Careers in Biotechnology

MicrobeLibrary Article: ***Focus on Microbiology Education***
Publication Date: **2/1/2002**

Author
Charlotte Mulvihill
Oklahoma City Community College

You have a student who asks about jobs in the biotech industry. How do you respond? First and foremost, ask if the student likes laboratory work and teamwork. Laboratory technicians do work independently but also function as part of a team. So the student needs good communication skills—both written and oral. Being a problem-solver is also essential, and the student MUST have a solid grasp of the mathematics and chemistry needed to accurately calculate molarities and to shift back and forth from quantities to concentrations. Many biotech companies give a molarity problem as part of the interview, and employers state that the main reason a new employee is not retained is that the person is not proficient with calculations. A sample problem: what is the molarity of water?

The student should be encouraged to write a résumé that is tailored to biotechnology. Advise the student to first attend some workshops at your institution on how to write a résumé and how to prepare for a job interview. The résumé should first focus on courses taken by the student and lab experiences the student has had. Courses in chemistry and microbiology are essential, and the transcript is enhanced by biochemistry and molecular biology courses. Experience is often a job requirement—but how does a student get experience? One approach is to take a job as a work-study student. Another excellent approach is to obtain undergraduate research experience: either as honors or independent study coursework or in a summer program. If your institution does not sponsor research for undergraduates, advise the student to check out the National Science Foundation website (http://www.nsf.gov/pubs/1997/reulist/reulist.txt) for locations around the country that do host undergraduate research. In addition, your local community college may have a biotechnology training program that can further a student's preparation for biotechnology work.

Next, the student should list in the résumé specific skills and proficiencies. For example describe proficiency in general laboratory techniques, such as aseptic technique; micropipetting; reagent preparation; glassware cleaning; use of balances, centrifuges, autoclaves and pH meters; and basic computer skills. Then add more specific experiences, such as work with radioactivity, animals, and special types of microscopy. Finally, highlight experience with any of the following: agarose gel electrophoresis; polyacrylamide gel electrophoresis (PAGE); Southern and Northern blots; polymerase chain reaction (PCR); extraction and purification of DNA, RNA, and proteins; plasmid preps; transformation; enzyme-linked immunosorbent assays (ELISA); protein assays; Western blots; chromatography; and cell culture.

The résumé should also reflect the nature of the biotechnology industry in the location where the student is seeking work. Tell the student to do some homework—visit a company's website, figure out what kind of work it is doing, and highlight in the résumé those skills the student can contribute to its enterprise. If the company is a manufacturing concern, the student should be aware of the importance of documentation and the existence of Good Manufacturing Practices (GMPs). In fact, there are online courses in GMPs, which could beef-up a résumé (http://www.bio-link.org; click on online courses). The student can also use the BioLink website to view job listings in the biotechnology industry.

Getting desirable experiences and preparing an effective résumé will help ensure success at landing a position in the biotech industry. But there is a final recommendation for those just starting on the job—*At*

the Bench: A Laboratory Navigator (1). This manual is a science insider's advice to novices. It not only outlines essential information about working with reagents, buffers, cell cultures, bacteria, nucleic acids and proteins, radioactivity, and centrifugation but also gives valuable advice concerning the unwritten rules of the culture of science—how to get along with laboratory mates and how to get organized and started with experiments. It's a great reference for new graduate students as well.

Reference

1. **Barker, K.** 1998. At the bench: a laboratory navigator. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y.