

# IHBI

Professor Lyn Griffiths  
IHBI Executive Director



## IHBI'S VISION

The Institute of Health and Biomedical Innovation (IHBI) **uses the latest technology** and **brings together the best minds** from around the world to conduct research into ways of improving health and wellbeing

# IHBI Research Themes

Health Determinants and Health Systems  
Injury Prevention and Trauma Management  
Chronic Disease and Ageing  
*Prevention Intervention Translation*



# IHBI members work in multiple locations

- Kelvin Grove- QUT **>1,200 researchers**
- Gardens Point- QUT
- Translational Research Institute & PAH
- Medical Engineering Research Facility (MERF)
- QLD Centre for Children's Health Research (CCHR)
- QIMR – Berghofer

# Research Centres at IHBI

- NHMRC Centre of Research Excellence in End of Life Care
- NHMRC Centre of Research Excellence in Reducing Healthcare Associated Infection
- Australian Centre for Health Services Innovation
- Australia-China Centre for Tissue Engineering & Regenerative Medicine
- Australian Prostate Cancer Research Centre
- Centre for Accident Research and Road Safety, Queensland
- Centre for Palliative Care Research and Education
- Contact Lens and Visual Optics Laboratory
- Dementia Collaborative Research Centre
- International Laboratory for Air Quality and Health
- Cancer and Ageing Research Centre
- ARC Industrial training Centre in Additive Biomanufacturing

# Genomics Research Centre

## Objectives

- Identify genes involved in common diseases
- Characterise gene structure and function
- Elucidate gene-gene, gene-environment interactions
- Develop diagnostic techniques and therapeutics
- Various disorders including:  
Migraine, MS, CVD, Glaucoma, Memory, Concussion and Ageing

## Genomics repository (~10,000) samples

- DNA from case-controls, pedigrees and cohorts e.g. Nambour, BC Biobank, tissue for MS
- Migraine: >100 families, 1200 matched case- controls, >3000 cases
- Norfolk Island genetic isolate



# GRC Commercial activities and Capabilities

- **Genomics - genotyping, sequencing, expression, epigenetics**
  - whole genome or individual gene, mitochondrial
  - extractions, DNA, RNA, miRNA, biobanking
  - MassARRAY, Illumina, ABI, Ion Torrent Suite, Rotorgene, Pyroseq
- **Biostatistics and bioinformatics**
  - database development, analysis, software, sequencing pipeline
- **Molecular Diagnostics**
  - neurogenetic disorders – FHM1-3, EA2, SCA6, CADASIL and Epilepsy
    - HGSA listed, NATA accredited
    - Sanger, NGS (WES and targeted panels)
- **Genomics Clinical Trial Centre**
  - Phase I- III
  - MS, migraine, nutraceuticals, Alzheimers Disease
- **Significant R & D contracts**

# Antroquinonol and AD

## Antroquinonol

- Extracted from *Antrodia Camphorata* mushroom native to Taiwan
- numerous biological and pharmacological activities
- Ongoing cancer clinical trials
- Crosses blood-brain barrier
- Previous preliminary study showed Antroquinonol improved learning and memory deficits and reduced hippocampal A $\beta$  levels in a transgenic mouse (Chang *et. al.*, 2015)



Golden Biotechnology Corporation and IHBI further preliminary study:

## Antroquinonol testing in an animal model for Alzheimers Disease study

Two studies:

### 1. Preventative animal study

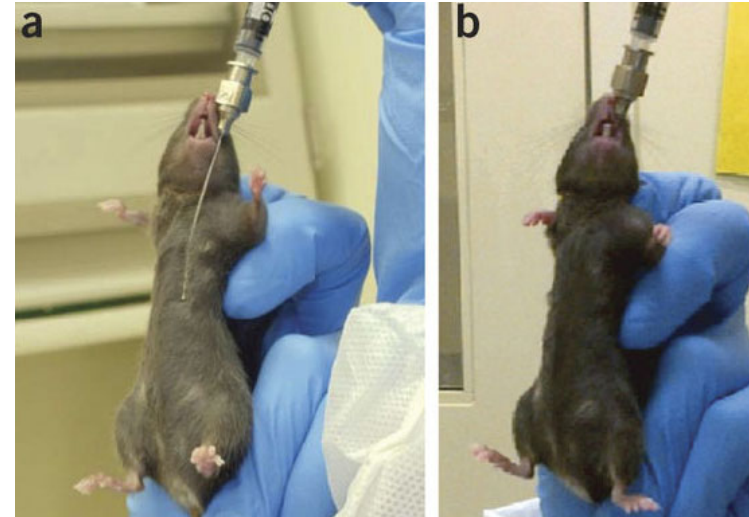
funded by Advance Queensland Johnson & Johnson Innovation QuickFire Challenge

### 2. Therapeutic animal study funded by Golden Biotechnology

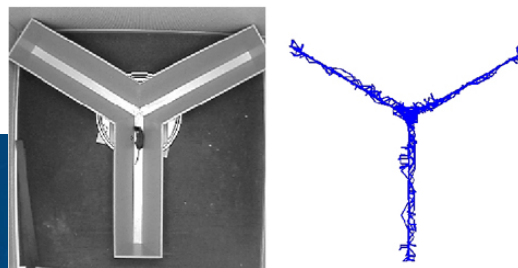


# Testing in an animal model

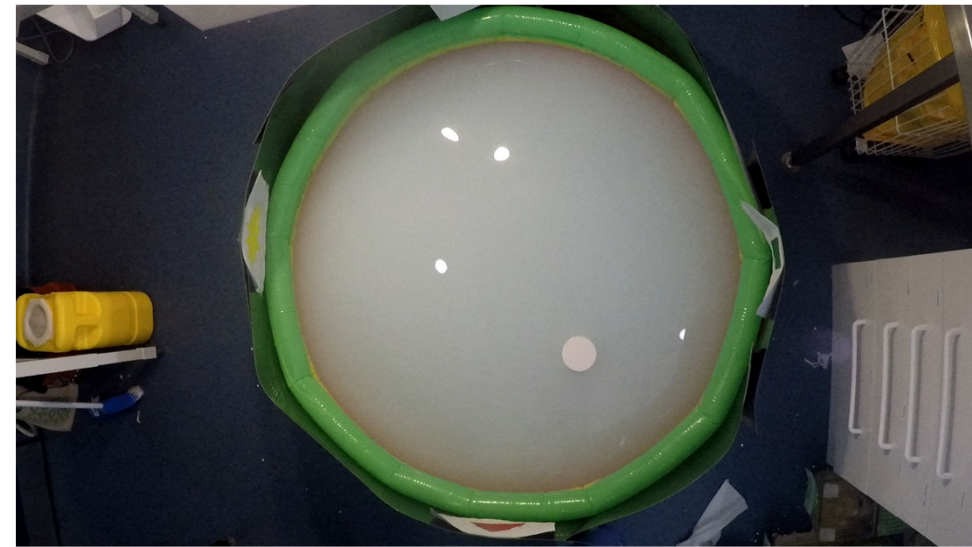
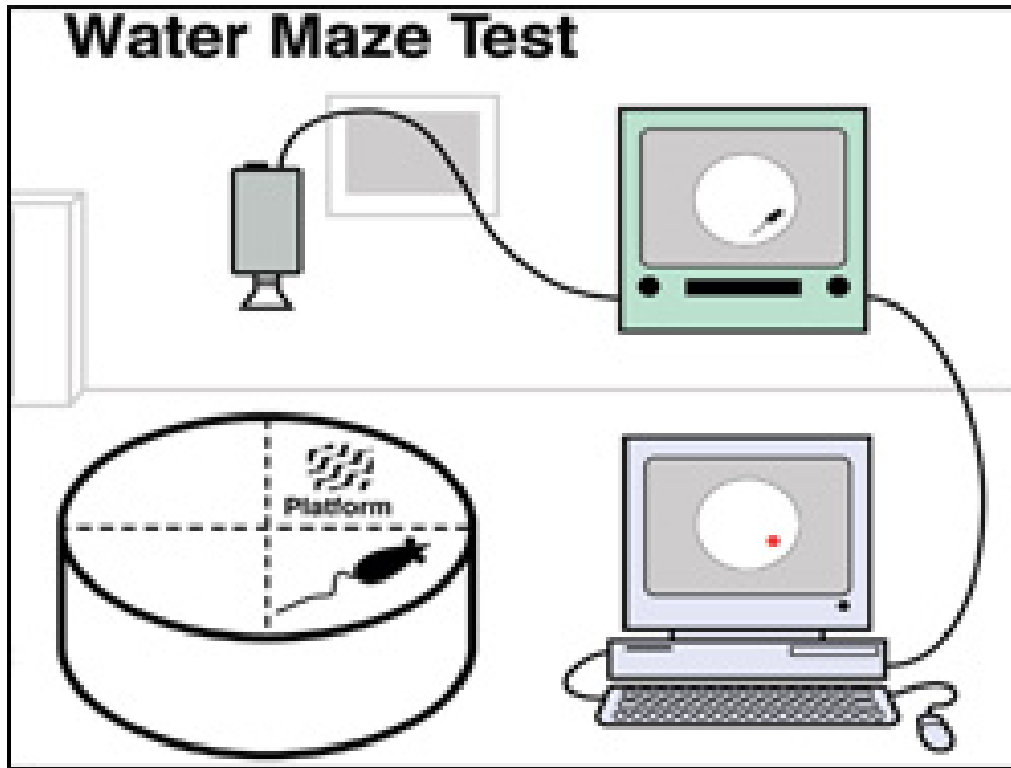
- AD transgenic mouse model and related controls
- **Treatment** : Drug administered daily for 2 months by oral gavage:
  - at 8 weeks of age for preventative study
  - at 8 months of age for therapeutic study
- **Behavioural testing**:
  - Open field
  - Elevated Plus maze and Y mazes
  - Object recognition test
  - Watermaze test
- **Biochemical assays** for AD and inflammatory markers for both studies



Y Maze Activity: Test for Spontaneous Alternation



# Watermaze: training and testing



# Next Steps

If the results are interesting...

- Clinical trials
  - *Antroquinonol is already in human trials for cancer*

## Genomics Clinical Trial Centre

- Gold Coast
- Multidisciplinary team (Neurologists, neuropsychologists, clinicians, study coordinators)
- Alzheimer's Diseases Trials To date:
  - 5 Sponsored Clinical Trials (2 preventative and 3 therapeutic)
  - Randomized over 90 participants
  - >800 participants consented for eligibility screening
  - >2000 potential participants engaged in pre-screening discussions



# Acknowledgements

Golden Biotechnology Corporation

Advance Queensland Johnson & Johnson Innovation QuickFire Challenge