



Shalen Kumar started as chief technical officer at biotechnology company AuramerBio.

are attributed to interpersonal conflict.

Investors know this, says Simpson. “They will invest in a ‘B’ idea in an ‘A’ team before they’ll do it the other way around,” she says. She looks to recruit team players who are eager to solve technical challenges, and happy to recognize others’ expertise.

#### MILESTONES AND SETBACKS

The team gets the company up and running. Companies then enter a cycle of hitting goals, seeking more funding and going for the next milestone. For example, Breathe’s first milestone was to convert 1 kilogram of carbon dioxide to methanol in a day — then 5 kg, then 400 kg. By the end of the XPRIZE competition, the company hopes to be converting 2 tonnes per day.

Meeting the demands of a growing business can be a challenge, especially for those balancing company and academic workloads. Liu found many differences between her academic and commercial research. Her lab invented a nanoparticle-based tool for fluorescence labelling, then spun off the company LuminiCell in 2014. Partners at Millipore, now part of the pharmaceutical company Merck, wanted the particles to have a shelf life of 12–18 months. “I can never imagine, as a researcher, paying any attention to stability at all,” she says. “These parameters took us more than a year.”

Liu was careful to draw clear lines between her academic and commercial work. She obtained approval from her university before engaging in commercial work, and kept her institute informed about the start-up and which researchers would be involved.

Although Liu learnt a lot from starting LuminiCell, the workload was stressful, especially during a period between grants when she took on many company tasks. Next time she has an innovation, she says that she might license it to another company. She could earn some money from royalty fees and perhaps

help that business as a consultant, but she wouldn’t want to feel the same pressure.

Start-up founders must be willing to change gears quickly. “In academia, if something doesn’t work out, it’s no problem — you just go on to the next project,” says Dirk Theis, a mathematician at the University of Tartu in Estonia and co-founder of Ketita Labs, a quantum-computing software company. “In the business world, if something doesn’t work out, it immediately puts into question whether your company is going to survive at all.” Start-ups must be flexible and ready to try plan B, or even C or D, advises Theis.

And if the start-up runs out of plans, then it might be time to throw in the towel. It’s hard to close the door on a company in which one has invested so much time and effort, says Chengee Lee, co-founder of the now-defunct Labit web platform, which he predicted would be a resource for scientists to create lab web pages and share resources. He shut down Labit at the end of 2017, and is currently working as an English teacher in Gwangju, South Korea, and writing a book about personal development.

“I don’t regret it,” says Lee. He says he learnt a lot about how not to run a company. For example, his idea wasn’t something that lab principal investigators — the people Labit was aimed at — particularly craved. He’s not averse to trying another start-up at some point, but next time he won’t make the same mistakes.

Breathe co-founder Peter doesn’t know yet whether he’ll fail or succeed, but he, too, has learnt a lot along the way. “I was a bit scared about the industry, a bit scared about the corporate world,” he says. “Now, I am very confident to say that it can be possible if you come forward and do it.” ■

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#### PUBLICATIONS

### One and done

In recent decades, the number of ‘short-term scientists’ — those who publish at least once but soon stop contributing to the literature — has surged, according to an analysis of astronomy and ecology journals going back to the early 1960s. The study, published in *Proceedings of the National Academy of Sciences*, found that the average ‘half-life’ of a science career — the time it takes for half the researchers of a given cohort to cease producing papers — has dropped from 35 years in the 1960s to just 5 years in the 2010s (S. Milojević *et al. Proc. Natl Acad. Sci. USA* **115**, 12616–12623; 2018). The study also found a strong decline in the proportion of postdocs, staff scientists and other non-senior researchers who lead publications. In cohorts from the mid-1960s, about 80% of ecology and astronomy researchers had been listed as a lead author on a paper; by the 2010s, that figure had dropped to about 40%. In each field examined, researchers who fail to become lead authors within the first 5 years of their careers are much more likely to leave academia. The study underscores a familiar problem: the number of PhD degrees awarded outpaces the number of available tenure-track or tenured academic positions.

#### GENDER BALANCE

### Quota failure

An effort to bring more women into academia by mandating gender quotas on hiring committees at French universities might have backfired, finds a study of decisions made by 455 hiring committees at 3 institutions (see [go.nature.com/2gef3ic](http://go.nature.com/2gef3ic)). The analysis — posted in November as a SciencesPo working paper from the Paris Institute for Political Studies (LIEPP) — suggests that committees adhering to the quota were much less likely to hire women — perhaps because of retaliation from men miffed by the policy, says study author Pierre Deschamps, an economist at LIEPP. In 2015, France enacted a law that requires all public-university hiring committees to have a gender balance of at least 60%–40%. Deschamps compared committees that had to reconfigure to comply with the law with those already in compliance. He estimated that the quotas reduced the hiring of women by 38% in the affected committees. The effect was most pronounced in some male-dominated fields. Deschamps didn’t have access to individual votes, so it’s unknown which committee members chose to hire men over women.