

## CROSSING OVER

### ACADEMIA OR INDUSTRY?

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#### **Crossing Over**

*Perhaps never before have the worlds of industry and academia been so closely intertwined. It's that very proximity that has people on both sides of the fence wondering what it feels like to be in their counterparts' shoes.*

*GT looks at the public/private divide to give you a sense of the differences and similarities, tips on how to get from one to the other, and expert advice on the most common question (if I don't like it, can I go back?) — all without having to walk a mile in someone else's wingtips.*

*By Meredith W. Salisbury*

In generations of scientists past, there was a clear distinction between those who worked in industry (that is, big pharma) and those whose careers played out from start to finish in academic labs. Today, with small biotechs thrown into the mix and a growing breed known as 'scientist-entrepreneurs,' the lines between public and private sector are increasingly blurred.

While it's much less unusual these days for scientists to go back and forth between academia and industry, it's still not common practice. Curiosity abounds with researchers on both sides of the divide: what's it like on the other side? And, more importantly, if I try it out and don't like it, can I come back?

*Genome Technology* interviewed a number of scientists who have done just that. They've crossed the fence and, in many cases, crossed back over — usually with no permanent damage done to their careers, and more often than not to greater opportunities than they likely would have had without the job zigzag. In remarkably candid discussions, these people offer their experiences and advice to help you determine whether a career shift is in order, and what it will take to accomplish the jump. (Hint: If you're looking to make a decision based purely on salary, don't waste your time reading ahead. Proceed directly to industry. What have you been waiting for?)

#### Similarities and Stereotypes

Let's get the basics out of the way first: what do industry and academia have in common, and just how different are they?

It's no secret that some academics tend to imagine their private-sector counterparts as researchers clad in expensive suits who have sold — well, not their soul, but certainly that part of the brain from which interesting and biologically relevant scientific questions spring. These are people who ignore the greater questions of science in their pursuit of a magical product that goes "cha-ching!" Conversely, of course, there's no shortage of industry researchers who look at their academic peers as mad-scientist types who chase down answers to impossibly huge (and sometimes useless) questions at the expense of coming up with meaningful results that could have an impact today. These people wouldn't know a bottom line if it bit them on their Birkenstock-clad toe.

As with all stereotypes, there's a grain of truth lurking somewhere in there; fortunately, as these worlds come closer and closer, scientists can see for themselves that those grains of truth are awfully small parts of the story.

Finance is one of those grains of truth, and the need for private-sector scientists to think in commercial terms is simply undeniable. "In industry the metrics for success or failure are very clear," says Steve Lincoln, vice president of informatics at Affymetrix, who spent seven years at the Whitehead Institute and had a stint at the Cold Spring Harbor Laboratory before heading to what he jokingly refers to as "the dark side." "In the end, did you bring in more money than you spent?" Because of the company's fundamental need to turn a profit, industry scientists might have to abandon certain projects or work on projects that they otherwise wouldn't have chosen to work on, points out David Ginzinger, director of scientific operations at Applied Biosystems, who spent the first eight years of his career at the University of California, San Francisco. Academics, of course, can afford to be more dedicated to their projects — often even after grant funding has run out.

Of course, the focus on the bottom line means that scientists at commercial enterprises might not have as much freedom to delve to the bottom of a biological problem for the sake of knowledge. "They [don't] necessarily have to, in their minds, completely identify and solve the problem to convert it to a commercial opportunity," says Michael Liebman, director of the Windber Institute and former pharma scientist.

"Pharma, I would have to say, doesn't invest in really understanding the disease from the clinical perspective to come up with a solution that's commercially viable."

Still, having that finance metric means that success can be easier to pin down in industry, points out Brian Gilman, a former team leader at what is now the Broad Institute who has since started up his own consulting firm, Panther Informatics. In the corporate environment, he says, "you're praised for what do you, how well you do it, and how well you manage it. In academia that's not always the case. Sometimes in academia it doesn't matter how well you do it; it only matters where you came from, whose lab you came out of."

Lincoln notes that the proxy measure of success that academia has adopted — the peer review process — is hardly objective. Even if it were, it would still be difficult to truly appraise someone's work: "In academia, in many cases, how important your research is might not become clearly understood for perhaps a decade," Lincoln says.

Another difference between academia and industry is how team-oriented people tend to be, Liebman says. "Academia tends to polarize people, each [creating] their own individual research empire," he says. Industry researchers probably have more incentive to work together in team environments.

ABI's Ginzinger notes yet another distinction: "The pace of change here is considerably different" than what he was used to in academia. "You have to turn on a dime sometimes, and you have to be prepared for that." Many of the experts *GT* interviewed underlined the differences between pharma and biotech, and this element is probably one that's affected by that. Pharmas, with their thousands-strong staff rosters, are considered slow-moving and are more comparable to academia; smaller biotechs, on the other hand, are known for their nimble dynamics and rapidly shifting environments. "My [academic] friends who go into discovery research in pharma say it's almost the same," says Gilman of Panther Informatics.

All that said, however, there are still similarities between academic and corporate organizations. Ginzinger says that contrary to the academic prejudice that industry is where science goes to die, "There's still a lot of science on the industry side ... [and] a lot of publication from industry." He adds, "I think that's a fear people have, that it's impossible to publish [in a corporate setting]. In some companies, it's actively encouraged."

Also, the basic means of getting science done and getting ahead are essentially the same on both sides of the fence, according to Steve Lincoln at Affymetrix, who says, "They're all about networking in both cases. Opportunities are things that happen for you by and large because of people you know."

### Perks and Pay

Getting down to brass tacks, the most obvious and tangible distinction between academia and industry is the salary. "Look, salaries in academia are not as good," says Jill Mesirov, CIO of the Broad Institute, who has in the past worked for IBM among other places. She says the difference is "at least on the order of 25 percent or more less pay" for academics.

Postdocs taking on a staff scientist position in industry stand to double their pay, according to Ginzinger. "If you're in a higher level position, it might increase by 50 percent." Gilman says that when he went from a startup to a public-sector research institute, he took a 50 percent pay cut for the move.

The annual *Genome Technology* salary survey bears out these claims. On average, a pharma or biotech staff scientist made between \$75,000 and \$100,000, whereas the same position in academia commanded between \$50,000 and \$75,000, according to data from this year's survey. Senior academic scientists fell into the same range as the academic staff scientists, while in industry a senior scientist position went up to between \$100,000 and \$125,000 for people in large pharma or biotech. Lab techs made between \$30,000 and \$50,000 in academia, while their industry counterparts took in between \$50,000 and \$75,000.

But Lincoln says that recent trends have served to boost academic salaries to some extent. "In the area of bioinformatics and some of the fields that were trendy for a while, the academic salaries for staff members have gone up considerably," he says. "I think that's in part a reaction to needing to be at least somewhat competitive with industry ... to retain high-quality talent."

Salary, of course, is only part of the compensation package story. When it comes to other benefits — such as health insurance — scientists agree that academic and industry scientists are on much more even ground. Both sides have retirement plans, although Ginzinger says universities "typically don't have a matching component" to their plans. (Of course, plenty of startups don't, either.) Stock options are a notable perk unique to industry, but after the rocky rides of so many biotech in the past several years, "the attraction of stock options has reached perhaps a more reasonable level," Lincoln says.

One area where public-sector institutions may have an advantage is in IP rights, according to Michael Liebman at Windber. There's an opportunity now "to share in ownership of intellectual property and things of that nature ... because of the way universities are valuing this in their long-term planning," he says. In industry, typically anything you create is by default the property of your company.

### Academia to Industry

The longstanding tradition of moving from academia to industry means that most public-sector scientists aren't too worried about being able to jump the fence, at least in this direction. In 1987, Michael Liebman made the leap from Mount Sinai Hospital in New York to Amoco because his research was happening "at the very earliest time in bioinformatics, and the problem was that it was very interdisciplinary and academics in 1987 was not interdisciplinary at all. So the opportunity to look at industry, which was interdisciplinary, was very attractive."

Ginzinger, who was working at the Comprehensive Cancer Center Genome Analysis Facility at UCSF, was looking for more “growth potential” than life at a core lab offered. ABI beckoned, and off he went.

Gene Myers famously made the leap to industry from the University of Arizona, where he had developed a bioinformatics tool that looked like it could be quite useful for the human genome. Myers says despite his concerns about leaving academia, he couldn't turn down the opportunity to go work on the landmark project, so he joined Celera.

For years, academic scientists — often postdocs — have moved to industry seeking better-paying pastures. For most people, it will be a “fairly seamless” transition, says Myers, “in the sense that when you go to a company you're usually hired into a specific position with a specific mandate and budget.” Myers adds that he took into consideration the other people who would be working at the company when he was trying to make his decision.

Still, there can be wrinkles. Industry work tends to demand a set of skills — financial and managerial, in particular — that are usually not a part of the academic scientist's repertoire. “The primary limitation to getting into industry is that you are not a person, if you are from academia, that understands certain standard operating procedures,” says David O'Hagan, who has bridged the academia-industry gap more than once and currently works for the Burnham Institute while starting up his own company called Ampliprot. Plus, academics have to get used to having much less freedom to carve out their own research goals in a corporate setting. It can be “a rude awakening when somebody says no, you can't do that experiment,” Gilman says.

But there are plenty of ways to leap the fence, no matter what level your career is. Find an opportunity to run a project, advises Ginzinger, who says that project management is a rare skill among academics and one that is highly valued in industry. That will help translate to a private-sector job by giving you an edge over the throngs of academics also sending out their résumés.

Steve Lincoln found his path to industry through a collaboration he was already part of in his academic job; the company got to know him as an academic and was comfortable enough with him that he had no trouble getting hired on. Such collaborations, increasingly common in this field, are particularly good places to make contacts in the private sector that can help when trying to land a job.

#### Industry to Academia

This career move is decidedly less common than the other way around, but it's far from unusual. “One of the great attractions to me of coming back into an academic setting was [that] I could focus on the scientific results and a little less on the marketing and revenue-driven stuff,” says Mesirov, whose career path took her from academia to industry and back again. “What really motivates me is the science and the results.”

Myers also left industry when Celera changed direction, and he headed out for a position at the University of California, Berkeley. He says it was the right move for him, but that the transition wasn't as easy as it had been on the way out. At Berkeley, he says, “I felt a little bit like I was starting over as an assistant professor. I got an office and a startup package, but the students don't necessarily know who you are.” It takes time to attract students and grants — a couple of years. “At a university, you're an independent entrepreneur, and it takes time to build your group,” he cautions. (Myers has left Berkeley but is remaining in the public sector; he will be one of the first scientists at HHMI's new Janelia Farm research institute.)

Crossing back to academia is more challenging than going to industry in the first place, experts agree. “There are some people whose names allow them to be able to cross back and forth

anytime they want, as many times as they want," says Linda Kirsch, who runs her own recruiting firm for the life sciences field. "When it comes to people going back into the academic world, it comes down to who can get funding" — and that's certainly not everyone.

"I think that if you go into industry and you keep up a really strong research profile, then you probably can come back," says Mesirov. "But if you go into industry and you start doing marketing and sales or something like that, it's going to be harder." She recommends that anyone interested in returning to academia maintain "a really strong, current research portfolio."

It can also just be a matter of time to get back to the public sector. "I know a number of people who have gone back. It certainly can be done," says Steve Lincoln. "In some cases it involved maybe a step backwards [or they] had to rebuild some street cred — some publication trail." He points out that as academic projects get bigger, thanks to models like the Human Genome Project, the need for project management and organizational skills in academia may pave the way for easier transitions for industry folks to cross over.

Ginzinger at ABI notes that moving back and forth can be easier between academia and biotechs than academia and pharma. "We collaborate all the time with academia," he says, so it's more likely that a corporate scientist's name will be known and respected by his or her academic counterparts.

David O'Hagan says that as the public/private-sector divide gets blurrier, a new model is coming into focus — that of the 'scientist-entrepreneur' who makes a career of straddling the fence. O'Hagan says he's done it more than once: while he was working on his PhD at Wayne State University in Michigan, he was recruited by Genomic Solutions to develop its microarray technology. He continued pursuing his degree full-time while also doing technology development as a company employee. Currently, he's a full-time employee at the Burnham Institute, and is simultaneously starting up a company based on proteomics technology with a fellow Burnham scientist. The startup was part of the condition of working there, he says, so he can split his time between the endeavors. In the future, he predicts, this model of doing both together will become increasingly common in the field.

Which is right for you?

Managing your career means doing more than waiting for opportunities to come knocking, says Linda Kirsch, who has built a career around finding the right person for the right job in the systems biology field. With that in mind, one way to set the goal of your next job — make the leap or stay in your sector — is to consider which side is better suited to your personality.

Entrepreneurial people will do well on either side of the fence, says Jill Mesirov at the Broad. But there are "some people who will get more satisfaction by building and driving a company, by building that revenue stream," she says. "You just have to understand what drives you."

Are you willing to move around? Relocating is more often required in a private-sector career, says Michael Liebman at the Windber Research Institute. He says another distinction is whether you get more out of working on a project or building a tool. "If your motivation is solving problems — a practical application of the solution — then I would say industry could be appropriate." But if you'd rather focus on a research project to really understand a biological problem, for instance, academia might be a better place for you. "They have to know ... if they like things versus principles," he adds.

Brian Gilman, who left academia to run his own startup, says, "You should really think about your adversity to risk." While this will be less of a factor for academics going to pharma, entry to biotech certainly means taking on an added risk load. "Think about how well you do with high-risk, high-reward type things." He also says considering your reaction to failure could help. "When you fail, do you sit there and beat yourself up for months on end? Or is it just, 'OK, I failed, next thing'?" Being able to shake off problems and regroup quickly is a skill you'll need to work in biotech, he says.

Gilman also says that people who worry they won't be able to publish in a corporate environment have really answered their own question. "If you feel that way, that publications are your lifeblood," he says, "you weren't cut out to [go to industry] in the first place."

#### Testing out the other side

There are a number of ways to get your feet wet without leaving the island.

Corporate postdoc or internship. "You specifically look for an opportunity to postdoc in the kind of environment that you think you might have an interest in," says Linda Kirsch. "They're shorter commitments. People do multiple postdocs, and you get a sense of the kind of projects you like, the size group you like."

Take a leave of absence. "If you have a faculty job, you can take a sabbatical ... and check out what it's like in an industrial lab," says Jill Mesirov. Gene Myers, who used this means when he left for Celera, adds, "At least a one-year leave of absence is pro forma. ... If you go to industry, a year will be long enough to tell whether you like it or not." Myers says this can be a good safety net, too: he negotiated a three-year leave when he left for Celera, with a guaranteed return option in case he didn't like the private sector.

Try an adjunct position. Many universities offer adjunct faculty positions to industry scientists, Mesirov points out. It's a good way see what academia's like. If you're an academic going to industry, hold on to an adjunct position as a safety net — that's what Michael Liebman did through his corporate career.

Think of the core lab as middle ground. When David Ginzinger was considering heading to industry from academia, he just wasn't sure — so he went to a core lab to get more business-type experience without leaving the safety of his university environment. It requires fiscal responsibility and managerial skills, he says, but keeps members in touch with the scientific research. He thinks of it as a solution that didn't close any doors while he figured out his next step.