

Winter School 2025

Genetic Epidemiology Module

Day 1 (Wednesday July 11 th , 9am-12pm, 1-4pm):		
9:00am-9:30am	Welcome + Intro to Genetic Epidemiology	Daniel Hwang
9:30am-11:00am	Lecture 1: Introduction to Mendelian randomization. We will introduce the concept of Mendelian randomization (MR), the assumptions underlying the approach, and empirical examples involving application of the method. We will also introduce Directed Acyclic Graphs (DAG) and illustrate how they can be used to inform study design, analysis of data and understand the implications of confounding, bias and missing data.	Daisy Crick
11:00am-11:15am	Break	
11:15am-12:00pm	<i>Practical 1: Single sample Mendelian randomization.</i> Software: R.	Kym-Mai Nguyen All speakers
12:00-1:00pm Lunch Break		
1:00pm-2:10pm	Lecture 2: Sensitivity Analyses in Mendelian randomization. We will introduce methods for detecting and/or correcting for horizontal pleiotropy in MR analyses including heterogeneity testing, MR Egger, MR weighted median and MR modal approaches. We will also discuss the STROBE-MR, a checklist/guideline for publishing MR studies.	Nicole Warrington
2:10pm-2:30pm	Break	
2:30pm-3:30pm	<i>Practical 2: Two sample Mendelian randomization.</i> Software: R.	Chris Flatley All speakers
3:30pm-4:00pm	Questions and Discussion	
Day 2 (Thursday June 27 th , 9am-12pm):		
9:00am-10:30am	Lecture 3: Introduction to Structural Equation Modelling. We will introduce the technique of structural equation modelling (SEM). Concepts that will be covered include maximum likelihood, optimization, and path analysis. We	Baptiste Couvy-Duchesne

	will discuss examples of SEM for genetically informative data (at both individual level and summary level).	
10:30am-11:00am	Break	
11:00-am11:50am	<i>Practical 3:</i> GenomicSEM. Software: R. Environment: Linux	Daniel Hwang All speakers
11:50am-12:00pm	Questions and Discussion + Survey	
12:00pm-1:00pm	Lunch break	