRO Chair, which she took to heart: “It’s not only about aptitude, it’s about attitude.”

Clockwise from Top Left:
Eugene Hong, Luluel Khan, Andrew Chiang, and Tatiana Conrad





EMBRACING CHANGE

REDESIGNING MEDICAL RADIATION SCIENCES



Above: Cate Palmer

The Medical Radiation Sciences (MRS) Program is the only undergraduate program of its kind in Canada to award an advanced diploma and a bachelor's degree to its graduates. Since its launch in 1999, the University of Toronto and The Michener Institute for Applied Health Sciences have been collaborating to educate students in one of three disciplines: Radiological Technology, Radiation Therapy, and the newly redesigned Nuclear Medicine and Molecular Imaging Technology.

Ms. Cate Palmer, Director of the Medical Radiation Sciences Program, has seen this program evolve over the years as the technology and the industry have changed. She explains: "Medical Radiation Sciences relies heavily on technology. As the technology grows exponentially, we need to respond to the changes that are happening in practice and are driven by changes in technology." This need for evolution is the reason that the MRS program has seen two major redesigns in the last decade, and is currently undergoing another redesign of the Nuclear Medicine and Molecular Imaging Technology discipline.

Any curriculum redesign comes with its challenges. Cate explains that for the MRS disciplines, the challenge is to balance the needs and learning expectations of the students with the changes taking place in clinical practice as well as the rapidly changing technology. In addition, learning styles of the students have changed. Students are asking for less traditional classroom lectures, and more independent online lessons. By putting the

Nuclear Medicine program intake on hold for two years, the MRS faculty was able to completely overhaul the program.

When the newly redesigned Nuclear Medicine program launches in 2014, it will offer students a hybrid of synchronous and asynchronous learning methods. In addition to lab work and classroom tutorials, students will be able to access lessons online, watch educational videos on a mobile device, complete exercises and tutorials at any time, and collaborate virtually with their classmates. This hybrid program will not only engage students, it will also ensure that they are better able to problem-solve and think critically through an integrated and applied curriculum.

In addition, the new Nuclear Medicine program will offer an integrated curriculum. This curriculum will integrate the various modules and components of the body system across a 2-year longitudinal course instead of across a semester-long course as had traditionally been done. "We are trying to replicate what is happening in practice in terms of the body systems," Cate elaborates. "For example, the students will spend six weeks on cardiology in which they will cover professionalism, patient management, pharmacological aspects, ECG, operation of equipment, clinical principles, etc. So instead of covering it individually in different courses, we will cover the whole gamut for cardiology. We have designed a very unique curriculum. So what is being learned in one course is being reinforced in the next course."

ALEX NICOLAE

FINDING MEDICAL RADIATION SCIENCES



Above: Alex Nicolae

Cate and her team have undertaken a very challenging task with the Nuclear Medicine discipline, but one that was necessary. Cate says, “Curricula can’t be static. We have to be looking at new and innovative ways to engage the students, deliver the content, and ensure that we are graduating adaptable professionals in order to ultimately improve patient outcomes.”

Four years ago, Mr. Alexandru Nicolae was a busy student in an Aerospace Engineering program at Ryerson University. Through friends, he was introduced to his campus emergency response team, and after a string of first-aid courses, he joined the team as an emergency medical responder.

In his third year, he switched programs and joined the Medical Radiation Sciences program in the radiation therapy discipline. “I love interacting with patients, and I did not want to give up my physics background. I was looking for a program in health care with a focus on technology and patients. MRS seemed perfect.” Alex, as he is commonly known, is now in his third year of radiation therapy training. During his first year, he took some

foundational courses, and enjoyed his physics classes and labs. “We would go to Princess Margaret after patients had completed their treatments, and we would experiment with all the machines. At the end of first year, I loved what I was doing.”

In his second year in the MRS program, as the courses went further in-depth, he found the content more challenging. The students also started treatment planning in their second year. Despite the intense course-load, Alex enjoyed his second year in the program. “We were building on top of previous knowledge. I absolutely loved treatment planning, and going through each site and understanding the theoretical aspect of every cancer.”

Now in his final year of the program, Alex is doing his clinical rotations at the Odette Cancer Centre. He is working with Dr. Ananth Ravi, Assistant Professor at University of Toronto’s Department of Radiation Oncology, on research involving a clinical trial for improving prostate cancer treatment. Alex is excited about the exposure he has had to faculty and resources. He has already presented preliminary results at a national conference, and is in the process of submitting a manuscript for publication.

During his clinical rotation at Odette Cancer Centre, Alex recalls a particularly rewarding incident. “I was treating a very young patient with brain cancer who was very nervous. I spoke with him and eventually developed a rapport with him which helped him relax. The fact that I was able to do this shows how far I have come in my program, and how much I have learned while in the clinical environment.”

With his multidisciplinary background, Alex feels that he has found the right program to help him establish a career that combines technology and patient interaction. For students considering the MRS program, Alex has some valuable advice: “Research the program as much as possible. Don’t underestimate the program; it does get tough but you need to remember everything you are learning. Lastly, you get as much out of the program as you put into it.”

BOUNLESSDESIGN



Above: Lisa Barbera

LISA BARBERA RESEARCHING THE HEALTH CARE SYSTEM WITH ICES

Unlike much of the research done at the University of Toronto's Department of Radiation Oncology (UT DRO), Dr. Lisa Barbera's research does not focus on the use of technology or biology to treat cancer. Instead, she has focused her research on patients, their experience, and their path through the health care system. In addition to her appointments as Associate Professor with UT DRO and the Institute of Health Policy, Management and Evaluation, Lisa is also an Adjunct Scientist with the Institute for Clinical Evaluative Studies (ICES), an independent research unit funded by the Ministry of Health and Long-Term Care.

Since her residency training, Lisa has had an interest in health services research. After completing a health services research fellowship in Kingston, and a Master's in Public Administration from Queen's University, Lisa joined Sunnybrook Health Sciences Centre and was introduced to Dr. Lawrence Paszat, Associate

Professor with UT DRO and Senior Scientist at ICES. "Larry helped me get started, mentored me and helped me develop a relationship with ICES," she notes.

Lisa explains that ICES houses multiple electronic databases of records relating to the administration of the health care system. Researchers like herself assess and link population-based health information with processes currently taking place in the health care system, and inform changes in health care delivery.

"The research that I do involves using these different sources of data and linking them together to try to answer questions about what kinds of services people are using, the particular types of problems they are facing, and how the healthcare system is functioning in a particular domain."

THIS IS A NOVEL APPROACH BECAUSE HEALTH CARE IS PROVINCIAL SILOED. SO WE ARE TRYING TO DEVELOP METHODS THAT WILL ALLOW US TO DO NATIONAL LEVEL COMPARISONS

Currently, there are three main areas of research that Lisa is focused on. Her first area of research involves looking at patterns of health care and services used by cancer patients towards the end of their lives. She has used large datasets that span the province to study the number of people who have received aggressive treatment towards end of their life, in order to assess quality indicators and help inform Cancer Care Ontario's annual Cancer System Quality Index (CSQI).

Lisa and her fellow researchers recently received funding for a project that will look at these quality-of-care indicators across multiple provinces. She explains, "This is a novel approach because health care is provincially siloed. So we are trying to develop methods that will allow us to do national level comparisons." This project, one of the first of its kind in Canada, is expected to be completed in 2014.

The second area of research that Lisa is currently working on involves her clinical site, gynecologic oncology. This project is a population-based cohort study looking at patterns of care in vulvar cancer. Collaborating with a colleague, Dr. Lilian Gien, and UT DRO Professors Dr. Anthony Fyles and Dr. Gillian Thomas, Lisa is conducting a ten-year retrospective chart review, and extracting information about the care that all patients diagnosed with vulvar cancer in the last decade received. Data about biopsies, surgeries, and lymph node dissections that these patients received will help describe different patterns of care that they received and evaluate the associated differences in outcome.

It is obvious from these two areas of research that Lisa is interested in quality of care. The third study she is currently working on ties into the same theme. Lisa is working with a large dataset of patient symptoms and patient reported outcomes to establish relationships between patient symptoms and the health care they receive. The novel dataset includes patient evaluations using the Edmonton Symptom Assessment System (ESAS), which is completed by all patients visiting cancer centres, and includes information about how they were feeling on the day of that visit. Lisa explains:

"In a context of administrative data, we tend to know a lot about the services and very little about the patients. This dataset provides a very rich data source of patient reported outcome, and how they were feeling on a given day. So this study is very novel in terms of content and structure of the data."

Lisa's research is directly applicable to the health care system. Results like these not only help inform policies and procedures, but also help train health care professionals. Dr. José Pereira, the Medical Chief of Palliative Medicine at Bruyère Continuing Care and The Ottawa Hospital, and Clinical Lead of Palliative Care at Cancer Care Ontario, has used the results of Lisa's research to create new programs. He elaborates, "I have used the results in presentations related to development of the Cancer Care Ontario's Palliative Care Program, particularly in our new strategy called INTEGRATION. The goal of this strategy is to get oncologists, family physicians and other specialists to think of palliative care much earlier in the illness trajectory."

Similarly, Mr. Sean Molloy, Program Manager at Cancer Care Ontario, notes that he has been using Lisa's research in several areas of their programming, including "education about the impact of symptom management, performance management, external conferences, programmatic decision making, and business cases."

Lisa enjoys the work she does with ICES, and feels that it is broadly applicable in the health care environment, and not necessarily focused on radiation therapy. For future researchers who have an interest in health services and want to join ICES, Lisa advises to connect with a mentor who is appointed with ICES. She adds, "ICES is a fabulous resource. The datasets and the resources there are tremendous, and the quality of work that comes out of there is very high. There are many ways to do health services research, and ICES is just one path. I have been able to work in my area of interest – making sure patients are getting the right kind of care at the right time – and develop my expertise in knowing what you can and can't do with the administrative data that lives at ICES."

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CLINICAL REPORT

DR. SHUN WONG, ODETTE CANCER CENTRE

The clinical, research and educational activities of the Radiation Treatment Program at Odette Cancer Centre (Odette), Sunnybrook Health Sciences Centre (Sunnybrook) continued to thrive and expand in 2012-13. Following a slight decline in clinical activities in 10-11 due to the opening of the radiation treatment facilities at Southlake, and in spite of the opening of the radiation facility at the Royal Victoria Hospital, Odette witnessed a return of its clinical volumes in fiscal year 12-13, with over 6600 new radiation oncology consultations seen. Over 7000 courses of radiation treatment were delivered. Upgrades to the existing clinical infrastructure continued. The tomotherapy unit was retired for a new linac with full image-guided radiation treatment capability and there were upgrades to planning and information software. Stereotactic radiation therapy (body and head) continued to expand. A total of 383 brachytherapy courses were delivered representing the highest brachytherapy volume centre in the country.

After over 11 years as Chief of Radiation Oncology and Head of Radiation Treatment at Sunnybrook, Professor Shun Wong completed his second term in June 2013. Following an external review and an international search, Dr. Gregory Czarnota was appointed the new Department Chief effective July 2013. Ms Kathy Mah stepped down as Interim Manager of Medical Physics, and Dr. Brian Keller is currently the Interim Head. Dr. Hany Soliman was recruited from the Credit Valley Hospital to replace Dr. Robert MacKenzie who retired after almost 30 years of service at Sunnybrook.

Members of the Radiation Treatment Program at Sunnybrook garnered a number of prestigious awards. Ms Sheila Robson, Manager and Head of Radiotherapy was awarded the 5th Annual Leo Steven Excellence in Leadership, and Ms Tammy Lui, a radiation therapist received a Schulich Award for excellence in clinical care. Dr. Eileen Rakovitch was awarded the Rose Award by the Sunnybrook Foundation for her leadership in fund raising effort which made the Louise Temerty Breast Cancer Centre a reality at Sunnybrook. Dr. Rakovitch was appointed the inaugural Medical Director of the Louise Temerty Breast Cancer Centre. Dr. Ewa Szumacher was promoted to the rank of Associate Professor.

The Program continues to foster its regional leadership role in cancer care, and continued to provide administrative, operational and clinical support for the radiation treatment facility at the Royal Victoria Hospital (RVH). In February 2013, Dr. Gerard Morton was appointed the Head of Radiation Treatment at RVH. 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, The Scarborough Hospital, Rouge Valley Hospital (Centenary Site), Humber River Regional Hospital, Toronto East General Hospital and St. Michael's Hospital. A new breast radiation oncology consultation clinic was started in early 2013 at the North York General Hospital, and another for prostate cancer began at the Centenary Site of Rouge Valley Hospital.

Despite the very competitive grant funding climate, faculty members secured over \$5 million in new external peer-reviewed and industry supported grants. Faculty at Sunnybrook published 169 peer-reviewed scholarly articles in 2012, with 119 as primary or senior responsible author.

CLINICAL REPORT

DR. ANDREA BEZJAK, PRINCESS MARGARET CANCER CENTRE

Princess Margaret Hospital Radiation Medicine Program (RMP) has seen a few changes this past year, including Dr. Michael McLean's retirement, Dr. Meredith Giuliani transitioning from Fellowship to Staff Radiation Oncologist, and Dr. Kathy Han joining us in January 2013. Dr. Andrea Bezjak has become the Director of the Clinical Programs, replacing Dr. Richard Tsang who is now Department of Radiation Oncology (DRO) Resource Allocation Adviser, and Dr. Padraig Warde, who has stepped down as Deputy Head and is now the Strategic Adviser for RMP. In 2012, RMP consulted on over 8,500 new patients, delivering over 10,000 courses of radiation therapy. The past year has seen an expansion of VMAT technology which facilitates precise delivery of complex plans over a shorter time period, thereby increasing patient comfort, and reducing target motion. Image guidance with daily cone-beam imaging has resulted in improved coverage for many clinical sites.

All clinical site groups continue to have regular weekly case review radiotherapy rounds, led by therapists but with involvement of all RMP team members, as well as multidisciplinary cancer conferences (MCCs). Radiation oncologists also participate in MCCs in our partner hospitals including Mt Sinai, St Michael's and St Joseph's Hospitals. In addition to the academically-focused weekly RMP rounds (which are joint with OCC as UT DRO rounds every 2 months, and combined with Department of Medical Oncology once per month), once a month, the entire RMP program attends RMP Quality Rounds which focus on quality initiatives, detailed analysis of any incidents or near misses, opportunities to improve the radiotherapy process, and dissemination of best practices.

RMP staff is involved in a broad range of research activities from basic cancer biology, translational, clinical trials, health services, and technology programs, many of these latter initiatives undertaken in conjunction with the newly opened Techna Institute (technainstitute.com/). We are particularly proud of the expanding research initiatives conducted by our RMP radiation therapists, the largest such program in the country and one of the largest internationally.

RMP leadership extends beyond our center and our city. Dr. Mary Gospodarowicz is Clinical Director, Princess Margaret Cancer Center, Regional Vice-President of the Toronto South LHIN, and is the President of UICC. Dr. Padraig Warde continues as Provincial Head, Radiation Treatment Program at Cancer Care Ontario and is also acting Vice President of Clinical Programs and Quality Initiatives at CCO. Dr. Andrea Bezjak just completed her two year term as President of CARO. Dr. Marco Carbone is the President-Elect of the Canadian Organization of Physicists in Medicine (COMP). Dr. Jim Brierley continues as Chair of the National Staging Advisory Committee of the Canadian Partnership Against Cancer. Many others hold Chair positions of various professional committees, Principal Investigators on clinical trials, and multiple other leadership positions locally, nationally and internationally.

UT DRO FACULTY MEMBERS 2012 - 2013

(As of June 30, 2013)

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Andrea Bezjak
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Robert Glen Bristow
Pamela Catton
Edward Chow
Bernard Cummings
Laura Dawson
Anthony Fyles
Maria Gospodarowicz
Richard Hill
David Jaffray
Normand Laperriere
Fei-Fei Liu
Michael Milosevic
Brian O'Sullivan
Jean-Phillipe Pignol
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Alex Vitkin
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Chong Shun Wong
Bradly Wouters

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Douglas Moseley
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Ivan Yeung
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Parameswaran
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UT DRO TRAINEES 2012 - 2013

(As of June 30, 2013)

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