**March 29th, 2021 (Monday): Metabolomics as a tool to investigate natural products**

10:00 – 11:00 Introduction to metabolomics (Robert Verpoorte)
11:00 – 12:30 Application of metabolomics to medicinal plant research (Alvaro Viljoen)

14:00 – 15:30 Metabolomics in human health and disease (Martin Giera)

15:30 – 16:30 Revisiting Traditional Chinese Medicine by Metabolomics (Mei Wang)

**March 30th, 2021 (Tuesday): How to extract and basic of data processing and multivariate data analysis**

10:00 – 11:00 Sample preparation (Hye Kyong Kim)

11:00 – 12:30 Basic chromatography theory for metabolomics (Erica G. Wilson)

14:00 – 15:00 Basic of multivariate data analysis (Harald van Mil)

15:00 – 16:00 Chromatography and spectroscopy data processing for metabolomics (Jeroen Jansen)

**March 31st, 2021 (Wednesday): How to detect metabolites by chromatography and spectroscopy**

10:00 – 11:30 Gas Chromatography-based metabolomics: theory and applications (Joachim Kopka)

11:30 – 13:00 LC-MS Metabolomics: Theory and Applications (J. William Allwood)

14:00 – 15:00 TLC application to medicinal plant metabolic fingerprinting (Tien Do)

15:00 – 16:30 NMR based metabolomics: Theory and Applications (Jan Schripsema)

**April 1st, 2021 (Thursday): Metabolomics applications in life sciences**

10:00 – 11:00 Integrating metabolomic data from multiple analytical platforms for a comprehensive characterization of lemon essential oil (Serge Rudaz)

11:00 – 12:30 Strategies for unambiguous identification of biomarkers (Jean-Luc Wolfender)

14:00 – 15:00 NMR-based profiling of intra – and extracellular metabolome (Sarantos Kostidis)

15:00 – 16:30 Metabolomics applications in agriculture and marine research (David Overy)

**April 2nd, 2021 (Friday): Techniques in detail**

 10:00 – 11:00 Ambient mass spectrometry a useful tool for metabolomics (Teris van Beek)

11:00 – 12:00 Identification of Metabolites by MS spectrometry (Rob van der Heijden)

14:00 – 15:00 Application of in-vivo NMR for plant physiology (François Mesnard)

15:00 – 16:00 Closing Remarks (Robert Verpoorte, Young Hae Choi)