

# PROJECT SNAPSHOT

## 2A: BLOOM-Antimicrobial Resistance: Impacts of Intrapartum Antimicrobials on the Health of Albertan Infants

Pillar: Treatment Optimization

Theme: Innovation and Commercialization

Keywords: Intrapartum Antimicrobials; Maternal Microbiome; Infant Resistome



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### AIM

This project aims to better understand the use of intrapartum antimicrobial prophylaxis (IAP) in Alberta and its impact on the neonatal resistome.

We will also explore how intrapartum pathogens could be more reliably detected, potentially decreasing the need for IAP exposure.

### WHY IS THIS IMPORTANT?

Over 25% of Albertan women receive IAP or other antimicrobial therapies during labour or shortly after giving birth. These antimicrobial exposures disrupt the natural process by which the neonate is colonized by maternal microbes and increase the burden of resistance genes in the infant microbiome.

### OUTCOMES

- 1 Expanded knowledge of how inherited resistomes are propagated in term and preterm neonates exposed to IAP.
- 2 Preliminary steps toward better detection of dangerous intrapartum pathogens affecting Albertan hospitals.

### RESEARCH QUESTIONS

- 1 How do bacterial species, plasmids, and phage in women exposed to IAP contribute to the neonatal resistome?
- 2 Could rapid genetic or metabolite-based diagnostics be used to screen women at POC for more selective use of IAP?

### OUR APPROACH

- 1 This study will engage 50 women delivering at term and 100 women delivering preterm in its first year.
  - Exposure to intrapartum antimicrobials will be captured through database and chart review.
  - Maternal vaginal and rectal swabs, breastmilk, and infant feces will be analyzed to determine the source of resistance genes in 20 term and 20 preterm infants exposed to maternal IAP.
- 2 iGAS and GBS strains banked by ALS from maternal and neonatal infections at Foothills Hospital will be sequenced and tested in a metabolomics-based diagnostic platform.

### ALIGNMENT WITH THE AMR - ONE HEALTH CONSORTIUM

#### LEVERAGED SOURCES OF SUPPORT

Canadian Institutes of Health Research: Early Career Investigator Award • Snyder Institute for Chronic Diseases • University of Calgary, Office of the Vice President (Research): IICD Big Ideas Campaign

#### KNOWLEDGE & TECHNOLOGY EXCHANGE AND EXPLOITATION

- Technologies for understanding how resistome inheritance and propagation occurs
- Feasibility of new approaches for detecting prevalent obstetric pathogens at POC

#### HIGHLY QUALIFIED PERSONNEL

- 1 Postdoctoral Fellow
- 1 MSc
- Medical and nursing students will be involved in BLOOM data capture and analysis
- ALS faculty are partnered in exploring the feasibility of new POC diagnostics

#### AFFILIATIONS:

