WHAT CAN PHYSICISTS DO?

An interview series that profiles scientists who opted for careers outside of academia.

Amelia Paine
works to bring rare-disease treatments to patients

By **Toni Feder**

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BS, materials science and engineering, MIT, 2018
PhD, applied physics, Harvard University, 2024

What was your research area?

For my PhD research, I investigated how a virus released its cargo RNA during an infection, and I explored the dynamics of viral disassembly in different chemical environments. I did both experiments and molecular dynamics simulations.

What were you looking for in a job?

I focused my search on pharma and biotech companies because I wanted my work to improve people's health. It was also important to continue to use the problem-solving skills that I gained during my PhD.

(Photo courtesy of Leia Liu.)



How did you find your job?

I applied mainly through LinkedIn and job boards. I applied for about 80 positions, but in retrospect, maybe 40 were appropriate in pharma and biotech for an entry-level PhD.

I ended up at a gene therapy company that uses viral vectors for delivery to treat rare diseases. My experience with viruses and with techniques like interferometric scattering microscopy is what got me in the door, even though I didn't have straight-up biology or industry experience.

How do you spend your time?

I am roughly 50% in the lab and 50% in the office. In the lab, I establish, troubleshoot, test, and tweak analytical chemistry methods to make sure they work reliably. I write protocols, technical reports, and journal articles.

What do you like about your job?

I have learned a lot in a short time. I get to use high-tech instruments built on cool technologies. And the idea that my work is going toward cures for diseases whose patients don't have other choices motivates me.

How do you use your physics?

A lot of the techniques I use are based on fundamental physics—light scattering or fluid mechanics, for example. A deeper understanding of how they work is very valuable for interpreting results.

What new skills did you need to learn?

I have had to learn to work more collaboratively. Other people have their own specialties, and working together is often more efficient.

What advice would you give new graduates?

In industry, science is guided by what is valuable for the company. You have to change your mindset from pursuing what you personally find interesting. PT

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