

Scanning the horizon for the next decade's biotech breakthroughs, including tools to fight the next pandemic

In 2017 we published the results of a 'horizon scan' that looked at emerging issues in bioengineering ([Wintle et al., 2017](#)). Here we report the results of an updated horizon scan based on a wider range of inputs (38 participants from six continents and 13 countries, compared with 27 participants from the UK and US in the 2017 exercise) and a broader definition of bioengineering.

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Since it was undertaken, there have been developments in a number of the issues identified in the 2017 bioengineering horizon scan. Human germline genome editing came to prominence in late 2019 when researcher He Jiankui announced the birth of two girls with CRISPR/Cas9-edited genomes ([Cyranski, 2019](#)).

Military funding of bioengineering projects also remained substantial: for example, projects funded by DARPA included programs to explore the use bioelectronics for tissue repair and regeneration (BETR) and to develop mosquito-repellent skin (ReVector). There have also been breakthroughs in the use of enhanced photosynthesis for agricultural productivity.

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The use of 'platform technologies to address emerging disease pandemics', another topic identified in 2017, has taken on particular significance as a result of the COVID-19 pandemic. Many of the vaccine candidates for COVID-19 currently undergoing clinical and pre-clinical evaluation have been developed from platforms for non-coronavirus candidates such as influenza, SARs and Ebola ([WHO, 2020](#)).

Horizon scanning aims to build societal preparedness by systematically identifying upcoming opportunities and threats from technological, regulatory and social change.

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