Laboratory Selection

Description:
Amos Jones was accepted to an excellent graduate program in molecular biology. The faculty was relatively small but there were two outstanding professors, Claire Cheng and Patricia Slocum, who really determined the quality of the graduate program. Amos had been encouraged to train under Dr. Slocum by his undergraduate advisor.

Amos planned to do rotations in both the Cheng and Slocum laboratories. When inquiring about the research activities in the labs, Amos was told by Dr. Slocum's trainees that whether for a rotation or a thesis, Amos would be given a specific project, he would be expected to communicate results only to his direct supervisor, and he would have to give a formal presentation on the progress of his research once every two months. They noted that daily handwritten and dated entries were required for their laboratory notebooks. Much of the work had potential for commercial applications, so the laboratory was locked even during the day, with entry limited to the staff. The graduate students were reluctant to describe their experiments. The pace was very intense and trainees were required to prepare abstracts for the two important national meetings every year. The trainees also noted that many famous investigators visited the lab, spending time in formal and informal scientific discussion. Trainees were allowed to examine copies of papers that Dr. Slocum had received for review and to discuss them at lab meetings. They also saw an occasional grant application that she was asked to review. The trainees expected to be in great demand for postgraduate fellowships.

Professor Cheng's students reflected on the openness of the laboratory and her constant and immediate availability. They thoroughly enjoyed broad scientific interplay within the lab and with investigators on campus and elsewhere. They indicated that they were encouraged to explore their own ideas and expected to select their own thesis project. The students gave no formal presentations except when rehearsing for meetings. Progress in the laboratory was episodic rather than steady as various concepts were explored. Although their notebooks were not specifically examined, Dr. Cheng knew about every experiment and provided constructive criticisms and suggestions. Dr. Cheng did not go to many meetings and refused to show papers she received for review to her trainees. The students admitted that they felt a little out of touch with the newest developments in the field. Although Dr. Cheng did not enjoy the same prestige and reputation as that of Dr. Slocum, the trainees said Dr. Cheng's lab was a much more pleasant and collegial environment in which to work.

Questions:

1. If you had to prioritize, which features would you value most highly in the selection of a laboratory for your rotation or for your thesis work?

2. What criticisms would you have of each laboratory as described? What would you describe as the strengths of each lab?

3. What would you like to know about an investigator and laboratory prior to selecting that individual as your thesis advisor?

4. The two laboratory chiefs presented in this scenario represent somewhat different philosophical views of science. How do you view a career in science?

Case E1 from Teaching the Responsible Conduct of Research Through a Case Study Approach, a handbook prepared by the Association of American Medical Colleges (Korenman SG and Shipp AC, 1994)

This case was contributed by Allan Shipp (acshipp@aamc.org) of the Association of American Medical Colleges. ©1994
Case Study: The Business of Mentoring

Susan Smith is a fourth-year biology graduate student at Paradise University. She is conducting her research in the lab of Dr. Frank Michaels, a well-respected lab director whose research focuses on DNA transcription. Susan’s work has been conscientious but unproductive. She feels stuck and has tried to discuss this with Dr. Michaels, but he tells her to just keep working. “You’ll get results eventually” is all Dr. Michaels ever tells Susan.

Recognizing that mentoring is of the utmost importance in the training of graduate students, the Biology Department at Paradise University has a policy that lab directors are to act as formal mentors for their trainees. Susan has therefore relied on Dr. Michaels and has not formed a personal relationship with anyone else in the department. She thinks that Dr. Michaels is not giving her the attention she needs because of his other activities. Dr. Michaels has a personal interest in computers and computer programming. As the instructor for the department’s molecular-biology course, he develops a computer program that generates a video demonstration of transcription (DNA Whiz) and uses it to teach the class. DNA Whiz is a hit with the students and with other faculty. Realizing that the program has broad appeal, and that he has a talent for programming, Dr. Michaels sets up his own business, BioProgram. He markets the program, and others he develops, commercially to faculty at other universities via the Internet, but he shares the programs with Paradise faculty free of charge.

In addition to Susan’s concern that Dr. Michaels is not providing her with the guidance she needs, she often ends up answering calls to the lab about BioProgram and troubleshooting programs for Dr. Michaels’ business. Along with research, exams, and work on her projected thesis, these activities have left Susan feeling overwhelmed. But she doesn’t want to appear unwilling to help. Susan knows that Dr. Michaels, owing to his excellent reputation and his extensive contacts in the field, can be very helpful to her in securing a postdoctoral appointment. She also hopes that in the next year Dr. Michaels will arrange for her to make presentations within the department as well as at a national meeting.

In Susan’s department, comprehensive examinations are given in part on a take-home basis. She has completed two drafts for one of her examinations, but it is being held up before approval by a particularly exacting member of the review committee, who has a reputation for unreasonable demands. She has shown her most recent draft to specialists in the field, who believe that her exam has earned well beyond a passing grade and cannot understand why it is being held up. When Susan discusses the exam with Dr. Michaels, in the hope that he will intercede in some way with the difficult faculty member, he refuses to get involved. "It is not my responsibility," he says.

To add to her feelings of neglect, Susan has not had a committee meeting to discuss her research in more than a year, and Dr. Michaels shows no signs of calling one anytime soon. Susan is quite frustrated and has thought of talking to Dr. Evelyn Chen, a more senior faculty member in the department and another member of her committee. Susan has seen Dr. Chen work with other graduate students, and Dr. Chen seems to take an active part in fostering their graduate work and careers.

Susan decides to talk to Dr. Chen, who suggests that Susan should have a committee meeting and initiates the scheduling of one. At the meeting, the other members of Susan’s committee express concern about her progress; they believe that she is not likely to finish by the end of her fifth year, her expected completion date. Susan is upset, because she believes that she has been doing exactly what was asked of her by Dr. Michaels, assuming that her work would eventually lead to a thesis. Dr. Michaels points out to the committee that he never asked Susan to answer the phone or troubleshoot the programs, that Susan did those things by her own choice and in doing so drew time away from her thesis and exam work.

Susan decides that even at this point in her graduate education she is better off starting over in another lab. She asks Dr. Michaels for a letter of recommendation. He tells Susan that he can’t write a strong letter, but he would be willing to describe her accomplishments, the coursework she completed, her time in the lab, etc. Susan schedules an appointment with the dean to discuss her graduate-student career and her timetable in working toward her degree.
3.2 Rob Woods is a second-year predoctoral student in neurobiology. His mentor, Dr. Ames, has helped Rob select a research topic for his dissertation and has been proactive in helping him get started in the lab. Dr. Ames has provided Rob with written guidelines and benchmark dates for completion of various phases of the project. Rob recognizes that this project is particularly ambitious and appreciates the need for the rigid deadlines Dr. Ames has imposed. Rob is concerned that he may have difficulty meeting these deadlines: his wife is pregnant and he is overseeing the care of his father, who has early-onset Alzheimer’s disease and resides in a local adult home. Rob has not disclosed either of these facts to his mentor. Rob begins the project enthusiastically but after a year is overwhelmed by the combination of the demands on him coming from both his research and his personal life. Because his progress has been modest, he finally tells Dr. Ames about his situation. Rob is shocked at Dr. Ames’s reaction. Dr. Ames is very upset with Rob for not providing this information sooner and implies that Rob has compromised the progress of the lab’s overall research program by not being honest with him when he began as a trainee. Dr. Ames immediately assigns Rob to a different dissertation research project that does not have as many time constraints and deadlines. Dr. Ames tells Rob that the work he has completed will be given to another student, who will be able to meet the time deadlines. Dr. Ames mentions that when the work is completed, he will look at Rob’s contribution and decide at that point whether Rob should be an author on the paper reporting the findings of the project. Rob becomes depressed at this turn of events. He takes a week off to regain his composure. During that time he comes to you for advice. Should he have done anything differently? Should be change mentors now? Did Dr. Ames behave appropriately? Are there compromises he could suggest to Dr. Ames that would allow him to continue working on his initial project?

3.3 John Broadt and Professor Woodworth have met several times to discuss possible projects that John might take on as a doctoral dissertation project. During the last discussion, Woodworth recites a series of rules that he applies uniformly to his advisees. He indicates that he wants John to know the rules of his laboratory fully before making a decision to join the lab. Most of the issues covered are straightforward, reasonable, and come as no surprise to John. However, one rule surprises and concerns him. Woodworth says that he does not permit his laboratory advisees to
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Past 5 years his laboratory has been significantly disrupted by romantic relationships between his student advisees. These situations have resulted in ill will, diminished productivity, and a negative effect on the overall morale of his laboratory group. Professor Woodworth indicates that he has carefully considered the implications of such relationships and has decided that the only reasonable thing to do is to prevent the problems they create by asking those involved to decide which of the two of them will leave the laboratory. Discuss the issues of mentorship responsibilities, ethics, and conflicts of interest that you feel are important to this scenario.

Milton France, a senior-level graduate student, is seen less and less during the day by his mentor and other members of the laboratory. It becomes apparent to the mentor, Dr. Wise, that Milton is working very long hours during evenings and nights when most of the other laboratory workers are not there. This persists for several weeks, and Dr. Wise does not think the pattern is a good one. Dr. Wise approaches Milton and requests that he spend more time during "standard working hours" in the lab. Dr. Wise argues that interaction with him and with other members of the laboratory is important and that it is best for all to talk about science regularly. Milton argues that he can work much more efficiently when fewer people are around. He cites the fact that a piece of equipment he was using in his research was continually busy throughout the daytime hours and this was not conducive to his performing needed experiments in a timely fashion. Milton discloses that this was the "straw that broke the camel's back," forcing him into working unconventional hours. Both the faculty advisor and the student hold tight to their arguments, and over the next several days the situation between them grows tense. Comment on this situation and consider what avenues might be pursued to bring about resolution of this conflict.

Robin Carvell has been a postdoctoral fellow in a large research group for 3 years. He has accepted a job at a university and is in the last month of his formal training. Dr. Eleanor Hunt, his mentor, requests to meet with him privately shortly before his departure. Dr. Hunt produces a typewritten document that summarizes Robin's contributions during his training. Moreover, the document lists biological materials that Robin will not be allowed to remove from the laboratory when he leaves. Finally, it spells out several areas not yet under investigation in Dr. Hunt's laboratory that Robin is forbidden to work on in his new position. There is a signature line at the end of the document for Robin to indicate his agreement with its language. Dr. Hunt asks Robin to take the document home.
3.6 Dr. Mitchell Conrad has received a grant from an industrial source
to do basic research that has long-term implications for commercialization. A new graduate student, Michelle Lawless, has just joined his
lab after completing one semester of graduate coursework. Dr. Conrad
outlines several projects that can be pursued by Michelle in the industrially
sponsored research program. Dr. Conrad indicates that there is a proviso
listed in the industrial grant agreement that says that all material to be sub-
mitted for publication must first be reviewed by the company. This review
must always be completed within 120 days. Dr. Conrad points out that this
presents only a minimal disruption to the normal publication process as
compared with the unrestricted publication of material gathered under
federal research grants. He also mentions that the positive aspects of working
on this proposal include the fact that there is money in the grant for
Michelle to travel to at least two meetings per year. Also, the grant appli-
cation provides money for a personal computer that will be placed at
Michelle's lab station while she is working on the project. Dr. Conrad
emphasizes that working on the project will likely give Michelle an “inside
track” with the company should she want to pursue job possibilities there
following graduation. Michelle agrees to work on the project. Comment
on the ethical and conflict-of-interest implications of this scenario.

3.7 Ron Archer is the graduate advisor for several predoctoral stu-
dents. One of his students, Gordon Polk, shows Ron data that de-
scribe a novel property of an enzyme under study. Both Ron and Gordon
believe this work has major implications for expanding the knowledge of
this enzyme. At Ron’s request, Gordon repeats the experiments success-
fully. Then, because of the important implications of this work, Ron ap-
proaches another predoctoral student in the lab and asks her to perform
the same experiments in order to double-check the results. Ron instructs
the student not to discuss the experiments with anyone else in the lab in
order to obtain independent data to confirm Gordon’s potentially impor-
tant findings. Are the advisor’s actions justified in this case?

3.8 Jim Allen has been a postdoctoral fellow in your lab for 3 years. He
is in final negotiations for a tenure-track assistant professorship at
another university. He is excited about taking this job, and you are pleased
that the position will allow him an excellent opportunity to grow into an
independent scientist. At the request of Dr. Wiley, his prospective depart-
mental chair, Jim has been preparing an equipment list needed to set up his
laboratory. Jim has come to you for advice several times while preparing