

WORKING RELATIONSHIPS

How mentors affect careers

Postdocs reap biggest gain.

BY CHRIS WOOLSTON

Researchers who incorporate ideas and techniques from multiple mentors while still forging their own paths are the most likely to succeed in academia, according to a study of 18,865 biomedical researchers, published last year (J. F. Liénard *et al. Nature Commun.* **9**, 4840; 2018). The authors also suggest that mentoring received during postdoctoral training had a bigger impact than mentoring received during graduate school.

The study analysed data from the Academic Family Tree, an online database of academic relationships that launched in January 2005. The authors identified ‘triplets’ — trios comprised a scientist, their graduate mentor and their postdoctoral mentor — dating back to 1970.

Professional success was gauged in part by the number of trainees a researcher mentored per decade, and an analysis of terms used in abstracts made it possible to track similarity of scientific approaches. The results give empirical evidence to support popular career strategies, says study co-author Stephen David, a neuroscientist at the Oregon Health & Science University in Portland. For example, the most successful scientists transferred concepts they learnt in graduate school to their postdoctoral work, suggesting that prospective postdocs should try to join labs that lack their particular skills.

“You want to be able to offer something new,” David says. That requires stepping beyond the shadow of a graduate mentor without becoming a facsimile of a postdoctoral mentor. “You have to stake out some unique territory, which is always a challenge for postdocs,” he says.

The study found that joining the lab of a prolific mentor — one who has trained many researchers over the years — also increases a scientist’s chance of success. This held true for both graduate and postdoctoral mentors, but a closer look at the data revealed that the qualities of a postdoctoral mentor were especially predictive of success. “You can get a graduate education just about anywhere,” David says. “Postdoc labs are where you establish professional relationships and develop collaborations.”

Researchers should be especially discerning when accepting postdoctoral positions, David says. “You can take a data-driven approach to choosing your mentor.” ■

once a year. Interested scientists apply online, typically filling out a short application describing their proposed project and potential applications, their research background and qualifications, and how they plan to spend the money. Some programmes include extra steps; for example, Microsoft invites finalists to the company’s headquarters for one-to-one interviews.

Competition for such awards is increasing. Amazon fielded more than 800 funding applications in its most recent round, of which 49 were funded, says Ralf Herbrich, director of machine learning at Amazon and managing director of the Amazon Development Center Germany in Berlin. Funded researchers so far have come from the United States, Canada and Europe, but the most recent round drew a more geographically diverse set of applicants, Herbrich says. Johnson is seeing a similar trend at Google; she received 17% more applications in the company’s latest funding round, including an 87% bump in applications from universities in the Asia Pacific region.

Scientists can set themselves apart by proposing original, rather than incremental, ideas. “We’re looking for people who are real innovators,” says John Krumm, a principal researcher at Microsoft Research in Redmond, Washington, which gives out five research awards each year. “If you’re adding 0.5% accuracy to a problem that’s been studied for decades, that doesn’t stand out quite as much as if you’ve formulated a new problem and one of the first solutions for it.”

Herbrich agrees. “Is this a big swing or not?” he asks, when considering proposals. “Will it affect many people? Is it technically interesting?”

Some companies also make larger investments in university research. Intel, for example, donates between \$1 million and \$3 million to about 15 ‘centres’ at select universities, where researchers collaborate on a problem. A centre at Delft University of Technology in the Netherlands, for instance, is developing quantum-computing technology. Microsoft also funds quantum-computing research at several universities. Samsung owns an entire university, Sungkyunkwan University in Seoul, where researchers can take advantage of company funding and data streams while also competing for outside funds. In 2013, the company launched a \$1.5-billion programme that hands out five-year awards of about \$450,000 a year — comparable to many government grants — to Korean academics. Around 75 such grants were given out in 2018, according to the company’s website.

SABBATICALS

Those who want closer ties to the tech industry can use a university sabbatical to work inside a company. Google, for example, offers a visiting faculty programme at its

headquarters in Mountain View, California; researchers can also work at one of its satellite campuses. Other tech giants offer similar opportunities.

“It’s one thing to read a couple of papers here and there. But it’s an entirely different feeling to be surrounded by this expertise, and attend seminars, talk to people and reach out and introduce yourself,” says Sankara Subramanian, who until last August was in the engineering department at the Indian Institute of Technology Madras in Chennai. He spent a year at Google’s headquarters, where he used the company’s sophisticated robotics tools to try to make robots better at picking up non-rigid objects. Subramanian used the knowledge he gained to launch a research project at his home institution on the mechanics of robotic grasping; he now works full-time on a start-up company that he’s dubbed PhotoGAUGE. He says that Google’s research environment helped to spawn the idea for the fledgling business.

LAB CONNECTIONS

Students can also benefit from working in the labs of principal investigators with connections to technology companies, says Youssef, who worked at Google from May to December 2016; his project there was related to obtaining better accuracy for Google Location services. He has also received funding and in-kind donations from Google, Intel, Microsoft and several other tech firms, and his students have got summer internships at companies. Youssef is preparing a paper for publication. Although the work could have raised concerns about Google’s user data, the data that he could access were stripped of personal information, he says.

“Typically, data are not available in any kind of raw format for most Googlers to look at,” says Jason Freidenfelds, a Google communications manager, regarding the company’s internal-data policy. “You have to have very specific access, and have to have specific reasons.”

Scientists’ publication rates might fall while they are temporarily working at companies, partly because publishing is less of a focus than it is in academia, and partly because companies are concerned about protecting intellectual property. On the flip side, working within a company provides a chance to contribute to real-world products, says Bast, who got a ‘Focused Research Award’ of \$1 million from Google, after her 1.5-year visiting-scholar stint, to continue improving transport-planning algorithms. “It’s great for companies to get someone from the outside to just think deeply about some problems,” she says. “It’s a real win-win situation. I can recommend it to anyone.” ■

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