Dr. Josh Trueheart is the Senior Director for Research at Microbia, a small industrial biotechnology company (recently acquired by the large global company DSM) located in Lexington, Massachusetts. He received his Ph.D. from MIT, and began working in industry after a postdoctoral position. He joined Microbia in 1999.

Basic job description:

Senior Director for Research at Microbia.

Type of education/training required:

To become a research director, you would a Ph.D. and ten to fifteen years of experience in industry after your degree or postdoctoral fellowship.

Special talents or skills that contribute to career:

You need to be flexible. In industry you can switch your "field" at a moment's notice based on the direction the research takes or the new projects started, so you can't be committed to a single system or a single organism. You need to be able to learn about a new field, technique, or organism quickly. You also need to have the ability to collaborate and work with a team, because in biotech firms everyone pitches in and the achievement is always a group achievement. Another useful skill is being able to talk to people with different training and backgrounds. To work collaboratively with a chemist or a statistician, you need to be able to talk with them!

Average income range for people working in your area (entry level through experienced persons):

It is difficult to be exact about this because salary is based a great deal on skill set, experience, and your ability to assimilate into the work environment. It is also based on job location because the cost of living plays such a large role in salary estimation. Starting salary is usually more than comfortable, and is fairly similar whether you have had a postdoc or started working in industry immediately after receiving your degree. After ten years in industry, it is possible to be making six figures.

What is involved in a typical workday?

As the Senior Director for Research, I oversee most of the biology. At Microbia, this means making industrial microbes for scaling up and producing fine chemicals. I participate throughout the process, from developing the new strains all the way to scaling up the production. Although we were recently acquired by a larger, global company called DSM, Microbia itself is still quite small, with 23 people total.

People in my position are typically disengaged from doing actual experiments at the bench, but I like to spend time at the bench—when I ask someone to do something, I want to know exactly what I am asking. I always have some non-critical projects that I can dive into. So during a typical day, I will do about an hour of benchwork. I usually spend about two to three hours talking to people one on one who meet with me about their experiments, or plan some new projects. Two to three hours are also spent in meetings, and I have quite a bit of of administrative work, which piles up with increasing responsibilities. I don't travel very frequently, but I have traveled to Switzerland or Amsterdam to report to our parent company.

What do you like the best about your work? The least?

I enjoy translating my work into something concrete that can be shared with non-scientists. However, the flip side of that is that means making presentations to people in a position to invest in your project, be it outside investors or internal business heads, always emphasizing what the percentage likelihood of success will be for a particular project. Of course, this is different from a conversation with another scientist who could provide constructive criticism about the project.

I also really like coming in each day and wondering what is going to be in the incubator! What does an experiment show? What other questions do the experimental results suggest? I can access the bench and access the people who are working at the bench, so I have detailed knowledge about what experiments they are doing and how the work is progressing. That's exciting.

How does your current position compare to working in other settings, like academia or industry?

I am imagining that working at Microbia is similar to other industry, with the added bonus of being free to do benchwork when/if I want.

In terms of comparisons to academia, in industry you tend to write grants or get investors based on an imperative, and the central question to be answered is about how I will do the research or technique better or more efficiently. In academia, you need to think about what the interesting questions are when you are writing a research grant, and ask the question that no one else is asking. I find that I think most questions are interesting, but just because it interests me doesn't mean I will receive a grant for it. Both positions have their time pressures: pressure to produce results and publish in academia to continue to receive funding, or pressure from investors in industry to produce results in a timely manner to achieve the stated goal. Also, perhaps more so than in academia, any failure of a project in industry is perceived as a failure of the whole team. You are all working together as a group and succeed (or fail) as a group.

Why did you choose this career?

I initially thought I wanted a career in academia. I gradually realized that what I was studying had no practical application; in my view, there was a sort of a fatal defect in my research program, which was that my research involved something that was completely unique to one organism, and was not something that was applicable or relevant in the larger world. So I reconsidered my career goals. Several people I already knew were involved in an exciting start-up biotech company in New York City—working on projects that intrigued me and did have application potential—and they contacted me about a position. The position seemed to be tailor-made for me, and (other than the commute into the City) was very rewarding and intellectually challenging. I've been lucky in that regard because I then moved to Microbia when it was a biotech start-up and have thrived here for 13 years now.

What are your career goals?

I love the intellectual challenge of being able to oversee and manage the science that we do. I like both strategizing about the direction in which the biology should go as well as the tactical decisions about how to plan an experiment in the most efficient and elegant manner. I want to continue to pursue questions that challenge me and areas I feel I can contribute to and add value.

What path did you take to get to your current position?

I earned my Ph.D. from MIT, did a postdoc at Berkeley, and then joined a small biotech company. After several years, I moved to Microbia, where I have held several positions, including Assistant Director, Principle Scientist, and Senior Director. Projects within the company have changed over time, causing my focus to change as well.

In what ways does your degree help you with this job?

I can plan experiments, understand the big picture and how that experiment will fit into it, and work at the bench independently. If you learn to be completely independent in graduate school, what you learn there can be applied to everything else that you do.

If you could begin again in your career, what would you do differently?

I would have made sure that any subject I was researching was relevant and interesting to the rest of the world, not just to me. I would try to focus on a research question that will eventually have a practical application, and choose something that someone is going to fund. I needed to be in an industry position before I understood the practical problems that need to be addressed while doing research.

What would be your career advice to someone who is currently in a genetics Ph.D. program? To someone who is currently a postdoctoral associate?

If you are sure that you want a career in industry, you can pursue any research question you want in graduate school and your postdoc, just make sure that you do it well. Look into what "industry" actually means, and what small subset of industry you want to be a part of. Also, mathematics! Knowing statistics is important, and having a good background in math is useful for understanding the computational biologists. There is a big need for people who can bridge the gap between science and math, certainly in industry.