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A macrophage white blood cell (centre) engulfs and destroys bacteria (orange) and spews out the remnants.

LIFE SCIENCES

Industrial immunology

In a tough job market, immunologists are in demand. To move from academia to a biotechnology or drug company, researchers must explore the options and stay flexible.

BY ALLA KATSNELSON

Olivia Schneider realized early in her graduate work on immune-cell signaling that she had no interest in becoming an academic researcher. “I didn’t want to work in a lab, or to write grants,” she says. In 2009, when she finished her PhD at the University of Cincinnati in Ohio, the global recession was in full swing and employment options looked scarce. Her husband had a well-paid job in the area, so relocating was impractical. Then Schneider saw an advert for part-time work through a local contract-research organization, doing tissue culture and cloning for a recombinant-protein manufacturer called Shenandoah

Biotechnology in Warwick, Pennsylvania. “I just wanted to get my foot into biotech in some regard,” she says. “I took this position — that I was way overqualified for — with the hope that it would turn into something else.”

And it did. The project involved using antibody-based kits to test the quality of Shenandoah’s products. Flying back and forth to give talks on progress, Schneider developed a rapport with Shenandoah’s owners. When the project ended unsuccessfully, they invited her to join their firm, working remotely as an associate director of research and development. Fifteen months later, she became chief scientific officer.

Schneider now brainstorms new products on the basis of feedback from researchers. She

manages quality control, represents the company at trade shows and conferences, trains sales personnel and even tackles marketing and customer relations. The variety suits her. “I try to tell people, try to pick out what you liked in graduate school. There is a job associated with that,” she says. As a student, Schneider had loved giving presentations and talking to people about their own work and science in general, but had little interest in actually analysing data. “I kind of created a job that reflects that,” she says.

Industrial opportunities for early-career scientists have decreased in the wake of the recession, but in some quarters, immunology has done better — especially when compared to fields such as neuroscience. Immunology ►

► and oncology are, for example, the most active fields for recruitment at the executive level, says Kenneth Israel, founder of Search Group of San Diego, a recruitment firm in California that focuses on executive-level positions in the life sciences.

The interest may be fuelled by companies increasing investment in biological drugs such as antibodies, says Ravi Chari, executive director of chemistry and biochemistry at ImmunoGen, in Waltham, Massachusetts, which develops antibodies for treating cancer. “Even traditional pharma companies like Merck and Eli Lilly are now getting into immunology,” he says. Jonathan Deane, a researcher at the Genomics Institute of the Novartis Research Foundation in San Diego, notes that several immunomodulating drugs have been approved in the United States in recent years, and there has been a stream of positive news about immune-based cancer treatments. Still, the job market is affected by broader industry forces, he warns. “Companies have their budgets — that’s just global,” he says, noting that many are making cuts.

CLEAR GOALS

In the current climate, immunologists need to be clear about the kind of job they are looking for. One niche is research positions, either at drug-development companies or at firms developing reagents and research materials for use by academic or industry scientists. But there are options beyond the bench, too — such as medical-liaison officers, who cultivate contacts in a particular therapeutic field to create awareness of a product or company.

For research positions, PhD holders can expect annual starting salaries ranging from €45,000 (US\$59,000) to €65,000 in Europe, says David Marimuthu, senior recruitment consultant at SIRE Life Sciences, a staffing company based in Amsterdam. However, he adds, someone with a few years of industry experience or specialized knowledge in a niche area could get double that — or even more with management experience. Starting research salaries are closer to about US\$80,000 in the United States, says Phil Mericantante, co-owner of Adante Staffing in Woburn, Massachusetts, which specializes in the life sciences. Medical-liaison officers might start at between \$85,000 and \$100,000 depending on the size of the company, and regulatory positions bring in something like \$50,000–60,000, says Mericantante. Recruiters do not tend to work with



Ravi Chari says the best applicants have explored several areas of research.

entry-level applicants, because companies are not generally interested in paying finders’ fees for such jobs, says Marimuthu. But it is a different story for people with highly specialized research backgrounds. “Companies developing one product, if they find a real genius in their field, they are willing to pay,” he says, and recruiters may be useful.

As with most career transitions, networking is a tried and true way to learn about the types of opportunities available and to land a job. Job seekers should do more than just show up to events, advises Schneider. They should seek out people from interesting companies at conferences, and mine their university career centre’s alumni list for contacts. Applicants can request informational interviews to find out about the company, and then ask who else they should speak to. “Once you know you want to go after a particular career, you really have to do your homework,” says Michael Crowley, director of business development at the biotechnology firm Genentech in South San Francisco, California. “You have to know the company, and you have to bring really good energy to the interviews. If interviewers are not sensing the investment, they will just write you off.”

As an undergraduate, Crowley was “devoutly focused on immunology” but, like Schneider, he realized during his doctorate that he did not picture himself running an academic lab. In 1999, a year after finishing his PhD on immune cells called $\gamma\delta$ T cells at Stanford University in California, he fell into a consulting job at the now-defunct Cellegy Pharmaceuticals. He loved the operations side of drug development, so he studied for a business degree, and Genentech hired him in 2003, after a summer internship. Now he leads a three-person team that seeks out research collaborations and licensing deals relating to immunology and infectious diseases.

Business-development positions differ depending on the size of the company, Crowley notes. At Genentech, he focuses on what he calls the “buy-side” — bringing in intellectual property on the basis of a wish list provided by company researchers. For example, in February, his group signed a deal with a San Diego start-up that had found an innovative way to pursue a target of interest. “Small companies are the sellers, and that’s a different kind of job,” he says.

Crowley adds that he does not feel as if he abandoned the work he loves to go into business. “I’m still very close to the science here,” he says. “But it’s also about communication and relationships, which I felt I couldn’t get at the bench.” Job seekers should decide from the start whether they want to remain in the lab or forge a non-research career, he says. “If you’re ambivalent, it will hold you back in both realms.”

Those who do want to stay at the bench should attempt to broaden out beyond a single field of expertise, says Chari. He has a PhD in organic chemistry but did his postdoctoral work in protein chemistry, enzymology and related fields. His broad background helped him to get hired at ImmunoGen in the late 1980s.

DIFFERENT STROKES

Company cultures take some getting used to. Probably the biggest difference from academia is team involvement, says Deane. Developing a drug involves multiple teams working in concert, he says: one group might be doing the immunology, but at the same time a second group is looking at protein expression, a third at X-ray crystallography and a fourth at pharmacodynamics. Each group must stay in close communication with the others, and with managers guiding the project.

Then there is the issue of publishing research. Some companies encourage it, whereas others prohibit it. Kerry Casey, a research scientist at MedImmune in Gaithersburg, Maryland, the biological-drugs research and development arm of AstraZeneca, feels fortunate to be at a company that promotes publishing. In her two years there, she has worked on a high-priority project in respiratory inflammation and immunity, and she currently has two manuscripts in the works. MedImmune is close to the US National Institutes of Health (NIH) in Bethesda, Maryland, so Casey can easily pop over for conferences. Many of her co-workers once did research at the NIH, and still have colleagues there. “We are really linked into the academic community,” she says.

Most industrial researchers work under some corporate limitations, however. “As a university professor, you are your own small business and your own chief executive,” says Lewis Lanier, a microbiologist and immunologist at the University of California, San Francisco. “Companies are dictatorships — unless you’re the chief executive, you’re not in charge.” ■

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