



国家自然科学基金
基金委员会

National Natural Science
Foundation of China

UK-China Antimicrobial Resistance Workshop Report

Shanghai, China

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Background

On 21 October 2015, UK Life Sciences Minister, George Freeman announced that the Medical Research Council (MRC), the Economic and Social Research Council (ESRC), the Biotechnology and Biological Sciences Research Council (BBSRC) and the National Natural Science Foundation of China (NSFC) would collectively make up to £9m available to fund collaborative research projects focusing on antibacterial resistance.

The objective of this call for proposals would be to deliver significant 2-3 year research funding for internationally competitive and innovative collaboration projects between researchers from China and the UK.

The aim of the UK-China Antimicrobial Resistance Workshop was to bring UK and Chinese researchers together, to further the understanding of the antibacterial resistance research landscape within the two countries and to identify opportunities for UK-Chinese collaboration in the area.

Prior to the workshop, the participating funding agencies had identified the following four areas as potential foci for the call. Please note that one of the goals of the workshop was to refine these focus areas, and the final amended versions can be found in the final call text: <http://www.mrc.ac.uk/documents/doc/uk-china-amr-call-text-v6/>

1. Understanding the development of resistance, the epidemiology, and the transmission dynamics of antibacterial resistance within and between species
2. Developing antibiotics and alternative approaches to treat and prevent resistant bacteria, and understanding the mechanisms of action and the use of antibiotics and alternative therapies currently in practise for both humans and animals. This would also include business models, economic and social/behavioural issues around treatment development and use.
3. Understanding behaviours in order to reduce the development, emergence and spread of antibacterial resistance within and beyond human and animal healthcare settings (this would include antibiotic prescribing but also broader public health approaches such as in hygiene and infection control practises in both human and animal settings. It would factor in barriers to behaviour change such as organisational and cultural norms, and financial incentives to prescribe drugs).
4. What are the functions of formal and informal healthcare and veterinary systems and sources of health advice? What are their interrelationships? How can 'formal' systems draw on local, informal practices? Is it possible to provide universal access to appropriately regulated therapies? What is the supply chain for AM? Can the supply chain be mapped? What are the global and local incentives for supply and demand of antibacterials?

Workshop Overview

The UK-China AMR Workshop (agenda provided at [Annex 1](#)) was hosted by Huashan Hospital, Fudan University, and was attended by over 60 participants (see [Annex 2](#)), representing a wide range of institutions across the UK and China. The workshop was jointly chaired by Professor Mark Woolhouse, University of Edinburgh, and Professor Minggui Wang, Huashan Hospital, Fudan University.

On day one of the workshop, representatives from NSFC, RCUK, RCUK China and Fudan University provided a series of introductory talks including:

- Dr Louisa Rahemtulla, International Programme Manager (MRC), provided an overview of the UK–China Research and Innovation Partnership Fund (Newton Fund), an introduction to the UK-China AMR call for proposals, and an overview of the workshop aims and objectives
- Dr Jonathan Pearce, Head of Infection and Immunity (MRC), provided an overview of the UK's strategy and approach to addressing the AMR challenge
- Professor Minggui Wang delivered a similar presentation from a Chinese perspective during which he highlighted the scale of the AMR challenge in China.

The introductory talks were followed by a group 'speed networking' session, which allowed attendees to introduce one another.

After lunch on day one, speakers provided UK and Chinese perspectives on the four focus areas. These talks (the slides for which are provided in [Annex 4](#)) set the scene for following breakout group discussions. In the breakout sessions, attendees discussed opportunities for tackling AMR through UK-Chinese collaboration. Topics that were discussed in relation to each focus area included:

- UK/China AMR strengths and gaps in the area
- Opportunities for collaboration between UK and China
- Barriers to overcome
- Relevant policy issues/impact

Day two began with the rapporteurs from each of the four breakout groups reporting to the plenary on the previous day's discussions. The PowerPoint slides used by the rapporteurs for this session, which provide an overview of the key topics discussed, can be found in [Annex 5](#) of this report 'Break out group report slides'.

After this, the participants were again split into different groups to allow them the opportunity to provide individual presentations outlining their own research interests as well as the wider research interests of their institution. The PowerPoint slides used by attendees for these individual presentations can be found here:

<http://www.mrc.ac.uk/funding/browse/uk-china-amr-partnership-initiative/presentations-uk-china-amr-workshop-nov-2015>

The workshop was closed with a wrap up session in which the co-chairs provided a summary of the workshop, and NSFC and MRC representatives outlined the next steps regarding the call for proposals.

On day three, participants visited the Institute of Antibiotics at Fudan University.

Chairs' Summary

The China-UK Antimicrobial Resistance Workshop was a great success, made possible by the valued contributions and open engagement of participants, who represented the research diversity of our two countries.

The workshop identified the need for continued efforts to understand the mechanisms and epidemiology of resistance. However it also highlighted the pressing challenge clinicians in China face in managing the significant burden of AMR in their patients and the need to take a One Health approach, given the potential impact of high antibiotic use in agriculture.

Addressing the AMR burden will require the development of new interventions and diagnostics, the design and implementation of effective health and agricultural systems, and an appreciation of the roles of the many actors in AMR – from the rural farmer all the way through to international policy makers. The most impactful developments will likely draw on insights from across all of these levels.

In addition to identifying numerous partnering opportunities, the workshop highlighted the need for a supportive infrastructure. Research is at its best when it has access to high quality data and resources, including bacterial strains. AMR poses a global challenge and requires a global response to the need for timely data/resource sharing and access. No research effort can be undertaken without appropriately skilled people. Skill gaps in the AMR field identified by the workshop included bioinformaticians, structural biologists and anthropologists.

The workshop has helped the research communities from both countries better understand the challenges we face but also the many opportunities we have to pool our efforts to address these. The joint RCUK-NSFC initiative will help to capture the momentum generated by the workshop. But the workshop's value goes far beyond this.

Annex 1: Workshop Agenda

TIME	ITEM	SPEAKER
November 23 rd	Registration (Shanghai Hotel)	
November 24 th		
9:00 – 10:15	1. Welcome & Introductory Talks (Chunshen Room)	
9:00 – 9:05	Chairs' welcome	Professors Mark Woolhouse & Minggui Wang
9:05 – 9:10	Huashan Hospital, Fudan University Welcome	Ying Mao
9:10 – 9:15	NSFC welcome	Rongkai Lu
9:15 – 9:20	RCUK China welcome	Grace Lang
9:20 – 9:30	Newton Fund Overview & Introduction to UK-China AMR Initiative	Louisa Rahemtulla
9:30 – 9:45	Overview of the UK AMR landscape	Jonathan Pearce
9:45 – 10:00	Overview of the China AMR landscape	Minggui Wang
10:00 - 10:15	Q&A panel session	Mark Woolhouse
10:15 – 10:45	Break & group photo	
10:45 – 12:30	2. Speed Networking	Naomi Beaumont & Grace Lang
12:30 - 13:15	Lunch	
13:15 – 13:25	3. UK and Chinese perspectives on the four call focus areas (Chunshen Room)	Minggui Wang
13:25 – 13:55	Topic 1: Understanding resistant bacteria (and Q&A session).	David Gally & Yonghong Yang
13:55 – 14:25	Topic 2: Developing antibiotics and alternative approaches (and Q&A session).	Paul Williams & Ling Lu

14:25 – 14:55	Topic 3: Reducing the development, emergence and spread of antibacterial resistance (within and beyond human and animal healthcare settings) and Q&A session.	Sharon Peacock & Hui Wang
14:55 – 15:25	Topic 4: Formal and informal healthcare and veterinary systems (and Q&A session).	Hayley MacGregor & Steve Hinchliffe & Baoli Zhu
15:25 – 15:35	Experience of UK-Chinese Collaboration in AMR	Timothy Walsh
15:35 – 16:00	Break	
16:00 – 17:40	<p>4. China–UK collaborations: Identifying opportunities to tackle AMR</p> <p><i>Delegates will discuss the four focus areas in breakout groups (25 mins per call focus area). Topics to be discussed in relation to each focus area include:</i></p> <ul style="list-style-type: none"> • <i>UK/China AMR strengths and gaps in the area</i> • <i>Opportunities for collaboration between UK and China</i> • <i>Barriers to overcome</i> • <i>Relevant policy issues/impact</i> 	
18:30	Dinner	

TIME	ITEM	SPEAKER
November 25 th		
9:00 - 10:30	1. Breakout Group Reports <ul style="list-style-type: none"> • Group 1: Chairs' report back (10mins) • Q&A (10 mins) • Group 2: Chairs' report back (10mins) • Q&A (10mins) • Group 3: Chairs' report back (10mins) • Q&A (10mins) • Group 4: Chairs' report back (10mins) • Q&A (10mins) 	Chair: Mark Woolhouse
10:30 – 10:45	Break	
10:45 – 13:15	2. Individual Presentations (within 4 groups) Group 1 - Chunshen Room [^] , Group 2 - Dignity Room [^] Group 3 - Pomposity Room [^] , Group 4 -Talent Room [^]	All
13:15 – 14:00	Lunch	
14:00 – 16:00	3. Networking/clinic sessions (Chunshen room)	All
16:00 – 16:30	Break	
16:30 – 17:00	4. Regroup for summary, wrap up and next steps (Chunshen room)	TBC
18:00	Dinner	
November 26 th	Site visit to Institute of Antibiotics, Huashan Hospital	
08:45	Meet at 8:45 in the hotel lobby	
9:00 – 9:30	Introduction of Huashan Hospital	Jianhua Shao

9:30 – 9:50	Introduction of Institute of Antibiotics	Minggui Wang
9:50 – 11:00	Divided into two groups to visit Hospital and Institute separately. Then exchange.	
11:45	Lunch (Jing'an Hotel Restaurant) meet at 11:45 in hotel lobby	

Annex 2: Full attendees list

The list of workshop attendees is provided below and their individual biographies can be found here: <http://www.mrc.ac.uk/documents/pdf/uk-china-amr-workshop-attendee-biographies>.

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Annex 3: Introductory Talks

Topic	Speaker	Presentation
Newton Fund Overview & Introduction to UK-China AMR Initiative	Louisa Rahemtulla	 Louisa Rahemtulla.pdf
Overview of the UK AMR landscape	Jonathan Pearce	 Jonathan Pearce UK AMR Landscape.pdf
Overview of the China AMR landscape	Minggui Wang	 Minggui Wang.pdf

Annex 4: UK and Chinese perspectives on the four focus areas

Focus Area	Speaker	Presentation
Understanding resistant bacteria	UK: David Gally	 David Gally Understanding Resist
Understanding resistant bacteria	China: Yonghong Yang	 Yonghong Yang.pdf
Developing antibiotics and alternative approaches	UK: Paul Williams	 Paul Williams developing antibiotics
Developing antibiotics and alternative approaches	China: Ling Lu	 Ling Lu.pdf
Reducing the development, emergence and spread of antibacterial resistance (within and beyond human and animal healthcare settings) and Q&A session.	UK: Sharon Peacock	 Peacock Sharon Reducing the develop
Reducing the development, emergence and spread of antibacterial resistance (within and beyond human and animal healthcare settings) and Q&A session.	China: Hui Wang	 HUI WANG - 副本.pdf
Formal and informal healthcare and veterinary systems	UK: Hayley MacGregor	 Hayley McGregor Formal and informal.p
Formal and informal healthcare and veterinary systems	UK: Stephen Hinchliffe	 Stephen Hinchliffe Formal and informal h
Formal and informal healthcare and veterinary systems	China: Baoli Zhu	 Baoli Zhu.pdf

Annex 5: Breakout Group Slides

Topic	Speaker	Presentation
Break out group report slides covering each focus area	Group rapporteurs	 Break out group report slides.pdf