

Day-to-Day Program for Molecular Pharmacoepidemiology Course

Course Director: Dr. Fariba Ahmadizar

Monday, July 7, 2025: Introduction to Molecular Pharmacoepidemiology

Time Place (TBA)	Description	Lecturer
09:30 – 09:45	Introduction: Welcome and Introduction to the Course	Dr. Fariba Ahmadizar
09:45 – 12:30	Lecture 1: Introduction to Molecular Pharmacoepidemiology - Overview of molecular pharmacoepidemiology and the role of omics (genomics, metabolomics). - Introduction to multi-omics data and their application in drug safety and efficacy. - Study design for pharmacoepidemiological studies using multi-omics. - Strengths and limitations of omics data in epidemiological studies.	Dr. Fariba Ahmadizar
12:30 – 13:30	Lunch Break	
13:30 – 17:00	Practical Work: Hands-on analysis with a genetic study dataset (Assignment 1) - Introduction to a synthetic dataset and initial steps for analysis. - Statistical methods for analysis with support from a dedicated statistician. - Group assignment briefing and initial group work (Assignment 2).	Malede Sisay, MSc, Statistician

Tuesday, July 8, 2025: Study Design in Pharmacogenetic Studies

Time Place (TBA)	Description	Lecturer
09:30 – 09:45	Introduction to Day 2: Overview of Study Design in Pharmacogenetics	Prof. Miriam Sturkenboom
09:45 – 12:30	Lecture 2: Study Design in Pharmacogenetic Studies - Overview of study designs in pharmacogenetics: cohort, case-control, and cross-sectional designs. - Challenges in pharmacogenetic study design: confounding, population stratification, and sample size considerations. - Analytical methods in pharmacogenetic studies: Introduction to Directed Acyclic Graphs (DAGs) for causal inference.	Prof. Miriam Sturkenboom
12:30 – 13:30	Lunch Break	
13:30 – 17:00	Practical Work: Analyzing Pharmacogenetic Study Design Challenges - Apply study design principles to the provided dataset with research questions, addressing confounding and sample size issues (Assignment 1). - Group work (Assignment 2).	Malede Sisay, MSc, Statistician

Wednesday, July 9, 2025: Genetic and Genomic Approaches in Pharmacoepidemiology

Time Place (TBA)	Description	Lecturer
09:30 – 09:45	Introduction to Day 3: Overview of Genetic and Genomic Approaches in Pharmacoepidemiology	Dr. Fariba Ahmadizar
09:45 – 12:30	Lecture 3: Genetic and Genomic Approaches in Pharmacoepidemiology <ul style="list-style-type: none"> - Understanding pharmacogenomics: The role of genetic variability in drug response. - Introduction to causal inference in genetic studies. - Mendelian Randomization (MR): Concept, applications, and limitations in pharmacoepidemiology. - Case studies of pharmacogenomics and drug response (e.g., warfarin, statins). 	Dr. Fariba Ahmadizar
12:30 – 13:30	Lunch Break	
13:30 – 17:00	Practical Work: Continue applying Genetic analyses to Genetic Data (Assignment 1). <ul style="list-style-type: none"> - Group work (Assignment 2). 	Malede Sisay, MSc, Statistician

Thursday, July 10, 2025: Translating Pharmacogenomics into Clinical Practice

Time Place (TBA)	Description	Lecturer
09:30 – 09:45	Introduction to Day 4: Overview of Translating Pharmacogenomics into Clinical Practice	Dr. Vera Deneer
09:45 – 12:30	Lecture 4: Translating Pharmacogenomics into Clinical Practice <ul style="list-style-type: none"> - From bench to bedside: Translating pharmacogenomics into actionable clinical guidelines. - Clinical implementation of pharmacogenomic testing in healthcare systems. - Incorporating genotype information into electronic health records (EHRs). - Case studies of successful pharmacogenomic implementation in clinical practice (e.g., oncology, cardiology, psychiatry). 	Dr. Vera Deneer
12:30 – 13:30	Lunch Break	
13:30 – 17:00	Practical Work: Continue applying Genetic analyses to Genetic Data (Assignment 1). <ul style="list-style-type: none"> - Group work (Assignment 2). 	Malede Sisay, MSc, Statistician

Friday, July 11, 2025: Artificial Intelligence (AI) & Advanced Analytical Techniques in Pharmacoepidemiology

Time Place (TBA)	Description	Lecturer
09:30 – 09:45	Introduction to Day 5: Overview of AI and Advanced Analytical Techniques in Pharmacoepidemiology	Dr. Said Bouhaddani
09:45 – 12:30	Lecture 5: Artificial Intelligence (AI) & Advanced Analytical Techniques in Pharmacoepidemiology <ul style="list-style-type: none"> - AI methods for analyzing multi-omics and pharmacoepidemiology data. - Applying machine learning techniques (clustering, neural networks, random forests) to predict drug responses. - Mediation analysis using omics data. - Hands-on practical session: AI in pharmacoepidemiology 	Dr. Said Bouhaddani
12:30 – 13:30	Lunch Break	
13:30 – 15:30	Group Presentations <ul style="list-style-type: none"> - Each group presents their reading assignment on a pharmacogenomics paper, including a critique and key takeaways (Assignment 2). 	Dr. Fariba Ahmadizar Dr. Said Bouhaddani Malede Sisay, MSc, Statistician
15:30 – 17:00	Q&A	Dr. Fariba Ahmadizar Dr. Said Bouhaddani Malede Sisay, MSc, Statistician