



PROTEIN CHROMATOGRAPHY - ENGINEERING FUNDAMENTALS AND MEASUREMENT FOR PROCESS DEVELOPMENT AND SCALE-UP

MAY 26TH TO MAY 31ST 2019, VIENNA, AUSTRIA

Held by: Prof. Alois Jungbauer; Department of Biotechnology, University of Natural Resources and Life Sciences Vienna, Austria
Prof. Giorgio Carta; Department of Chemical Engineering, University of Virginia, Charlottesville, VA, USA

Aim

Chromatography became an indispensable tool in research and development in biotechnology. The method is frequently applied for analytical and preparative separation purposes. Equipment, separation media and auxiliary materials have reached a very advanced level. The course will provide insight in the basic theories on chromatography and the fundamental relationships to understand the function of new media developed for high throughput and high capacity. The course will present the necessary chromatographic theory and give the participants an opportunity to apply the theory to experimental laboratory data.

Course description

The scope of the course is to provide insight in the application of chromatographic theory with special emphasis on mass transfer and dispersion.

The theory will cover the fundamentals, the sorption equilibria, modes of operation, insight in chromatographic media, dynamics of chromatography, effects of dispersion and extra column effects. The experimental part will comprise pulse response experiments, dynamic binding capacity, shallow bed experiments, and linear gradient elutions. The experiments will be carried out with typical conventional porous media exhibiting different transport mechanisms. Participants will be also trained in the pitfalls of peak fitting and evaluation of chromatographic data. Detailed course notes will be provided. At the end of the course a detailed protocol has to be worked out.

Who should attend?

The course is aimed at those already employed in industry who is interested in getting more information out of their chromatographic data as well as PhD-students, Post Docs and those working in research laboratories. The participants will work in groups of 3-4 and should have some practical experience in performing chromatographic experiments. No particular background in chromatographic theory is required but a basic knowledge in separation science is an advantage.

Duration and location

The course will be given from Sunday May 26th to Friday May 31st 2019.

The course will be held at the

Department of Biotechnology
University of Natural Resources and Life Sciences, Vienna
Muthgasse 18
A-1190 Vienna, Austria
Phone: 0043 1 47654 79083, Fax: 0043 1 47654 79009
E-mail: alois.jungbauer@boku.ac.at

Lunches, a reception on Sunday May 26th and the course dinner on Thursday May 30th will be provided. For other meals, a variety of restaurants may be found in Vienna.

Accommodation

Hotel or student hostel accommodation can be arranged at your request addressed to Petra Polak BA (petra.polakg@boku.ac.at).

Fee and registration

If you are interested, please fill in and return the attached form. Participants in the course are restricted to 20 people.

The fee is:

2800 Euro in case of payment before March 22nd 2019

3000 Euro in case of payment after March 22nd 2019

1800 Euro for PhD students

The fee includes course materials, laboratory expenses, lunches and coffee breaks, the reception on Sunday May 26th and the course dinner on Thursday May 30th. The fee does not cover other meals and lodging.

In the event of cancellation **before May 13th 2019** a full refund will be granted, after this date, a 25% fee charge will be made.

Course outline

The lectures and exercises will be given by Professor Alois Jungbauer, Department of Biotechnology, University of Natural Resources and Life Sciences and Professor Giorgio Carta, Department of Chemical Engineering, University of Virginia. Experiments will be performed on ÄKTA Purifier. For each chromatography workstation one tutor will be available.

Detailed course notes including simulation programs will be provided. The instructors have also published a book covering the theory and examples given during the course.

Current time schedule

Sunday, May 26th

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| 16:30 | Registration |
| 17:00 | Introduction to the course |
| 17:30 | Downstream processing of biotechnological products |
| 19:00 | Dinner |

Monday, May 27th

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| 09:00 | Introduction to chromatography, definitions, models of operation |
| 11:00 | The chromatographic workstation |
| 12:30 | Lunch break |
| 13:30 | Experiments I (pulse response experiments, fitting of data) |
| 16:30 | Categories of chromatographic media |

Tuesday, May 28th

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|-------|--------------------------------------|
| 09:00 | Evaluation of experiments I |
| 11:00 | Sorption equilibrium |
| 12:30 | Lunch break |
| 13:30 | Determination of binding capacity |
| 14:30 | Experiments II (breakthrough curves) |

Wednesday, May 29th

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| 09:00 | Evaluation of experiments II |
| 11:00 | Local equilibrium dynamics, ideal chromatography |
| 12:30 | Lunch break |
| 13:30 | Linear gradient elution |
| 14:30 | Experiments III (LGE, peak position and HETP from LGE) |

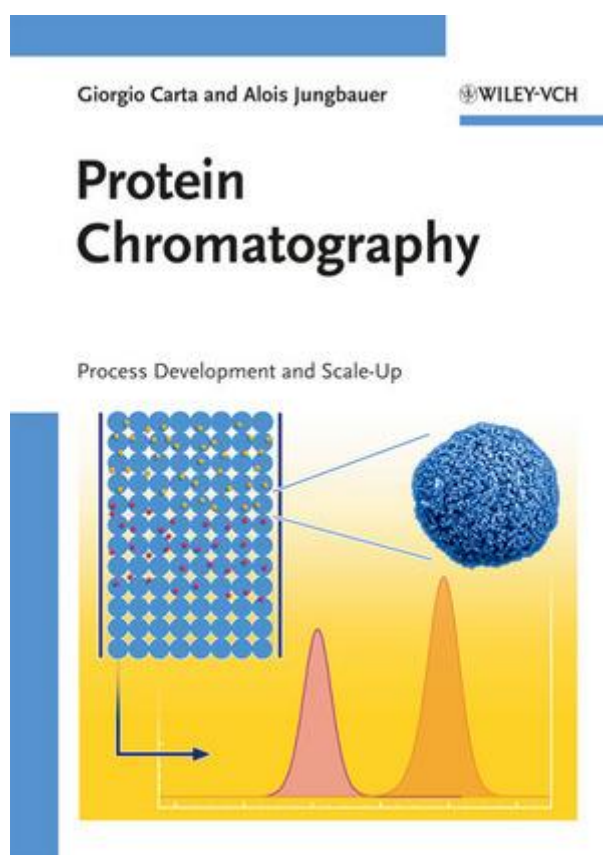
Thursday, May 30th

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|-------|--|
| 09:00 | Evaluation of experiments III |
| 11:00 | Effects of dispersion |
| 12:30 | Lunch break |
| 13:30 | Effects of dispersion and extra column effects |
| 14:30 | Experiments IV |
| 19:00 | Course dinner |

Friday, May 31st

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|-------|--------------------------------|
| 09:00 | Evaluation of experiments IV |
| 11:00 | Summary of course and protocol |
| 12:30 | Lunch break |

Book covering the content of the course – Recommended additional literature



1. Edition - April 2010

99.- Euro

2010. XVIII, 346 Pages, Hardcover

178 Fig. (3 Colored Fig.), 45 Tab.

- Practical Approach Book -

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