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## Innovate UK Global Expert Mission Antimicrobial Resistance in India

Mission Brochure

6<sup>th</sup> – 10<sup>th</sup> November 2023



## About Global Expert Missions

Innovate UK (IUK), part of UK Research and Innovation (UKRI) is the UK's national innovation agency. IUK supports business-led innovation in all sectors, technologies, UK regions and globally. It helps businesses grow through the development and commercialisation of new products, processes, and services, supported by an outstanding innovation ecosystem that is agile, inclusive, and easy to navigate.

As innovation is increasingly a global endeavour and more UK businesses have the ambition to grow and scale globally, it is important to create the right opportunities on which businesses can capitalise. Innovate UK's Global Expert Missions (GEM) programme uses a small team of UK experts to do a deep dive to better understand the opportunities in specific countries, and technology and sector areas. GEMs provide the evidence base for where IUK (and wider UK Government) should commit resources to better provide the opportunities for UK businesses to build partnerships and collaborations with key economies.

Built around UK business, policy and research representation, a GEM's objectives are:

- 1. Building International Collaborations**

The mission identifies key strategic partners and provides expert and objective insights to inform and enhance the UK's innovation partnership with global economies.

- 2. Informing UK businesses and government**

Providing unique market insights and drivers for UK businesses and strategic actions plans to support Government initiatives and to identify new opportunities.

- 3. Sharing UK Capabilities**

During the Mission visit, the delegation of experts will use the opportunity to share the UK's innovation strengths.

## India Antimicrobial Resistance Global Expert Mission

Like many other countries, India is seeking ways to reduce the burden of AMR, which poses a significant threat to public health and the economy. The global impact of AMR is clear, with economic projections indicating a 3.8% decrease in annual GDP by 2050 and exceeding a cost of \$1 trillion annually after 2030.<sup>1,2</sup> According to data estimates, there were 4.95 million (3.62-6.57) deaths related to bacterial AMR in 2019, with 1.27 million deaths attributable to bacterial resistance.<sup>3</sup> AMR is a multi-faceted problem and, in many cases, requires a multi-pronged approach. The One Health concept highlights the relevance and the relationship between humans, animals and the environment and the need for a joint effort from all three sectors to effectively control, contain and reduce AMR in the population locally, regional, and internationally.

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<sup>1</sup>[Drug-Resistant Infections: A Threat to Our Economic Future](#)

<sup>2</sup><https://www.worldbank.org/en/topic/health/brief/antimicrobial-resistance-amr>

<sup>3</sup>[Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis](#)

## Challenges and Drivers for AMR in India

India's growing and dense population, and diverse healthcare practices have seen AMR spread rapidly across India. This is primarily driven by the uncontrolled human and veterinary use of antibiotics, lack of public awareness and, more recently, environmental factors, including waste from agriculture, livestock, and manufacturing. In addition, several infectious diseases that are highly prevalent in India, such as tuberculosis, malaria, and cholera, make it challenging to combat AMR effectively.

## India's National Action Plan to combat AMR

With AMR continuing to pose a significant threat to public health, the Indian Government, along with public and private sector organisations, are working diligently through India's National Action Plan (NAP).<sup>4</sup> The objectives of the NAP include improving awareness, enhancing surveillance measures, strengthening infection prevention and control, research and development, promoting investments, and collaborative activities to control AMR.

## AMR initiatives in the UK

The UK is at the forefront of AMR innovation and stewardship and has worked diligently with international partners on research and innovation. The Global AMR Innovation Fund (GAMRIF) supports early-stage innovation projects in areas typically underfunded in AMR research. The UK has expanded efforts to address the global AMR crisis through several initiatives, including:

- UK Government developed its AMR strategy, revised in 2019, with a rolling 5-year action plan with Innovate UK as a key delivery partner. The resultant National Action Plan emphasises the funding for research and innovation, including public-private partnerships to promote the development of new priority vaccines, therapeutics and diagnostics spanning human and animal health.
- The UK is leading the way in implementing a subscription-based model to circumvent low antibiotic sales and usage. With a fragmented market, the new business model will pay a fixed fee to access antibiotics regardless of how much is being used to treat patients. The purpose of the new model is to encourage companies to invest in antimicrobial research.
- The UK Department of Health and Social Care have invested £50M in its Global AMR Innovation Fund to address the problems of AMR in Low- and Middle-Income Countries (LMICs).
- The UK is committed to developing new vaccines to combat AMR and infectious diseases through the Global Health Security team. A funding of £477M was allocated to establish projects in and for LMICs. It included a £110M UK Vaccine Network Program to develop new vaccines and technologies to tackle diseases with epidemic potential (a high priority for Official Development Assistance programme; ODA), £70M of which is being delivered by Innovate UK.
- The UK has invested £210M to partner with countries across Asia and Africa to tackle AMR. The investment will support the second phase of the UK-India Fleming Fund, with £3M allocated to facilitate collaboration on AMR surveillance.

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<sup>4</sup> [India's National Action Plan for antimicrobial resistance – An overview of the context, status, and way ahead](#)

## Mission Objectives

This Global Expert Mission will bring a team of UK industry experts to assess the AMR R&I ecosystem in India to identify key areas for collaboration and potential programmes needed to enable UK innovators to collaborate with Indian partners.

The objectives of the Mission are to:

- Help determine how Innovate UK can best support UK businesses more effectively and efficiently when considering AMR innovation partnerships with India. Our assessment would include where best to focus efforts on technology and sector areas, locations, and the type of programmes needed to maximise opportunities between India and the UK.
- Develop a deeper understanding of the research and innovation landscape on AMR in India and build relationships with key individuals and organisations.
- Identify synergies between the AMR activities of both countries and relative strengths and weaknesses across the one health space, including diagnostics, therapeutics, and vaccines.
- To understand the Indian market and key AMR stakeholders and develop long-term engagement strategies to support business collaboration for new products and services.

## Themes

The UK delegation will focus on five key areas:

- **Environmental** - To better understand the antimicrobial pollution from waste effluents such as agriculture, livestock, aquaculture, and manufacturing waste.
- **Animal** – What are the infrastructure and processes for disease surveillance in livestock and the practices for better stewardship.
- **Diagnostics** - Review R&I for diagnostics in India, focusing on microbial diagnostics and their approach to primary and secondary care.
- **Therapeutics** - What are the regulatory processes for new therapeutics and strategies to mitigate AMR through investment in non-traditional antimicrobials.
- **Vaccines** - Review India's manufacturing capability and the development of new technology for production and scale-up.

## Outcomes and Post-Mission Activities

A report on the findings of the mission and recommendations for potential future activities will be made available after the mission visit. The findings of this report will be crucial in determining the type of opportunities for innovation activities to support collaboration and partnership between the UK and India.

A post-visit dissemination event will be open to the public to highlight opportunities in India for AMR research and future Innovate UK activities. The event will primarily focus on supporting UK businesses and research institutions seeking to expand globally on AMR but also welcome interested stakeholders from India to attend.

## Mission Details

**Location:** India - Bengaluru (Karnataka) & Vijayawada (Andhra Pradesh)

**Date:** 6<sup>th</sup>-10<sup>th</sup> November 2023

### Delegation

The delegation comprises of a broad range of AMR and One health expertise, including technical and policy experts from industry, academia, and government.

#### UK Experts

- **Mandy Nevel**, *Head of Animal Health and Welfare*– Agriculture and Horticulture Development Board (AHDB)
- **Mike Strange**, *Head of Global Health* – LifeArc
- **Joanna Wiecek**, *Chief Science Officer* – CircaGene
- **Robin Cohen**, *Chief Business Officer* - aVaxiPen
- **Simon Doherty** – *Senior lecturer*, Queen's University Belfast

#### Organisation Team

- **Phil Packer**, *Innovation Lead AMR, and Vaccines* - Innovate UK
- **Charlie Fraser**, *India Partnership Manager* – Innovate UK,
- **Syed Ahmed**, *GEM Programme Lead* – Innovate UK KTN
- **Alexandra Leech-Gribben**, *Project Coordinator* - Innovate UK KTN
- **Zille Anam**, *Senior Programme Manager* – UKRI India
- **Maarten van Dongen**, *Founder*- AMR Insights

## UK Sector Representatives

### Mandy Nevel, Head of Animal Health and Welfare – The Agriculture and Horticulture Development Board (AHDB)

#### Company biography

The Agriculture and Horticulture Development Board (AHDB) is a statutory levy board, funded by farmers, growers, and others in the supply chain to help the industry succeed in a rapidly changing world. We want to create a world-class food and farming industry, inspired by and competing with the best.

#### Personal biography

Head of a team of scientists in Animal Health and Welfare at AHDB - Agriculture and Horticulture Development Board. A vet by training with 30 years' experience mainly in livestock disease and welfare. Interests are antibiotic stewardship in animal health and welfare, endemic diseases of livestock and their control. A One Health approach to human and animal health and welfare and the environment.

## **Mike Strange, Head of Global Health – Life Arc**

### **Company biography**

LifeArc is a self-funded, charitable medical research organisation committed to investing £1.3 billion by 2030 in areas of high unmet medical need. Their teams are experts in drug and diagnostics discovery, technology transfer, and intellectual property and their work focuses on translational science – bridging the gap between academic research and clinical development.

They provide funding, research and expert knowledge, all with a clear and unwavering commitment to having a positive impact on patient lives. They have been doing this for more than 25 years and their work has contributed to five licensed medicines, including cancer drug pembrolizumab (Keytruda®), and a diagnostic for antibiotic resistance.

### **Personal biography**

Dr Mike Strange joined LifeArc as consultant in May 2022 and took on the role of Head of Global Health in April 2023. Mike oversees our three Global Health Translational Challenges in: Antimicrobial Resistance, Neglected Tropical Diseases and Emerging Viral Threats.

These challenges aim to reduce the burden of infectious diseases by enabling the translation of scientific innovations, accelerating their path to deployment in underserved populations.

Mike previously spent more than 20 years at GlaxoSmithKline (GSK), where he held several senior strategic and operational roles in pharmaceutical and vaccine R&D. For the last 12 years at GSK, he worked in Global Health, where he led the creation of several industry-leading collaborative initiatives including the Tres Cantos Open Lab, the Africa Non-Communicable Diseases Open Lab, and a collaboration with Novartis exploring genetic diversity and response to medicines in African patients.

Mike's most recent role at GSK was Vice President Global Health Catalyst, where he was responsible for partnerships/external funding, business strategy and operations, and product strategy/market access within GSK's Global Health Pharma Unit.

Mike has a PhD in Applied Mathematics, an MSc in Mathematics and Biology, a BSc in Mathematics, as well as an Executive MBA from London Business School.

## **Joanna Wiecek, Chief Scientific Officer – CircaGene**

### **Company biography**

CircaGene is a London-based start-up focused on genetic health and oral microbiome testing. CircaGene was established 4 years ago, with the ambition to utilise powerful “omics” techniques such as metagenomics, metabolomics and advanced AI-predictive modelling to successfully diagnose the early onset of oral diseases (i.e., periodontitis) and any related systemic diseases such as diabetes, Alzheimer's and rheumatoid arthritis.

### **Personal biography**

Joanna's scientific background is in molecular microbiology, sequencing, microbiome dysbiosis and antimicrobial resistance. She has received her scientific training through a PhD in molecular biology at University College London, MSc degree in Environmental Diagnostics and Management at Cranfield University, and MSc in Biotechnology from Silesian University of Technology, Poland. Her recent positions prior to CircaGene include Entrepreneur in Residence at ZINC, Clinical Study Lead at Covance, and Research Advisor at Wellcome.

As a Clinical Study Lead at Covance, she led large multi-national and multi-center clinical studies with companies such as Bayer and Sanofi. At Wellcome, she was responsible for managing and de-risking the research portfolio of CARB-X (50+ research projects; <https://carb-x.org/>), one of the biggest life-sciences start-up accelerators based in Boston, US (Wellcome grant of £125m). Through this role, she provided technical and scientific expertise to the start-up community. Joanna worked closely with 8 diagnostics and pharmaceutical companies, providing support throughout their entire programs (e.g., T2 Biosystems, HelixBind). Prior to this, she worked as senior scientist at Pertinax Pharma and Dyson. Both roles focused on developing innovative diagnostics in the healthcare sector. Joanna used her technical expertise to contribute to the development of the WHO Essential List of in-vitro Diagnostics (WHO IVD) and managed the delivery of Target Product Profiles (TPPs) for diagnostics devices for infectious diseases-guidelines were published on WHO website in January 2020 (a grant of £1m). Furthermore, her opinion piece on “Creating a Sustainable Research and Development Ecosystem to Meet the Global Need for Antibiotics, 2020” was published in ACS Infectious Diseases in January 2020.

## **Robin Cohen, Chief Business Officer – aVaxiPen Limited**

### **Company biography**

aVaxiPen Limited is a UK based biotech developing transformation vaccine delivery technology. The technology is based around creating solid dose, thermally stable and needle free vaccines to enable more rapid, cost effective and easy to administer vaccines to address some of the world’s most impactful pathogens. The proprietary technology consists of our novel formulation – we take commercial partners liquid vaccines and formulate them into thermally stable, highly immunogenic solid doses (0.89mm in diameter) and these are then delivered using our multi-use pen applicator – ‘click and deliver’. The solid dose is delivered to the SC layer of the skin where it fully dissolves in around 15 minutes.

### **Personal biography**

Robin has over 25 years of experience in the pharmaceutical industry with over 20 years working for global pharma companies and more recently in the Biotech space with a strong executive level commercial and business development focus. Robin has a strong track record in biotech fund raising, commercializing products from pre-clinical through to post license as well as building commercial teams and leading them to exceeding their strategic and commercial goals in both Global Pharmaceutical and Biotech organizations.

Prior to joining aVaxiPen as Chief Business Officer, Robin worked as Chief Commercial Officer at Emergex Vaccines where he built strategic partnerships and built the commercial strategy for the company. Prior to Emergex Robin worked for 20 years in a variety of senior level strategic commercial roles at Janssen Cilag (Johnson & Johnson) where he helped launch a range of ground-breaking therapeutic launches from Oncology to Infectious diseases with a focus on the HIV, Hepatitis and the wider Infectious disease portfolio. Robin worked as part of the EMEA strategic marketing group in the EMEA and Global business development teams where he focused on licensing and acquisition and was involved in a number of high-profile asset acquisitions into the organization.

## **Simon Doherty, Senior Lecturer – Queen’s University Belfast**

### **Company biography**

The Institute for Global Food Security (IGFS) is one of four interdisciplinary Global Research Institutes at Queen’s University Belfast, established to address key, international challenges - in this case, the integrity of our food systems.

Food and drink have become a global industry with many positive aspects - access, affordability, variety. Yet that industry is also faced with a number of conundrums:

Climate change throws up huge challenges for agriculture & food production.

- Soon there may not be enough food to feed a growing population.
- The integrity of increasingly complex food supply chains is often compromised.
- Deliberate food fraud is a growing crime.

Our researchers address challenges - environmental, food-safety, animal-health, nutritional - at each point of the food chain, from farm to fork. IGFS is anchored in the School of Biological Sciences but includes many researchers from other schools and faculties.

### **Personal biography**

Dr Simon Doherty holds a senior position at the IGFS, QUB, where his interests lie in livestock health & welfare, One Health & sustainability, and international trade & investment in the animal health & veterinary sectors. He is a co-lead for the QUB maOH Lab (microbiome, AMR & One Health).

Prior to his presidency of the British Veterinary Association in 2018-19, he was the Animal Sciences & Aquaculture Sector Specialist for the UK Department for International Trade and has over two decades of experience in veterinary practice, industry, academia and professional representation (including previous visits to India).

Simon was one of the Founding Directors of Vet Sustain. He was previously the Chair of the Federation of Veterinarians of Europe FishMedPlus Coalition and of the FVE Food Safety & Sustainability Working Group and was the Founding Chair of the UK One Health Coordination Group. He recently chaired the BVA Sustainable Aquaculture Working Group and regularly presents at national and international conferences on One Health and veterinary sustainability topics, particularly around production animal welfare and antimicrobial resistance (AMR).

## **Organisers**

### **Innovate UK**

Innovate UK is the business arm of UK Research and Innovation, the organisation that brings together research and innovation funding. Innovate UK helps businesses to identify the commercial potential in new technologies and turn them into the new products and services that will generate economic growth and increase productivity. With a strong business focus, Innovate UK drives growth by working with companies to de-risk, enable and support innovation.

To do this, Innovate UK works to:

- Determine which science and technology developments will drive future economic growth.
- Meet UK innovators with great ideas in the fields we're focused on.
- Fund the strongest opportunities.
- Connect innovators with the right partners they need to succeed.
- Provide access to state-of-the-art facilities and expertise to commercialise new ideas through our Catapult programme.
- Help our innovators launch, build and grow successful businesses.

Since 2007, Innovate UK has committed over £1.8 billion to innovation, matched by a similar amount in partner and business funding. Innovate UK has helped more than 7,600 organisations



with projects estimated to add more than £11.5 billion to the UK economy and create 55,000 extra new jobs.

Innovate UK supports UK business-led innovation to explore global opportunities through a range of connecting and funding programmes and has supported UK organisations access over 75 international markets.

## **Phil Packer, Innovation Lead AMR and Vaccines – Innovate UK**

### **Personal biography**

Innovate UK have a One Health approach to AMR, funding SMEs and industry to develop new vaccines, antimicrobials and therapies for infectious disease in both man and animals. In addition, solutions, capabilities and technologies are supported in Infection, Prevention and Control to reduce further spread of antimicrobial resistance in the Human Health, Environment and Agri-sectors.

I am the Innovation Lead on AMR and Vaccines at Innovate UK, developing & delivering funding calls, supporting workshops and strategy. This includes overseeing extant and new projects funded through IUK funding mechanisms such as the Biomedical Catalyst and SMART call.

I also the technical lead on the IUK AMR Global programme and its Missions to various countries (including Germany, USA, India and Switzerland).

I am also the IUK lead for the delivery of a £50M DHSC, UK Vaccine Network programme delivering vaccine with outbreak potential in Low- and Middle-Income Countries. During the SARS-COV2 pandemic I was involved in the UK Governments Vaccine response.

### **Area of Interest:**

- One Health approach to addressing Antimicrobial Resistance (AMR). This includes:
  - Therapeutic & prophylactic solutions
  - New diagnostics
  - Solutions in the Agri-food sector
  - Solutions in Infection, Prevention & Control
- New vaccines:
  - Diseases with epidemic potential (e.g., Ebola)
  - New solutions to extant problems, (e.g., Flu)

I work widely across government and the scientific community including:

- UK AMR Diagnostics Programme Board
- UKRI AMR Exec.
- AMR Funders Forum
- Input into the UK AMR National Action Plan
- BactiVac Network Management Oversight Board
- Co-Chair Northern Health Cluster: AMR Focus Group
- Providing support to the development of strategy and plans for the UKVN

## **Charlie Fraser, India Partnership Manager – Innovate UK**

### **Personal biography**

Charlie manages the relationships for Innovate UK with all their stakeholders in India working across many sectors within Innovate UK. Prior to joining the global team Charlie managed the competitions team overseeing all the R&D funding calls across Innovate.

## **Innovate UK KTN**

Innovate UK KTN exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions.

The world we live in faces ever-changing societal, environmental, and economic challenges, which are felt regionally, nationally and globally. Innovate UK KTN's mission is to connect ideas, people and communities to respond to these challenges and drive positive change through innovation. Innovate UK KTN's diverse connections span business, government, funders, research and the third sector.

## **Syed Ahmed, GEM Programme Lead – Innovate UK KTN**

### **Personal biography**

Syed leads the Global Expert Mission programme at Innovate UK KTN. He has a background in chemistry, industrial biotechnology, and life sciences with a focus on sustainable manufacturing and synthetic biology. He has led several research and innovation projects across the UK and Europe and has successfully commercialised products and services during this time. Syed has led complex international programmes across NA and EMEA in healthcare, life sciences and digital technology supporting Innovate UK's and the UK Government's international strategy.

## **Alexandra Leech-Gribben, Project Coordinator – Innovate UK KTN**

### **Personal biography**

Alexandra Leech-Gribben is a Project Coordinator for the Global Alliance team having joined IUK KTN in November 2022. Their key roles are supporting the logistics of Global Expert Missions to facilitate research and innovation collaborations with key sectors across the world.

With a Masters in International Development from the University of Manchester, Alexandra has a background in providing administrative and research support for the third sector and cultural industries.

## **UKRI India**

UKRI India represents the nine UKRI councils in India, and as interlocutors play a key role in enhancing the UK-India relationship in research and innovation matching the Indian research and innovation priorities with those of the UK. We jointly fund programmes between UKRI, Government of India and third parties. Through these collaborative programmes, UKRI enables a strong, strategic, and mutually beneficial partnership with India. Since the establishment of our office in India in 2008, research and innovation cooperation between UKRI and India has risen from less than £1 million to over £330 million.

## **Zille Anam, Senior Programme Manager – UKRI India**

### **Personal biography**

I did my PhD in Directed Evolution and Codon Shuffling from Special Centre for Molecular Medicine, Jawaharlal Nehru University, New Delhi. I worked on developing peptide-based therapies for the treatment of Malaria. My strong interest in making science accessible and



inclusive led her to venture into science communication and outreach, which I continue to work on. At IndiaBioscience, I contributed to the International Grants Awareness Program (iGAP) and other outreach activities. Through my work, I aimed to raise awareness about international grants and the success rate of applications from India. At UK Research and Innovation, I lead on facilitating discussions for the research communities under the purview of health and life sciences.

## Technical Writer & Consultant

### **Maarten B.M van Dongen, Director – AMR Insights**

#### **Personal biography**

Dr Maarten B.M. van Dongen is originally a Molecular and Medical Microbiologist. After his PhD in Biochemistry at the University of Amsterdam, The Netherlands, he has worked for the international Pharma and Biopharma Industry in The Netherlands, Switzerland, Finland, and Belgium. As such he has gained extensive experience as a (project) manager of complex, international projects. More recently Maarten has worked as an advisor for Dutch and international public and private organizations in the domains of Life Sciences and Innovation.

In 2016 Maarten took the initiative, together with 12 Dutch organisations, to investigate the feasibility of a new to set up global information platform on AMR. Based on the positive outcome, he decided in 2017 to start AMR Insights. As of then he focused his professional activities on combating the global threat of AMR.

AMR Insights was set up to inform, educate and connect professionals with the aim to add to the curbing of antimicrobial resistance. AMR Insights is increasingly involved in AMR-related projects including the development of an easy access database with technologies, products and services involved in curbing AMR. Together with three other Dutch organisations he cofounded in 2020 the 'Dutch Consortium Antibiotics and Pharmaceutical Residues from Water'.

In 2020 Maarten took the initiative to set up the global AMR Insights Ambassador Network. This Network now comprises over 500 professionals including MDs, Epidemiologists, Hospital Pharmacists, Scientists and Veterinarians in some 60 countries.

Maarten is committed to eliminating antimicrobial resistance because he does not accept that millions of innocent people need to die as a result of resistant bacteria and other microorganisms.

#### **Contact Details**

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