

academia. Another 8% go on to do a second postdoc, many in academia. Recent alumni of the Novartis postdoctoral programme include Sereina Riniker, a chemist now at the Swiss Federal Institute of Technology in Zurich, and Andreas Bender, a principal investigator working on molecular informatics at the University of Cambridge, UK.

Preston says that scientists who complete a sound industrial postdoc should be well prepared for a career in academia. The main strike against them, she says, is that they won't gain much experience in writing grant applications, which is important for academic survival. Joe Arron, director of immunology at Genentech, agrees that people who do industrial postdocs usually have that important gap in their skill set. "They're coming out of their postdoc without a foot in the money bucket," he says. "Typical academic postdocs are going to be more involved in the grant process." It's always possible to learn how to write grant applications through seminars, workshops or online courses, however, and Genentech offers its employees special grant-writing programmes.

It's understandable that industrial postdocs tend not to return to academia, Preston says. Certain personalities are simply better suited for industry, and those who thrive there are likely to want to stay. "In industry, you have to be team-oriented and cooperative," she says. "People in academia are more independent."

Cooperative or not, it takes a competitive edge to get in the door at a top research company. Arron says that he gets hundreds of applications whenever there's a postdoc opening in his lab. "We're looking for really great scientists with a lot of potential," he says (see 'How to get your CV noticed'). "Beyond that, it's open-ended."

In his experience, many of the top scientists didn't have a clear preference for academia or industry when considering their postdoc options. Instead, they were looking for the right mentor with the right project, no matter where it might be. "If you're a talented scientist, you want to go to an elite institution in your area," he says. "We're competing with top academic and medical centres for postdocs."

In the end, Arron says, industrial postdoctoral positions can be just as valuable and productive as academic postdocs, and vice versa. "Good science," he says, "is good science." ■

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TURNING POINT

Activist engineer

Last year, civil engineer Marc Edwards spent at least US\$150,000 of his own money to prove that tap water in Flint, Michigan, was contaminated with lead. Over the past decade, Edwards has been documenting and exposing lead contamination in the Washington DC water supply and fighting to hold government officials accountable. Edwards explains how this work equipped him for the Flint case, which garnered international attention and shone a spotlight on similar concerns nationwide.

A mother's plea for help got you involved in the Flint crisis. Is it similar to the DC case?

In Flint, up to 12,000 children have been exposed to high lead levels. The DC-area case was much worse than Flint, in terms of harm done and number of children affected. Unfortunately, there was betrayal by government officials in both cases.

How did the DC case prepare you for Flint?

As a civil and environmental engineer at Virginia Polytechnic Institute and State University in Blacksburg, I researched corrosion in homes. In 2003, I started sampling water in DC homes and found outrageously high levels of lead. Ultimately, we discovered that the public had been misled by local and federal agencies. I've had to disprove falsified government reports, which my earlier work had not prepared me for. But without that experience, I would not have been able to help people in Flint.

How did the events in Flint unfold?

Flint was the exact opposite of DC in every respect. Once we confirmed the contamination and government oversight, we had sample kits going to Flint in less than a week. We knew we had to cooperate with anyone who wanted the truth about the lead, and fight anyone who tried to obfuscate matters. There is a line between science and activism, and it's one you cross only as a last resort. It's either that or, in this case, letting kids be hurt and a city destroyed. We used Freedom of Information Act (FOIA) requests — which invoke a federal law to access information from the government — to get the data about who knew what was happening with the contamination and when.

Your findings contradicted official reports.

Were you concerned about credibility?

Only the paranoid could possibly survive something like this. If you make one mistake, you will never, ever recover. It makes you very careful not to say anything you are not prepared to back up 100%.



How have your efforts affected your workload?

I worked on the DC case for 30 hours a week as a volunteer, for 10 years. But I worked 70 hours a week to make money and produce papers, the things that count towards academic-career success. There's no way you'd put on your CV that you made FOIA requests and attempted to get falsified reports retracted.

How did you fund the Flint work?

I knew the day would come when another community would need help, so I donated my fees from consulting and other work into a fund in the department. It was put into a discretionary account. We did, eventually, get \$33,000 from the US National Science Foundation, which gave us credibility.

Are you getting calls from people in other cities about more contamination concerns?

I get 20–30 communications every single day. I work 65 hours a week on Flint, so I don't have time to check these things out. But in the back of your mind, you say, what if they are valid?

Why do you maintain a website with Flint research updates?

I didn't want to be dependent on the few investigative reporters left to explain the science behind it. Every single major breakthrough came out on our blog first.

Do you have lasting concerns?

There was a time when engineers and scientists were the leaders of their generation. But we have created our own world, set apart from society, where we tell each other we're important. If we cannot get this fixed, we are destined to enter a new dark age. ■

INTERVIEW BY VIRGINIA GEWIN

This interview has been edited for length and clarity.