

CAREERS

COLUMN A tool for physicists to gauge risk and pick their projects wisely **p.279**

CAREERS BLOG The latest discussions and news on research jobs go.nature.com/ielkkf

NATUREJOBS For the latest career listings and advice www.naturejobs.com

3D STOCK



INNOVATION

The big idea of technology transfer

Working at the interface between science and business offers an opportunity to bring ideas to market.

BY CHARLOTTE SCHUBERT

As Angela Loihl worked her way through her graduate research project at the University of Iowa in Iowa City, she noticed the scope of her studies getting narrower. “I spent all my time learning more and more about less and less,” she says of her research in mice, which focused on a protein thought to have a role in stroke. “I questioned

how relevant that was to the human condition.”

Fourteen years after she earned her PhD, her career is far broader. As a technology manager at the Center for Commercialization at the University of Washington in Seattle, she covers a wide range of life-science fields — from microbiology to radiology, with an occasional foray into chemical engineering.

Loihl’s role is to take scientific ideas from academia and negotiate their transfer to

biotechnology start-ups and pharmaceutical companies, at which point the most promising leads may become new therapies. Loihl is routinely presented with intriguing, and sometimes thorny, questions. What is the commercial potential of a particular university technology? Which company will license the rights to which innovation? Are a researcher’s findings strong enough to launch a spin-off?

Loihl has helped to foster technology related to influenza treatments, tests to assess the risk of cardiovascular disease and a vaccine for the type 2 herpes simplex virus. “Every day I learn something new from the science and business perspective,” she says. “I love this job.”

Working in technology transfer demands teamwork and the ability to assess a huge range of scientific areas. Those who thrive have the right mixture of extroversion, scientific breadth and business sense. They are also able to juggle multiple projects at once. The hardest thing, says Loihl, is keeping everyone’s expectations realistic, such as ensuring a researcher does not overestimate the commercial value of his or her work, or that a company does not underestimate it. “If you do something well by one stakeholder, it usually means you are upsetting another,” says Loihl, adding that the variety of duties and challenges is what makes her job great.

WHERE THE JOBS ARE

Fourteen years ago, there were 26 employees at what was then called the office of technology transfer at the University of Washington. Now there are 54. The growth, which is not atypical for large academic institutions in the United States, is due in large part to the Bayh–Dole Act of 1980. The act changed the pace and manner of innovation in the United States, giving universities and not-for-profit organizations control over the intellectual-property rights of federally funded research done within the institution. The result was a huge increase in technology-transfer related opportunities, particularly in the 1990s as universities mined this new source of revenue.

The expanding offices have taken on functions beyond the usual roles of patenting and licensing technology, resulting in new types of work. At the Center for Commercialization, office head and entrepreneur Linden Rhoads leads a team of 15 technology managers (also known as licensing managers or licensing specialists), which are typical positions for people making the jump from science, as Loihl did. Rhoads also employs specialists who team ▶

► up with the managers on various projects. “We have all kinds of people in support roles,” she says.

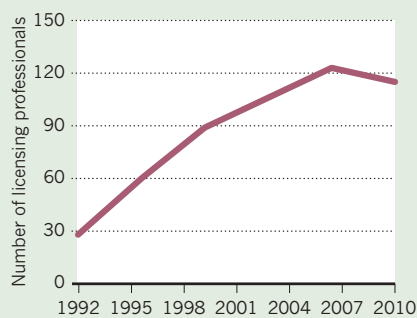
For instance, three industry-relations officers help the technology managers to understand industry needs and to forge collaborations between faculty members and companies. Most of these officers are scientists or engineers with extensive business experience. Four people, most of whom have business experience at small start-up companies, are in a ‘New Ventures’ group, which works with technology managers and researchers to start companies by inviting potential investors to the office, for example, and recruiting business people for an ‘entrepreneurs-in-residence’ programme. The New Ventures group also boasts a grant writer, who can pull in funding from sources such as the US Small Business Administration in Washington DC to foster a start-up.

Patent agents in Rhoads’ team, some of whom have law degrees, write the lengthy and technical patent applications and handle the continual back-and-forth between the patent office and researchers to keep the application moving forward — a task that technology managers often perform in smaller offices. Loihl advises job seekers to “scrutinize the office to see what kind of resources are available”.

Although Rhoads is still hiring staff, the big expansion in the number of US technology-transfer jobs has slowed, says Robin Rasor, director of licensing at the University of Michigan in Ann Arbor and former president of the Association of University Technology Managers in Deerfield, Illinois (see ‘Growth subsidies’). The association’s annual survey of technology-transfer offices at US universities, hospitals and research institutions showed a slight drop in the number of

GROWTH SUBSIDIES

Number of licensing professionals at eight major US research universities shows a slight decrease.



full-time licensing jobs from 1,041 to 1,018 between 2009 and 2010, at the 172 institutions that responded in both years. Job markets in Germany and the United Kingdom, which have long had laws similar to Bayh–Dole, are likewise slowing, says Anders Haugland, president of the Association of European Science and Technology Professionals, based in Leiden, the Netherlands. But ongoing changes in patent law and technology-transfer policies elsewhere have created job potential, notes Haugland, who also heads a technology-transfer office of seven institutions, including the University of Bergen and Haukeland University Hospital, in Norway.

Norway adopted policies similar to the Bayh–Dole Act in 2003. The countries universities now retain one-third of the proceeds from intellectual property arising from research conducted on their campuses. Previously, faculty members generally retained the full rights. Back then, Haugland’s technology-transfer office did not even exist. It now has 23 employees, some of whom have

come from as far as India, Croatia and Lithuania. “We are hiring people every year and we are growing,” says Haugland.

GETTING THE JOB

As Loihl became disillusioned with bench science, she began inquiring about internship opportunities at the then-small technology-transfer office at the University of Iowa, but they showed little interest. “They didn’t know how they would use me,” she says.

But times have changed. Technology-transfer offices now offer various paid and unpaid internship programmes. The University of Washington has a typical technology-licensing intern programme. Interns prepare summaries about the university researcher’s innovations to facilitate licensing negotiations, and help to evaluate whether a new technology can be patented and whether there is a potential market for it. Often an internship can lead to a longer, salaried apprenticeship, says Rhoads. A technology-transfer role may also lead to a position in industry (see ‘Jumping to industry’).

An internship is the best way to get a foot in the door, especially for those making the transition from science, says Rasor. She and Rhoads have both hired interns who came straight from postdoctoral fellowships or graduate programmes as junior technology managers.

Courses in business, marketing or law can help to land a job or internship. PraxisUnico, a not-for-profit organization in Cambridge, UK, offers a three-day ‘fundamentals of technology transfer’ course, which is popular for those new to the sector, says Alison Campbell, a consultant and chair of PraxisUnico’s training committee. Aspiring technology managers can learn the basics of patenting, trademarks and licensing, as well as marketing and negotiation tactics.

Although not all of Rhoads’ team have a masters in business, she says that the degree can help with tasks such as assessing the market potential for a technology — for example, by researching the size of the market, cost of goods or pricing models. Rhoads herself has a law degree, which helps in understanding the complicated language of contracts. But in the end, it may be business experience that carries the most weight. “If you have someone who has any kind of experience in industry, that is a big plus,” says Rasor. Experience in a business office is preferable, but even work as a researcher at biotechnology company can help, she says.

There is no typical route into a technology-transfer role. And ultimately, less-tangible abilities, such as communication and people skills, could be what leads to success in the field. “People need to be good at having consultations with scientists, turning over rocks and introducing researchers from industry to academic researchers,” says Rhoads. Those who thrive in the job, she says, are “natural connectors”. ■

Charlotte Schubert is a freelance journalist based in Seattle, Washington.

JUMPING TO INDUSTRY

Making the move to the private sector

Working in a technology-transfer office does not mean staying in academia. Some use their technology-transfer experience to make the leap to the private sector.

“We are at the other side of the deals,” says Polly Murphy, a vice-president at drug firm Pfizer in San Diego, California, who leads 30 people in the business development team for the company’s research and development branch. The team negotiates transactions with other companies, not-for-profit organizations, universities and other institutions. Most of the team came from the technology-transfer world, which, says Murphy, is the best place to learn how to draft licensing and collaboration agreements. Working in technology transfer can also lead to a job in

a contracts and outsourcing office, which manages agreements for clinical trials and other projects. But Murphy cautions that shrinkage in the industry has made such jobs scarce. “In my department nobody ever leaves,” she says.

Other technology-transfer employees head to biotechnology firms or use their scientific knowledge and understanding of the market to work in a venture-capital firm. But biotechnology start-ups come and go, along with their licensing offices. Those who are risk averse should be wary of the jump to industry, says Anders Haugland, head of the Association of European Science and Technology Professionals in Leiden, the Netherlands. And universities and research institutions often have better benefits. **C.S.**