PROJECT SNAPSHOT

1C: Investigating the Mechanisms Governing the Dissemination of Antibiotic Resistance Among Bacteria

Pillar: Treatment Optimization

Theme: Innovation and Commercialization

Keywords: Bacterial Conjugation; Type IV Secretion System; Antibiotic Resistance

AMR One Health Consortium

PRINCIPAL INVESTIGATORS: Wael Elhenawy, PhD; Matthias Götte, PhD

AIM

Discover drugs that can interfere with the replication and transfer of the extrachromosomal elements that carry antibiotic resistance cassettes.

WHY IS THIS IMPORTANT?

Infections by antibiotic resistant-bacteria are expected to be the leading cause of mortality among humans by 2050 (Mahoney AR et al., 2021). The environmental factors that promote the spread of drug resistance genes among bacteria remain unknown. By uncovering the mechanisms that drive the spread of resistance genes, new therapies can be developed to interfere with this process

OUTCOMES

1. Identify the factors that promote the replication and spread of antibiotic resistance genes among bacterial communities.
2. Developing new drugs that can be coupled with antibiotics to inhibit the spread of antibiotic resistance among the persistent bacteria.

RESEARCH QUESTION

What are the factors that promote the spread of antibiotic resistance genes among bacteria?

OUR APPROACH

Using state-of-the-art genetic screening platforms, we aim at identifying the mechanisms that drive the spread of antibiotic resistance among bacteria. In the second phase of this project, we will employ chemogenomics to identify novel drugs that can interfere with the lateral transfer of antibiotic resistance genes between bacteria.

ALIGNMENT WITH THE AMR - ONE HEALTH CONSORTIUM

LEVERAGED SOURCES OF SUPPORT

Li Ka Shing Institute of Virology

KNOWLEDGE & TECHNOLOGY EXCHANGE AND EXPLOITATION

- New partnerships with the private sector.

TRAINING OF HIGHLY QUALIFIED PERSONNEL

- 2 MSc

AFFILIATIONS: University of Alberta; LKSIoV

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Alberta Government