

R&D: building the GARDP portfolio

Antimicrobial resistance (AMR) is a major and rapidly growing global public health threat. Responsible for more than 700,000 deaths a year, it poses a significant threat¹ to the attainment of the UN Sustainable Development Goals (SDGs), in particular SDG3, which aims to ensure healthy lives and promote wellbeing for all.²

The Global Antibiotic Research and Development Partnership (GARDP) is a not-for-profit research and development organization that addresses global public health needs by developing and delivering new or improved antibiotic treatments, while endeavouring to ensure their sustainable access.

Initiated by the World Health Organization (WHO) and the Drugs for Neglected Disease *initiative* (DNDi) in May 2016, GARDP is an important element of WHO's Global Action Plan on Antimicrobial Resistance that calls for new public-private partnerships to encourage R&D of new antimicrobial agents and diagnostics. Following a successful incubation period, GARDP became an independent legal entity in 2019.

GARDP's programmes incorporate access and stewardship strategies to ensure treatments are affordable and available to all those who need them.

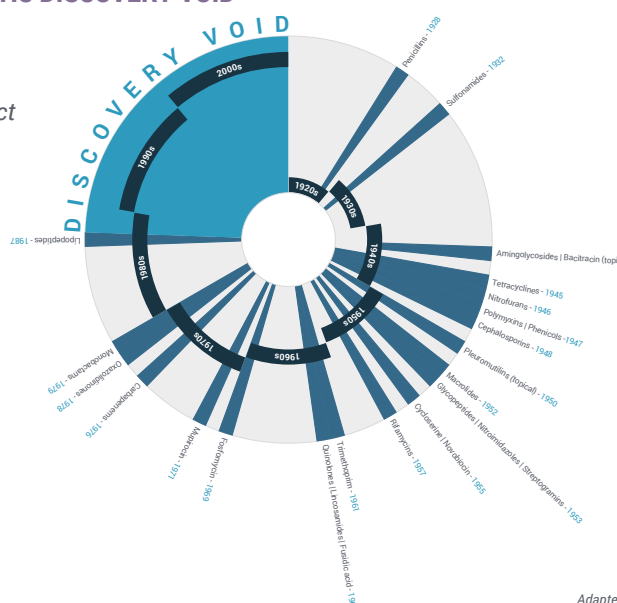
Partnerships are central to GARDP's model and include WHO, pharmaceutical and biotechnology companies, academia, governments, health authorities, philanthropic organisations and civil society from across the world.

For more than thirty years, there has been a 'void' in the discovery and development of new antimicrobials. Challenges including complex science, lack of return on investment and changes in R&D priorities in the pharmaceutical sector, led to the abandonment of countless antibiotic development programmes.

As the world grapples with AMR, it is increasingly understood that the development of drug resistance is inevitable. A healthy antibiotic development pipeline is critical to ensuring infections can be treated today, and in the future. Achieving this requires investment at all stages of drug development; including novel discovery to look for new chemical entities (compounds not previously evaluated in clinical trials); efforts to recover, repurpose and improve existing compounds; and evaluation of assets to ensure that the right drug candidates progress into clinical development. There is a particular need to focus on the priority pathogens identified by the WHO as most in need of renewed antibiotic R&D.³

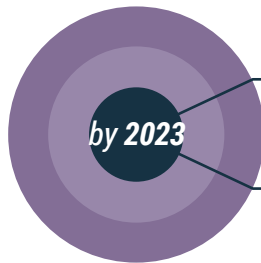
THE ANTIBIOTIC DISCOVERY VOID

The discovery dates of distinct classes of antibiotics



GARDP'S R&D PROJECTS

GARDP's R&D projects to build its pipeline include discovery & exploratory research, including screening of chemical compound libraries for activity against WHO priority pathogens, and asset evaluation & development of new and recovered antibiotics with the potential to be incorporated into GARDP's clinical development programmes.



Discovery and exploratory research

- One new antibiotic candidate advanced into pre-clinical development

Asset evaluation and development

- One recovered drug advanced into clinical development
- One new chemical entity advanced into a Phase III clinical trial

TO DATE, GARDP HAS

- Evaluated more than 80 new and 'recovered' chemical entities, of which:
 - Two existing antibiotics (fosfomycin and polymyxin B) are undergoing pre-clinical and clinical evaluation as candidates for the neonatal sepsis and paediatric antibiotics programmes.
 - Two recovered assets with potential for the neonatal sepsis and STI programmes are being further evaluated.
 - Six new assets in development have been identified as potential candidates for GARDP's pipeline.
- Set up a research project with the University of Verona, Italy to conduct a systematic review of combinations of antibiotics to treat sepsis from drug-resistant bacteria in adults. The report will analyse the strengths and weaknesses of evidence in relation to setting, drug availability and real-world practice.
- Established an agreement with drug discovery alliance Evotec to explore opportunities for antibiotic discovery and early development of assets as part of an exploratory joint pipeline of novel antibiotic assets.
- Set up an AMR screening consortium with Japanese pharmaceutical companies Eisai and Takeda and the Institut Pasteur Korea, to screen parts of the companies' libraries.
- Entered into a partnership with non-profit translational research institute Calibr, the Helmholtz-Institute for Pharmaceutical Research Saarland (HIPS) and the Community for Open Antimicrobial Drug Discovery (CO-ADD) at the University of Queensland to screen Calibr's ReFRAME compound library and HIPS' natural products library.

LOOKING AHEAD

- As a result of ongoing evaluation, it is anticipated that up-to-two additional drug development partnership projects may be initiated by the end of 2019.
- Select pre-clinical and clinical activities will be taken to test the developability (capacity and sustainability of development) of evaluated assets.
- The University of Verona report will be delivered in early 2020, with preliminary results to be discussed at a workshop on combination therapies in late 2019. The knowledge gained will support efforts to incorporate new assets into GARDP's drug development pipeline; inform R&D efforts within existing programmes and/or establish new programme areas.

A GLOBAL COLLABORATION



The R&D projects to build the portfolio have partners in

Australia
Germany
Japan
Korea
Italy
UK
USA

For a full list of partners see gardp.org/partners

1 O'Neill, J. (Chair) Antimicrobial Resistance: [Tackling a crisis for the health and wealth of nations](#): The Review on Antimicrobial Resistance, 2016
 2 The [2030 Agenda for Sustainable Development](#), 2015.
 3 World Health Organization (WHO) priority pathogen [World Health Organization \(2017\). WHO publishes list of bacteria for which new antibiotics are urgently needed.](#)
 4 Silver, LL. [Challenges of antibacterial discovery](#). Clin Microbial Rev. Jan, 2011.