Volume III, Number 2- September 1999

What They Don't Teach You in Class

Roy Auty (G2)

My name is Roy and I have been asked to distill the most important lessons ... in less than 500 words. The views reflected in this article represent my own, written in some haste about 11 months after I arrived here. Everyone does things differently and other views may be valid; they just aren't written here.

It is hard to know where to start such an article. There are a few things which are obvious to some but need stating anyway: it gets quite chilly in the winter or that you'll need two months to break a lease. What you don't find out until afterwards is that it can get quite humid in the summer and that places are available to rent only one month before you move in. So bring all of your clothes (winter and summer) and boxes to put them in for when you move.

If you haven't got boxes, don't worry - think of how many boxes a typical lab gets through. Now multiply this number by 250 for each lab and multiply by 2 because of the associated medical school. Subtract the number you first thought of and that's how many boxes Harvard will still end up throwing out ... this week.

I know many of you have worked in labs before and the usual advice still applies. Most importantly, bring your own coffee cup, use a Sharpie to label it and don't leave it lying around. Check your pipettes at the start of each rotation and be prepared to make up solutions. Do read the papers they ask you to but don't get too comfortable at your desk - it won't be yours for too long. After you have accumulated a small forest on your desk, a certain amount of inertia has to be overcome in order to move. OK, I can see I'm losing your interest. Which means that by now there shouldn't be any PIs left reading this article so I can tell you things that I found useful.

First, I am a big advocate of doing four (or five) short rotations. I'd recommend eight weeks as a minimum. Remember that you'll get the feel of a lab within a short period of time and you'll spend the rest of your rotation confirming your hunch. I did several rotations which were shorter than eight weeks but these weren't really long enough from the PIs' points of view (although I'd like to thank them for tolerating my behavior).

If you find yourself competing with another rotation student for a place in a lab, don't panic. This happens more often than expected and it usually all works out for the best. I firmly believe in the Œbest-fit' hypothesis of labs. First, there is no single perfect lab. If you still think I'm wrong at

your thesis defense, I'll admit I was too cynical. Second, what works best for one student might not work for another. Don't be afraid to like a lab that received an unfavorable review from a former rotation student. These opinions give a useful perspective and highlight points of concern but they are not infallible.

To summarize, short rotations allow one to meet lots of people in different buildings, learn how different labs do different techniques and work in lots of different fields. You probably won't ever have this chance again. Of course, you probably won't get anything useful done but isn't that what a thesis is for? Perhaps the biggest advantage is that you¹ll be able to collect enough IDs to get from the Warren Alpert Building to the Longwood Galleria without ever going above ground. Perhaps.

As for classes, enjoy them. Discuss which ones to take with your program advisor and your buddy. Quarter courses are easier, in general. However, they aren¹t useful unless all the participants are prepared to speak out and have an opinion. If you can¹t decide whether you should take a course or not, find out if the course director is enthusiastic. If you¹re still having trouble, consult the course guides produced by Robert Pickford for the DMS. Much more effort went into those than went into this article.

Finally, some one-liners: Talk to both your buddies and your friends. Make friends throughout all years of the program. Stay involved in extracurricular events.Last but not least, good luck!

Now, just in case any of the PIs did their trick of reading the first few lines and the last few lines, I have to end the way I started. Now, where was I? Oh yes, the T stops running just after midnight but it is the best way to get anywhere (including the airport) if you want to travel at a sane hour. The Prudential Center is overpriced but air-conditioned. Instead, try the Cambridgeside Galleria at Lechmere (any Green Line) or the K-mart at the Andrews stop on the Red LineŠ If you have any questions or comments, e-mail me! (auty@fas.harvard.edu)

[back to top]

Volume III, Number 2- September 1999

ANNOUNCEMENTS

Recent Publications by BBS Students

Moy, T.I. (G4) and Silver, P.A. Nuclear export of the small ribosomal subunit requires the Ran GTPase cycle and certain nucleoporins. *Genes & Dev.* 13:2118-2133, 1999.

Syken, J, (G5) De-Medina, T, Münger, K. hTid-1, the human homolog of the Drosophila tumor suppressor Tid56, is a mitochondrial regulator of apoptosis. *Proc. Natl. Acad. Sci. USA* 96:8499-8506, 1999.

Vyas P, McDevitt MA, Cantor AB, **Katz SG** (G3), Fujiwara Y, Orkin SH. Different sequence requirements for expression in erythroid and megakaryocytic cells within a regulatory element upstream of the GATA-1 gene. *Development* 1999 Jun;126 (12):2799-811

Carmeliet P, **Ng Y-S** (G8), Nuyens D, Theilmeier G, Brusselmans K, Cornelissen I, Ehler E, Kakkar VV, Stalmans I, Mattot V, Perriard J-C, Dewerchin M, Flameng W, Nagy A, Lupu F, Moons L, Collen D, D'Amore PA, Shima DT. Impaired myocardial angiogenesis and ischemic cardiomyopathy in mice lacking the vascular endothelial growth factor isoforms VEGF164 and VEGF188, *Nature Medicine*, 1999, 5:495-502.

D'Amore PA, **Ng Y-S** (G8), Darland DC. Angiogenesis. *Science and Medicine.* May/June 1999 pp44-53.

JM Casasnovas, **M Larvie** (G7) & T Stehle. Crystal structure of two CD46 domains reveals an extended measles virus binding surface. 1999. *MBO J.* 18. 2911-2922.

Schneider, V. (G4) and Mercola, M. Spatially distinct head and heart inducers within the Xenopus organizer region. *Current Biology*, 1999, 9: 800-809.

Zhu, L., Marvin, M. Gardiner, A., Lassar, A.B., Mercola, M., Sterm, C.D. and **Levin, M.** (BBS Alum) Cerberus participates in controlling left/right asymmetry of the embryonic head and heart. *Current Biology,* 1999, 9: 931-938.

Congratulations are in order!

Amy Lepre (G2) will marry Jeffrey Brock on September 11, 1999 in Cambridge!

Peter Juo (G7) and Jasmine Soo-Hoo were engaged this month.

Community Announcements:

Students interested in Theater or Film should show up to the Dudley Drama Organizational Meeting on Thursday, September 16th at 8PM in the Fireside Room of Dudley House. Valerie Weiss (G5) is the new Dudley Drama Fellow. Dudley Drama would love even more DMS students to be involved in the group. This Fall they will perform a play and in the Spring students will write, direct and produce their own short films to be screened at the end of the semester. Any questions? Contact valerie@pride.med.harvard.edu.

Announcing the World Premier of "Western Blot Story"

Friday Evening, Friday, 17 at the BBS Student Retreat
Provincetown, MA

[back to top]

Volume III, Number 2- September 1999

Learning How to Teach: The Bok Center

Cathie Pfleger (G5)

The Derek Bok Center for Teaching and Learning, located on the third floor of the Science Center on Harvard's Cambridge campus, goes unnoticed and under-utilized by most of us who conduct our research on this side of the Charles. A brief survey of BBS students revealed that few knew about the Bok Center. Those who recognized the name generally had little idea what the Bok Center does unless they had participated in teaching undergraduate courses. The Bok Center offers a wide variety of services that may prove useful to both new and upper year graduate students involved in teaching.

At the beginning of each semester, the Bok Center runs a teaching orientation comprised of a series of workshops and panel discussions. The orientation runs over a period of two days addressing matters of interest to both new and veteran teachers. Talks targeting beginners offer special hints and advice while talks for upper-year students address matters of building teaching portfolios and looking at the job market. Some sessions cover issues relevant to all teachers such as how to get shy students involved in discussions, how to give good lectures and lead discussions, and how to deal with issues of race and gender in the classroom. Other sessions involve topics relevant to specific subjects such as teaching quantitative material or lab courses.

The Bok Center also holds "micro-teaching" sessions generally prior to the beginning of undergraduate classes.

Each Teaching Fellow (TF) gives a five to ten minute presentation to other TF's who act as students. After each presentation, the presenter and the other TF's critique the presentation, discussing alternate ways of presenting the material. Later, each TF may view a videotape of the practice presentation with a Bok Center teaching consultant.

Several BBS students have improved their teaching skills through the Bok Center training sessions. Dereth Phillips (G9) commented, "You shouldn't start teaching without them. They get you into the right frame of mind and get the creative teacher juices flowing." Joe Chen (G5) also found the sessions positive , "[they] helped me overcome some of my initial trepidation." Others found the sessions less productive. "The microteaching was okay," comments Heather Morehouse (G5), "but they didn't make enough constructive criticism, it seemed like the whole thing was just to boost your confidence."

The videotaping aspect of microteaching intimidates some graduate students. Many hate the sound of their voices or seeing themselves on tape. Watching the tape, however, frequently helps identify possible problems, such as saying "um" frequently or talking to the blackboard rather than the class. "I did not take advantage of the videotaping option," Chen adds "but I think that would have helped me improve my section leading skills." In addition to making teachers aware of problems, watching the tape also shows positive skills and allows the presenters to see how they appear to others. Rather than point out difficulties, the tape often reveals the presenter to be more fluid and upbeat than his or her own perception. "I thought I was horrible," said one TF, "I felt so nervous and insecure, but on tape it didn't look so bad."

The Bok Center also provides sample evaluation forms which TF's can use to get feedback from students and build a teaching portfolio. More information on the upcoming Fall Teaching Orientation, September 15-16, and the other resources available at the Bok Center can be found at http://www.fas.harvard.edu/~bok_cen/.

[back to top]

Volume III, Number 2- September 1999

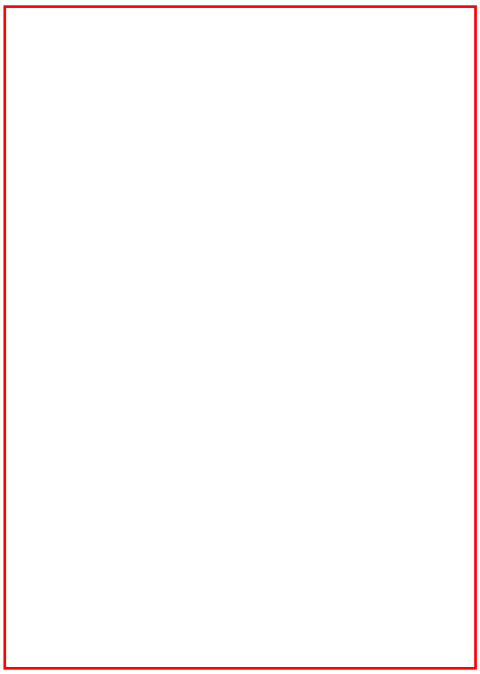
Where to eat at Longwood

By Sheldon Rowan (G5) and Karen Fang (G2)

The challenges of finding good food options in the Longwood Medical area are matched only by theological questions surrounding the origin of life on our planet. OK, maybe not quite that difficult, but no easy task nonetheless. Let's face it - Longwood is no Back Bay or Harvard Square. You need plotting, strategy, and covert operations to get decent food around here. This is why the fine people of the BBS bulletin have put an effort into systematically listing all the notable restaurants in the Longwood area. Not only that, but the hours of operation and a short critique are here as well.

Why eat? Or more specifically, why eat here? Several reasons propel us to eat in this area. The most common by far is the late night munchies syndrome. That 4 hour experiment, through the wonders of entropy and chaos, has lasted you well into the night. Where to eat? What's open? Alternatively, you are in charge of organizing a lab outing and need a place

that has enough seating and diversity of selection to accommodate your laboratory (and you know how difficult and choosy they are). What happens when you slept-in, didn't get a chance to make lunch, and need somewhere close (since your incubation is only for another 20 minutes)? Then there is always the parental visit where they're treating and want to take you somewhere nice for lunch in the area.



It's all here. And if you care, our personal suggestions for the above situations are The Longwood Grill, Mississippi's, Souper Salad, and Gardiner Museum Cafe respectively. But don't take our word on it. Read the list. Learn the list. Love the list. Then eat.

[view the list of restaurants]

[back to top]

Volume III, Number 2- September 1999

The FEBS Meeting in Nice

By Michael Roherl (G2)

Cote d'Azur - the intensity and clarity of the region's colors and lights appealed to many painters - including Cezanne, Van Gogh, Matisse, and Picasso. It comes as no surprise that the city of Nice, center of the French Riviera, was chosen by the Federation of the European Biochemical Societies (FEBS) for its 26th Annual Meeting during June 19-24. More than 2,000 participants from 53 countries were in attendance.

The conference was opened by Stanley Prusiner (UCSF) who delivered the distinguished Sir Hans Krebs Lecture. Like anybody of his caliber he faced the difficult task of keeping his talk wisely balanced between a historical review of his contributions to the prion field and his laboratory's latest cutting edge results. He reported on recent transgenic experiments in which a shorter version of prion PrPSc in a null background showed a drastic reduction in incubation period in comparison with full-length PrPSc. More than ever is the heat on for the first structure determination of PrPSc which may now be facilitated by the new construct.

Another great noon plenary lecture was given by Kai Simons (EMBL, Heidelberg). His talk reviewed work on lipid rafts in membrane trafficking and signaling. Lipid rafts formed by tightly packed membrane assemblies of sphingolipids and cholesterol carry proteins to different destinations in the cell, e.g., to the apical membrane in epithelial cells. Rafts also function as dynamic devices to

compartmentalize signal transduction processes by partitioning membrane proteins between raft and non-raft membrane areas.

Simons recently received attention as the founding president of the European Life Scientist Organization (ELSO) which aims at reshaping and strengthening cell and molecular biology research in Europe in one pan-European group without the intermediates of the many national organizations (see BBS Bulletin, August issue, and www.elso.org).

Of the many session speakers, a few are mentioned below. Andrei Mirzabekov (Moscow/Argonne, IL) presented the development of the clever MAGIChip. Different from other systems, the chip contains tiny three-dimensional gel-pads in which oligonucleotides, DNA, proteins, or other compounds are covalently bound. He presented mutation and genome poly-morphism analyses as well as DNA sequencing by single base extension.

Sister chromatid cohesion in yeast was the topic of a brilliant talk by Kim Nasmyth (Research Institute of Molecular Pathology, Vienna). By looking for mutants that separate sister centromeres in the presence of the anaphase inhibitory protein Pds1p, his group has identified 6 proteins essential for establishing or maintaining sister chromatid cohesion. They have now shown that the eukaryotic cohesion apparatus is required both for the repair of recombinogenic lesions and for chromosome segregation which ostensibly lies at the heart of the meiotic process.

Manuel Serrano (Madrid) reported on his widely appreciated INK4a-ARF work and the control of Rb and p53 pathways, respectively.

A number of sessions dealt with structural biology. Rolf Hilgenfeld (Institute of Molecular Biotechnology, Jena) chaired a satellite meeting on the European Bio-Crystallogenesis Initiative which brings together 13 laboratories to gain better understanding and control of macromolecule crystallization, a task which largely remains

a time-consuming trial and error effort. Further information on this exciting program can be found at www.imb-jena.de/EBCI.

It was intriguing to hear John Kuriyan (Rockefeller) speak about the structure of the Hck protein. Interestingly, the structure of Hck is almost identical to that of c-Src, which was published by BBS faculty member Michael Eck in 1997. Both structures reveal a mechanism of intramolecular binding of SH2 and SH3 domains to suboptimal recognition sequences. Kuriyan further reported a structure containing an originally unmodeled activation loop around Tyr 416 of Hck, which in the unphosphorylated, inactive kinase is nicely positioned within the catalytic center to block substrate binding.

Further insight into the giant 700 angstrom structure of the Bluetongue Virus core particle was the topic of David Stuart's (Oxford) talk. Kurt Wüthrich (Zurich) illustrated the new TROSY-CRINEPT experiments which promise to expand the molecular size limit for NMR studies in solution.

Perhaps too often, the absence of stimulating discussions following the presentations was noticeable. It happened quite frequently that very few or even no questions were asked by the audience. It would have been great to see more of the younger participants challenge the speakers.

All in all, the meeting in Nice was a very pleasant and instructive event, for its broad range of talks (one of the advantages of large conferences), the large number of poster presentations (which suffered a little under space constraints), and, of course, the personal interaction with so many young scientists of such varied backgrounds.

[back to top]

Volume III, Number 2- September 1999

Compilation of the Best of the 'Ask the Faculty' & 'Ask the Students' Columns

The BBS Bulletin thought by reprinting responses to past 'Ask the Faculty and Ask the Students' column, incoming BBS students would find them helpful as they think about rotations and classes.

Ask the Faculty:

Q. How should you split your time between classes and rotations the first year? Some people seem to think that classes are unimportant and you should spend most of your time in the lab. Others say course work should take precedence. How much time is enough to spend in a rotation?

A. It's a balancing act. Rotations are a way for you to get to know the lab, and vice versa. It's a mistake to think of your courses as simply repeats of undergraduate topics. Lectures and reading courses here at the Medical School are often given by major players in their respective fields, so they can provide efficient ways to access a particular, fast moving area. Any reasonable faculty member knows that classes should not be ignored for a rotation project. For first year students in particular, it may be hard to find a project that is flexible enough to allow you to get to the lectures and section meetings, study for exams, and schedule time in the lab, especially when it involves making arrangements with another student, postdoc or the lab head to learn new techniques, go over experimental plans and actually get to the bench. A faculty member who encourages you to favor the rotation over classes will probably also be unsympathetic when you want to take time off to study for prelims, go to journal clubs or attend seminars outside the lab's narrowly defined area. You should definitely discuss this with your prospective rotation supervisor before starting in the lab to make sure that everyone's expectations are similar.

Don't, however, let courses dominate your life. Information in certain fields becomes rapidly outdated, and the ability to get yourself up-to-speed in your own field, or a new one, is a skill that you should work on acquiring right now. The success of your scientific career depends largely on this ability, the research you accomplish, and the quality of the mentoring you receive in your lab. The key to a successful rotation is a thorough exposure to the people in the lab and, most of all, to the scientific, practical and intellectual material unique to that lab. The success of the actual rotation project itself is unimportant. Therefore, you should spend a lot of time in your rotation exploring the science and the people around you without becoming obsessed with the results. This should leave plenty of time for course work.

Ask the Students:

Q. "What are the most important questions to ask a potential rotation advisor or thesis advisor? What are the most important things to keep in mind as a student makes these critical decisions?"

A. I've found that first you have to figure out for yourself what you want to get out of your rotation. The most important are (1) evaluating the lab as a potential thesis lab and (2) learning something. A lot of people worry that they must finish the project they are working on, or that they must leave the rotation having co-authored a paper. My advice is to forget these concerns. Relax, learn about the lab, and most importantly, learn about yourself and what you need/want in a lab environment.

Different labs can have different environments. It is often good to choose very different labs to figure out the best environment for you. Would you fare better in a small lab or a big lab? A post-doc heavy lab, or one with more graduate students? A new lab or an established lab? A lab in the main quad, or a lab in one of the hospitals?

In terms of evaluating a potential rotation/thesis advisor, I think it's best to ask more, rather than fewer, questions. Don't assume that faculty members will volunteer all the advice or information you want to know. They are busy and might not realize what your concerns are. There are many issues you should probably address before your rotation begins. Will there be room for you if you decide to join the lab? Some labs are quite full and make a great place to rotate, but there is no possibility of taking a student, or there may be one spot but more than one student will want it. It's better to ask first and weigh your options before you start than to find out at the end of your rotation that there's no possibility of staying.

Also, ask about other issues that might come up in the future. How does he or she feel about your wanting to teach? How would he or she feel if you got married and had kids? If you're already married and have kids? How much time should a graduate student spend in lab? On other science related activities? Sleeping? How long does he or she like his or her graduate students to take? If you join the lab, will you be handed a project, or must you work one out for yourself? Will you get direct supervision? Indirect supervision? Any supervision at all? How much access to him or her will you have? How willing is he or she to let you follow an interesting result which distracts from your main project? How closely will he or she monitor your progress to make sure you stay focused enough?

When evaluating a lab, we also strongly urge you to talk to graduate students and postdocs in the lab. They are your best resource for the inside story on the grad student experience in that lab. Their take on things can be particularly valuable in cases where the faculty member doesn't work in the lab anymore and so may not have as accurate a picture of what goes on. In any case, you shouldn't feel uncomfortable asking a potential advisor about questions or concerns you have. Chances are, if you're uncomfortable bringing these issues up now, it won't get any easier later.

Ask the Faculty:

Many of the questions sent to this column over the past year have centered on issues regarding lab rotations. We felt that many students might find it helpful to see how this issue was recently addressed among the faculty. The fellowing memo was sent to all BBS faculty from Connie Cepko (BBS Program Head) and Cliff Tabin (BBS Associate Program Head).

1. The purpose of a rotation is to allow both faculty and student to assess whether the lab is a good fit for the particular student and hence a suitable place for the thesis work. In general, students feel greater satisfaction and thus have a better experience in a rotation when they achieve experimental results. However, due to the short nature of the rotation and due to other demands on the student's time, rotation projects are typically not completed. This usually is not a problem as data are not necessary to achieve the goal of the rotation. Putting pressure on the student to bring in data is counter productive and unnecessarily stresses the situation.

2. The first semester in graduate school is very busy, with courses and the adjustments to life as a graduate student. Many students find that they cannot spend much time in their first rotations. Nonetheless, it is not rare that a student returns to the first rotation for the thesis and it is thus worth being open to accepting first semester rotation students. More importantly, since students are anxious to get into a laboratory and to begin identifying their thesis labs, the Program encourages students to rotate in the first semester. We must support them in this.

3. When discussing the possibility of a rotation with a student, you (the faculty member) should make clear whether you have space and funds to support a student for thesis work. This is, of course, not a commitment to a particular student, but a point of information that students need to know.

4. At the end of the rotation, you should conduct an "exit interview," in which you and the student discuss the rotation. This can include constructive criticism from you, as well as encouragement for things that went right. If you decide not to take a student (whether it is at the end of the rotation or at some later point) you should clearly indicate to the student your reasons. This can be difficult and painful, but it is part of your responsibility as a mentor. In addition, if you ask the student for suggestions for the next rotator, you may get some very useful insights into how you are running your lab.

[back to top]

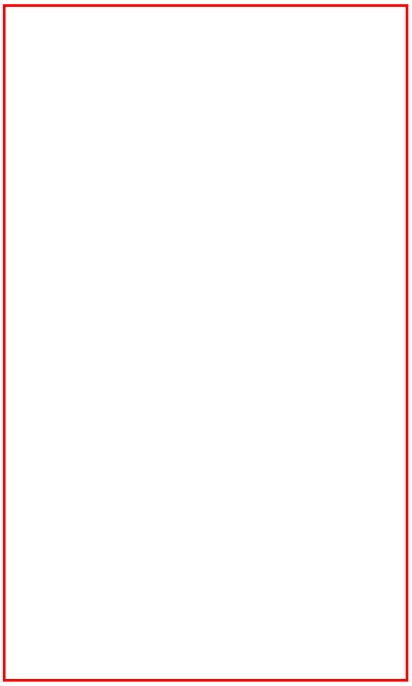
BBS Bulletin Previous Issues | BBS Calendar | BBS Bulletin Staff | BBS Home Page

Volume III, Number 2- September 1999

Student Science: Snapshots of Recent Work

Picture of yeast cells with DNA stained blue, Nop1 stained green, and 5' ITS1 rRNA stained red. The left picture is of wild-type yeast cells and the right has cells lacking the exonuclease that degrades 5' ITS1, by Terry Moy (G4), Silver Lab.

Crystal structure of two CD46 domains reveals an extended measles virus binding surface, by Mykol Larvie (G7), Stehle Lab.



The Nodal gene is normally transcribed on the embryo's left side, but perturbation of gap junction communication in the early embryo unbiases LR asymmetry, by Michael Levin, (BBS Alum), Mercola Lab.

[back to top]