AMR

Antimicrobial Resistance Interdisciplinary Research Group

Programme Leaders

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What is AMR IRG?

The Antimicrobial Resistance Interdisciplinary Research Group (AMR IRG) is a unique translational research and entrepreneurship program aimed at solving the growing threat of resistance to antimicrobial drugs. In synch with the National Strategic Plan for Antimicrobial Resistance, the AMR IRG was launched in January 2018 as a research programme funded by the National Research Foundation, under its Campus for Research Excellence and Technological Enterprise (CREATE) programme.

The problem of AMR

The rationale for the AMR IRG lies in the sobering recognition that existing drug-resistant pathogens as well as emerging pathogens with the potential to become drug resistant represent a threat to Singapore's public health and national security. A significant 35-50% of bacterial infections in Singapore hospitals are now resistant to front-line antibiotics. Globally, continued growth of antimicrobial resistance is predicted to cause

more deaths than cancer (10M annually) and cost the world up to S$130 trillion by 2050. There is also a real economic impact of the microbial biofilms that foul medical devices, ship hulls and water pipes, which have the same microbiology underlying antibiotic resistance. AMR seeks to play a dominant role in satisfying these unmet needs.

How does AMR IRG work?

AMR leverages the scientific and clinical strengths of MIT and Singapore to develop transformative technologies to identify, respond to, and treat drug-resistant microbes.

AMR projects address the threat of drug-resistant microbes by developing diagnostics and drugs based on synthetic biology; defining new resistance mechanisms in biofilms and dormant infections; developing anti-resistance drugs and drug delivery strategies; and exploiting host immunity to combat resistant microbes. We will also accelerate the pace of drug development by streamlining clinical trials and regulatory practice.

Who is AMR IRG?

To achieve these goals, the AMR IRG research program is driven by a team of world-class researchers: OOI Eng Eong, Duke-NUS; Julien LESCAR, LIU Chuan-Fa, MU Yuguang, Peter PREISER (Co-Lead PI) and YEO Tsin Wen, NTU and LKC Medicine; LOW Guek Hong Jenny, SGH; and MIT researchers Eric ALM, Jianzhu CHEN, Peter DEDON (Lead PI), Paula HAMMOND, Tim LU, Ram SASISEKHARAN and Hadley SIKES.

Drs. Farzad OLFAT and Christopher FRASER provide research management and professional development leadership.

AMR IRG Project Highlights

Our unique convergent technologies tackle one AMR problem with multiple innovative and disruptive approaches to develop holistic solutions for Singapore and the world.
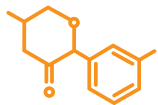
We are diagnosing and treating AMR in the human microbiome

We are engineering viruses to kill AMR bacteria

We are engineering antibodies against AMR

We are building new drugs for resistant microbes

We are harnessing the power of the human immune system

We are creating fast, cheap, and easy AMR diagnostics

We are designing nanoparticles to kill bacteria hiding in biofilms

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For more information about the SMART AMR IRG, please contact: Dr Farzad Olfat (farzad@smart.mit.edu) and Dr. Chris Fraser (chrisfraser@smart.mit.edu). Website: http://smart.mit.edu

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Updated: March 2018

CREATE
Campus for Research Excellence And Technological Enterprise

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