BCBA Acceptance Speech. Victor Ling Feb 10, 2000

Salutation to honoured guests:

I am truly delighted to be the recipient of the BC Biotechnology Alliance Award for Innovation and Achievement. I am pleased also that with this award I am identified with the work of the BCBA, which is playing an important role in helping to shape the economic and societal well being of this Province.

When I started many years ago to isolate colchicine-resistant Chinese hamster ovary cells to study microtubule function, I could not have predicted that it would be the beginning of a wonderful scientific journey. Nor could I have anticipated that the multidrug resistance phenotype found in those cells could be so neatly explained by P-glycoprotein nor that it would prove so relevant to the treatment of cancer. Moreover to my complete surprise P-glycoprotein turns out to be a member of a fundamental superfamily of ABC transporter proteins found in all kingdoms of life. They are associated with a number of human diseases. It is exciting to see Canadians leading the way in innovation in this area and some of their discoveries include ABC transporter genes associated with: cystic fibrosis; Tangier disease; Stargardt's disease; and familial cholestasis in children. Experiencing such surprises is ample reward for doing research.

What is Innovation? To me, it is the product of creativity. To me there are few human activities that compare with the innovation that is generated when creative people from different disciplines come together towards a common goal. In this regard, my own scientific journey has been greatly enriched by colleagues, postdoctoral fellows, students and support staff who have been most generous in sharing their ideas and expertise. It has been my observation that innovation is best sustained by collaborative creativity and that this does not happen by accident.

Collaborative creativity can only thrive in a culture where there is adequate resources for a stable infrastructure, a supportive environment that encourages risk-taking and unselfish sharing of ideas, and a system that values every member of the team. Every sector of society has a role to play in such a culture. An example of this is the creation of the Centre for Integrated Genomics a joint venture of the BC Cancer Agency and the University of British Columbia. Here this Province's leading cancer care and cancer research organization joined with its leading University to create the Genome Sequence Centre with Michael Smith as director. This endeavour was able to get off the ground because the BC Cancer Foundation, through it donors, made an early decision to commit to raising $25M to support this enterprise.

Genome science is an enabling technology that will drive innovation in all of life sciences and medicine in the coming decade. A major goal for the Centre for Integrated Genomics is to bring together expertise in clinical care, in cancer research, in biotechnology and in genomics to reduce the burden of cancer in the coming decades. I look forward to this. I know that my scientific journey and that of many others will be a whole lot more interesting because of this! I would like to take this opportunity to thank the BC Cancer Foundation for taking this bold initiative.

On a personal note, I want to thank a group of people that meet with me every Tuesday morning, the Research Executive of the BC Cancer Agency, for sharing the responsibility and joy of running a dynamic Cancer Research Centre; to Marion Kealy, my personal assistant for her excellence over the years and to my wife Lela and our children for their encouragement and support. Thank you.

Ground Breaking Ceremony for the New BCCRC May 14, 2002-05-13

Introduction:

• Minister Rock, honoured guests, colleagues, ladies and gentlemen. Wow, what a great day this is! The new BC Cancer Research Centre promises to be the home for up to 600 scientists and physicians who will work closely together to generate the new knowledge that can be translated and applied to benefit patients. The world-class research done here will make a real difference in the control of cancer in British Columbia, in Canada, and in the world.

• There are many people who have been responsible for bringing us here today and I want to thank them.

• First, I would like to acknowledge Dr. Don Carlow former CEO of the BCCA for convincing me to move here from Ontario almost 7 years ago. He gave me the best job in the world. You have worked tirelessly in supporting the vision of putting research as process # 1 in Cancer Control.

• I would like to thank the staff, the Board and supporters of the BC Cancer Foundation, for making this happen today, for willingly taking the risk to support scientists. Especially thank you Jane Hungerford, lain, and Mary

• I would like to thank the Government of Canada for their leadership in creating institutions such as the Canada Foundation for Innovation, for Genome Canada, and for CIHR, providing unparalleled opportunities in Canadian history for scientists here to compete for research funds. I am pleased to say that scientists and clinicians here at the BC Cancer Agency have been very competitive and we are amongst the very best in this country.

• Thank you CFI, for your grant of $27.8 M towards this new building. Through your international peer review committee you have recognized the excellence of the people and the power of the vision. I believe it was the largest grant given out by CFI that year. Thank you also for the matching $27.8 million from the Province of BC through the Knowledge Development Fund.

• I would, like to thank our partner UBC, The Biotech lab for working together with us to create the Centre of Integrated Genomics, particularly Doug Kilburn the former Director. Thank you also to Simon Fraser University and University of Victoria for partnering with us.

• I would also like to thank our Industrial partners and the numerous companies that have spun off from the research done here at the BCCA for your technology and for helping us bring innovations to practice as soon as possible. A particular thank you to Genyous Life Sciences for partnering with us in developing the Tumour Tissue Repository.

• A special thank you to you, the community. The Canadian Cancer Society, and other organisations that support cancer research. Without your support, we would not be here today. On behalf of all the scientists and physicians here at the BCCA I want to say thank you as we work together to build a better future for a world free of cancer.

• Before I wrap up I do want to make a few observations. Although we are breaking ground today for the new BC Cancer Research centre, I want the architects to know, as they dig down to lay the

foundation for the new building, that a solid scientific foundation has already been laid based on a tradition of innovation, breakthrough research and scientific excellence that spans decades.

• We have been blessed with innovators and pioneers such as Dr. Lloyd Skarsgard who founded the first research lab, the Department of Medical Biophysics in the early 70's, Dr. Allen Eaves, founded the world renowned Terry Fox lab, Dr. Charles Beer discovered the anticancer drug vincristine, Dr. Nick Brukovsky who started a prostate research program here at the Agency before it was fashionable and pioneered hormonal treatment for prostate cancer, Dr. Joe Connors initiated new treatments for lymphoma, Dr. Branko Palcic and Dr. Stephen Lam and their colleagues in the Cancer Imaging Department, the unique lung cancer prevention program, the first large scale Genome Centre dedicated to cancer research founded by the late Dr. Michael Smith and now headed by Dr. Marco Marra. I want to thank them and the many, many unsung heroes, the students, the residents and postdoctoral fellows who strived after excellence in all that they did. They have set the standard for us.

• It has been said that we cannot predict the future however, we can create the future. As we build on the legacy of excellence that has been handed to us, we are charged to build carefully not to destroy what is the excellence that is already in place and nor to shrink from taking the necessary risk to innovate. This can only happen in a community where there is trust and support.

• The scientists, clinicians and care givers at the BC Cancer Agency have all worked together building on this Foundation of excellence so that British Columbians today enjoy the best cancer outcome in Canada by a significant margin. This is something that we should be proud of; yet, our job is not done as the war against cancer is not yet won. We must continue to generate new knowledge through research and to translate this knowledge to patient care. This is what this new Research building is all about.

The launch of the Terry Fox Research Institute

Thank you Chris, Betty and Rolly, Judi, Darrell, Minister Clement, Mr. Wilkinson, Minister Taylor, and honoured guests.

I am truly delighted to be part of this exciting new initiative. I want to thank the cancer researchers and physicians across the country who served on the working groups to help envision the Terry Fox Research Institute. Also, I want to thank the Terry Fox Foundation and particularly, Darrell Fox for the leadership in creating this Institute. I feel immensely privileged to be the founding Scientific Director. The cooperation amongst the cancer community in helping to create this Institute is truly unprecedented. Many have worked behind the scene to make it happen today. I want to thank them. Numerous organizations across the country have already indicated their support for this Institute. We look forward to discussions with them and others on how we can work productively together.

As Betty has already mentioned, The Terry Fox Research Institute is a virtual institute, an institute without walls, linking the best cancer research and care centres in this country as partners, working together as a team to focus on translational cancer research. This type of research is not commonly deployed, and it is widely recognized as a major gap in the ultimate translation of discoveries into practical outcomes.

Members of the Terry Fox Research Institute will work together to identify translational projects that will most likely result in significant improvement in cancer outcomes and patient care. Further, these projects would be closely managed, driven by business plans with concrete milestones and with a clear objective to enable discoveries to translate into a practical solution for the benefit of cancer patients as soon as possible. A commitment to integrate the validated results from the translational research project into patient care will be expected from each partnering organization.

In this way we hope to accelerate, for example, the development of more targeted cancer drugs, drugs that will be more specific for the cancer and less toxic to the patient. For example, we will identify biomarkers, sentinel molecules in the patient, that will give us early warning of the presence of aggressive cancer cells at a stage where they can be more easily managed. We will capitalize on the vast amount of new knowledge generated by the human genome project to choose the most promising discoveries for application and then to do the necessary translational research to see if it can be integrated into our heath care system....where the rubber hits the road so to speak.

We will form a blue ribbon scientific advisory committee made up of outstanding national and international scientists, physicians, innovators, health economists, ethicists to evaluate and critique our proposed projects, to advise us, and to help us develop the best possible milestone driven business plans for our projects.

We know that cancer is made up of over 100 different diseases. It affects every family. We all want to see real progress against cancer be made as quickly as possible. We hope that the concept of the Terry Fox Research Institute will help us find solutions to the cancer problem more quickly than ever before....so that every Canadian will benefit, so that the whole world will benefit.

Today, we are launching the initial phase of the Terry Fox Research Institute made up of nodes in Quebec, in Ontario, in Alberta and in British Columbia. By next year, we plan to establish nodes to include the rest of Canada.

Today we also launch the website of the Terry Fox Research Institute: www.tfri.ca. The website will play a vital role in enabling real time communication between the members of TFRI, as well as advancing the dialogue between our partners and the public.

I now would like to invite the leaders of the TFRI team, the coordinators of the provincial nodes, to come to the stage. I will ask a member of each node to say a few words.

From Quebec
- Dr. Anne-Marie Mess-Masson
- Dr. Michel Tremblay

From Ontario
- Dr. Rob Rottapel
- Dr. Chris Paige

From Alberta
- Dr. Sandy McKewan
- Dr. Peter Forsyth

From British Columbia
- Dr. Clay Smith
- Dr. Simon Sutcliffe who is not able to be with us here today.
- Victor Ling

York University
June 14th, 2006

Rise, approach the lecture, turn towards and bow to the Chancellor, turn towards the audience and announce

May I now present to this Convocation the candidate for the Doctorate, honoris causa, to be conferred by York University:

Victor Ling

The candidate will rise and stand, the chair of senate will rise, stand to the right of Dr. Ling , then I read again

Dr. Ling is being honoured first and foremost for his accomplishments in cancer research. All of us here have been touched by cancer - and all of us here wish we could contribute to the cure. Dr. Ling has done just that - his research determined how it is that many cancers become resistant to chemotherapy. Dr. Ling made this breakthrough in the 1970's, and it took about 20 years, until the mid-nineties before science and medicine had reached the sophistication whereby a designer counter-acting drug could be made - with the result that patients whose cancer is resistant to chemotherapy can now be treated effectively. It may well be that you or a friend or relative has benefited from Dr Ling's discoveries.

Although many of you here are scientists, not all of you are, so let me take a minute to explain the scientific method Dr. Ling used. Back in 1972 Dr. Ling worked with experimental cells. These are cells that are used commonly by researchers to investigate diseases. They are transformed and thus able to grow outside the body for essentially forever. These experimental cells are frequently derived from a patient's cancer. Dr. Ling found that he could isolate from these experimental cells some that were resistant to specific chemotherapeutic drugs - that is, when the cells were grown in the presence of a chemotherapeutic drug, they were not killed by the chemotherapy. By careful testing and screening he was able to isolate some cells that were resistant to many chemotherapeutic drugs - Dr. Ling determined these cells were multi drug resistant, and coined the name Multi Drug Resistance - since drugs are different from each other, no one would have expected that a cell resistant to one type of killing chemotherapy, would also be resistant to another.

Dr. Ling became intrigued and explored further - an example perhaps of what distinguishes truly exceptional scientists over others. During the next ten years and yes it took 10 hard, slogging years, Dr. Ling discovered that a single cell protein, which he named P- glycoprotein had mutated, or changed in these multidrug resistant cells. The year was 1985. Exploring further, Dr. Ling found that many of the cancers in patients which do not respond to chemotherapy had this changed or defective p-glycoprotein. The research had moved from the test tube to the clinical patient. The year was now 1990.

By 1995 Dr. Ling had discovered a way to counteract the defective P- glycoprotein. That is to make the resistant cells sensitive to chemotherapy. One of the first clinical uses of this discovery was with children with retinoblastoma where using a counteractive to glycoprotein greatly improved the response of these children's cancer to chemotherapy. Twenty years from the first hint of a cancer connection to the clinical application of helping cure cancers. Twenty years is a long time to

spend on answering one question - and few scientists have this focus, this dedication and these insights, and fewer still are as successful in helping alleviate this terrible disease. We all owe Dr. Ling our deep gratitude.

Dr. Ling engaged in these studies with students similar to those who are graduating here today at the bachelor or master's or PhD level. The students worked with Dr. Ling at the Princess Margaret Hospital in downtown Toronto funded by your donations to the Canadian Cancer Society and by your tax dollars through the Canadian Institutes of Health Research. When you participated in the Terry Fox Run in the 80s your dollars help support this research. And for this support, we are all thankful. Dr. Ling is recognized internationally for his discovery of P-glycoprotein, a crucial link responsible for resistance to anticancer drugs in patients. This groundbreaking research has been recognized by honorary degrees from Memorial University, Simon Fraser University, and Trinity Western University, by the General Motors Kettering prize for cancer research from USA, the Josef Steiner Cancer Research award from Switzerland (he is the only Canadian to win this prize), the Gairdner Foundation International award and the Order of British Columbia.

Dr. Ling was born in China, and came to Canada as a child. He studied in Toronto, Vancouver, British Columbia and Cambridge, England - in Cambridge the leader of the group he was in was awarded two Nobel Prizes. Dr. Ling moved back to British Columbia about 10 years ago and is now the Vice President of the British Columbia Cancer Agency - and he hasn't stopped researching and having an impact on the health of us all. Everyone here will remember the SARS virus and how its genome was decoded by a Canadian group - beating out all the US groups. That was Dr. Ling's group.

Mr. Chancellor, as York draws close to opening the doors of its first Faculty of Health, it is most appropriate that we honour this extraordinary, influential health researcher. Mr. Chancellor I ask that you confer upon Victor Ling the degree of Doctor of Science, honoris causa.

Pause, bow to the chancel/or, return to your seat

Victor Ling's Speech

York University "Excellence" June 14, 2006 --- Victor Ling

Thank you, Dean Wu for your most kind and generous remarks. Chancellor Cory, President Marsden, Members of the Board of Governors, Senate, Faculty, distinguished awardees, fellow graduates, family and friends. When Dr. Marsden called a few months ago to invite me to speak at this convocation, I was absolutely delighted. Thank you for this great honour.

Graduating class of 2006, like you, I am receiving my York University degree today and I am very excited. Unlike you, I have not been studying for the last four years, writing reports, burning the midnight oil, cramming for exams, working towards this day. I am receiving my degree through the "back door". You have worked hard for your degree and I congratulate you. Enjoy and celebrate your achievement, it is well deserved.

But, what about tomorrow? And the day after? What will life be like? What will you be striving for then? Some of you may already have made your career choice, while others may still be waiting for that "great revelation". No matter which category you fall in, I encourage you to strive for excellence. Excellence can be embraced by an individual, by a University, or a community.

Although it is not easy to define what excellence is, we can readily recognize what it is not. For example, I would not be excellent if I speak for longer than my allotted time of 10 min. It doesn't matter how eloquently I speak, Dr. Marsden will let me know that I am not excellent because she will come and get me with a big hook. At home, I know that I am not excellent if I don't put in a new roll of toilet paper when I use up the last bit. Someone in my family will let me know, in no uncertain terms, how "un-excellent" that was! I know I am not excellent if I break a world record but used drugs to achieve it, even if nobody knows about it. As a cancer scientist, I know I am not excellent if I find the cure for cancer but would not share that knowledge.

Although excellence is hard to define, we recognize and experience excellence every day. Educators and parents can imprint excellence even without realizing it. I learned this one day when I overheard a conversation between my son and his track coach. The coach asked my son, David, "how did he do" at a recent track meet. David responded proudly that he had won a few medals. The coach's response was that he was less interested in the number of medals David won, but did he do his PB - his personal best. I learned something about excellence that day and blessed that coach for his wise remark. In today's highly competitive world, we are often caught up in the pursuit of achievements rather than excellence. Achievements are not the goal of excellence, they are simply a by-product. Striving for achievements is a very poor counterfeit of striving for true excellence.

My father for example had a big influence on me. I did not fully realize this until about two years ago when I was preparing to say a few words at his memorial service. He passed away at the age of 95. I was trying to define his essence for the group that gathered to celebrate his life. Although my father was not a buddy to his children, watching him conduct his business, as we were growing up taught us his values. He loved to make good deals but he would rather take a personal financial loss than to have his reputation as a person of integrity questioned. That imprinted on us, his children, the value of honesty and trustworthiness.

In the scientific world, excellence is often marked by the awarding of the Nobel Prize. This prize is not given for a flash-in-the pan but for an original discovery that has a major and lasting impact. The Nobel committee actually has a very difficult job because often discoveries are so fundamental that one doesn't know how important they are until many years later. Therefore the Nobel Prize is often given to people whose discoveries were made years ago because it took time for the impact of a discovery to be appreciated. To achieve excellence at this level, one needs vision and a long term perspective.

In this respect, I was very fortunate to have worked with Professor Frederick Sanger who had won two Nobel prizes. He won his first Nobel Prize for research he did as a graduate student, on the structure of insulin. He won his second Nobel for working out a method for sequencing DNA, the principle upon which the human genome was decoded 3 years ago. So Sanger knows something about excellence in science. I was a post-doctoral fellow in Sanger's lab in Cambridge in the early 1970's. Soon after arriving in his lab, I was completely frustrated by the lack of progress of our research and I complained to Fred one day that it would probably take more than 50 years before we would learn how to sequence DNA. His simple reply was: "You think so? Well, someone has to start"! On hearing that simple response I realize that Fred Sanger is a scientific giant because he has a long term perspective, and because of that he is able to identify problems of fundamental importance to work on.

I know that cancer has touched the life of everyone in this room. Some have suggested to me that it must be very discouraging working in cancer research where the problem is so great and progress seems so slow. However, I have not found this to be the case. In fact, I have been inspired by the optimistic

spirit and determination of scientific colleagues, caregivers, physicians, cancer survivors and patients. I have learned also from talking with patients that cancer must be fought not only in the arena of discoveries and scientific breakthroughs but also at the level of what is important to the human spirit. Cancer patients, who are facing their impending mortality, do not talk about their achievements but about their family, about relationships, about God, about life, about death, about things that really matter. How we fight cancer is a metaphor for how we deal with seemingly unsolvable problems in life. As a leading University and as part of a wonderful, dynamic, multicultural society called Canada, we need to face such problems squarely, with determination, with knowledge, with understanding, with honesty, with a clear long term vision, with compassion and with excellence.

Graduating class of 2006, you are the leaders of our society and the future is yours to create. In that process, I encourage you to create with excellence.

Thank you.