Short Course: **Molecular Epidemiology of Chronic disease and the Exposome**

Location: Utrecht / online

8-12 July 2024

**Course Co-Coordinators** Roel Vermeulen & Jelle Vlaanderen (IRAS, Utrecht University)

(L) lecture, (P) practical, (CT) course text

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| **Day** |  |  | **Topic** | **Speaker** | **Reading** |
| Monday 8 July Morning | LL | 10:0010:30 | **Introduction Exposome and Molecular Epidemiology**Introduction course and practical mattersExposome and health: where chemistry meets biology (2x 45min) | VlaanderenVlaanderen | **CT Chapter 1, 3, 6** “The exposome: from concept to utility” C.P. Wild *Int j epidemiol* 2012.“The exposome and health: Where chemistry meets biology” Vermeulen et al. *Science* 2020.  |
| Monday 8 JulyAfternoon | PL | 13:0014:00 | Computer lab I*Introduction to working with OMICs data in R*Computer lab II*Variability in OMICs measurements* | Vorstenbosch/Oosterwegel/MalliorisOosterwegel | **CT Chapter 9.** Environmental and occupational toxicants**CT Chapter 14.** Population based designs in molecular epidemiology**CT Chapter 19.** Cancer |
| Tuesday 9 JulyMorning | LLL | 09:0010:0011:00 | Discussion computer lab IIEpigenetics and Transcriptomics in Exposome researchMetabolomics to study the exposome | OosterwegelIbiDubbelman | **CT Chapter 7.** Platforms for biomarker analysis using high-throughput approaches in genomics, transcriptomics, proteomics, and bioinformatics. |
| Tuesday 9 JulyAfternoon | LPP | 13:0014:0015:00 | Microbiome Group exercise reading an Exposome paperGroup discussion Exposome paper | BossersIbi / VlaanderenIbi / Vlaanderen |  |
| **Day** |  |  | **Topic** | **Speaker** | **Reading** |
| Wednesday 10 JulyMorning | L | 10:0011:30 | Introduction into statistical methods to study the ExposomeComputer lab III*Statistical analysis of OMICS data in Environmental Health* | Marc Chadeau-Hyam (ICL)Vorstenbosch/Oosterwegel/Mallioris | “Deciphering the Complex: Methodological Overview ofStatistical Models to Derive OMICS-Based Biomarkers” Chadeau-Hyam et al. *Environ Mol Mutagen* 2013.**CT Chapter 8.** Measurement error in biomarkers: sources, assessment, and impact on studies |
| Wednesday 10 JulyAfternoon | P | 13:30 | Computer lab III continued | Vorstenbosch/Oosterwegel/Mallioris |  |
| Thursday 11 JulyMorning | LP | 10:0011:00 | Discussion Computer lab IIIComputer lab IV*Variable selection and dimension reduction* | PortengenVorstenbosch/Oosterwegel/Mallioris |  |
| Thursday 11 JulyAfternoon | PL | 15:0016:00 | Discussion Computer lab IVMendelian randomization in Exposome research | Portengen Thio |  |
| Friday 12 JulyMorning | LP | 10:0011:00 | Bioinformatics Computer lab practical work V*Pathway enrichment* | ArshiVlaanderen /Arshi | **CT Chapter 27**. Future perspectives on molecular epidemiology |
| Friday 12 JulyAfternoon | L**E** | 13:00**14:00****15:00** | Discussion OMICS practical work VTime to prepare for examEXAM | Vlaanderen / Arshi |  |