communication skills, gaining valuable experience in portraying their own area of specialization and the study of science in general. This promotes their research in the community, and results in a public with a better understanding of research.

What happens in the end? The university produces well-rounded and successful graduate students who have gained valuable experience, skills, and confidence through volunteerism. Inadvertently, the university also attracts keen and motivated future students. Science outreach improves science literacy in the community, leading to a scientifically literate society that values post-secondary education. Science outreach at the University of Toronto can lead the way to enhancing science curricula in our school system, while promoting the value of its own activities within the community.

While there are a few science outreach opportunities at the University of Toronto, they often remain a well-kept secret, but if you hunt around a bit, you’re bound to find one that fits your interests. As a coordinator for the Let’s Talk Science Partnership Program at the St. George campus, I don’t expect all of the students we reach to become scientists one day, but I do hope to give them an appreciation of the everyday science that affects each and every one of them. Having a little fun never hurts either.

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The Meeting of Minds: Students as a Bridge Between Research Disciplines

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When passing by the College-University intersection, it is impossible not to notice the numerous construction sites. One of these is the Terrence Donnelly Centre for Cellular and Biomolecular Research (TDCCBR), one of the University of Toronto’s Capital Projects. The idea behind the TDCCBR is that it will offer an arena where scientists from a range of disciplines, from pharmacy to engineering, will forge interdisciplinary collaborations and address scientific problems from a variety of angles. Under each umbrella of individual expertise, one will find unique ideas and approaches to problem solving and the technology necessary to develop and apply therapies to a variety of diseases. By combining several of these umbrellas under one roof, the aim of the TDCCBR is to make expedient, innovative progress to answer specific research questions.

From the collaborative perspective, multi-disciplinary research is quite exciting for the scientific community at the University of Toronto. However, let’s look at it from a more reductionist viewpoint: where do students fit into this integration of knowledge, ideas and technology? Should students in this research environment learn the basics of numerous disciplines? Or should students simply study under one supervisor’s area of expertise, and not be directly involved in cross-discipline collaborations? What are the potential benefits and drawbacks for students of a multidisciplinary program?

Perhaps to gain some insight into these questions we should examine one of the existing interdisciplinary platforms at the University of Toronto: the Department of Medical Biophysics (MBP), which offers students the option of studying molecular biology, structural biology or medical physics. Students focusing their research in any of these areas have access to resources and facilities at a number of different research sites across the campus. The collaborative effort involving students in this department may not be as strong or as broad as that proposed for the TDCCBR; however, this department is designed upon a similar concept in that it attempts to create a multidisciplinary research environment with the objective of diagnosing and treating cancer.

MBP was initially more heavily weighted toward the “physics” of biophysics. In more recent years, however, it has evolved to include a separate biology stream. Currently, all students specialize in one area. One of the MBP research facilities is at Sunnybrook Hospital where separate floors are dedicated solely to molecular biology research and medical physics respectively. As a student working in this facility, my impression is that although they are technically part of the same department, these different disciplines rarely interact with one another to integrate and expand their scientific findings. Furthermore, I feel that the creation of an 'intermediate stream' may
act to bridge this gap".

Having an intermediate stream would allow for students coming from either a biology- or physics-based background to transition into a broader field. I was asked to write this article because I am an example of a student making such a transition. My undergraduate background is in molecular biology and genetics, but I applied to graduate school with an interest in diagnostic imaging. My Master's supervisor is a magnetic resonance physicist. So there began the story of a biologist working with a physi­cist on research that involves a great deal of chemistry. The nature of my background, combined with the technical expertise of my supervisor and the access to MRI technology and molecular and cellular biology equipment, has resulted in a project that has been successful thus far. Perhaps this example may serve as a model to expand upon in order to create such intermediate "multidisciplinary streams" in departments offering graduate programs.

Although a situation like mine leaves room for many potential problems as the skill sets of the supervisor and student are not matched, it also holds huge potential for expansion in both knowledge and research experience. A post-graduate degree in science is important for equipping the student with the skills necessary for approaching and answering complex research questions. A multidisciplinary graduate program would provide the advantage of exposure to many facets of research and an excellent opportunity for graduate students to become familiar with a broad range of scientific methodologies commonly separated by discipline related boundaries.

Too much variety, however, may "spread the student too thin" and hinder in-depth comprehension. Careful supervision and guidance from researchers with expertise in the appropriate fields of study will therefore be crucial in order to guide students though a broad range of scientific disciplines. In addition, the student's principal supervisor will have to ensure that the student's project and tutelage retains its focus.

The innovative research goals of the TDCCBR will be an exciting addition to the U of T research community. This will provide researchers with multiple avenues through which to address scientific problems, and in my opinion, will result in a more effective way of doing science. However, it demands that researchers explore options outside their immediate area of study, and this may be a difficult proposition for those whose focus and success lie in one particular field.

The Department of Medical Biophysics, like other collaborative efforts underway at the University of Toronto, is in an ideal position to address challenges in trying to establish truly useful multidisciplinary environments. Conceivably, the first step in creating a more coherent collaborative effort among researchers with diverse backgrounds is through students who establish a common link between the principal investigators.

OPINION

From the Other Side of the Fence, is the Grass any Greener?

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Professor + Idea = Biotech Company. So is it industry, academia or somewhere in between? Having spent 14 months in a biotech company, learning the ropes of industry before jumping into graduate school, I thought I would share a few of the important things I learned while earning a pay cheque.

The Corporate Ladder
I had always thought that the hierarchy of jobs would be straightforward. As a technician, I assumed that I would be the strong base of that corporate triangle, but I quickly realized that either I had forgotten the basics from grade school geometry class, or things were slightly skewed in the world of biotechnology (Figure 1). I was correct in assuming where I stood in the pecking order, but industry seemed to have too many scientists for the number of technicians, and a vice president for everything.

While the route to success in academia seems to be a linear path – from graduate student, to post doc, to professor, I couldn’t see how people jumped ranks in industry. A B.Sc. made you a technician, a M.Sc. made you the fine owner of the same title, and a Ph.D. gave you the well-deserved title of scientist. And to leap to VP or CEO required time spent with a major pharmaceutical company, successful biotech company, or an academic collaboration with the CEO. The main issue at hand, is that there are very few ranks to move through before you are staring at the glass ceiling above you wondering where you should go next… and for me it was right to grad school.

Beware of the pink slip
We have all watched or participated in the stress of finding funding, whether it was for our own graduate scholarships or our advisors' operating grant. And for some, the outcome may determine whether they will be casting their own gels or purchasing the pre-cast ones, fixing the old broken equipment or buying it brand new. Yet through it all, we consider our life as a graduate student to be safe and secure. Have you ever heard of a graduate student being asked to leave due to a lack of funding? We're the cheapest labour out there!