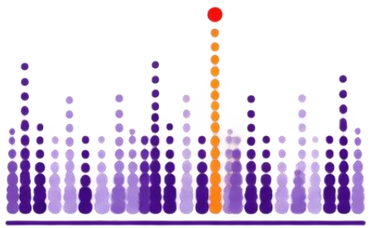
Genetic & Genomic Winter School 2027

Brisbane, Australia | 5–16 July 2027 | In-person only

Hands-on training in statistical and computational methods for understanding complex traits, from genetic association to biological mechanisms and therapeutics

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WEEK 1 (5–9 July 2027) Statistical Genetics – From Association to Causality



Module 1: Genome-wide Association | Dr Kathryn Kemper

This module will introduce basic concepts and methods for mapping genetic variants associated with a trait or disease in the context of genome-wide association studies (GWAS). Topics covered include introduction to GWAS for quantitative and disease traits, procedures of data cleaning and quality control, methods to consider population structure and relatedness, GWAS meta-analysis, using summary statistics, fine-mapping and annotation. Computer practicals will involve the use of real genotype data and popular programs to conduct GWAS such as PLINK and GCTA.

Prerequisites:

- Basic knowledge of introductory statistics (e.g. correlation, simple linear regression)
- Requires undergraduate-level understanding of genetics
- Expects basic programming skills in R and Unix
- Focuses on human traits and data
- Notes that the same principles can be applied to other species

Goal:

- Students will understand the requirements and limitations of GWAS and be able to perform a GWAS on a trait of interest.
- They will be introduced to post-GWAS analysis such as meta-analysis, fine mapping & annotation.



Primary Instructor:

Dr Kathryn Kemper

Dr Kemper is a senior post-doctoral fellow in quantitative genetics at the Institute for Molecular Bioscience (IMB) at the University of Queensland (UQ).

Her research involves understanding the sources of variation in human populations for traits such as height and body mass index (BMI).