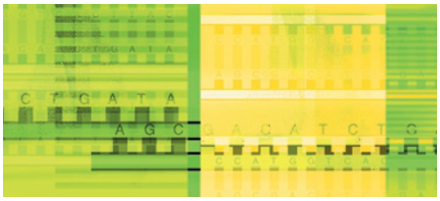
Biotech research



Twenty-five years ago, human insulin became the first therapy produced through recombinant technology to be approved, a landmark in the history of the biotech industry. This month, two researchers who have been with major biotech companies for more than two decades discuss their experiences in conducting research in this environment.

Jeff Browning
Senior Director, Immunobiology Research, Biogen Idec, Boston, Massachusetts, USA

In the early 1980s, the biotech industry was just starting to grow, providing new opportunities for life-sciences researchers. "As I finished my second postdoc, I did not feel that the junior professors were getting to do the fun parts of science, but rather became chained to the grant process," recalls Jeff Browning, now Senior Director for immunobiology research at Biogen Idec. "True or false, I jumped to the emerging biotech industry as an alternative, and have enjoyed this path, which gets even better as I get closer to clinical experiments."

In his current role, Browning is very engaged in the clinical testing of an inhibitor of the lymphotoxin-β receptor pathway for treating autoimmune disorders. More generally, he still does some lab work, contributes to project selection, provides scientific guidance and manages researchers. "I particularly enjoy mentoring younger scientists and helping to make connections between older historical ideas and new observations," he says. "I love to see science unfold and the ramifications for changing medicine given immunology's current fast pace."

The speed of change represents a considerable challenge as well as an opportunity. "An excellent example is playing out right now — the involvement of B cells in so many autoimmune diseases. It is tough to try to harness the critical B-cell leverage points while the basic science is in rapid evolution," Browning says.

A further hurdle is envisioning where medicine should be in 5–10 years and setting that spot as a target, he highlights. "For example, in autoimmune disease, we need to have as a goal the resetting of the immune system back towards a more balanced state; that is, a durable remission, not simply maintaining patients on expensive drugs for many years. But a constant drag on the development of a long-term vision is the equally pressing need to drive the current approaches."

When it comes to tackling such challenges, Browning considers that his diverse scientific background has been a major asset. He studied ion channels in the protozoan *Paramecium* for his Ph.D. at the University of Wisconsin, USA, and then followed this with 4 years of postdoctoral work in biophysics at the University of Basel, Switzerland, exploring phospholipid membrane structure using solid-state NMR methods. "However, I missed the unpredictability of living systems," says Browning. So, he returned to the US for another postdoctoral stint in neurobiology with Louis Reichardt at the University of California, San Francisco. Then, with the biotech industry emerging as an exciting alternative venue for research, he made an initial jump to a small Boston-based start-up, Angenics, before moving to Biogen in 1984.

"I think my scientific wandering contributes to a wholesome view of biology from the molecular level to the whole organism," Browning says. This need for a broad view is also reflected in another factor that he considers very important for success in research: staying widely read. "One can often find biological insight into one's own problems by analysing parallel systems."

Steve Elliott
Scientific Executive Director, Hematology, Amgen, Thousand Oaks, California, USA

A typical career path for a scientist in industry might involve performing basic research, becoming an expert and achieving success, and then being rewarded by promotion to a management position. Steve Elliott, a Scientific Executive Director at Amgen, is happy to have had the opportunity to develop his career along a different route. "I particularly enjoy research, the thrill of exploring new concepts, and adding to the knowledge of the scientific community," says Elliott. "So, I have tried hard to avoid being converted from a 'scientist' to a 'manager', and fortunately at Amgen this is possible — successful scientists are rewarded with more responsibility and latitude in research duties they are good at."

Elliott began his research career with a Ph.D. in 1978 at the University of California at Irvine, USA. Around the time, the biotech revolution was beginning, and he was keen to join a biotech company, but realized he needed to gain expertise in the area first. "I joined a laboratory led by John Carbon at the University of California, Santa Barbara, which was one of the first to develop basic methodologies in genetic engineering, DNA sequencing and all the methods that are now routine, and developed and refined my skills in this area," recalls Elliott. "This allowed me to apply for the job I really wanted — a biotech research job, and I applied to Amgen."

Since joining the company in 1983, Elliott has been primarily engaged in research in the field of haematology, including a key role in the discovery and development of the blockbuster drug darbopoetin-α, which is widely used to treat patients with anaemia. He currently has an active research programme with a primary focus on erythropoiesis, where he can execute his ideas using considerable resources, but with minimal administrative responsibilities. "I believe my job gives me the opportunity to organize and direct a research engine that has and will continue to do excellent science," says Elliott. "I and others like me at Amgen are limited by our own creativity and energy, and not the resources around us."

Nevertheless, there are challenges for researchers in industry that are not typically encountered in academic institutions, Elliott notes. "First, some of the high quality research is never published, often because the work is considered proprietary. Second, some think that good scientists do not gravitate to biotech, and if they do their work is 'tainted'. I have found that this is not true; in fact, a considerable volume of excellent science is performed and published."

He feels that a key to harnessing the potential of such research is having the courage to challenge conventional thinking, as well as to focus on the areas that may have the biggest impact, although this often involves greater risk. "I would rather spend my time working on breakthroughs," says Elliott. "I learned to manage the risk by trying to identify and execute the 'key proof of principle experiment' as soon as possible — if the experiment fails, you must quickly move on to the next good idea. I'm proud to say that these principles were successful with darbopoetin-α, and knowing that the drug has impacted the lives of many patients is very satisfying."

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