

### **Global approach to overcome resistance**

Infectious diseases are the second most important cause of death globally after heart disease, and kill more people than cancer. The last 50 years have witnessed the emergence of multi-drug-resistant bacterial pathogens, which have globally impacted on human health and well-being.

Bioplatforms Australia through the Commonwealth Government NCRIS programme has granted \$1 million to facilitate the coordinated comparative analysis of the 'top 10' sepsis pathogens using genomics, transcriptomics, proteomics and metabolomics technology, which is not being undertaken elsewhere in the world.

Antibiotic resistance is universally recognised as a significant threat to global human health. Several recent reports from the World Health Organisation and the Centers for Disease Control and Prevention have highlighted the enormity of this problem and the challenge of treating infections caused by multi-drug-resistant pathogens. It has been estimated that drug-resistant infections could kill an additional 10 million people per year, globally, by 2050. The Australian government has recognised the urgent need to tackle antibiotic resistance and recently released a National Strategic Position paper based on expert views across the animal and human health, food and agriculture sectors.

In the last 5 years, Australia has rapidly built significant capacity in the infectious diseases area, through the establishment of six institutes and centres that are specifically focused on the problem of infectious disease. These organisations will all participate in this collaborative data initiative, along with a number of the leading international research facilities investigating antibiotic resistance including researchers based at the Centers for Disease Control and Prevention and National Institute of Health (US) and the Wellcome Trust Sanger Institute (UK).

This project addresses several key objectives in the Australian National Strategic Position paper, including the discovery and development of new approaches to prevent, detect and contain antimicrobial resistance, and the strengthening of international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance.

"The primary outcome of this collaborative approach will be an intensive investigation of the most important sepsis pathogens," said Gilbert. "This will lead to the identification of a core set of targets for antibiotic development and a well characterised reference set against which other genomic, proteomic and metabolomic data can be interpreted. The learnings from this multi 'omics analysis will be valuable and transferrable to the large genomics screens (and beyond) being undertaken internationally and locally."

Collaboration among members of the consortium, who represent the leading infectious diseases researchers in Australia, will result in follow-up opportunities to deeply mine the data resource to study individual pathogens, representative pathogen sets, develop new technologies and methods, and study common virulence pathways shared between distinct sepsis pathogens. The dataset will be established as a resource open to all researchers undertaking research on these important human pathogens.

### **Further information:**

Andrew Gilbert, General Manager, Bioplatforms Australia

E: [agilbert@bioplatforms.com](mailto:agilbert@bioplatforms.com)

T: 02 9850 8281 M: 0410 538648