



## 2018 AARHUS UNIVERSITY PHD SUMMER SCHOOL

MONDAY 11 JUNE – FRIDAY 22 JUNE 2018, FLAKKEBJERG, 4200  
SLAGELSE

### HANDS-ON LIQUID CHROMATOGRAPHY–MASS SPECTROMETRY COURSE IN THE ANALYSIS OF SMALL MOLECULES (PHYTOCHEMICALS, CONTAMINANTS, PRIMARY METABOLITES)

#### Short description

Advanced tools such as liquid or gas chromatography coupled to mass spectrometry are necessary tool in the research into small molecules, either phytochemicals with defense or health properties, environmental contaminants such as pesticides or primary metabolites that can be affected by the presence of other bioactive compounds. The course will take place in a well-equipped laboratory at Aarhus University, Research Centre Flakkebjerg, DK-4200 Slagelse, Denmark. LC-MSMS, LCMS-QTRAP, LC-TOF, GC-TOF instruments will be available for the students during the course and our experienced staff will provide instruction on the use of the equipment as well as practical techniques for the preparation of samples.

#### Programme

The course is constructed as follows:

- ◆ Preparatory reading of selected chapters in an LC-MSMS textbook
- ◆ Approximately three days of practical exercises on basic LC-MSMS, quantitation methods, optimization of parameters for selected small molecules, preparation of samples, matrix effects, validation of the quantitative method
- ◆ Approximately three days of practical exercises chosen on the basis of each student's on-going PhD project
- ◆ Theoretical lessons on
  - ◆ Optimization of extraction methods
  - ◆ Method validation: LOD, LOQ, recovery, matrix interferences
  - ◆ ESI and APCI inlet systems
  - ◆ Use of an ion trap for analysis of small molecules
  - ◆ HPLC method development and optimization
  - ◆ Interpretation of mass spectra
  - ◆ Metabolomics
  - ◆ Representative sampling: plants, soil and water
  - ◆ Good Laboratory Practice
  - ◆ New developments in mass spectrometry
- ◆ Subsequent elaboration of a 30- to 40-page report on the practical exercises.

**Note:** Part of the practical exercises will take place in the evening to assure that all participants have plenty of hands-on time. The detailed distribution of instrument time will not be done until the course has started.

**Course weight:** 8 ECTS points (European Credit Transfer System).

#### Course assessment

The report is assessed as "passed" or "not passed". Presence at a minimum of 90% of theoretical and practical lessons is required to obtain the course diploma.



### **Lecturers from Aarhus University**

Associate professor Inge S. Fomsgaard (course coordinator)

<http://pure.au.dk/portal/en/inge.fomsgaard@agro.au.dk>

Laboratory Technicians Bente Laursen, Kirsten Heinrichson, Claudia Jensen; Postdocs Stine Krogh Steffensen, Nanna Vidkjær, Enock Dankyi; PhD students Bina Bhattarai, Kourosh Hooshmand.

### **Visiting lecturers**

Mass spectrometry specialist, Sciex; Chromatography specialist, Phenomenex.

### **Course venue**

The course venue is Research Centre Flakkebjerg, situated in Southwest Zealand, 10 km south of Slagelse (100 km west of Copenhagen). Complete address:

Department of Agroecology, Research Centre Flakkebjerg, Forsøgsvej 1,  
DK-4200 Slagelse, Denmark, Tel: +45 87 15 81 92

Direct telephone number to Inge S. Fomsgaard (+45 87 15 82 12 or +45 22 28 33 99).

[Inge.Fomsgaard@agro.au.dk](mailto:Inge.Fomsgaard@agro.au.dk).

### **Accommodation**

Accommodation will be at Hotel Antvorskov, Trafikcenter Alle 2-4, DK-4200 Slagelse.

### **Fee**

The fee includes teaching materials, laboratory consumables, access to instruments, textbook, lodging 10-22 June, transport Slagelse-Flakkebjerg and meals on all workdays.

Total price in single room with private bathroom and toilet: 1740 EUR

Total price in double room with private bathroom and toilet: 1410 EUR (per person) (option only valid if other participants of same sex require the same).

Price without accommodation and breakfast: 815 EUR.

### **Deadlines**

Deadline for registration and payment: 15 March, 2018. Maximum number of participants: 12. First come, first served. Please register at <https://auws.au.dk/default.aspx?id=34945>.

**Further information:** Please contact Sonja Graugaard - [sonja.Graugaard@agro.au.dk](mailto:sonja.Graugaard@agro.au.dk).

### **Comments from participants in our 2017 course**

- ◆ “A super course for people who has a LCMS in their department, but not fully confident in using it”
- ◆ “The proportion of lectures, laboratory work, instrument use and group study time was well distributed and in each period we could finalize some activity”
- ◆ “Learning through practical way instead of just listening to lectures: learning more deeply”
- ◆ “Promoting self-thinking and advice from experts are well balanced”
- ◆ “Course team is highly trained, cooperative and organized”

## **GSST (GRADUATE SCHOOL OF SCIENCE AND TECHNOLOGY)**

## **AARHUS UNIVERSITY**

