Course

Data analysis for Metabolomics, a practical course

Metabolomics experiments based on mass spectrometry (MS) or nuclear magnetic resonance (NMR) produce large and complex data sets. This course will introduce approaches to process and analyse data and design high-quality experiments. Through hands-on workshops and lectures highlighting the different concepts you will get a thorough basis for tackling the challenges in metabolomics data analysis.

Target audience
This course targets professionals working in health and life sciences (*e.g.*, food industry, breeding and seed business, pharmaceutical companies, hospital laboratories, biotech and agro chemical industry).
Presumed knowledge: a background in and basic understanding of analytical chemistry or metabolomics by work or education. No prior knowledge of programming, mathematics or statistics is assumed.

Results for you
The course provides an overview of the tools and approaches used to design a study, process and analyse the data, avoiding common traps and mistakes. Principles will be explained in a general way, meaning they are valid for all common data acquisition platforms (*e.g.*, NMR and MS) and software packages. The focus is on understanding, correct application and interpretation. After the course, participants are able to design appropriate experiments for typical metabolomics studies, taking into account quality assurance and quality control considerations.

Location:	Wageningen Campus
Dates:	4 and 5 June 2020
Course leader:	Dr. Ron Wehrens, Biometris, WUR
Organized by:	Wageningen Academy

Set-up and topics
The course is set up in blocks covering all topics relevant for experimental design and preprocessing, exploratory analysis and modelling. The material is presented in an attractive mix of lectures and hands-on computer practicals using real-world data. This set-up offers participants an ideal mix to learn how to:

- choose pretreatment strategies relevant for the goal of the analysis and the data characteristics;
- select and execute appropriate data analysis methods to link metabolite data to properties of interest;
- interpret and assess the results of these data analysis methods.

This interactive course is led by experts in the field of metabolomics. They offer interactive tuition with Q&A sessions and the opportunity to discuss case studies submitted by the participants.

Practical information

Price
The price for this course is € 1.395,- per person and covers tuition, course materials, one dinner, lunches and refreshments. Hotel accommodation is not included in the course fee. Computers for the practicals are available on site.

Group size
Between 20 and 30 participants.

Certificate
Based on your attendance you will receive a certificate after the programme is finished.

Registration
Registration is possible via www.wur.eu/academy
The registration deadline is 10 May 2020, or until the maximum number of participants is reached.

Programme

Thursday 4 June 2020
- Welcome and introduction
- Designing good experiments and avoiding common pitfalls
- Preparing your data for analysis:
  – Data processing: from raw data to a data matrix
  – Data matrix pretreatment: missing values, batch correction and scaling
  – Q&A
- Fundamentals of metabolomics data analysis:
  – Exploratory analysis / Visualization
  – Univariate and multivariate analysis
  – Principal Component Analysis (PCA)
- Q&A: discuss your own research
- Networking dinner

Friday 5 June 2020
- Linking metabolite data to continuous properties: regression
  – Linear regression
  – Principal Component Regression (PCR)
  – Validation
  – Partial Least Squares Regression (PLS)
- Linking metabolite data to discrete properties: classification
  – Univariate hypothesis testing
  – Linear Discriminant Analysis (LDA)
  – Partial Least Squares Discriminant Analysis (PLSDA)
- Finding biomarkers
- Q&A: discuss your own research
- Evaluation and certificates

Wageningen Academy

We offer professional education based on demand of the Food & Agri sector in relation to the expertise of Wageningen University & Research. Our portfolio contains a mix of online, blended and onsite programmes, such as courses, Summer Schools and Executive Education. Besides open enrollment programmes we also offer tailor-made education.

www.wur.eu/academy
E-mail: monique.tulp@wur.nl
Direct: +31 (0) 317 48 22 98
General: +31 (0) 317 48 40 93

Today's knowledge, tomorrow's business