Andrew Chien, director of research and vice-president of corporate technology group Intel, based in Hillsboro, Oregon

2003–05: Founding director, Center for Networked Systems, University of California, San Diego
1998–2005 Professor of computer science, University of California, San Diego
1999–2003 Co-founder, chief technology officer and chairman of the board, Entropia, San Diego, California

As an undergraduate at the Massachusetts Institute of Technology (MIT), Andrew Chien thought he would become a doctor. When a glass-blowing seminar he was taking for fun was cancelled, he followed a friend to check out the "crazy engineering teacher" — Gerald Sussman, a computer programmer legendary for his enthusiasm. Chien was thenceforth hooked on computers and engineering.

Corporate giants and entrepreneurs were always Chien's heroes. But near the end of his doctorate at MIT, his adviser, Bill Dally, though a successful entrepreneur himself, convinced him to spend time in academia first. Chien took a junior faculty position at the University of Illinois at Urbana-Champaign, where his programming and computer-architecture work set him up for early tenure. If that wasn't enough to cause a stir on campus, his request to do his sabbatical in an industrial research lab did. He convinced his dean to let him spend a year at the Hewlett-Packard lab in Palo Alto, California, where he got his first taste of the corporate research environment.

At the time, California was a hot spot for computing and engineering. When the University of California, San Diego (UCSD) offered him an endowed chair — at the age of 34 — he accepted it to take advantage of the area's wealth of computational and bioinformatics.

He was finally able to indulge his inner chief executive at the helm of an information technology start-up called Entropia in San Diego. It fell victim to the bursting technology bubble in 2000 but he has since straddled the line between academia and industry, being involved with a number of leading companies.

"Academia's appeal is the tremendous freedom to follow research interests, and industry's advantage is being much closer to the innovations that transform society," he says.

Three years ago, he created a multipartner academic–industry research centre at UCSD called the Center for Networked Systems. Setting mutually beneficial technical agendas while juggling intellectual-property issues and long-term financial commitments prepared him for his new position as director of Intel Research. His greatest challenge yet, he says, will be to drive the company's research agenda. He hopes to get more people hooked.

“I really encourage scientists to spend time in corporate America,” he says. “There's much to be learned that can make you a stronger scientist overall.”

Virginia Gewin

What's holding you back?

Through hundreds of consultations with young researchers, I have heard many say that they want to “get away from the bench” while still wanting to “use their science”. Identifying how they can do this is challenging and requires recognition of both the practical and psychological forces at play.

Practical career advice is widely available. But the psychological dimensions, equally significant, are less commonly addressed and understood. Those willing to modify their attitudes to themselves and their profession can develop highly satisfying careers. Here are three common psychological pitfalls that impede young scientists.

Blood from a stone. It can be tempting to believe that one's specific area of scientific knowledge will be the source of the best job opportunities. But the greatest value from a PhD or post-doctoral training experience will often be the knowledge gained of research methods, the acquisition of analytical skills, the ability to communicate with and teach a variety of audiences, and to interpret science at the highest level — all can be valuable outside the lab. A belief that doing something other than research is tantamount to leaving science can hold people back from using their knowledge and skills in other meaningful and rewarding ways. Scientists who leverage their skills in other fields tend to see themselves as adding to, not replacing, their identity.

The 'shining star' syndrome. Before arriving at graduate school, research trainees have typically stood out academically. Now, surrounded by other stand-outs, they may not feel so gifted. To strive for excellence is important, and I'm not advocating a celebration of mediocrity, but there is tremendous value in performing at a level sufficient to do what is needed. Humility is about as rare as that monumental scientific breakthrough, but is no less important.

Can't please everyone. Some young researchers see only a few career options as acceptable, based on parental, mentor and societal influences. Disappointing a parent or mentor can be traumatic, but can also allow one to discover self-responsibility and freedom of identity, a critical task. There comes a time when it’s crucial to take steps towards defining, on one's own terms, career objectives and a means for reaching them.

Those who understand these barriers can work to overcome them and take the first step towards defining the careers and lives they truly want.

Michael Alvarez is founding director of the Stanford University School of Medicine Career Center.

http://med.stanford.edu/careercenter

Master of multitasking

It isn't until the end of graduate school that you begin to wonder whether you've acquired any transferable skills. Despite having been at school since the age of five, it suddenly occurs to you that you're not generally useful to the world. I know what transferable skills I don’t have. I once sat next to a hypochondriac on a plane who berated me for four hours for being a biologist but not being able to cure his adult-onset diabetes. Thing is, unless you are a yeast cell I can’t really help you with your health problems. I can measure sporulation efficiency pretty well, but most humans don’t actually turn into spores, it turns out.

Then I started watching the Olympics. The commentators kept telling me how much pressure these athletes are under. That's when it hit me. This month I taught a class, wrote an abstract for a thesis committee meeting, finished key experiments for two projects, caught up with the literature, met my adviser a few times, and in my spare time even made it to the supermarket once or twice.

This would have seemed like a bit much to handle in my first year of graduate school. Now, it's par for the course. I’m not sure it’s enough to get hired, but where were those commentators when I trudged to my lab during a blizzard because an experiment couldn’t wait? Good at multitasking under pressure — that’s one transferable skill. Now if only I could land a triple axle.

Milan de Vries is a molecular-biology graduate student at the Massachusetts Institute of Technology in Cambridge, Massachusetts.