

Policy Brief

POLICY@SUSSEX | OCTOBER 2017



Improving the effectiveness of the UK's medical innovation ecosystem

SUMMARY

The Life Sciences Industrial Strategy – a report to UK Government from the Life Sciences sector – contains a goal to develop four companies within the sector with a market capitalisation in excess of £20bn in the next ten years.

However, in their book *Science, the State and the City*, Geoffrey Owen and Michael Hopkins show that the UK has generated only one such firm since 1980. By comparison the US - which has a significant competitive advantage in its size - has generated many large and successful firms engaged in medical drug development (see chart overleaf). This is indicative of substantial differences between the UK and US innovation ecosystems in this economically important sector. Nonetheless, the performance of the UK life sciences industry is strong relative to other leading countries.

This briefing focuses on the growth of 'biotech firms' seeking to develop novel drugs. The following questions are addressed:

- Why has it been so difficult for firms in other countries to match the success that leading US companies have achieved?
- What can the study of innovation ecosystems reveal about the UK's ability to grow new science-based firms?
- How can public investment in science be used to boost the performance of the UK's life sciences industry?

Policy implications

US success in growing highly-capitalised biotech firms stems from several factors that are difficult for smaller economies to imitate. European efforts are needed to remedy this.

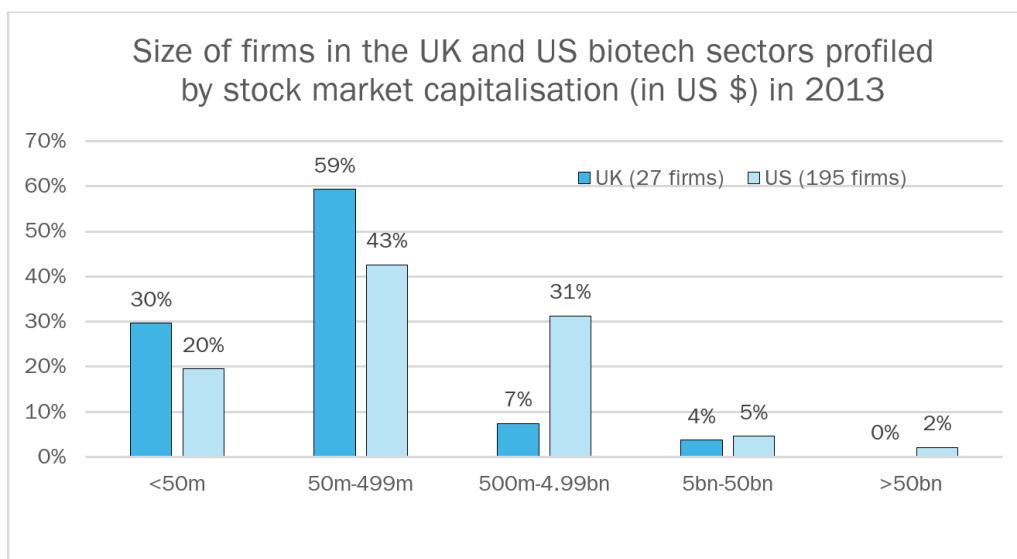
Much higher levels of public spending on science are required to generate the technologies, drugs and expertise needed to build up the size of the UK industry.

The lack of UK biotech firms with 'blockbuster drugs' makes it rational for investors to not prioritise high-risk investments, without incentives.

Horizontal policy interventions may not be efficient in delivering new investment to biotech firms. Targeted co-investment could be effective but is limited by WTO and state aid rules.

US biotech firms produce drugs that are often not affordable to the NHS. Licensing conditions for UK public sector intellectual property should ensure UK patient access.

Supporting biotech firms is only one pathway to apply UK science for health benefit. Other pathways such as preventative medicine should be better resourced too.



Source: based on statistical analysis in Owen and Hopkins (2016) p. 190.

Key findings

In the US, a number of factors have combined that create a uniquely supportive environment for biotech firms:

- The US government funds medical research at a much higher level than the UK and has done for decades.
- The US hosts a much larger and more diverse market for healthcare than the UK, without stringent prices controls. In 2013 the US spent 17% of its GDP on healthcare, making it a global outlier (in contrast, the UK spent 9%).
- The US has many more venture capital funds than the UK. The average size of these funds and their investments are larger than those of UK-based funds.
- The US investment industry has more specialist expertise, and is more keen to invest in science-based firms (and in early stage firms too) than UK investors.
- US biotech firms benefit from much higher levels of investor capital before and after they join the stock market. This gives them a strategic advantage over most firms in other countries.
- The US biotech sector is structurally different to the UK's, as it contains many more firms that are much larger than those in the UK (see chart above).
- The commercial success of early US biotech firms in bringing drugs to market led to a virtuous cycle of reinvestment (at scale) and further success. In contrast, failure led to a vicious cycle for the UK sector in the 2000s, when many promising but low-valued firms were bought up by rival drug developers.

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Dr Hopkins' research was supported in part by EPSRC grant EP/E037208/1.

REFERENCES

Bell, John (2017) *Life Sciences Industrial Strategy*. Report to the UK Government from the life sciences sector.

Hopkins, Michael M, Crane, Philippa A, Nightingale, Paul and Baden-Fuller, Charles (2013) 'Buying big into biotech: scale, financing, and the industrial dynamics of UK biotech, 1980–2009'. *Industrial and Corporate Change*, 22 (4). pp. 903-952. This paper is Open Access.

Owen, Geoffrey, and Hopkins, Michael (2016) *Science, the State and the City: Britain's struggle to succeed in biotechnology*. Oxford: Oxford University.