

Doherty Applied Microbial Genomics



Doherty Applied Microbial Genomics was established to facilitate research directed towards implementing microbial genomics within public health and clinical microbiology practice in Australia. The centre is funded by The University of Melbourne and houses technology that uses next-generation DNA sequencing, providing unparalleled speed and accuracy to genetically identify and track disease-causing microbes.

How does it work?

Located in the Microbiological Diagnostic Unit Public Health Laboratory (MDU PHL) at the Peter Doherty Institute for Infection and Immunity (Doherty Institute), the centre is home to a PacBio RSII sequencer, one of only three in Australia and the only one of its kind to be located within a public health facility in the country. The PacBio RSII sequencer allows researchers to generate "closed" sequences that are used to study genomic modifications and complex genomes containing regions not amenable to sequencing by other next generation technologies. Being part of the public health laboratory provides the team with access to relevant microbiological samples.

Bioinformatics capabilities

The centre also harnesses advanced, high-end computation capabilities led by bioinformatician, University of Melbourne Associate Professor Torsten Seemann from the Victorian Life Sciences Computation Initiative, which enables scientists to use the large amount of data generated by sequencing microbial genomes to ultimately fast track their investigations and respond to disease outbreaks. In addition, it enables

clinicians to make more informed therapeutic decisions. Having this expertise within the centre also allows the team to be involved in every aspect of a research project – from initial conceptualisation and development, through to the final analysis of the genomic data sets generated.

Services

While the centre conducts its own internal research projects, it also collaborates with external parties who require applied microbial genomics to answer a research or clinical question. The centre's significant sequencing and bioinformatics expertise has already enabled the team to establish an extensive collaborative research network both nationally and internationally, allowing them to provide leadership, advice and training to scientists, clinicians and students working in this area. The ultimate goal of this research is to inform policy and expedite the use of genomic technologies within public health and clinical microbiology in Australia. The centre is directed by The University of Melbourne's Professor Ben Howden (Director of MDU PHL) and Professor Tim Stinear, and managed by The University of Melbourne's Dr Glen Carter and Dr Deborah Williamson.

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