

# Integrative Structural Biology School – Institut Pasteur

18 - 24 July 2016

Organizers **Claudine Mayer, Michael Nilges, Nicolas Wolff** (Paris)

## Sunday, July 17 | Arrival of participants

20:00 Informal get together / dinner at the Baribal

## Monday, July 18 | Protein production

### *Amphitheatre François Jacob*

9:00 – 9:30 *General presentation of the course – Michael Nilges* (Paris)

9:30 – 10:00 1 slide presentation of the participants

10:00 – 10:45 *Protein production in E. coli – Bruno Miroux* (Paris)

### 10:45 – 11:00 Coffee break

11:00 – 11:45 *Gene design and codon metrics – Gregory Boel* (Paris)

11:45 – 12:45 *Methods to stabilize protein complexes – David Haselbach* (Göttingen)

### 12:45 – 14:00 Lunch - Cantine

14:00 – 14:30 *Quality controls on purified proteins – Bertrand Raynal* (Paris)

14:30 – 15:30 *GPCR thermostabilisation - Guillaume Lebon* (Montpellier)

15:30 - 16:30 Membrane protein production in eukaryotic systems - **Lise Carpenter** (Oxford)

### 16:30 – 17:00 Coffee break

17:00 – 17:45 *Amphipols for membrane protein studies - Manuela Zoonens* (Paris)

17:45 – 18:30 *Reconstitution of Membrane Protein for functional studies – Martin Picard* (Paris)

### 18:30 – 20:30 Dinner (Buffet) / Poster session

## Tuesday, July 19 | X-ray diffraction

### *Amphitheatre François Jacob*

9:00 – 9:30 *No structure without crystal, the long road to get it – Isabelle Broutin* (Paris)

9:30 – 10:30 *How the crystal got its spots – Andy Thompson* (Saclay)

### 10:30 – 10:45 Coffee break

10:45 – 11:45 *From diffraction data to initial phases and from phases to model building and validation – Marc Delarue* (Paris)

11:45 – 12:30 *The contribution of crystallography in an integrated structural approach: case of the study of bacterial efflux pumps involved in antibiotic resistance* – **Isabelle Broutin** (Paris)

**12:30 – 14:00** Lunch - Cantine

***Bioinformatics module (below the canteen)***

14:00 – 18:00 Practical session – From data processing to structure refinement – **Marco Bellinzoni** (Paris), **Clément Madru** (Paris), **Stéphanie Petrella** (Paris)

**18:30** Free evening

**Wednesday, July 20** Electron microscopy

***Amphitheatre François Jacob***

9:00 – 10:00 *An overview of cryo-EM* – **Dorit Hanein** (San Diego)

10:00 – 11:00 *Image processing basics* – **Niels Volkmann** (San Diego)

**11:00 – 11:30** Coffee break

11:30 – 12:00 *Visualizing macromolecular machines* – **Remi Fronzes** (Paris)

12:00 – 12:30 *Sponsor presentation* – **Wim Voorhout** (FEI)

**12:30 – 14:00** Lunch

***Bioinformatics module (below the canteen)***

14:00 – 18:00 Practical session – Image processing and visualization – **Mario Borgnia** (Maryland), **Niels Volkmann** (San Diego), **Dorit Hanein** (San Diego), **Remi Fronzes** (Paris), **François Bontems** (Paris), **Gérard Pehau-Arnaudet** (Paris), **Joao Miguel Calado Da Silba Freier** (Paris), **Wim Voorhout** (FEI)

**18:30 – 19:30** Dinner (Buffet) / Poster session

**Thursday, July 21** Liquid/solid NMR

***Amphitheatre François Jacob***

9:00 – 10:00 *Principles of NMR, structure determination et dynamics* – **Sophie Zinn-Justin** (Gif-sur-Yvette)

10:00 – 10:45 *Structure calculation from NMR data* – **Benjamin Bardiaux** (Paris)

**10:45 – 11:15** Coffee break

11:15 – 12:15 *NMR of biomolecular interactions* – **Nadia Izadi** (Paris)

**12:30 – 13:45** Lunch

13:45 – 14:45 HADDOCK – **Alexandre Bonvin** (Utrecht)

***Bioinformatics module (below the canteen)***

15:00 – 17:00 Practical session – **Alexandre Bonvin** (Utrecht), **Benjamin Bardiaux** (Paris)

**Amphitheatre François Jacob**

17:30 – 18:15 *Combining NMR and EM: application to the study of the viral particle of bacteriophages* – **Sophie Zinn-Justin** (Gif-sur-Yvette)

**18:30 – 19:30** **Dinner (Buffet) / Posters**

19 :45 – 20 :30 **Evening talk:** *Solid state NMR-based structural biology* – **Antoine Loquet** (Bordeaux)

**Friday, July 22**

**SAXS - Biophysics**

**Amphitheatre François Jacob**

9:00 – 10:30 *Hydrodynamic properties of biological macromolecules in solution* – **Bertrand Raynal** (Paris)

**10:30 – 11:00** **Coffee break**

11:00 – 12:30 *Solution X-ray Scattering from Biological macromolecules* – **Patrice Vachette** (Orsay)

**12:30 – 14:00** **Lunch**

**Bioinformatics module (below the canteen)**

15:00 – 18:00 Tutorials - Hydrodynamic properties and SAXS data analysis and modeling – **Bertrand Raynal** (Paris), **Yannick Spill** (Barcelone), **Patrice Vachette** (Orsay)

**18:00** **Free evening**

**Saturday, July 23**

**Mass spectrometry**

**Amphitheatre François Jacob**

9:00 – 9:30 *Mass Spectrometry in Structural Biology: an Introduction* – **Julia Chamot-Rooke** (Paris)

9:30 – 10:30 *Structural probing of protein complexes by protein cross-linking and mass spectrometry* – **Florian Stengel** (Konstanz)

**10:30 – 11:00** **Coffee break**

11:00 – 12:00 *Insight into protein structure and dynamics utilizing backbone amide hydrogen/deuterium exchange monitored by mass spectrometry* – **Thomas Jorgensen** (Southern Denmark)

12:00 – 13:00 *Higher-order protein structure by native MS and ion mobility* – **Frank Sobott** (Antwerp)

**13:00 – 14:00** **Lunch (Buffet)**

**Bioinformatics module (below the canteen)**

14:00 – 16:00 Practical session: IMP Tutorial – **Ben Webb** (San Francisco)

**16:30 – 16:45** **Coffee break**

16:45 – 17:45 Round table

17:45 – 18:00 *Conclusion of the course* - **Michael Nilges** (Paris)

**19:00 – 20:00** **Free evening**

**Sunday, July 24**

**Departure**

*Coffee every afternoon around 16:00 during practical sessions*