

MEDIA RELEASE

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CARB-X awards Oxford Drug Design funding to develop a new class of antibiotics to treat drug-resistant Gram-negative infections

Compounds directed against a novel aminoacyl-tRNA Synthetase target site represent a new approach that reduces the chances that bacteria can develop drug resistance to it

(BOSTON, USA) – CARB-X is awarding Oxford Drug Design Ltd. of Oxford, UK, up to \$2.55 million in non-dilutive funding with the possibility of \$4.24 million more if certain project milestones are met, to develop a new class of antibiotics for the treatment of Gram-negative bacterial infections using an approach designed to reduce the likelihood that resistance will emerge.

“We need new antibiotics and other products to combat the global rise of drug resistance and to prevent, diagnose and treat bacterial infections that are killing thousands of people each year,” said **Kevin Outterson, Executive Director of CARB-X and Professor of Law at Boston University**. “CARB-X partners are making solid progress supporting innovative antibacterial R&D like the Oxford Drug Design project to treat drug-resistant bacterial infections. But we know that much more is needed – more investment and global leadership to establish incentives that will ensure that life-saving products reach the market and patients who need them.”

Oxford Drug Design CEO, Paul Finn, said: “We are delighted to be working with CARB-X to develop our series of aminoacyl tRNA synthetase inhibitors, which have been identified with the aid of our innovative cheminformatics and machine learning technologies. The compounds represent a new class of antibiotics with activity against Gram-negative organisms, an area of critical unmet medical need, which the CARB-X funding will enable us to accelerate towards clinical evaluation.”

Oxford Drug Design is working to develop inhibitors of aminoacyl-tRNA synthetases (aaRSs), enzymes that are essential for bacterial viability. The aaRSs are a clinically validated target family, but to date, no inhibitors with systemic activity have reached the market. Oxford Drug Design has discovered a novel class of small-molecule aaRS inhibitors with activity against Gram-negative ESKAPE pathogens. The compounds are directed against a novel aminoacyl-tRNA Synthetase target site with a design strategy of targeting more than one synthetase, decreasing the probability of resistance emerging to the new compounds compared to aaRS inhibitors pursued in the past. Oxford Drug Design intends to progress these compounds as quickly as possible through hit-to-lead and optimization towards clinical development.

In addition to the CARB-X award, the company has received £2 million in funding from Innovate UK, on behalf of the UK government's Department for Health and Social Care (DHSC), which will provide synergistic resources to accelerate other aspects of Oxford Drug Design's novel tRNA synthetase inhibitor research portfolio.

New antibiotics urgently needed to fight superbug crisis

Drug-resistant superbugs are on the rise worldwide and represent a threat to global public health and health security. According to the World Health Organization, an estimated 700,000 people die each year worldwide from bacterial infections. In the United States, an estimated 23,000 people die each year from drug-resistant bacterial infections. In Europe, the number of deaths yearly is estimated at 33,000.

Partnership driving antibacterial innovation globally

The CARB-X portfolio is the world's largest antibacterial development portfolio with 29 projects in five countries. Since its inception in 2016, CARB-X has announced awards for 44 projects in seven countries exceeding \$126.15 million, with the possibility of additional funds if project milestones are met, to accelerate the development of antibacterial products. These funds are in addition to investments made by the companies themselves. As well as funding, CARB-X provides business and scientific support for projects through the CARB-X Global Accelerator Network, a network of 10 expert organizations around the world. The CARB-X pipeline will continuously evolve, as projects progress or fail.

CARB-X, led by Boston University, is investing more than \$500 million in antibacterial R&D between 2016-2021 to support the development of new antibiotics, vaccines, diagnostics and other products. The goal is to support projects through the early phases of development through Phase 1, so that they will attract additional support for further clinical development and approval for use in patients. The scope of CARB-X funding is restricted to projects that target drug-resistant bacteria highlighted on the Centres for Disease Control and Prevention (CDC)'s 2013 Antibiotic Resistant Threats list, or the Priority Bacterial Pathogens list published by the WHO in 2017 – with a priority on those pathogens deemed Serious or Urgent on the CDC list or Critical or High on the WHO list.

CARB-X recently announced four new funding rounds for 2019, each with a specific scope and application period. Product developers from around the world are invited to apply.

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About CARB-X

CARB-X, led by Boston University, is a global non-profit partnership dedicated to accelerating early development antibacterial R&D to address the rising global threat of drug-resistant bacteria. CARB-X funding is provided by the Biomedical Advanced Research and Development Authority (BARDA), part of the Office of the Assistant Secretary for Preparedness and Response (ASPR) in the U.S. Department of Health and Human Services; the Wellcome Trust, a global charity based in the UK working to improve health globally; Germany's Federal Ministry of Education and Research (BMBF); the UK Department of Health and Social Care's Global Antimicrobial Resistance Innovation Fund (UK GAMRIF); the Bill & Melinda Gates Foundation, and with in-kind support from National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health (NIH) within the U.S. Department of Health and Human Services. A non-profit partnership, CARB-X is investing more than \$500 million from 2016-2021 to support innovative antibiotics and other therapeutics, vaccines and rapid diagnostics. CARB-X supports the world's largest and most innovative pipeline of preclinical products against drug-resistant infections. CARB-X focuses exclusively on high priority drug-resistant bacteria, especially Gram-negatives. CARB-X is headquartered at Boston University School of Law. <https://carb-x.org/>. Follow us on Twitter @CARB_X

About Oxford Drug Design Limited

Oxford Drug Design is based in Oxford, UK. Founded in 2001 as a spin-out company from the Oxford University Chemistry Department by its Chairman, Professor Graham Richards, the company has developed a suite of proprietary computer-aided drug design and machine learning technologies and unique 3D chemical database technologies. Oxford Drug Design applies these technologies to its internal drug discovery portfolio, which is focused on the anti-infective therapeutic area. These computer-aided design and machine learning methods enable the company to solve problems that have proven challenging to the industry, such as obtaining activity against drug-resistant Gram-negative bacteria.

For more information, visit www.oxforddrugdesign.com

About BARDA and NIAID

The US Department of Health and Human Services works to enhance and protect the health and well-being of all Americans, providing for effective health and human services and fostering advances in medicine, public health, and social services. Within HHS, ASPR's mission is to save lives and protect Americans from 21st century health security threats. ASPR leads the nation's

medical and public health preparedness for, response to, and recovery from disasters and public health emergencies. BARDA provides a comprehensive, integrated, portfolio approach to the advanced research and development, innovation, acquisition, and manufacturing of medical countermeasures – vaccines, drugs, therapeutics, diagnostic tools, and non-pharmaceutical products for public health emergency threats. These threats include chemical, biological, radiological, and nuclear agents, pandemic influenza, and emerging infectious diseases. NIH is the primary US federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases. NIAID conducts and supports research — at NIH, throughout the United States, and worldwide — to study the causes of infectious and immune-mediated diseases, and to develop better means of preventing, diagnosing and treating these illnesses.

About Wellcome Trust

Wellcome exists to improve health for everyone by helping great ideas to thrive. We're a global charitable foundation, both politically and financially independent. We support scientists and researchers, take on big problems, fuel imaginations and spark debate. The Wellcome Trust is a charity registered in England and Wales, no. 210183. Its sole trustee is The Wellcome Trust Limited, a company registered in England and Wales, no. 2711000 (whose registered office is at 215 Euston Road, London NW1 2BE, UK)

About BMBF

Education and research are the foundations for our future. The promotion of education, science and research by the Federal Ministry of Education and Research (BMBF) represents an important contribution to securing Germany's prosperity. Education and research are a Federal Government policy priority, which is reflected in the development of the funding it is making available to these fields.

About the Global AMR Innovation Fund (GAMRIF)

The Department for Health and Social Care (DHSC) is the UK Government department which is responsible for helping people to live more independent, healthier lives for longer.

The partnership with CARB-X is part of DHSC's Global Antimicrobial Resistance Innovation Fund (GAMRIF). GAMRIF was established to provide seed funding for innovative research and development, specifically in neglected and underinvested areas, in the field of AMR. GAMRIF is a £50m UK Aid investment, which means all projects funded must support research primarily and directly for the benefit of people in low- and middle-income countries (LMICs). The Fund takes a 'One Health' approach, seeking to invest in potential solutions to reduce the threat of AMR in humans, animals, fish and the environment. The Fund seeks to leverage additional global funding through interaction with international government bodies, public-private partnerships, product development partnerships, global funding mechanisms and global fora.

About Boston University

Founded in 1839, Boston University is an internationally recognized institution of higher education and research. With more than 33,000 students, it is the fourth-largest independent

university in the United States. BU consists of 17 schools and colleges, along with a number of multi-disciplinary centers and institutes integral to the University's research and teaching mission. In 2012, BU joined the Association of American Universities (AAU), a consortium of 62 leading research universities in the United States and Canada. For further information, please contact Jeremy Thompson at jeremy22@bu.edu. www.bu.edu.