



## Novel Small Molecule Combinatorial for treatment of Antibiotic Resistant Infection

### TECHNOLOGY AVAILABLE FOR TRANSFER

#### BACKGROUND & UNMET NEED

Antibiotic resistance is one of the most urgent threats to the public's health. Antibiotic resistant bacteria can cause illnesses that were once easily treatable with antibiotics to become untreatable, leading to dangerous infections. Antibiotic-resistant bacteria are often more difficult to kill and more expensive to treat. Bacteria can become resistant to antibiotics through several ways. Some bacteria can "neutralize" an antibiotic by changing it into harmless compound. Others have learned how to pump an antibiotic back outside of the bacteria before it can do any harm. Due to this efflux pumps, bacterial pathogens acquire resistance to fluoroquinolones which are one of the most commonly used antibiotics. To reverse this resistance, fluoroquinolones can be used in combination with efflux pump inhibitors to restore the activity of the antibiotics. In the present technology this resistance is revoked by a combinatorial drug.

#### TECHNOLOGY

The invention involves development of a molecule — named IITR08027 — which disrupts the proton gradient that is responsible for energizing the efflux pumps and thus slows down the outflow of antibiotics. IITR08027, when used in combination with fluoroquinolones — antibiotics like ciprofloxacin commonly used to treat respiratory and urinary tract infections — allows the drugs to kill the bacterial cells, thereby effectively tackling the antibiotic resistance problem. Small molecule IITR08027 is effective against multi-drug-resistant clinical strains of *Acinetobacter baumannii*, one of the most prevalent pathogens, especially countering fluoroquinolones.

#### STAGE OF DEVELOPMENT

- Proof of concept is established in lab set-up.
- In-house Lab Validation complete

#### MARKET POTENTIAL

The global antibiotic resistance market size was valued at USD 7.81 billion in 2017. It is anticipated to register a CAGR of 5.6% from 2018 to 2025. High burden of antibiotic-resistant infections and emergence of multi-drug resistant pathogens have been augmenting the market. Current estimates place the annual number of deaths from antibiotic resistant bacteria at around 700,000 worldwide. This figure is predicted to rise, according to one study, to 10 million by 2050. Antibiotic resistance is a global phenomenon. But the epicenter of this catastrophe is India. The country is afflicted by easy access to the strongest of antibiotics which has led to super-resistant microbes.

#### APPLICATIONS

Restoration of antibacterial activity of Antibiotics especially fluoroquinolones.

#### ADVANTAGES

- Restores the activity of three major drug resistant fluoroquinolones.
- Expected to be less toxic as compared to current available AbeM inhibitors
- Environmental friendly

#### LICENSING OPPORTUNITY

BCIL is looking for an industrial partner for commercialization of novel small molecule drug candidate.

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