

# FEBS Practical Course 2018 - Advanced methods in macromolecular crystallization VIII

## Sunday, 2018/6/10

10:00 - 14:00 Blue Hall

### Registration

10:00 - 12:00 Laboratory

### Eppendorf Workshop on Pipetting

Experimental

10:00 - 10:15 **Talk Title Example 1**

Presenter Y

10:15 - 10:30 **Talk Title Example 2**

Presenter Z

10:30 - 11:00 **Talk Title Example 3**

Presenter W

14:00 - 15:00 Theatre hall

### Welcome

Chairs: I. Kuta Smatanova, P. Rezacova (organizers) F. Vácha (Dean), FEBS ACC Chair

>>>>14:00-14:30

>>>Welcome and Course remarks [ Ivana Kutá Smatanová & Pavlína Řezáčová]>

>>14:30-14:45>>

>Prologue by the vice-rector USB [Tomáš Polívka]> >> 14:45-15:00>>

>Introduction by member of the FEBS ACC>>>>

15:15 - 18:15 Theatre hall

### Lecture session

Lectures

>>>>> 15:15-16:00>>>>>Principles of protein crystallization: The nature of Protein Crystals and the

Physical Chemistry of their formation [Bernhard Rupp]> >>>16:00-16:45>>>>> >Capillary counterdiffusion

technique for protein crystallization and screening [Gavi = J. Gavira]> >> 16:45-17:30>>> >Crystallization of

membrane proteins in lipidic systems [Martin Caffrey]> >> >17:45-18:30

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Conventional crystallization methods and their modifications [Jeroen Mesters]> >>>>

18:35 - 19:35 Theatre hall

### IUBMB Speaker Lecture [Petra Fromme]

Lectures

Chair: Petra Fromme

>>>>>18:35-19:35>>>>>Lecture by IUBMB speaker>: MOLECULAR MOVIES WITH NANOCRYSTALS USING>

>>>> XFELS: SMALL IS BEAUTIFUL [Petra Fromme]

## Monday, 2018/6/11

09:00 - 13:05 Theatre hall

### Lecture session

Lectures

>>>>>9:00-9:45>>>>>Principles of protein crystallization II: Methods, evaluation, and properties of 'real'

crystals [Bernhard Rupp] >>> 9:45-10:30>>>>> >Unconventional crystallization strategies and techniques for

screening and optimisation [Naomi E. Chayen]> >>>11:00-11:30>>>>> >Interpretation of the crystallization drop

results [Terese Bergfors]> >>>11:30-12:00>>>>> >Seeding Strategies for ##Random## Crystal Screening and

Crystal Optimization [Patrick Shaw Stewart]> >>>12:00-12:45>>>>> >Tips and tricks for protein crystal

manipulation and handling [José A. Gavira]> >>>12:45-13:10>>>>> >>>>> Evaluation of crystallization trials with

the UVEX microscope [James Gordon]

# FEBS Practical Course 2018 - Advanced methods in macromolecular crystallization VIII

- 14:00 - 19:15 Laboratory  
**Lab Exercises** Experimental  
>>>>1. Conventional techniques and their modifications, crystallization of own proteins [J. Mesters]>>2. “The secret life of your crystallization drop”? [B. Rupp]>>3. Crystallization of membrane proteins in lipidic system [M. Caffrey]>>4. Observation of crystal growth / Seeding [T. Bergfors]>>5. Crystallization under oil [L. Govada]>>Optional exercise: Conventional techniques and crystallization of own proteins [J. Mesters, L. Urbániková]>>Optional exercise: Evaluation of crystallization trials with the UVEX microscope [J. Gordon]>>Optional exercise: **Random** Microseeding [P. Shaw Stewart]>>>>
- 20:00 - 21:00 Theatre hall  
**Theory of X-ray diffraction [Jeroen Mesters]** Lectures
- 20:00 - 23:00 Blue Hall  
**Posters and discussion** Poster Sessions

## Tuesday, 2018/6/12

- 09:00 - 13:00 Theatre hall  
**Lecture session** Lectures  
>>>>9:00-9:35>>From protein expression and purification to its crystallization [Radka Chaloupkova]>>9:35-10:10>>Protein as the main variable in crystallization [Lubica Urbániková]>>10:10-10:45>>**What to do if everything has failed** [Terese Bergfors]>>11:15-12:00>>Crystallization in microfluidic systems: strategies and perspectives [Claude Sauter]>>12:00-12:35>>Publication of scientific results with emphasis on crystallization communications [Howard Einspahr]>>12:35-13:00>>Analytical Ultracentrifugation: New Multiwavelength Sedimentation Analysis of Proteins in Solution [Martin Máša]>>>>
- 14:00 - 19:15 Laboratory  
**Lab Exercises** Experimental  
>>>>1. Observation of crystal growth / Seeding [T. Bergfors]>>2. Capillary protein crystallization using counter-diffusion techniques [J. Gavira]>>3. **Random** Microseeding Microseeding [P. Shaw Stewart]>>4. Crystallization under oil [L. Govada]>>5. Publication of scientific results with emphasis on crystallization communications [H. Einspahr]>>Optional exercise: From the biomolecule solution to its 3D structure in a microfluidic chip [C. Sauter]>>Optional exercise: “The secret life of your crystallization drop”? [B. Rupp]>>Optional exercise: Conventional techniques and crystallization of own proteins [J. Mesters, L. Urbániková]>>Optional exercise: Evaluation of crystallization trials with the UVEX microscope [J. Gordon]>>Optional exercise: Dynamic light scattering [K. Dierks]>>>>
- 20:00 - 23:00 Blue Hall  
**Posters and discussion** Poster Sessions

# FEBS Practical Course 2018 - Advanced methods in macromolecular crystallization VIII

## Wednesday, 2018/6/13

09:00 - 12:00 Theatre hall

### Lecture session

Lectures

>>>>9:00-9:30>> >Using Fluorescence to Find Your Crystals [Crissy> >L. Tarver]> >>9:30-10:00>>> >Crystallization Results Analysis and Optimization using Ionic Liquids [Marc L. Pusey]> >>10:00-10:45>>> >Advanced and Non-conventional Methods for Controlling the Size and the Shape of Protein Crystals [Abel Moreno]> >>11:15-12:00>> >DLS measurements prior to crystallization experiments [Christian Betzel]> >>12:00-12:45>> >Crystallization of Protein-Nucleic Acid> >Complexes [Christian Biertümpfel]> >>>>>

13:00 - 18:15 Theatre hall

### Social program

Networking

>>>> >Visit of NH old castle and Teresa Valley (14:30 – 18:00 )>>>> >Free afternoon>>>> >Dinner at >18:00> in the castle>>>>

20:00 - 20:45 Theatre hall

### Structure of a symmetric photosynthetic reaction center [Raimund Fromme]

Lectures

## Thursday, 2018/6/14

09:00 - 12:00 Theatre hall

### Lecture session

Lectures

>>>> >9:00-9:45>>> >Preparation of protein samples for crystallization experiments [Pavlna Řezáčová]> >>9:45-10:30>>> >Preparation of Micro- and Nano-Crystals for Free-Electron-Laser and Synchrotron Radiation Sources [Christian Betzel]> >>11:00-11:45>>> >Membrane protein crystallization [Hartmut Lücke]> >>11:45-12:30>>> >Crystallization of viral complexes [Ivana Nemčovičová]> >>12:30-13:00 >>> >Assessing the diffraction quality of crystals [Vernon Smith]> >>>>>

14:00 - 19:15 Laboratory

### Lab Exercise

Experimental

>>>> >1. Dynamic light scattering [K. Dierks]> >2. Trace Fluorescent Labeling and Low Cost Fluorescent Imaging [M. Pusey, C. Tarver]> >3. Capillary protein crystallization using counter-diffusion techniques [J. Gavira]> >4. From the biomolecule solution to its 3D structure in a microfluidic chip [C. Sauter]> >5. Practical Considerations for the Crystallization of Protein-Nucleic Acid Complexes [Ch. Biertümpfel]> >>Optional e>>>ercise: >Publication of scientific results with emphasis on crystallization communications [H. Einspahr]> >>Optional e>>>ercise: >Conventional techniques and crystallization of own proteins [J. Mesters, Ľ. Urbániková]> >>Optional e>>>ercise: >Practical Crystallography – how to perform a diffraction experiment? [V. Smith]> >>Optional e>>>ercise: >Single particle cryo-EM [E. Cunha]> >>Optional e>>>ercise: >Methods for Controlling the Size and the Shape of Protein Crystals [A. Moreno]> >>>>

20:00 - 21:00 Theatre hall

### Theory of X-ray diffraction II [Jeroen Mesters]

Lectures

# FEBS Practical Course 2018 - Advanced methods in macromolecular crystallization VIII

## Friday, 2018/6/15

09:00 - 12:30 Theatre hall

### Lecture session

Lectures

>>>>9:00-9:45>> Introduction to single particle cryo-EM [Eva Cunha]>>9:45-10:30>> Optimisation of crystal growth for neutron crystallography [Monika Budayová-Spano]>>11:00-11:45>> State-of-art biological Small-Angle-Scattering and new possibilities on Free Electron Lasers [Manfred Rössle]>>11:45-12:25>> Complex view into structure [K.V. Venkatachalam]>>>>

14:00 - 19:15 Laboratory

### Lab Exercises

Experimental

>>>>1. Trace Fluorescent Labeling and Low Cost Fluorescent Imaging [M. Pusey, C. Tarver]>>2. Practical Considerations for the Crystallization of Protein-Nucleic Acid Complexes [Ch. Biertümpfel]>>3. Conventional techniques and crystallization of own proteins [J. Mesters, Ľ. Urbániková]>>4. Single particle cryo-EM [E. Cunha]>>5. Methods for Controlling the Size and the Shape of Protein Crystals [A. Moreno]>>Optional exercise: >Practical Crystallography – how to perform a diffraction experiment? [V. Smith]>>>>

## Saturday, 2018/6/16

09:00 - 12:00 Laboratory

**Crystal observation, testing, handling, mounting and cryocooling [J. Brynda, P. Pachi]**

Experimental