

Biotechnology: Why is Europe lagging behind the U.S.?

Of all the new technologies that have emerged since the Second World War, biotechnology is notable in the extent to which US-based firms, having taken the lead at the start, continue to dominate the world market. Why has it been so difficult for other countries to catch up?

Biotechnology in this context refers to a set of techniques, based on advances in molecular biology, genetics and immunology, which came to the fore in the 1970s. They opened up new approaches to drug discovery that were radically different from the chemistry-based methods on which the pharmaceutical industry mostly relied. Partly because of its novelty, the established pharma companies were slow to appreciate the importance of biotechnology, and left the field open to new entrants.



European scientists had been responsible for several of the discoveries which paved the way for new commercial opportunities. But American entrepreneurs were much quicker to exploit the new techniques than their European counterparts. The most successful of the pioneers, Genentech, was founded in 1976 and launched its first drug, a genetically engineered version of insulin, in 1982. It was followed by a host of imitators, many of which listed their shares on the stock market.

The success of these firms owed a great deal to the ingenuity and vision of their founders, but the US had other advantages which supported the growth of the sector. Biomedical research was funded on a very large scale by the Federal government, contributing both to advances in knowledge and to the supply of well-trained scientists. American universities were well equipped, especially after the Bayh-Dole Act of 1980, for transferring the results of academic research into industry. The US had a venture capital industry which had experience in nurturing early-stage firms, especially in electronics, and could apply the same skills to biotechnology. The safety and efficacy of new drugs were regulated in the same way as in Europe, but there were no government controls over prices; the US market was not only much larger than any single European country, but also more rewarding for innovators.

Among European countries the UK seemed well equipped to follow the US lead, not least because of its strength in biomedical research. A missing ingredient was venture capital, and that was part of the rationale for using public funds to support the establishment of Celltech, the UK's first biotech firm, in 1980. But Celltech was soon followed by a stream of wholly private-sector firms, and by the mid-1990s a sizeable biotech sector, well supported by local investors, was taking shape. Then came a series of setbacks, as failures in clinical trials exposed the over-optimism of some of the most highly valued firms. The result was an investor retreat. From the early 2000s the inflow of capital dried up, and several of the best firms either were acquired or moved to the US. Despite a partial recovery in 2014 and 2015, the gap between the US and the UK is probably wider today than it was at the start of the new millennium.

Some observers believe that the failure of UK biotech to build on its apparently promising start was due to short-termism, the reluctance of institutional investors to back high-risk, science-based firms whose research may not pay off for ten years or more. Yet countries such as Germany which have a more patient, long-term approach to the financing of companies have been no more successful than the UK in biotechnology. The lag behind the US is a European, not a purely British phenomenon.

How did the US do so well? First-mover advantage is part of the answer, coupled with the fact that (alongside numerous failures) several of the pioneers produced blockbuster drugs within very few years of their foundation. These star performers attracted investor support to what came to be seen as a high-risk but potentially high-reward business. As more scientist-entrepreneurs entered the market, the increasing size and sophistication of the investor community committed to biotech meant that promising firms could access capital on a scale that was not available in Europe.

The sheer scale of the US biotech sector, much of it being concentrated in Boston and San Francisco, is a huge competitive advantage, and there are other features of the US health care system which are difficult or impossible for European countries to imitate. For example, there is no way in which the European Union, with or without the UK, can match the amount spent by the US National Institutes of Health on biomedical research. Nor, given the determination of European governments to keep control of their national health care arrangements, is there any possibility of a genuinely integrated European market for medicines, let alone one in which drug companies have the same pricing freedom as in the US. Even if that freedom is curtailed under the next US administration, American leadership in biotechnology is unlikely to be seriously challenged.

Notes:

- *This post is based on the author's book [Science, the State and the City: Britain's struggle to succeed in biotechnology \(2016\)](#) co-authored with Michael Hopkins.*



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