

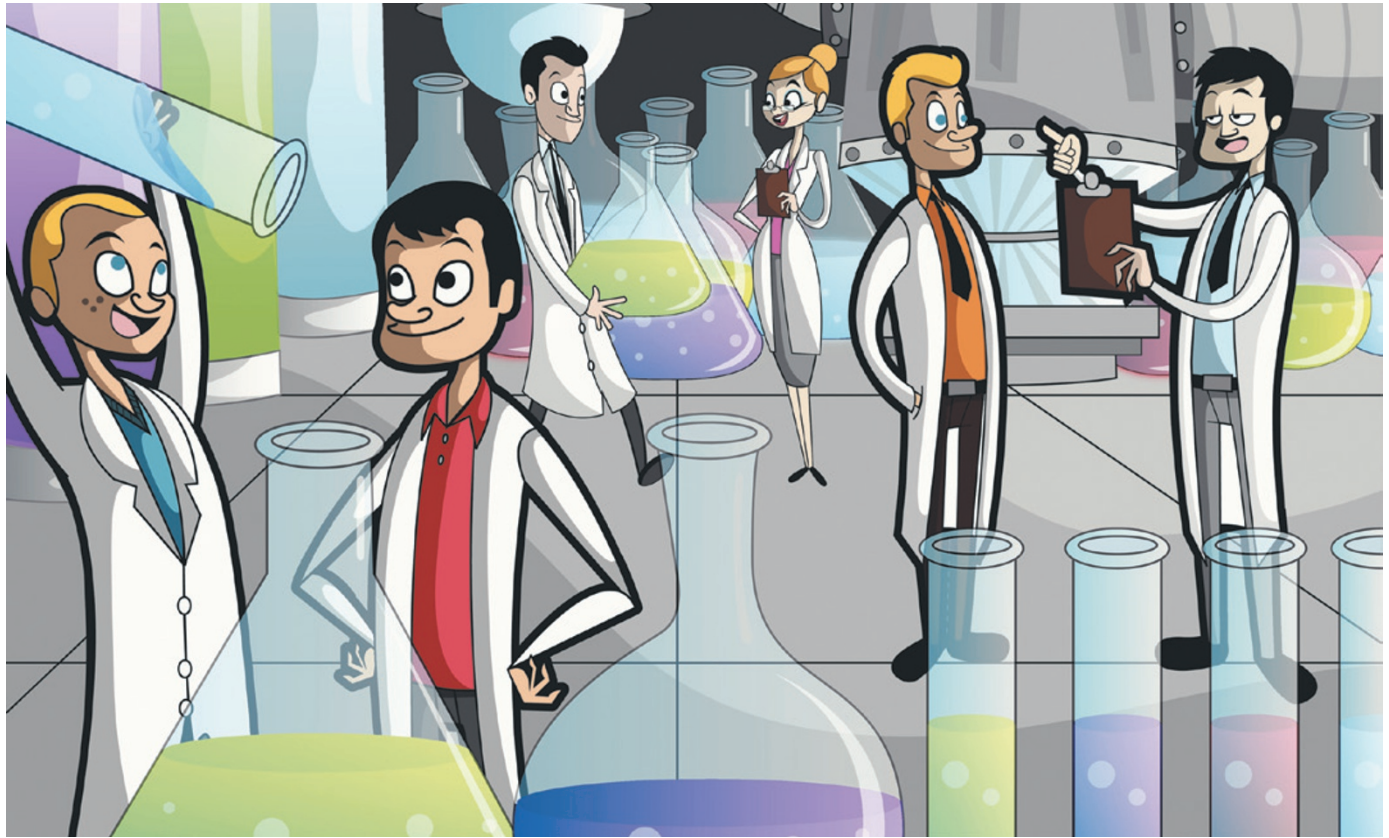
# CAREERS

**TURNING POINT** Neuroscientist reaches milestone in fruit-fly brain map **p.251**

**WORK-LIFE BALANCE** Creativity breaks can pay job dividends, study finds **p.251**

**NATUREJOBS** For the latest career listings and advice [www.naturejobs.com](http://www.naturejobs.com)

FANATIC STUDIO/GETTY



## CONTINUING EDUCATION

# Study broad and deep

*Short tutorials can help researchers to sharpen skills, and longer courses can provide a way to deepen knowledge.*

BY SARAH WEBB

A successful research career demands that scientists engage in non-stop learning — after all, technologies advance, interests shift and discoveries transform understanding, especially in today's era of 'big data'. Training sessions such as workshops, courses or online tutorials can fill the gaps in a scientist's knowledge and skills, helping them to improve and expand their research programme and support their efforts to land a job.

To derive maximum benefit from off-site training, researchers need to identify exactly

where the gap is, then search online or talk to colleagues to find a workshop or course that matches their needs — scientific societies and conferences are often good sources — and manage logistics, including cost and timing (see 'The right fit'). They may want to apply for grants or fellowships from societies or other professional organizations to cover tuition and off-site travel expenses, and allocate the time needed to do so. They may have to calculate how to juggle their resources if they are unable to get funding or if their employer cannot provide support. Some courses are offered only once a year and may fill up quickly, so prospective students need to make themselves aware of

enrolment dates and be ready to pull the trigger.

When does a short course or workshop make sense? Researchers often turn to training manuals or online tutorials when they need to pick up a new laboratory technique or learn how to use equipment or software. But sometimes hands-on, in-person instruction is more effective than reading, especially when it comes to mastering complex tasks such as troubleshooting instrument problems or managing data analysis.

Are the costs worth it? Tuition might cost anything from a few hundred dollars for a day-long workshop to US\$1,500 for a week-long course — and that would not include travel ►

► expenses. (Some day-long workshops and courses are scheduled directly before or after major scientific meetings, allowing researchers to save on travel costs.)

Furthermore, if the researcher is lucky, the right offering will be close by. Saik-Kia Goh, a bioengineering PhD student at the University of Pittsburgh in Pennsylvania, took a free two-week course in clinical and translational research at the US National Institutes of Health (NIH) in Bethesda, Maryland, an easily drivable distance of 370 kilometres. Accommodation costs came to about \$2,000, half of which he covered himself — but he not only gained a greater understanding of the clinical and regulatory side of stem-cell research, he was also able to discuss his research with NIH scientists and learn about postdoctoral opportunities he had not been aware of. “I wasn’t expecting it to be as much of a networking opportunity,” he says. “It was an investment in my career.”

Sometimes, however, researchers need to travel halfway around the world. Kirstin Wurms, a plant pathologist at Plant & Food Research, a government institute in Hamilton, New Zealand, examines mechanisms of plant resistance to disease. The field increasingly relies on gene-expression data from a technique known as the quantitative polymerase chain reaction (qPCR), which requires specialized expertise to produce reliable, reproducible data. Wurms, who did not have that know-how, initially relied on a colleague’s assistance. But when that colleague left the institute, she knew that she needed to learn the technique herself. She signed up for two short courses offered last September at TATAA Biocenter, the world’s largest qPCR training centre and service provider, in Gothenburg, Sweden. Supported by a fellowship that helps to pay for overseas travel for scientists, plus some funds from her institute, Wurms learned the technique, its international guidelines and how to use a statistical program to analyse data.

International travel was also on the cards for Stefan Suter, a wildlife-management researcher at the Zurich University of Applied Sciences in Switzerland. He needed to learn how to analyse communication between wild boars, and found that the Cornell Lab of Ornithology in Ithaca, New York, offered a week-long course on working with sound-analysis software. Suter had used a simplified version of the software during his doctoral research, but needed to go deeper to realize his plan of protecting



**“It was an investment in my career.”**

Saik-Kia Goh

## THE RIGHT FIT

### How to find the ideal course

Trying to figure out how to fill a knowledge gap can be overwhelming. Jacquelyn Gill, a palaeoecologist at the University of Maine in Orono, has advice on how to tackle the issue.

- Look around online and talk to colleagues and mentors about the skills you would like to learn and how you might bridge the gap.
- Know your learning style. If you work well independently, you might be able to learn about a statistical model or a programming language simply by working through a textbook. If you need group accountability, you might be able to work with a group of other graduate students or postdocs who want to learn the same skill.
- If money is tight or travel difficult, consider an online option.
- Sometimes, an in-person course is the only way to gain a particular skill. If that skill is needed at a crucial point in your training, you should make a good case for the time and expense.
- “When you apply for funds, you need to get really good at framing why that course is essential for you at this stage in your career,” Gill says. If you can’t communicate that need effectively, maybe you do not need the course as much as you thought. **S.W.**

agricultural fields. The course helped him to create warning calls that scare boars away from valuable crops. Suter received full financial support from his university for the US trip because he made the case that taking the course would also allow him to improve his English. His previous experience working with the software meant that Suter could focus on specific questions and maximize the opportunity to get answers from experts. Although the course had a basic curriculum, “there was a lot of space for individual questions, and an interactive approach, which I really appreciated”, he says.

#### UNEXPECTED BENEFITS

Short courses can be effective for quickly acquiring new skills. But at other times — when aiming to deepen their knowledge of a research area or to explore a new field — a researcher may want to devote more than a week or two to their pursuit, even though the costs of tuition, travel and accommodation are likely to be much higher. Four to eight weeks might sound like a long time to be away from one’s primary research, but it can provide an opportunity to dig more deeply into a discipline or to expand into a new field.

Physiologist Christopher Tubbs used a six-week seminar at the Marine Biological Laboratory in Woods Hole, Massachusetts, to deepen his knowledge of reproductive biology. Tubbs, who now examines the effects of endocrine disruption on endangered wildlife, took the seminar as a doctoral student in the hope of learning new ways to study fish-sperm motility.

At the same time that he learned more about fish, he acquired a new understanding of hormones, hormone signalling and gamete biology that helped him to secure his current post at the San Diego Zoo Institute for Conservation Research in California.

Savvy researchers can often find ways to bring down costs to achievable levels. Chemist

Jennie Mayer of Bellevue College in Washington wanted to learn how to maintain a new mass spectrometer and nuclear magnetic resonance spectrometer purchased by her institute. Fortuitously, Mayer subscribed to e-mail updates from the American Chemical Society (ACS), of which she was a member, and received one about its six-week series of online chemistry courses known as Sci-Mind. These include tutorial videos, laboratory exercises and opportunities to interact with instructors and other students.

At its original price, the course would have cost just half that of the on-site equivalent, and she managed to get both the members’ rate and a promotional discount that ACS was offering, with a final price tag to her institution of about \$900. The course refreshed her skills on how to use the instruments and taught her how to maintain and troubleshoot the spectrometers. She is now creating modules that will help her to train students and her colleagues in their use.

As a postdoc, palaeoecologist Jacquelyn Gill opted to take a massive online open course (MOOC) in calculus because it was free and she could fit it into her schedule as she pleased. She had come to realize that she would need much deeper familiarity with calculus for her field’s increasingly quantitatively based research, but enrolling in a class alongside undergraduates felt awkward. So when the MOOC format became available, she leapt on-board and signed up for a 14-week course through the online platform Coursera. Each week, she spent just two hours working on problems and taking online quizzes.

Now a faculty member at the University of Maine in Orono, Gill stresses that it is never too late to learn something new — and far too easy to put it off. “Just do it,” she says, “and do it now.” ■

**Sarah Webb** is a freelance writer based in Chattanooga, Tennessee.