New antibiotics on the way, but not quickly enough

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A report by University of Queensland researchers has warned a global crisis of antibiotic resistance is inevitable, despite promising developments in new antibiotics.

The Center for Superbug Solutions at the University of Queensland's Institute for Molecular Bioscience has monitored the clinical pipeline for more than a decade, with its latest snapshot showing 62 new antibiotics in development. The research was published in *The Journal of Antibiotics*.

Professor Mark Blaskovich said it was encouraging that 34 of those were based on structures not previously used as an antibiotic.

"It means the resulting medication will be less likely to have existing resistance in the bacteria and potentially it will take longer for resistance to develop," Professor Blaskovich said.

"But it's still a glass half-empty situation compared to other classes of drugs, where pharmaceutical companies stand to gain more profit.

"Sixty-two new antibiotics in development is still very low compared to almost 2,000 in the cancer drug pipeline.

"We're still not where we need to be given the urgency of the situation."

Drug-resistant infections continue to grow, with a 2022 report showing 1.27 million deaths globally in 2019 were directly attributed to resistant bacteria and a further 4.9 million deaths were associated.

Professor Blaskovich said major "push" funding initiatives such as Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X) were appearing to have some impact in the early stages of the antibiotic pipeline, with nearly double the number of candidates in the first stage of clinical testing, compared to the first analysis in 2011.

"But new incentives are needed to help make it financially viable for pharmaceutical companies to advance new antibiotics through the later

stages of clinical testing," Professor Blaskovich said.

"These include the Netflix-style subscription payment model recently being tested in the UK, where the government pays for access to an antibiotic regardless of the quantity.

"It means the pharmaceutical company is less interested in sales volume and more likely to invest in developing novel treatments.

"It also discourages doctors from overprescribing antibiotics which leads to resistance."

The researchers said there was also hope from non-antibiotic approaches to combat infection.

"There is renewed interest in vaccines, particularly with mRNA technologies, which have been incredibly effective—and unlike antibiotics, can be lucrative products for pharmaceutical companies," Professor Blaskovich said.

IMB's Community for Open Antimicrobial Drug Discovery (CO-ADD) is fostering antibiotic discovery by offering researchers free screening of compounds for antimicrobial activity.

More information: Mark S. Butler et al, Antibiotics in the clinical pipeline as of December 2022, *The Journal of Antibiotics* (2023). DOI: 10.1038/s41429-023-00629-8

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