

Question: What percentage are your workshop attendees HS versus CC or 4yr?

Answer: Most of our workshop attendees are from high schools (about 90%), with a few from community colleges and one or two from four year colleges

Question: I am wondering--were you inspired by someone who seemed like you culturally or in another way?

Answer: Well, I can say that my parents and older brothers suggested I go into science, but nobody else that was not related to me. The reason they suggested it was because science and medical related careers are more stable than most others. My parents actually wanted me to study dentistry like my oldest brother. This is a fairly common suggestion in asian families...either doctor or dentist is the usual suggestion. Unfortunately I didn't have the aptitude or desire to pursue those paths. I think it is important to have someone who you can identify with in one way or another make a suggestion regarding what you should do with your life. Most people do identify with their ethnicity quite easily, unfortunately not all professions are represented equally by all races. I think this is why it is very important to have people of all cultures participate in outreach programs to inspire the next generation. Anyone who has experienced any level of success (in any endeavor) should help out the next generation. This is the only way that our society can improve over time. So to answer your question, yes, I did have someone in my culture inspire me. I think inspiration is all around us all the time, it's really a question of our own ability to listen to it. It's a question of what inspires us as opposed to who.

Question: Dina and Jeanne, can you share any feedback from teachers and/or evaluation on the impact of the strong career focus in a science class, as well as the very practical aspects like writing a resume, practicing an interview, etc?

Answer: (Jeanne) The feedback has been very positive. I think one of the aspects we're really exploring is how science teachers have really been stepping up and talking about science careers in their classrooms. Many of the schools we work with, the funding for counselors has been cut, which is extremely unfortunate, of course. So the science teachers are trying to figure out way to talk about careers in their classrooms. Especially for the students and classes and students that are already thinking about careers and writing resumes as part of a broader school mission to prepare students, so they're finding those resources useful. Dina, did you want to comment at all on that?

(Dina) I think what was interesting, a couple of things come to mind, is that there is a push here in Washington, and I'm sure around the country, to expose students to the resume activities and get them familiar with those skills. But we found that none of them, or very few of them, had ever heard of a cover letter. Once they were set loose with that skill set they really resonated with the idea of, "oh, this is how you bridge the gap between "I want a job," "Here's a job" this is how I make the connection. This is how I introduce myself and how I explain why I'm looking for this position." They really seemed to find that useful. The other thing I was thinking about in response to Sam's slides. There was one student who, in response to one of the highlights we have about a veterinarian, because genetic testing is increasingly being done with non-human species, and it's a picture of Dr. Tegarden with her son, and this female student said, "oh my

goodness, I didn't realize you could have a career and have a family at the same time." And I think that that kind-of gets back to Jeanne's comment about students really resonating with young people and when they see those younger people having a career and also having important things outside of the lab, outside of science, and that that is possible, I think especially with some of the girls. That's a really profound thing that stuck with me.

(Jeanne) Something else that has come back is that students are surprised by the range of jobs in science. A lot of them, when they think bioscience, they think doctor, nurse, veterinarian, and they aren't necessarily thinking biomedical engineer or the other potential careers that Dina mentioned earlier. We even have someone that we profile who is in 3D animation, but specifically for science. I think that is another interesting feature, just to expose students to the range of jobs that are out there. They like seeing the different profiles and learning about those. Once they get to high school, they are starting to think about, what is my path? Where am I going?

(Dina) The other thing I wanted to point out is that students had a hard time wrapping their mind around salaries and a living wage. It's a minor point, but sometimes something as simple as talking about things in terms of an hourly rate can make it more relevant to students and more accessible.

Question: I am curious about Piper's experience in that she did not feel prepared to enter the workforce until she received her AAS degree from Seattle Community College after getting her Bachelors Degree. Could she expand in that? What specifically did she learn at the community college level that prepared her for her career?

Answer: I'd be happy to. In my biology background, this was in the very early 90's and I was in a small liberal arts college. If I wanted hands-on laboratory training, I would have gone to the University of Nebraska and worked in a medical lab. But for me, I called people on the phone and raised money – that was my job. I wanted to get the techniques for what I would be doing on entry-level into a job. So the Associates degree program from biotechnology was right there with diversity of lab techniques, from tissue culture, DNA sequencing, data analysis, working with viruses, working with bacteria and it also had a great segment on career development and how do you get a job and leading you into internships. I think it was giving me the diversity because at the time, coming out of university, I wasn't sure what I wanted to do. I had all options from thinking I wanted to go to medical school to thinking I wanted to go into women's health and do a Master's degree in public health. I was like many people – you just don't know. So this helped me ground myself with some techniques to start getting work experience.

Question: I currently teach the biotech program at Bates, and I come from a predominantly immunologic background, I am curious if there are specific technologies that maybe I am not conversant in that would help my students gain a step ahead?

Answer: Actually I think you're in a very good position to talk about the future of Biotech with your immunology background. A lot of the medicines coming out in the next few years are a fusion of small molecule drugs attached to an antibody. The traditional cancer (and other) medicines have severe side effects since they also effect healthy cells. That's why patients

undergoing therapy lose their hair, lose weight, etc. The new medicines about to come out have the advantage of a targeted antibody which is directed to cancer cell specific markers. This allows the linked drug to be delivered directly to cancer cells only. This is kind of like a smart bomb as opposed to a regular bomb. Seattle Genetics is a local player in this field, you can read up further about their technology.

Other changes in biotech are the advancements in automation. With the aging of our population, more and more firms rely on automated platforms to do the screening of molecules and other vital research activities. Much like the transition from film cameras to digital cameras...research is doing the same thing. Once biotech companies realize that they can arrive at the answer to their problem by applying technology such as automation, informatics...they rarely go back to manual methods. For example the ELISA assay is a common procedure in research. These days there are multiplex assays where a researcher can measure multiple proteins in a single drop of blood. <http://www.rulesbasedmedicine.com/> This is a link to a company with this multiplex platform that is widely used.

One last big change is computers. We are in the Information Age. Students who can stay up to date with recent technology changes will be very desirable to companies on the cutting edge. This does not minimize the importance of knowing the fundamental, it emphasizes knowing the basics first.