GRADUATE STUDIES UNDER THE SUPERVISION OF DIANE BEAUCHEMIN

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by

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This handout details how I operate and what I expect from my graduate students. In the past, I have conveyed this information to students orally. To ensure consistency, I now put it in writing. If you are considering asking me to become your research supervisor, then please read this carefully. Do not hesitate to ask questions as they arise so that we may quickly clarify issues.

My supervisory methods and practices

Academic development

I prefer that my students take all their courses during the first fall and winter terms so that they can thereafter concentrate on their research project. I try to motivate my students as much as possible. In addition to taking them to conferences as soon as they have results and making them first author of any paper arising from their work, I also add a bonus to the guaranteed minimum annual stipend. Their annual salary is indeed increased by an amount corresponding to 10% of any scholarship that they get, as an incentive for them to excel in their academic work.

Frequency of interactions

I push my students to become independent researchers, especially at the Ph.D. level, by refusing to spoon-feed them what to do. That is why they are expected to regularly report to me, with a proposal for the next step, which we then discuss. Because a lot of data is quickly acquired, my students spend a lot of time processing data. I have no problem with them doing it at home, as long as they regularly report to me and they make good research progress.

My door is always open when I am in my office. My students are expected to report to me as soon as they have completed parts of their projects, or when they want to discuss their results and the next step. I prefer to have one on one interaction with each of my student rather than relying on senior students to train junior ones. Past experience has indeed revealed too much "error propagation" when I used the latter approach. Efficient instrument use has become a priority because the ICPMS (inductively coupled plasma

mass spectrometry) equipment, on which all my research is based, is increasingly expensive to operate.

Because I value the one on one interaction with my students, I limit the size of my group to 5 graduate students, with typically one undergraduate summer student and a maximum of 3 undergraduate students doing their 4th thesis under my supervision during the fall and winter terms.

Training in oral communications/scientific presentations

The rule of thumb in my group is that M.Sc. students are to present their results at a national meeting whereas Ph.D. ones present at international ones. However, I take as many students (who have something to present) as I can afford to scientific meetings (whether national or international) that are held within the Toronto-Ottawa-Montreal triangle. I have my students make presentations as soon as they have good results so that they can start making contact with potential future employers/supervisors. In general, the first presentation is a poster one. This is typically the only presentation that M.Sc. students will make aside from their supervisory committee meetings and thesis examination. I go through each student's poster presentation with them after they have discussed it with their peers.

Ph.D. students are expected to make an oral presentation at an international conference prior to their graduation. I have them rehearse in front of the group. I also get the group together for practice thesis examinations and comprehensive exams, where I encourage all my students to ask questions to the candidate. In all cases, I go through each slide, one by one, and discuss ways to improve or clarify it with my group so that they all learn at the same time.

Some students (whose salary comes from industry) have to make additional presentations (typically one per term) to show their progress to representatives from the industry. The group can generally not be present at these (because of non-disclosure clauses).

Training in written communications/scientific writing

I encourage my students to publish as they get the results, as this greatly facilitates the writing of their thesis in the end. I insist on them writing the first draft of each manuscript, which I then go through while discussing it with them so that they learn in the process. I make them the first author of any paper arising from their work. When the reviewers' comments arrive, I let them have a first shot at making corrections and writing replies/rebuttals. Most of them need encouragement when they first read the comments. I help my students put them in perspective so that they can see that their manuscript will be improved by the corrections and then be published. I then go through and complete the corrections. I copy them on all correspondence pertaining to their paper and have them also check the proofs before I do.

I go through each supervisory committee report, comprehensive essay, project summary (for scholarship application) and thesis in the same manner, prior to their official

submission. Inasmuch as possible, I try to complete my review within a week (so that the content is still fresh in the student's mind).

Career development and counseling

I check the curriculum vitae of each of my students, and make recommendations on how to improve it, prior to its submission to, for example, scholarships granting agencies. I push my students to apply for all the awards to which they are eligible, and help them prepare their application.

I also entice my students to get involved in professional organizations (such as being student representative on the executive committee of the Canadian Society for Analytical Sciences and Spectroscopy) so that they may make additional contacts with potential employers from all sectors. Of course, I always make a point of introducing my students to all the people I know at conferences, for the same reason.

I never miss an opportunity to mention the imminent availability of some of my students to potential employers. I immediately forward any job announcement to my students, and encourage them to apply before the completion of their degree, so that they can get interview experience. Of course, this can backfire, i.e. a student can get a job prior to graduation. However, I prefer that they get a job sooner rather than later, as it can be quite discouraging to have a new degree and nowhere to use it.

I have earned the respect of the scientific community for being objective and critical as well as having high standards. I try to transmit these qualities to my students and, so far, have mostly succeeded. Indeed, my graduate students receive such a valuable training that they have no difficulty finding a job upon graduation. In fact, most of them find a position (either job or post-doctoral fellowship) prior to completing their graduate studies. They are sought after not only for their ICPMS experience, but also for the trouble-shooting skills that I ensure they develop. Indeed, I teach them not only how to operate and maintain the ICPMS instrument but also how to trouble-shoot it, from the sample introduction system to the mass spectrometer. I personally train each of my students until they are comfortable operating the instrument. They are expected to call me if anything goes wrong. I then insist that they be present while I trouble-shoot the instrument so that they learn in the process. They are also expected to be present when service engineers come for scheduled maintenance (while an instrument is under warrantee) or to fix a major problem that I cannot handle.

Student's responsibilities

It is better to prevent than to cure. So, if you are unsure about something, please ask!

General departmental responsibilities

- Read and implement the policies and guideline of the Department of Chemistry and of the School of Graduate Studies and Research found at http://www.chem.queensu.ca/Graduate/regulations.htm
- Follow safety regulations (http://www.chem.queensu.ca/safety/index.htm), including WHMIS training and keeping your WHMIS certificate valid.
- Consult the Graduate Secretary (Annette) in the General Office as needed for either the paperwork or general questions regarding graduate studies.
- Attend the weekly departmental seminar (during the fall and winter terms).
- Set-up the annual meeting of your supervisory committee.

Specific responsibilities

- Work conscientiously and think!
- Take all your courses seriously, as the probability of getting scholarships (and a salary bonus!) increases with your average.
- Report to me regularly with, in addition to a summary of your results, either a proposal for the next step or questions with possible answers. (This may require making appointments with me by e-mail at times of the year where I am heavily involved in teaching and committees meetings, and may be hard to catch in my office.)
- Be available to meet with speakers that I host to give them an oral summary of your research.
- Be critical. For instance, you can argue with me if you disagree with one of my recommendations. You can also bring up things that you think are wrong in literature papers that you have read (some things can indeed have escaped the reviewers!).
- Keep up to date with the literature pertaining to your research area. This greatly facilitates the writing of introductions (in either papers or your thesis)!
- When using material from a paper in a manuscript or thesis, place the material between quotation marks if it is reproduced verbatim (i.e. word to word); always make reference to the source.
- Share the maintenance of the ICPMS instrument that you use for your research.
- Report any instrumental problem to me, even more so at the beginning of your studies.
- Let me know when chemicals are about to run out so that an order may be placed.
- If you have a sense of humour, feel free to tell or e-mail me a joke. (This may make my day at depressing times!)

Thank you for having or considering having me as your research supervisor!