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Feature article

What is the value of a PhD in today's society?

By Dr. Megan Nelles

There were a plenitude of articles published this past year on the problems facing PhD education; all of which painted an utterly dismal picture. Some even went so far as to call us “disposable academics”.¹ The purpose of this editorial is to look at some of the arguments a little more critically, not to be unrealistically rosy about the current situation. There are surely some serious problems facing PhD students, but are all of the statements about the system fair? Or are they just confusing the discussion?

One figure that was oft repeated stated that the number of PhD graduates in the Organisation for Economic Co-operation and Development (OECD) countries increased by 40% between 1998 and 2006; a statistic used to suggest that this “[u]nlimited growth could dilute the quality of PhDs by pulling less-able individuals into the system”.² A look at the data, however, shows that all of this growth took place in China. While this is not an inaccurate statement, it *is* misleading: Canada has increased the number of PhDs awarded by only 1%;³ an increase precisely in line with a population increase of 1% over that same period.⁴ This statistic was also used to argue that the number of jobs available has been totally outpaced by graduate production. This is true if one assumes that the sole purpose of a PhD education is to produce academic faculty members – “America produced more than 100,000 doctoral degrees between 2005 and 2009. In the same period there were just 16,000 new professorships”.¹ Even so, a survey taken of the Medical Biophysics department here at UHN suggests the reality isn't so misaligned. **Con't, see PAGE 02**

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Though 50% of students in years 1 and 2 aspire to careers in academia, only 20% of senior students do.⁵ The real questions are: is this attrition directly related to the paucity of faculty jobs or are students simply becoming aware of a wider range of possibilities available to them? And, is our assumption still true today or is it reasonable, and desirable, for doctorate holders to spill over into other sectors?

Another issue that is of paramount importance in this debate is the matter of remuneration. In this respect, we feel that some of the data was presented with a blatantly biased spin and yet failed to convincingly make the point. “The PhD Factory”³ presented a “Scale of Dissatisfaction” showing that doctorate holders are generally satisfied with factors such as: intellectual challenge, degree of independence and contribution to society, but are largely dissatisfied with their benefits and salary. Yet, the salary earnings reported in this article (for the US) show that PhD holders earn on par with Non-PhD holders. Though we are not able to look at the data they used to produce this figure, the same is certainly not true in Canada. A doctorate holder can make approximately twice the annual income of the average male worker (once established; though it should be noted that a researcher, for example, also works nearly twice the number of hours).⁶ Having said that, wouldn’t a more appropriate comparison be between PhDs and professionals that also have advanced degrees? By this measure, researchers don’t fare so well; earning approximately half the salary of a private-sector lawyer or general practitioner, not to mention specialists. There is also the issue of health and employment benefits and the amount of time it takes to complete a PhD *and* the post-doctoral training required to become fully qualified for a faculty position. These issues will be discussed in our next installment: “The Value of a PDF” coming in The ORT Times’ January Issue.



Photo courtesy of: Stock.xchng

References:

1. The Disposable Academic: Why Doing a PhD is Often a Waste of Time. *The Economist*; December 16, 2010.
2. Fix the PhD. *Nature*;472:259-260.
3. Cyranoski D, Gilbert N, Ledford H, Nayar A, Yahia M. Education: The PhD Factory. *Nature*;472:276-279.
4. World Development Indicators, The World Bank.
5. Survey conducted by Andrea Fung & Krupa Patel, 2010.
6. Statistics Canada website (www.statcan.ca)



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Continue the Discussion!

If you would like to comment on this article, please visit ‘My ORT’ at www.uhntrainees.ca

Success

recent awardees



Have any Holiday Events coming up? Send us pictures! Your submission may appear in the ORT Times' next issue.

(Photo: Courtesy of C. Bros, Penn Lab, OC/PMH)

2011 Charles H. Tator— Barbara Turnbull Lectureship Poster Session Awardees



From Left to Right: Event Organizer, Dr. Michael Fehlings; Barbara Turnbull Foundation, Barbara Turnbull; Tator-Turnbull Lecture Host, Dr. Charles Tator; and poster awardee, **Jared Wilcox**

Research title: *Evaluating Stem Cell-based Combination Therapy in a Model of Cervical Spinal Cord Injury*

Supervisor: Dr. Michael Fehlings, TWRI



From Left to Right: Event Organizer, Dr. Michael Fehlings; Barbara Turnbull Foundation, Barbara Turnbull; Tator-Turnbull Lecture Host, Dr. Charles Tator; and poster awardee, **Dr. Sukhvinder Kalsi-Ryan**

Research title: *Responsiveness of a Clinical Impairment Measure Specific for Traumatic Tetraplegia: An International Multi-Centre Assessment of the GRASSP Outcome Measure.*

Supervisor: Dr. Michael Fehlings, TWRI

Program: Postdoctoral Fellow

The ORT is pleased to announce the award recipients of the 2011 Charles H. Tator—Barbara Turnbull Lectureship Series in Spinal Cord Injury Poster Session and Competition. The event held on November 25th, showcased the research and discoveries of students in the area of spinal cord injury.

1st place: Jared Wilcox (pictured left)

2nd place: Dr. Sukhvinder Kalsi-Ryan (pictured right)

Congratulations!



Alumnus Dr. Helen Razmjou, now an Associate Scientist at the Hollard Orthopaedic and Arthritic Centre of the Sunnybrook Research Institute, has been investigating the effect of disability and rehabilitation in musculoskeletal disorders for a number of years. Her research interests include factors that affect disability, response shift (a phenomenon of adaptation to disability), clinical diagnostic tests of the shoulder, and gender related analyses. Her clinical work as an Advanced Practice Physical Therapist involves assessment and management of non-surgical and post-surgical cases of rotator cuff, osteoarthritis and labral pathologies of the shoulder. She has used her clinical expertise and research training to prove the reliability and efficiency of Physical Therapists with extended roles in the assessment and management of patients with shoulder problems.

Commenting about her doctoral training, Dr. Razmjou says, “Completion of the PhD program (2009) and training I received from two renowned researchers in the area of disability, Drs. Aileen Davis & Susan Jaglal at the UHN, and two highly respected orthopaedic surgeons, Drs. Robin Richards & Richard Holtby at the Sunnybrook Health Sciences Centre, helped me to better understand the relationships among variables that are influenced by the complex nature of human beings. Who we are as men or women and how we deal with the hardship of the musculoskeletal disease influence how we perceive our health-related quality of life and that has little to do with our true physical limitations”.

Two recent publications from Dr. Razmjou are:

Razmjou H, Davis AM, Jaglal SB, Holtby R, Richards RR. Disability and Satisfaction after Rotator Cuff Decompression or Repair: A Sex and Gender Analysis. *BMC Musculoskeletal Disorder*. 2011 Apr 1.

Razmjou H, Schwartz CE, Holtby R. Impact of Response Shift on Perceived Disability Two Years Following Rotator Cuff Surgery. *Journal of Bone and Joint Surgery*. 2010 Sep 15.

latest & greatest



Inhibition of mitochondrial translation as a therapeutic strategy for human acute myeloid leukemia.

Škrtić M, Sriskanthadevan S, Jhas B, Gebbia M, Wang X, Wang Z, Hurren R, Jitkova Y, Gronda M, Maclean N, Lai CK, Eberhard Y, Bartoszko J, Spagnuolo P, Rutledge A, Datti A, Ketala T, Moffat J, Robinson BH, Cameron JH, Wrana J, Eaves CJ, Minden MD, Wang JCY, Dick JE, Humphries K, Nislow C, Giaever G, Schimmer AD. *Cancer Cell*, 2011 Nov 15. Ontario Cancer Institute (OCI)

Marko Škrtić, an MD/PhD candidate in the laboratory of OCI Senior Scientist Dr. Aaron Schimmer, has been studying whether common FDA-approved drugs can be repurposed as anticancer therapeutics. His most recent findings, published and featured on the cover of November's **Cancer Cell**, have identified an antimicrobial drug toxic to leukemia cells and characterized its mechanism of action, presenting a new therapeutic strategy of inhibiting mitochondrial protein synthesis. [Click to read.](#)

We caught up with Marko to discuss this recent publication:

ORT: What has been the greatest challenge in completing this project?

MS: The greatest challenge has been exploring an area of mitochondrial research that was novel for both the Schimmer lab and myself. When I had validated tigecycline as an active agent against leukemia after the initial screens, we began to discover that a mechanism of mitochondrial translation was likely. These type of mitochondrial assays had never been performed in the Schimmer lab. Therefore, it took many long hours searching PubMed for experimental insight, and subsequent troubleshooting afterwards to design appropriate assays. Our collaborators were also extremely helpful in providing added expertise along the way as we began to put together the story.

ORT: How has the experience of this research project complemented your studies in the MD program, and vice versa?

MS: It is definitely one of the added benefits of the combined MD/PhD program that I can now approach my clinical interests using the intuitive skills that I have learned throughout this project in the Schimmer lab. Similarly, it is important to troubleshoot experiments using the clinical problem-solving algorithms that are used in patient care. Also, my experience in this translational project has definitely ignited an interest in hematology and oncology.

ORT: How have collaborations with other groups enhanced your training experience?

MS: As you can immediately notice from the author list and affiliations, this project was fueled by multi-lab collaborations across the Canada and the world. Whether it was experimental help, important reagents or insightful advice, it was important that I quickly learned how to interact with other researchers in a time-conscious and effective manner. This type of two-way discussion is integral to the scientific process in today's fast-paced research environment. Collaborative opportunities are one of the major benefits of training at the UHN in Toronto, and I hope to continue this approach in my future career in Toronto.

latest & greatest



SCRIPDB: a portal for easy access to syntheses, chemicals & reactions in patents.

Heifets A, Jurisica I. *Nucleic Acids Research*, 2011 Nov 8.
Ontario Cancer Institute

Abraham Heifets, a PhD candidate in the lab of OCI Senior Scientist Dr. Igor Jurisica, has been building bridges between organic chemistry and computational science. By creating computational tools that allow researchers to search chemical structures, synthesis schemes, and other information, the efficiency of drug development and synthesis can be improved. This paper, published in **Nucleic Acids Research**, describes the development of a database of chemical information extracted from patents, providing a welcome data mining resource for scientific researchers and the business-minded alike. [Click to read](#)

We talked to Abraham about his experience developing this study:

ORT: What drew you to a project incorporating both computer science and chemistry?

AH: Many people want to make the world a better place, but I feel that there is a qualitative difference between work that helps save lives and work that contributes yet another dotcom website ("It's like Facebook, but for your pets! With badges! On a smartphone! With coupons!"). As computer scientists working in healthcare, we have an opportunity to contribute to research that has enormous impact.

In modern pharmaceutical research, a computer is used as often as a test tube. For example, no one can be expected to memorize the properties of 31 million compounds listed in PubChem, a popular public chemical database. Finding relevant molecules manually is no longer feasible, but rather it requires the support of an intricate computational infrastructure.

ORT: What impact might your computational tools have on scientific research and the pharmaceutical industry?

AH: Chemical patents have been analyzed to uncover differences in properties between compounds that are tested in the lab and the compounds that are eventually approved as new drugs. Marked differences could help avoid pitfalls such as liver toxicity. Our paper also discusses a number of other uses for our database, such as annotating biomedical research and describing alternative chemical series by *in silico* pharmaceutical lead optimization.

ORT: How have UHN resources or facilities supported your research program?

AH: This research would have been impossible without the computational resources of our lab. The raw data files comprise every patent granted at UHN, numbering several thousand per week, and totaling over 10 terabytes of data. We use a Linux cluster with 1,344 CPU cores to filter out the patents that are not relevant to the biological, chemical, or medical domains. This system allows us to calculate in days what would otherwise take months.



UPCOMING EVENTS CALENDAR:

12/15 **Dystonia Fellowship.**
Two-year fellowship available for PDF's.
Due December 15th.
www.dystonia-foundation.org

01/07 **Medical Biophysics (MBP)
Open House.** Princess Margaret Hospital
(PMH), 7th Floor Atrium from 9.30am-
2.00pm

02/01 **Canadian Institutes
of Health Research (CIHR) Master's &
Postdoctoral Fellowship Award Deadline.**
Due February 1st.
www.researchnet-recherchenet.ca

02/01 **Melanoma Research Grant.**
Career development award for salary sup-
port. Due February 1st. www.hjltrust.org

02/22 **Banting & Best Diabetes
PDF Fellowship.** One year fellowships
offered to PDF's to be used for full-time
research training in Diabetes.
Due February 22nd www.bbdc.org

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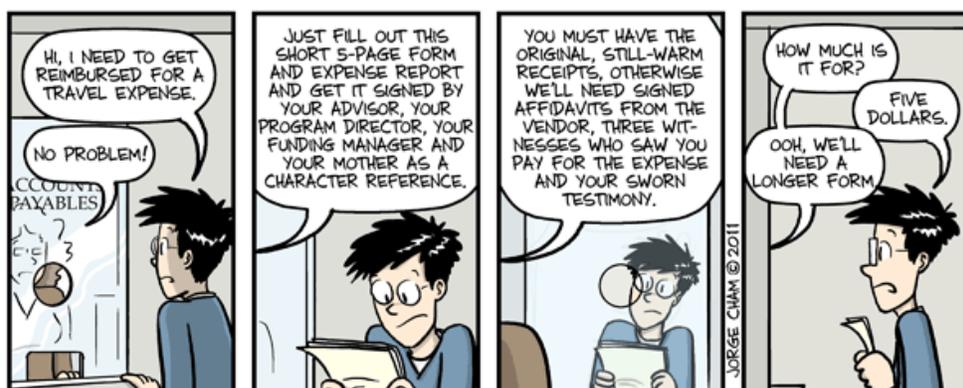
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**Tator-Turnbull
Lectureship
November 25**

The Spinal Program at The Krembil Neuroscience Centre proudly presents the 10th Annual Charles H. Tator - Barbara Turnbull Lectureship Series in Spinal Cord Injury. It was held on November 25th at The Old Mill Inn & Spa. Canadian Institutes of Health Research (CIHR) announced the recipient of the 2011 Barbara Turnbull Award in Spinal Cord Research, Dr. Simon Gosgnach. This prestigious award, which was established in 2001, is presented to the top ranked spinal cord researcher identified through CIHR's investigator-initiated grants competition.

Pictured from Top Left-clockwise: Lectureship Speakers; Mayor's Letter, 2011 Barbara Turnbull Award Dr. Simon Gosgnach (far left)
(Photos: Courtesy of C. Ruff, PDF in Fehlings Lab & Jeff Peng, Photographer)



"Piled Higher and Deeper" by Jorge Cham
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