



The CCRA honours Dr. Ling with Exceptional Leadership Award. See full details on page 3.

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TFRI-led study results give **new hope** for population at high risk for lung cancer

A Terry Fox Research Institute (TFRI)-led study has developed a new clinical risk calculator software that accurately classifies, nine out of ten times, which spots or lesions (nodules) are benign and malignant on an initial lung computed tomography (CT) scan among individuals at high risk for lung cancer.



Dr. Stephen Lam reviews CT scans with Chris Douglas-Homes, a participant in the lung study who underwent surgery for removal of a malignant nodule that was detected early. Photo credit: Chuck Russell/BC Cancer Agency

The findings are expected to have immediate clinical impact worldwide among health professionals who currently diagnose and treat individuals at risk for or who are diagnosed with lung cancer, and provide new evidence for developing and improving lung-cancer screening programs. A total of 12,029 lung cancer nodules observed on CTs of 2,961 current and former smokers were examined in the population-based study.

The results were published in the Sept. 5th issue of the *New England Journal of Medicine* (NEJM) and will have an immediate impact on clinical practice. "We already know that CT screening saves lives. Now, we have evidence that our model and risk calculator can accurately predict which abnormalities that show up on a first CT require further follow up, such as a repeat CT scan, a biopsy, or surgery, and which ones do not," says co-principal investigator Dr. Stephen Lam, chair of BC's Provincial Lung Tumour Group at the BC Cancer Agency and a professor of medicine at the University of British Columbia. "This is extremely good news for everyone – from the people who are high risk for developing lung cancer to the radiologists, respirologists and thoracic surgeons who detect and treat it. Currently, there are no Canadian guidelines for us to use in clinical practice."

In countries where guidelines do exist, they largely relate to nodule size. The pan-Canadian team's prediction model, developed by Brock University epidemiologist Dr. Martin Tammemägi, includes a risk calculator that considers several factors in addition to size: older age, female sex, family history of lung cancer, emphysema, location of the nodule in the upper lobe, part-solid nodule type, lower nodule count and spiculation (presence of sharp or needle-like points). "Reducing the number of needless tests and increasing rapid, intensive diagnostic workups in individuals with high-risk nodules are major goals of the model," says Dr. Tammemägi.

The TFRI team used two sets of data to determine their findings, studying a total of 12,029 nodules from 2,961 persons—current and former smokers, aged 50-75, who had undergone low-dose CT screening. One set involved participants in the TFRI Pan-Canadian Early Detection of Lung Cancer Study from 2008 to 2010, where 1,871 persons with a total of 7,008 nodules (102 of which were malignant) were screened and followed. The other set involved 1,090 persons with 5,021 nodules (of which 42 were malignant) who took part in several lung cancer prevention trials conducted by the BC Cancer Agency during 2000-2010 and were funded through the U.S. National Cancer Institute (NCI). In the former study, participants were followed for an average of three years; in the latter, for an average of eight-and-a-half years.

Dr. Lam says the prediction model holds up even in cases where clinicians are faced with the toughest challenges; for example, deciding what to do when nodules are one centimeter (the approximate width of an adult thumbnail) or smaller. While nodule size is one predictor of lung cancer, the largest nodule appearing on the CT was not necessarily cancerous. The pan-Canadian study team found that nodules located in the upper lobes of the lung carry an increased probability of cancer. In both data sets studied, researchers found that where cancer was present, fewer nodules were found. This model will simplify the work involved, especially for radiologists, in evaluating and assessing nodules on scans, as well as respirologists and thoracic surgeons who must make decisions about tests and treatment for their patients.

"Many jurisdictions throughout the world are now considering whether or how to best implement lung cancer screening. Studies like this one are key to answering important questions so decisions are most likely to result in good practice and planning, and ultimately benefit patients," says Dr. Heather Bryant, vice-president, cancer control at the Canadian Partnership Against Cancer.

The Pan-Canadian study is funded by the TFRI, the research arm of the Terry Fox Foundation, and the Canadian Partnership Against Cancer. The BCCA study was supported by the United States Public Health Service National Cancer Institute. In Canada, lung cancer kills over 20,000 Canadians annually. It is the primary cause of cancer deaths in Canada. One in 12 Canadians will receive a lung cancer diagnosis in his or her lifetime. With early detection, five-year survival rates can be over 70%.

2014 PPG Competition

Invites were extended in September 2013 to seven teams to submit Full Applications for the 2014 New Frontiers Program Project Grants Competition. A total of 12 Letter of Intent applications were received in July and subsequently reviewed by TFRI's new Steering Committee on Research Excellence (SCORE). Details are available at www.tfri.ca or by going directly to: http://www.tfri.ca/programs/foundation_2014_ppgrfa.asp. The competition is being overseen by TFRI. Winners will be advised in June 2014.

UPDATE

\$13.6 million awarded to tackle unmet cancer needs

Three exemplary Canadian cancer research teams are receiving \$13.6 million from The Terry Fox Foundation to conduct cutting-edge research in several areas where there are unmet cancer needs, it was announced Oct. 9 in Vancouver, BC by The Terry Fox Research Institute and partners.

In Ontario, scientists are applying new techniques using lasers and nanotechnologies to improve imaging and treatments for early-stage prostate and esophageal cancers. In British Columbia, researchers are searching for new treatments for lymphoid cancer and rare and unusual tumours.

"For over three decades, the Terry Fox Foundation has been funding research into 'new frontiers' science to ensure that fundamental questions in cancer research are probed and addressed," said Dr. Victor Ling, president and scientific director of The Terry Fox Research Institute. "Without these investigations, we would lack the knowledge and technology we have today of this complex disease. This kind of research is critical to the creation of innovative solutions that can be applied in cancer clinics worldwide. It takes excellent scientists like those we are funding today to push forward with cutting-edge research."

"We are proud of the legacy that has been built over the past three decades by Terry Fox supporters to fund excellence in team science which tackles major problems and issues in cancer research. This important work would not be possible without the generosity of the millions of Canadians who keep Terry's dream alive today," said Judith Fox-Alder, younger sister of Canadian hero Terry Fox, for whom the Foundation and Institute are named.

Dr. David Huntsman's team, at the BC Cancer Agency, is studying rare cancers – sarcomas and uterine/ovarian cancers with the aim to unlocking their genetic mutations, so that those, and eventually more common cancers, will be treated more successfully. "Rare tumours offer some real advantages because they tend to be more homogeneous [similar in structure], so it's easier to find what mutation is actually causing that cancer," said Dr. Huntsman, a pathologist and medical director at the Centre for Translational and Applied Genomics. "These cancers can also be keys to unlocking biology which is important for other more common cancers."

Two emerging technologies being developed by Dr. Brian Wilson's team, based at the University Health Network, may be able to work together to address unmet needs in cancer control. The first technology is a new technique called photoacoustic imaging which combines light and sound to



Left to right: Dr. Paul McDonald, scientist at the BC Cancer Agency and 11-years cancer free (survivor of follicular lymphoma); Dr. David Huntsman, pathologist and medical director, Centre for Applied and Translational Genomics, BC Cancer Agency; Dr. Brian Wilson, senior scientist, Princess Margaret Cancer Centre, University Health Network (Toronto); Ms Judith Fox-Alder, international director, The Terry Fox Foundation; Dr. Victor Ling, TFRI president and scientific director; Dr. Randy Gascoyne, research director, Centre for Lymphoid Cancers, BC Cancer Agency; Dr. Sam Abraham, vice president strategic relationships and research, BC Cancer Agency; and Mr. Doug Nelson, president and CEO BC Cancer Foundation.

– Photo credit: Cameron Herjet

make high-resolution images of tumours that can be targeted for treatment. The second technology uses their newly discovered nanoparticles to act as contrasting agents for the photoacoustic imaging. His team will apply this innovative approach to early-stage prostate and esophageal cancers. "The combination of these two techniques is what makes this a unique opportunity," said Dr. Wilson, a senior scientist at the Princess Margaret Cancer Centre. "This funding is being used to accelerate this technology platform into human use."

Dr. Randy Gascoyne's team, also based at the BC Cancer Agency, is looking to catalogue genetic differences in biopsy cells in non-Hodgkin lymphomas to determine why some patients have cancers that behave more aggressively than others. "We are going to try and determine the genetic underpinnings that define those people whose primary therapy fails," said Dr. Gascoyne, research director for the Centre for Lymphoid Cancer. The Terry Fox Foundation has been the main funding source that has allowed Gascoyne's team to become one of the leading lymphoma genomics centres in the world.

These three scientists lead outstanding research teams that have been selected as the best groups for New Frontiers funding for their excellence and impact. Dr. Wilson is receiving a first award of \$2.249 million to be paid over the next three years. The two BC Cancer Agency projects are receiving renewal funding: Dr. Huntsman's team is awarded \$7.5 million over five years. Dr. Gascoyne's team is receiving \$3.885 million over three years, with \$600,000 provided by the BC Cancer Foundation.

Lymphoma PPG gets support from new partner

"The BC Cancer Foundation is pleased to support Dr. Gascoyne's innovative project that has the potential to create major breakthroughs in lymphoid cancer treatments from which we all benefit. We are also excited to be the first Foundation to partner with the Terry Fox Foundation and are confident that as partners in discovery we will bring significant hope to the thousands of British Columbian's that are impacted by cancer," said Doug Nelson, president and CEO of the BC Cancer Foundation at the Vancouver announcement on Oct. 9.

The BC Cancer Foundation contribution marks the first time a partner has co-funded a Terry Fox New Frontiers Program Project Grant since the program was created over 30 years ago. A highly competitive program, funds are awarded annually to groups of investigators to support breakthrough and transformative biomedical research which may form the basis for innovative cancer prevention, diagnosis and/or treatment. The program is unique in Canada for its sustaining support for a small but significant number (currently 12) of the most productive and internationally recognized cancer research groups.



PPG project leader Dr. Randy Gascoyne (right) discusses his research with Paul McDonald and Judith Fox-Alder, who both spoke at the project funding announcement.

– Photo credit: Cameron Herjet



In the above photograph, Terry Fox-funded investigator Dr. John Bell (back row, fifth from left) hosted supporters from the University of Ottawa and the Ottawa Hospital Research Institute after their Terry's CAUSE on Campus with a pancake breakfast at his home. Dr. Bell is a senior scientist at the Ottawa Health Research Institute and leader of the TFF-supported Program Project Grant: Canadian Oncolytic Virus Consortium (COVCo).

Participation in Terry's CAUSE doubles

In just one year, organizers of Terry's CAUSE on Campus have more than doubled the number of Canadian universities and colleges involved in this new fundraising initiative targeted at post-secondary students. Fifteen new institutions and colleges participated in CAUSE this year to honour Terry's legacy and raise money for cancer research. A few institutions teamed up together in some cities for joint events. New institutions participating this year included: UBC and UBC-Okanagan, Wilfrid Laurier, Western University Northern Alberta Institute of Technology, MacEwan University, University of Alberta, Concordia, Norquest, Queen's University, Marine Institute (Newfoundland & Labrador), York University, University of Ottawa, Brock University, University of Regina, and Mount Allison. Inaugural institutions kicking off the event last year included: SFU, University of Manitoba, Carleton University, McMaster University, Memorial University, University of Toronto, Dalhousie University and University of Calgary.

BC & Alberta TFRI nodes hold research days

The BC and Alberta nodes of the TFRI held research days in Vancouver and Edmonton in October to shine a spotlight on the Terry Fox-funded research in these provinces. The BC event, chaired by BC Node leader Dr. Marco Marra, included a keynote talk from Dr. Jeff Trent at Tgen (Translational Genomics Research Institute) as well as a panel discussion on the ethical and economic issues of personalized/precision medicine, poster presentations and rapid-fire talks. Currently Terry Fox funds \$37.3 million in cancer research in the province of British Columbia.

The Alberta node day was held in conjunction with the Alberta Cancer Foundation's Cancer Research Conference Oct. 20-22 in Banff. Dr. Carol Cass chaired a plenary session titled "New Frontiers in Cancer Research" featuring presentations from Dr. Victor Ling, TFRI president and scientific director, as well as talks by Terry Fox New Investigators Ryan Brinkman (leukemia and lymphoma) and Jennifer Chan (brain).

TFRI a silver supporter at CCRC meeting

TFRI is a silver supporter at this year's Canadian Cancer Research Conference in Toronto Nov. 3-6. The Institute will sponsor a session titled "Effective Biomarker Discovery, Validation and Implementation" on Wednesday, November 6, 2013 from 10:30 am-12 noon in the Grand Ballroom Center. Chaired by Drs. David Huntsman and Nada Jabado, speakers include: Drs. Torsten Nielsen (BC Cancer Agency), Janusz Rak (McGill University), Christian Steidl (BC Cancer Agency) and Saima Hassan (Sunnybrook Research Institute). Examples in breast cancer, lymphoma and non-tissue based biomarkers will be discussed.

New program manager for PPGs

Julia Chae has joined TFRI as the associate research programs manager for the Terry Fox New Frontiers Program Project Grants. She brings with her three years' experience as project manager for the Michael Smith Genome Sciences Centre in Vancouver. Chae assumed her position with TFRI in September. She holds a masters degree in computer science from the University of Toronto as well as bachelor degrees in life sciences and computing, both from Queen's University. She is a certified project management professional and formerly worked as a bioinformatics coordinator at the BC Cancer Agency. Chae is based in Vancouver where she joins TFRI staff Stephen Herst (COO) and Cynthia Ferguson (research programs manager).

Exceptional leadership honour for Dr. Victor Ling



TFRI's president and scientific director Dr. Victor Ling will receive the Canadian Cancer Research Alliance's award for Exceptional Leadership in Cancer Research on Nov. 5 at the Canadian Cancer Research Conference in Toronto. The award recognizes Dr. Ling's seminal contributions to and outstanding leadership in cancer research. His work on the development of a Canadian strategy for cancer control ultimately led to the formation of the Canadian Partnership Against Cancer.

"It is wonderful to see Vic recognized for his outstanding leadership with this national award. His career achievements directing research in his own lab, as well as in research institutes, mark him as one of Canada's leading cancer researchers of all time," said TFRI Board and Executive member Dr. Christopher Paige, vice-president of research, University Health Network.

"Focused and leading research by passionate professionals like Dr. Vic Ling have contributed greatly to The Terry Fox Foundation's ability to raise money for cancer research. With that in mind, we congratulate Vic on this well-deserved award for leadership excellence and we thank him for the many contributions he has made in giving Canadians hope with the monies that have been raised," said TFF board member Jim Gabel.

"We greatly appreciate and value having Vic as our lead of the Terry Fox-branded research portfolio," said Darrell Fox on behalf of the family of Terry Fox. "We have covered a lot of ground in a relatively short period of time since launching the Terry Fox Research Institute five years ago. This is in large part due to Vic's vision and leadership, and how well-respected he is by his research colleagues."

In addition to his role as TFRI's founding president and scientific director, Dr. Ling is a Distinguished Scientist at the BC Cancer Agency (BCCA), professor of pathology, and professor of biochemistry at the University of British Columbia (UBC). He served previously as vice-president of discovery research at the BCCA and assistant dean at UBC. In that capacity he was instrumental in launching in 1998 the Michael Smith Genome Sciences Centre in Vancouver that was the first to decode the SARS virus, and led the initiative to construct the new BC Cancer Research Centre in 2005 that currently is home to over 650 research staff, including over 200 trainees. He has served on many national and international boards and committees for cancer research. Notably, he chaired the working group that produced the "Ling report" on cancer research for the Canadian Strategy for Cancer Control (CSCC). CSCC ultimately led to the formation of the Canadian Partnership Against Cancer.

As a scientist at the Ontario Cancer Institute, Dr. Ling discovered the P-glycoprotein (named MDR) associated with multiple drug resistance in cancer, the sister of P-glycoprotein (named BSEP), the bile acid transporter in liver, and the superfamily of ABC transporters.

Dr. Phil Branton, chair of TFRI's Scientific Advisory Committee, said "I don't think that anyone in Canada and, in fact, anyone anywhere has done more than Victor Ling in recent years to foster excellence in cancer research. The programs he initiated at the Terry Fox Research Institute have transformed Canadian efforts in both fostering new directions in team research and in bringing them closer to the clinic." Branton received the CCRA's inaugural award in this category in 2011 and will pay tribute to Dr. Ling at the CCRC awards dinner.

The Canadian Cancer Research Alliance provides a common voice for a Canadian cancer research strategy and The Terry Fox Foundation is an alliance member.

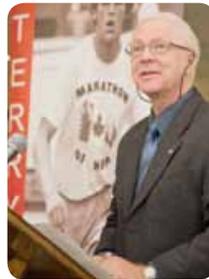
Terry Fox Foundation elects new board

The Terry Fox Foundation has a new board it was announced in August 2013. The Fox family announced the appointment of three new board members and, with these new members, expressed appreciation to Isadore Sharp (Toronto) for his dedication to the Marathon of Hope over the past 33 years. Bill Pristanski (Ottawa) is the new board chair. He has run in all 32 Terry Fox runs and raised nearly \$400,000 for cancer research. Jim Gabel (Toronto) is currently president of adidas Group Canada and is a long-time Foundation supporter. Ara Sahakian (Dubai) is a chartered accountant and chair of the organizing committee of the annual Terry Fox Run in Dubai that, to date, has raised \$2 million for cancer research. Isadore Sharp was named Board chair emeritus.

Did you see Terry run in 1980? Did you take a photograph?

The Canadian Museum of Civilization (CMC) is looking for photographs taken by Canadians of Terry Fox in 1980 during his Marathon of Hope. The photographs will be used as part of an upcoming exhibition that the CMC and the Terry Fox Centre are developing to be launched in April 2015, marking the 35th anniversary of the Marathon of Hope. For full details visit: <http://www.civilization.ca/terryfox>

In memory of Dr. Anthony (Tony) Pawson



We wish to express our profound sadness and loss over the death of Dr. Anthony (Tony) Pawson in August 2013. Dr. Pawson was a leading cancer scientist at Mount Sinai's Lunenfeld-Tanenbaum Research Institute in Toronto, Ontario, who was revered worldwide for his seminal, transformative and innovative work in signal transduction. He has helped to advance cancer research and research in other diseases for his understanding of how cells communicate.

His untimely death is a blow to our entire Canadian cancer research community and he will be deeply missed. Tony and his team were extremely successful in forging new and innovative advances in cancer research, and it is in this capacity that he led a long-standing New Frontiers Program Project Grant funded by the Terry Fox Foundation and the Terry Fox Research Institute. He was funded by the Terry Fox Foundation for over 25 years, and currently held a grant awarded in 2010.

Tony was the recipient of many prestigious scientific awards and among Canadian researchers was regarded as a potential recipient of a Nobel Prize in medicine for his groundbreaking work. He was awarded the Kyoto Prize ("the Japan Nobel") in 2008. The Signal Transduction Society in 2010 presented its new honorary medal to him as "one of the founding fathers of protein - protein interaction research in cell signalling 'for the discovery of protein interaction domains and elucidating their essential roles in the transmission of cellular signals.'"¹ Dr. Pawson and his team discovered the Src Homology 2 (SH2) domains in the mid-1980s and the field subsequently expanded massively.

While we mourn his loss, we know he has left us a rich research legacy. We remain confident those who are following in his footsteps will find continued strength and inspiration in their work, knowing that they are now standing on the shoulders of a giant. Tony, we thank you for your brilliance, your discoveries, your passion and your humility.

To his colleagues, family and friends, we offer our sincere condolences at this time of great sorrow.

(¹ *Cell Communication and Signalling*, Jan. 19, 2011)

-Statement from TFRI

MARK YOUR CALENDARS!

TFRI's 5th Annual Scientific Meeting

May 8-10, 2014

**Hyatt Regency
Montreal, Quebec**

TFRI Executive & Node Leaders

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Dr. Victor Ling, O.C., O.B.C., F.R.S.C., PhD

Alberta: Dr. Carol Cass

Atlantic: Dr. Michael Johnston

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Ontario: Dr. Robert Rottapel

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Quebec: Dr. Anne-Marie Mes-Masson

Chair, Scientific Advisory Committee:

Dr. Phil Branton

TFRI Board Member: Dr. Christopher Paige

Senior Advisor: Dr. Simon Sutcliffe



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