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.
This same job security isn’t apparent in the biotech industry. CEOs talk of ‘burn rates’ and ‘money in the bank’, leaving that constant taste in the back of your mouth that your job is never secure. With no products on the market, start-up biotech companies rely on investors, and as of late investors have little confidence in the biotech world. Once a biotech company gets off the ground, with an attractive product pipeline, they tend to be eaten up by larger companies, more often taking the merchandise but not the employees. And large pharmaceutical companies with drugs on the market provide no more comfort as they are plagued with mergers and subsequent job cuts. At least they attach a severance package with the pink slips to take away some of the pain.

Tainted by money
In graduate school, some of us work for ourselves seeking out the satisfaction of self-accomplishment, others work for their advisors looking for the rewards of respect and responsibility, and still others work for reasons unbeknownst to the rest of us. Regardless, our ultimate goals are still the same: to participate in novel and interesting science, to finish in a decent amount of time, and to publish, publish, publish. As a naïve young technician entering the biotech world, I wanted to make a scientific impact. I had joined the biotech world to participate in solid, meaningful research while reaping the benefits of a pay cheque and a rather luxurious health plan. But the reality of the biotech world is that you work for a company, a company that is owned and operated by shareholders. Shareholders see dollar signs, not meaningful research; shareholders mean business, not science.

I poured my heart and soul into my first project. I got data, I wrote reports, I moved forward with my new-found discoveries, and then one day everything changed. The shareholders decided there was no obvious financial gain from my project – it was over, discarded like contaminated tissue culture plates into a biohazard container.

With a knife through my left ventricle, I was assigned a new, financially savvy project. And off I went, with a little less enthusiasm and a lot less hope for this world I was working in. If you’re comfortable with unpredictable change, this is the industry for you; and if not, beware of what you’re getting yourself into.

And a few last little tidbits
Location, location, location. Do you like big city life? Ever considered moving south for better weather and taxes? The biotech sector in Canada is limited to large cities, mainly Montreal, and to a lesser extent Toronto and Vancouver, and compared to our neighbours, the opportunities are few and far between. If you’re patriotic and against brain drain, be prepared for few work options and little control over where you live.

You ain’t getting rich. The job posting reads ‘Ph.D. with 2-5 years experience’. Interpretation, you’re off to do one or two post-docs before you’re heading to industry. So you’ve now been out of high school for 12+ years, and are ready for a real paying job. Just to give you a heads up, the salaries of scientists in the biotech world are rather insulting considering all of the hard work you have put in to your career to get this far. But don’t pout, if you can figure out how to get through that glass ceiling into a VP position, you can buy a few of your dream cars!

Still a bit of academia hanging around. Unlike many science-based industries, which are plagued by QC (quality control) and SOPs (standard operating procedures), biotech companies are typically formed by academics striving to take a brilliant idea to the market. So rather than following tedious, brain numbing protocols all day like some science jobs, the biotech world is a work environment that applauds the scientific curiosity that got us all on the road we’re now traveling on.

It was a learning experience indeed: fourteen months, two projects, one pink slip, and a severance package. I think I experienced it all. And would I ever think of returning? In an instant, especially since I’ll be looking at a different glass ceiling than last time!