Database for Cardiovascular Functional Genomics

The genomics revolution has lead to an exponential increase in health data generation. More recently, our capacity to 'phenotype' or measure the functional properties that manifest from the genotype has developed to a similar scale.

Using robotic, automated platforms, we can now measure the phenotype of many hundreds of thousands of cells, from hundreds of individuals. The first integrated cell phenotyping facility of this kind in Australia was recently opened at the Victor Chang Cardiac Research Institute with a focus on gathering data from heart cells derived from stem cells of patients with inherited heart diseases. This technological progress means that we can now generate parallel genetic and phenotypic datasets that when interpreted together, present enormous opportunity to answer questions about disease processes as well as define inter-individual variation in drug responses. To maximise impact, we need to build a central data resource that brings together genomic and phenotypic data from research labs across Australia that work on diverse systems – including cells, bioengineered and isolated tissue, and other model organisms. No current equivalent combined dataset exists in the world, making this a unique resource that plays on Australia's strengths in these disciplines.

Start date

3 June 2019

Expected completion date

21 October 2019

Investment by ARDC

$49,999

Co-investment partners

Victor Chang Cardiac Research Institute

Lead node

Victor Chang Cardiac Research Institute

1. Develop a strategy for the establishment and maintenance of a 'Database for Cardiovascular Functional Genomics'

An engagement program and workshop will bring together leaders from cardiovascular research, stem cells, genomics, computer science, disease modelling, and drug screening to develop a strategy for establishment, usage, ongoing growth and funding support for a 'Database for Cardiovascular Functional Genomics'.

2. Convene a steering group

Bring together a steering group to develop a scope of works and business case for the proposal.

3. Completion of project

Project outcomes will be presented at an ARDC Data and Services Summit in October 2019.

Core features

Central data resource

A central data resource that brings together genomic and phenotypic data from diverse research labs across Australia

Answer questions about disease processes

Provides the opportunity to answer questions about disease processes as well as define inter-individual variation in drug responses

Fairer and wider sharing of this data

Promotes fairer and wider sharing of this data to facilitate discovery across a range of scientific disciplines

Who is this project for?

- Clinicians
- Researchers
- Peak bodies such as Australian Cardiovascular Alliance, Australian Functional Genomics Network, and Stem Cells Australia
- Hospitals
- State & Federal Health Departments

What does this project enable?

By creating a central open resource for cardiovascular functional genomics, this project will lead to greater data discovery across a range of disciplines and industries, such as the pharmaceutical industry. This project enables parallel genetic and phenotypic cardiomyocyte datasets to be interpreted together, presenting enormous opportunities to answer questions about disease processes as well as define inter-individual variation in drug responses.

Handy resources

- Final Report [PDF 188KB]
- FAIR Assessment [PDF 98KB]
- Presentation [PDF 880KB]
- Heart research at VCCRI
- Australian Cardiovascular Alliance
- Incidence of cardiovascular disease in Australia (AIHW)

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