

# Teaching Dossier

Prepared in support of candidacy for promotion from Associate Professor to Professor,

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## Undergraduate Education

### **Bedside Clinical Teaching, Fourth Year:**

In each of the academic years since I came on staff in 1993, I have taught one to two sessions (three hours each), of clinical bedside teaching to fourth year students in the context of my outpatient breast cancer clinic at the TSRCC. Students are exposed to some of the clinical problems in the management of breast cancer. In addition, I review their skills in history taking and physical examination and provide them with individual feedback.

Clinical Teaching Sessions to Clinical Clerks at SHSC teaching hours included:

6 hrs	1998-99
16 hrs	1999-00
14 hrs	2000-01
6 hrs	2001 to 2002 to date

### **Undergraduate Supervision, Independent Laboratory Study**

Sept 2001-May 2002

I have been project supervisor for Ms Kathy Han from Sept 2001 to spring 2002. Ms Han is taking 2 independent study courses as part of her BSc program under my supervision was a project supervisor. She began the work in my lab as a summer student She has an excellent flair for bench research and is keenly interested in the MD PhD program to which she has applied for next fall. Ms Han has benefited from the exposure to the lab and discussions of the application of molecular biology to clinical oncology problems. The summer student project in which Ms Han participated has led to a submission to Nature Medicine.

### **Undergraduate Summer Student Mentoring**

I have mentored several summer students in the last few years. One of the strengths of these summer studentships is that I can provide a role model for students interested in careers in molecular medicine.

Ms Andrea Milic spent 3 summers in the lab: after her fourth year undergraduate and after her first 2 years in Medical School at the U. of Ottawa. She has carried out projects investigating molecular mechanisms underlying Tamoxifen resistance in breast cancer and has spent one half day per week seeing breast cancer patients in the clinic.

Mr. Jeff Rothenstein carried out a similar summer studentship in summer of 2001. He was then a 2<sup>nd</sup> year Medical student at U of Toronto. He also combined a lab project with ½ day breast cancer clinic per week.

Mr. John deAlmeida spent the summer of 2000 in the lab. He entered U of Toronto Medical school in the fall of 2000. He also had a career interest in molecular medicine that was fostered by his time in my lab.

Ms. Helen Wong will be joining the lab for a research internship this summer. She has completed an MSc and hopes to enter the MD PhD program in the fall.

## Postgraduate Medical Education

### **Resident Teaching:**

Each year, I present several one-hour teaching sessions to residents who are doing rotations in medical oncology. These residents are either in the Internal Medicine Program, years 2 and 3 or are Medical Oncology, Radiation Oncology, or Surgical Oncology trainees. I use these sessions as an opportunity to provide an overview of major areas of research in the molecular biology of cancer.

In the last 2 years I have provided the fellows in Medical Oncology with a two hour overview of the cell cycle and cancer as part of their basic science of Oncology training. I introduce the residents to the concepts of oncogenes, tumor suppressors, growth factors, and cell cycle regulation. I try to finish the sessions with a brief discussion of some of my own laboratory research and how it applies to clinical oncology.

Teaching sessions, in Cell Cycle Regulation and Cancer, have included:

3 x 1 hr	3 hrs	1998-1999
1X2hrs	2 hrs	2000-2001
1X2 hrs	2hrs	2001-2002

### **Fellowship Core Curriculum on Surgical Oncology:**

I participated in the core curriculum for the Surgical Oncology Fellows in June 2000. My lecture discussing the application of molecular investigation to problems in clinical Oncology was well received. (see AppendixXX)

### **Career Mentorship in Fellowship Training:**

Over the last 3 years I have participated in the career day set up for our Medical Oncology Fellows. During these one-hour sessions, I discuss what it is like to have a clinician scientist career in Medical Oncology. I discuss balancing clinical medicine with lab obligations, the challenges of grant writing, and sources of support (salary and grant) for basic and translational research. No formal feedback has been provided but the fellows are very appreciative of the information provided in these sessions.

I have also participated in workshop sessions on Careers in Hematology in 1998 and will do so again this year. These sessions are much appreciated by the fellows and occasionally I get formal feedback on the sessions. (see AppendixXX).

### **Continuing Medical Education**

I have had several opportunities to present medical grand rounds, oncology grand rounds and other CME lectures. I use these formal lectures to translate my basic science research to a clinical audience. The grand rounds' topics reflect my research efforts in the areas of altered regulation of the cell cycle in cancer. Specifically, my rounds topics have included research on mechanisms of resistance to growth arrest by cytokines like TGF $\beta$  and altered responses to DNA damage in cancer cells, and our discovery that loss of the cell cycle inhibitor protein p27 represents a new prognostic factor in many cancers.

These grand rounds are not formally evaluated. Clinicians have provided positive feedback regarding my ability to articulate the relevance of basic scientific topics to clinical practice. (Appendix D)

(Presentations below include only those since the time of promotion to Associate Professor)

### **Grand Rounds Presentations:**

#### **International:**

*Deregulation of the cell cycle inhibitor p27 in human breast cancer Oncology Grand Rounds The Sylvester Comprehensive Cancer Centre, University of Miami School of Medicine, Miami, Florida, November 27<sup>th</sup>, 2001.*

*p27: An essential effector of growth arrest by Tamoxifen and a novel prognostic factor in breast cancer". City Wide Hematology-Oncology Conference, Strong Memorial Hospital, University of Rochester Medical Center, Rochester, NY, October 26, 1999.*

#### **Local:**

*p27: A new Prognostic factor – the bench to bedside story. Medical Grand Rounds, Sunnybrook & Women's College Health Sciences Centre, Toronto, 23 January 2001*

*How to move a molecule from the bench to the bedside: The p27 story and breast cancer. Oncology Grand Rounds, Toronto Sunnybrook Regional Cancer Centre, Toronto, 31 May 2000*

### **Other CME Presentations:**

#### **International:**

*p27<sup>kip1</sup>, a Novel Prognostic Factor and Predictor of Tamoxifen Responsiveness in Breast Cancer". Cancer Education Seminars (part of Medical Oncology training series), Stanford University Medical Centre, Palo Alto, California, August 14<sup>th</sup>, 2001.*

**The following are plenary talks given at conferences were either clinical or scientific but with prominent attendance by Physicians**

*p27, a novel molecular marker of prognosis. Fourth Leura International Breast Cancer Conference, Leura, Australia, November 17, 2000.*

*The MAPK pathway: new molecular targets for the therapy of hormone resistant breast cancer." Hormones and Cancer (HC2000) meeting, Port Douglas, Australia, November 4, 2000.*

*New insights on p27 degradation and the prognostic role of p27 in human cancer. Impact of Cancer Biotechnology on Predictive Oncology & Therapy, 5<sup>th</sup> International Symposium, Geneva, Switzerland, October 28, 2000.*

#### **Local**

*"An update on p27 as a prognostic factor in human cancers". Progress in Pathology Rounds, Sunnybrook & Women's College Health Sciences Centre, Women's Campus, Toronto, 30 May 2000*

*"How to move a molecule from the bench to the bedside: the p27 story and breast cancer". Breast Cancer Research Meeting, Vaughan Estate, Estates of Sunnybrook, Toronto, 29 Feb. 2000.*

*"The cell cycle inhibitor p27 is a novel prognostic factor and an essential mediator of the effects of Tamoxifen in breast cancer". Oncology Research Seminar, Ontario Cancer Institute, Toronto, 11 Jan. 2000.*

*"Changes in p27 phosphorylation, localization and loss of cdk inhibitory function in TGF- $\beta$  resistant breast epithelial cells". Research Institute Seminar, The Hospital for Sick Children, Toronto, 3 Dec.1999.*

### **Graduate Teaching (Outside of the Department of Medicine)**

#### **Graduate Courses**

Medical Biophysics - Basic Science of Oncology Course (MBP-1018Y), two-hour lecture on Cell Cycle Deregulation and Cancer. In 1998 I received a letter from the course supervisor with positive feedback on my lecture (see AppendixXXX).

Over the last four years I have taught a six-hour session to masters and Ph.D. students in the Medical Biophysics Advanced Cell Biology Graduate Course MBP-1001.

Lectures on Cell Cycle Regulation in Mammalian Cells, have included:

6 hrs	1998-1999
6hrs	1999-2000
6 hrs	2000-2001

No formal evaluations of lectures have been made available to me.

Medical Biophysics - Graduate Student Seminar (MBP-1015Y). In this is a weekly seminar series, a required core course in Medical Biophysics, all students at the Masters and Ph.D. levels have to present their work to faculty and students in a one-half hour seminar. The goal of the course is to help students present complex scientific work to a broad audience. Two students present weekly. My role in this course was to help my own graduate students (n=4) prepare their presentations. In addition, I attend the weekly sessions, evaluate student presentations and provide feedback to the students and their supervisors.

Time commitment to the course was 1.5 hrs/wk, 1998 - Present

#### **Organization of Seminar Series**

Division of Cancer Biology Research, Invited Scientist Cancer Research Seminar Series. Over the last 3 academic years I organized a weekly (Sept-June) series of scientific seminars with invited speakers both from Toronto and abroad. More recently I have shared this with Dr. Dan Dumont. My role has been to coordinate the topics, to invite and host the speaker. These seminars provided important opportunities for networking between scientists, and keep scientists and students up to date on state of the art developments in molecular biology.

These were well attended throughout the year. The average weekly attendance was 40 to 50 students, post-docs, and senior scientists.

### **Primary Supervision of Students and Post-doctoral Fellows**

Within my laboratory I strive to provide an atmosphere in which students, post-doctoral fellows and technicians cooperate in their research efforts. As a mentor I assist in hypothesis generation, experimental design, and sometimes execution, and critique of results. This is done in individual one-on-one sessions with the trainee or technician and in the context of weekly lab meetings. I teach my students how to write scientific papers and how to review critically scientific papers by other groups. I also teach them how to present their work to an audience familiar with our particular area of research in our Divisional Seminars and how to present to a broader scientific audience in our Medical Biophysics Seminar course MBP-1015Y. Finally, I assist students in the preparation and defense of their reclassification proposals from the Master's to the Ph.D. stream and in preparation and defense of their theses.

#### Summer Students

Summer studentships provide exposure for B.Sc. or medical students to lab research.

Jeffrey Rothenstein, Summer Student, Department of Medical Biophysics, U of T  
Dates: May – September 2001

Katherine Han, Summer Student, Department of Medical Biophysics, U of T  
Dates: May – September 2001  
Outcome: Co-authorship on Manuscript in preparation

Andrea Milic, Department of Medical Biophysics, U of T  
Dates: June 1999 – Sept. 2000  
Project: Post translational regulation of p27 in TGF- $\beta$  sensitive and resistant cells.  
Outcome: Co-authorship on 2 published papers and one to be submitted

John DeAlmeida, Summer Student, Department of Medical Biophysics, U of T  
Dates: May-Sept 2000  
Project: Worked on of PKB activation in TGF-b resistance.  
Ourcome : Acknowledgement on paper

#### Graduate Students

I assist Master's and Ph.D. students in formulation of hypotheses, experimental design and critical evaluation of results. As the students' grasp of cell-cycle regulation and the molecular biology of cell growth increases, the complexity of our dialogue increases. Most of my students have career support awards. I help them formulate their projects and write grants for their awards.

Angel Arnoaut, MSc Student,

Dates: September 2001- present

Project: Angel joined the lab after her 3<sup>rd</sup> year general Surgery rotation at Dalhousie University. She has enrolled in the Surgeon Scientist training program and the Rolal College Clinician Investigator Program. She is studying molecular mechanisms leading to loss of ER protein and the poor prognosis of ER negative breast cancer. She plans to pursue a career as a surgeon scientist specialized in breast cancer.

Lin Yang, PhD Student, Institute of Medical Sciences

Dates: September 2001-present

Project: How growth factors signalling opposed G1 arrest by TGF-beta

Isabel Chu, PhD Student, Department of Medical Biophysics, U of T

Dates: September 2000-present

Project: Regulation of ER proteolysis by the Ubiquitin pathway

Jiyong Liang, PhD Student, Department of Medical Biophysics, U of T

Dates: July 1999 - present

Project: How PI23K signaling alters regulation of p27 function

Outcome: 1 first author and 1 co-authored paper. 2 more papers in preparation.

Anticipated PhD defense early 2003

Jeffrey Donovan, PhD Student, Department of Medical Biophysics, U of T

Dates: Aug 1998 – 2002

Project: Jeff is an MD/Ph.D. student who is interrupting his medical training at U. of Ottawa to carry out a PhD in my lab. He has found that p21 and p27 are required for the therapeutic efficacy of Tamoxifen and shown that MAPK signaling opposes p27 function and causes Tamoxifen resistance in breast cancer. Jeff will return to med school at U of Ottawa in fall 2002 on completing his PhD defense. He plans to pursue a residency in Oncology and a career as a clinician scientist.

Outcome: 3 first author papers, 1 review article and 1 book chapter (Basic Sciences of Oncology Text) Ph.D thesis written. PhD defense in 2002.

John Tsihlias, MSc Student, Institute of Medical Science, U of T

Dates: Nov. 1996 – January 1999

Project: Dr. Tsihlias completed his Urology Fellowship and then began graduate work in my lab. He created a prostate cancer data base of 113 patients. He identified loss of p27 as an important prognostic factor in prostate cancer. He also studied how androgen influences the cell cycle in prostate cancer cells.

Outcome: 2 first author papers and one Review.

MSc defended Jan 1999.

Sandra Ciarallo, M.Sc Student, Department of Medical Biophysics, U of T

Dates: Sep. 1996 – August 1998  
Project: Alteration in cell cycle regulators in TGF- $\beta$  resistant mammary epithelial cells.  
Outcome: First author paper in MCB. M.Sc., Dec. 1998. Went on to teachers training and is currently a High School science teacher.

Charanjit Sandhu, PhD Student, Department of Medical Biophysics, U of T

Dates: Sep. 1995–December 2000.  
Project: He has worked on two different projects: Cell cycle regulation by TGF-  $\beta$  and mechanisms of cell cycle arrest at senescence. He has collaborated on the p27 breast cancer project, in my lab, and on another project with the Harlow lab at Harvard University.  
Outcome: First author on MCB paper, 2 other published paper on mechanisms of cellular senescence and co-author on Nature Medicine( our lab) and Genes and Development (Harlow Lab) papers. PhD defense Jan 2000.  
Currently in 2<sup>nd</sup> year Med School at U of Toronto

Teresa Petrocelli, PhD Student, Department of Medical Biophysics, U of T

Dates: Feb. 1995 – Aug 2001  
Project: Cell cycle responses to DNA damage by UVB in melanoma progression. She collaborated on study of cell cycle effects of mitogenic integrin linked kinase with Dedhar lab, and another study of differentiation in erythroleukemia with Ben David lab.  
Outcome: 2 first author Oncogene papers; 2 second author papers (Dedhar collaboration and Ben David collaboration); PhD defense in 2002. Currently working as Associate researcher in Biotech.

#### Post-doctoral Fellows

Post doctoral fellows come to the lab with a general knowledge of molecular biology and some expertise in cell cycle regulation. My goals for post doctoral fellows include the following: to provide them with the opportunity to further develop their research questions and technical expertise, carry out experiments with increasing independence, and stimulate ongoing scientific dialogue with me and with other scientists, locally and internationally.

Vivi Ann Florenes Post-doctoral Fellow, Cancer Biology Research, SHSC

Dates: March 1995- May 1998  
Project: Mechanisms of TGF- $\beta$  and IL-6 mediated G1 arrest  
Outcome: 3 first author, 2-co-author papers. Currently independent Research Scientist, Norwegian Radium Cancer Hospital in Oslo Norway

Sandrine Cariou, Post-doctoral Fellow, Cancer Biology Research, SHSC

Dates: Feb. 1997 – 1999  
Project: Post translational regulation of p27 by estradiol in breast cancer cells and mechanisms of resistance to Tamoxifen in breast cancer.  
Outcome: First author review in Breast Cancer Research and Treatment; first author PNAS and co-author on submitted manuscript. Currently Research Scientist in France.

Wieben Zhang, Post-doctoral Fellow, Cancer Biology Research, SHSC

Dates: Nov. 1996 – September 2000  
Project: Expression of telomerase in prostate cancer; cell cycle regulation by vitamin D3 and androgen in prostate cancer cells.  
Outcome: 2 first author and one 2<sup>nd</sup> author paper. Currently Research Associate in Narod lab.

Jinhwa Lee, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: Sept. 1998-October 1999  
Project: the role of PKB in TGF- $\beta$  resistance.  
Outcome: Co-author on 1 published and one submitted paper. Independent Research Scientist in Seoul Korea

Michael Connor, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: Aug. 1999-present  
Project: Nuclear export of p27  
Outcome: one first author submitted and one co-author in press.

Rouslan Kotchetkov, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: Nov. 1999-June 2001  
Project: Nuclear export of p27  
Outcome: one co-author submitted and one co-author in press.  
Research Supervisor at Ventana Corp ( Biotech)

Venkateswaran Subramaniam, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: Dec. 1999-present Dec 2000  
Project: TGF-beta resistance  
Outcome: second author on McB paper. Currently Research Associate in Narod lab.

Richard Beniston, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: Jan. 2000-Jan 2001  
Project: p27 phosphorylation and localization  
Outcome: Co-author on 3 paper. Currently Research Associate at Beatson Institute in Glasgow , Scotland

Wesley Hung, Post-doctoral Fellow, Cancer Biology Research, S&WCHSC  
Dates: August 2000 – Feb 2002t  
Project: regulation of p27 function  
Outcome: Co-author on 2 paper. Research Associate at S. Lunenfeld Institute. Toronto

**MSC and PhD Oral Exam Committees (1998 onward):**

Nov 1999 Brad St. Croix Med Biophysics PhD  
June 2000 Dr Susan Done Lab Medicine and Pathology PhD  
June 2000 Dr R. Griffe Institute for Medical Sciences.