

Katie Prescott

Pharma firms buy into promise of AI shortcut to designing new drugs

In the centre of Cardiff, looking rather like a set of badly stacked brown and yellow boxes, sits Spark, or Sbarc, to give it its Welsh name. Part of Cardiff University's Innovation Campus, it is home to Antiverse, a start-up using AI to design antibodies that can attach to difficult targets in the body.

The weather may have been gloomy in south Wales this week but it couldn't dampen the celebrations when the young biotech company announced a deal with Japan's Nxera, which will apply its antibodies to develop drugs.

While business has been quick to trumpet the productivity gains from generative AI, drafting emails or building customer service chatbots, increasingly attention is turning to what it can do for drug discovery.

Murat Tunaboylu, chief executive of Antiverse, describes the use of AI as moving the dial from drug "discovery", to drug "design". Rather than trying to get lucky with trial and error, the company is learning from patterns, which is proving more accurate and more focused.

Pharmaceutical companies generally spend up to 15 years to bring a drug to market and can expect to spend anywhere from \$1 to \$2 billion in the process. By trawling through vast amounts of data, generative AI allows scientists to speed this up significantly, analysing patterns from patient information, identifying targets, predicting molecular behaviour and improving the designs of clinical trials.

When the development of a drug fails, it is mainly in the later safety or efficacy stages. The hope is that AI models can predict the impact on the human system earlier on, which will reduce these issues. It can support researcher productivity.

According to McKinsey, the technology "could offer pharma companies a once-in-a-century opportunity", if they can scale it and deal with some of the challenges. It claims that generative AI could generate \$60 billion to \$110 billion annually in economic value for pharma companies.

Google DeepMind has long been focused on accelerating drug discovery using AI and it quadrupled its R&D spending last year to £49 million. It announced

almost \$3 billion of partnerships in January with Eli Lilly and Novartis.

Google DeepMind's co-founder Sir Demis Hassabis and director Dr John Jumper won a Nobel prize this year for their work on AlphaFold, a tool predicting the structure of proteins from their amino acid sequences. DeepMind has a joint venture with BioNTech to build AI lab assistants.

In September, OpenAI and others put \$30 million into the six-month-old Chai Discovery, which focuses on making new treatments by predicting the structure of biochemical molecules and reprogramming how they interact. Last month Nvidia and Microsoft said they were expanding their programme for AI start-ups, focusing their attention on healthcare and life sciences.

At the other end of the spectrum, Antiverse employs 30 people. It raised \$4.6 million in October, bringing its total funding to over \$10 million. It is just one small example of how British companies are making waves in this space.

Exscientia in Oxford, which claims to be the first company to automate drug design, listed on Nasdaq in 2021. There are many others, from HealX, which recently raised \$47 million and looks at rare diseases, to Diosynvax, a Cambridge spinout that uses AI to develop vaccines.

UK health and life science start-ups are attracting "significant investment", according to figures from HSBC Innovation Banking UK and Dealroom. Three of the largest British venture capital funding rounds in the third quarter of this year came from the biotech industry — Myricx Bio raised \$114 million in July, while in September Vicebio and F2G both raised \$100 million each.

The headline numbers sound good, but biotech firms say investors remain cautious about putting their hands in their pockets. The promise of the technology is there and "everyone is waking up to tech companies coming into biology", said one, yet the question remains: when will the promise translate to the clinic and to patients?

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