Day-to-Day Program for Molecular Pharmacoepidemiology Course

Course Director: Dr. Fariba Ahmadizar

Monday, July 7, 2025: Introduction to Molecular Pharmacoepidemiology

Time **Place: Hijmans van den Bergh building 2.79**	**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: Hijmans van den Bergh building 2.79**	**Description**	**Lecturer**
09:30 – 09:45	**Introduction to Day 2**: Overview of Genetic and Genomic Approaches in Pharmacoepidemiology	Dr. Fariba Ahmadizar
09:45 – 12:30	**Lecture 3**: Genetic and Genomic Approaches in Pharmacoepidemiology - 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). - Group work (Assignment 2).	Malede Sisay, MSc, Statistician

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

Time Place: Hijmans van den Bergh building 2.79	Description	Lecturer
09:30 – 09:45	**Introduction to Day 3**: 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

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

Time Place: Hijmans van den Bergh building 2.79	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 - 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). - Group work (Assignment 2).	Malede Sisay, MSc, Statistician

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

Time **Place: Hijmans van den Bergh building 2.79**	**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 - 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** - 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