

# Introduction EMBO course mPEPC2

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EMBL Hamburg/Centre for Structural Systems Biology  
2<sup>nd</sup> September 2022

5<sup>th</sup> – 12<sup>th</sup> September 2022  
Hamburg, Germany



# Course organizers



Maria Garcia Alai



Eric Geertsma



Kim Remans



Christian Löw



Margret Fischer

mPEPC2 is an EMBO (sponsored) course



organized by EMBL Hamburg



Location: EMBL Hamburg and Centre for Structural Systems Biology (CSSB)



EMBL Hamburg 48e/47c

Practicals, coffee, lunch, ...



CSSB building 15

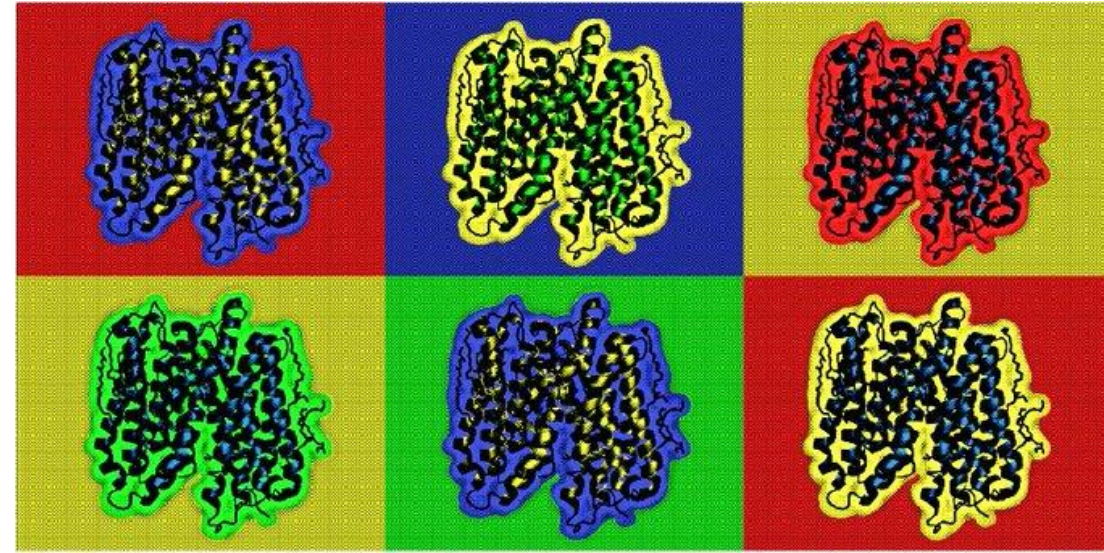
Lectures, Practicals, Poster sessions

History of the course:

**PEPC1 – PEPC10**: biannual EMBO course; soluble proteins

New course in 2018:

**mPEPC1**: focus on integral membrane proteins



mPEPC2: planned for 2020 → postponed to 2021 (Covid!), then cancelled

New EMBO application for 2022

**mPEPC2 in 2022**: in person event

## Idea behind the course



Research on membrane proteins in the past



# Idea behind the course



## Today:

- Know-how on Membrane Proteins has dramatically increased over the last 15 years
- Multiple tools for membrane protein research available

# Structure of the course

Lectures and Talks (+ mixture of both) and Practical Sessions (on selected topics)

## A) Membrane protein research

topics	Speaker	Ideas to cover
cloning, expr.	Kim Remans	Introduction to practical/Cloning/Expression (transient transfection, BacMam, methods for stable cell lines)
function	Martin Picard	Introduction to practical/Reconstitution strategies/Functional assays
expr./puri./qc	David Drew	GFP pipeline/Expression host /Purification/ Stability/transporters
qc	Maria Garcia	Introduction to practical/ biophysics on membrane proteins/ quality control
expr./puri	Bernadette Byrne	novel detergents/stabilizing mutations/ relevance of lipids
function/qc	Dirk Jan Slotboom	transport kinetics/functional characterization/SEC-Malls ...
discs	Jens Frauenfeld	Salipro/disc technologies/perspective from industry

# Structure of the course

## B) Structural analysis of membrane proteins

topics	Speaker	Ideas to cover
crystal	Martin Caffrey	Introduction to practical/LCP crystallization/enzymes
integ. model.	Jan Kosinski	Integrative modelling/usage of Alpha fold/nuclear pore complex
MX	Thomas Schneider	Intro to practical/ Basics of crystallography/serial crystallography
SAXS	Melissa Gräwert	Intro to practical/ Basics of SAXS/ SAXS and membrane proteins
Cryo-EM	Yong Zi Tan	Cryo EM on membrane proteins/ sample preparation tools
nanobodies	Jan Steyaert	nanobodies for structure determination of membrane proteins/stabilization of specific conformations

## C) Methods for addressing large complexes and membrane protein dynamics

topics	Speaker	Ideas to cover
CryoEM	Thomas Marlovits	CryoEM on large membrane protein assemblies
CryoEM/MX	Carola Hunte	membrane super complexes – a practical approach/antibodies as crystallization chaperons
AFM	Simon Scheuring	Atomic force microscopy on membrane proteins/new applications
mass spec./complexes	Nina Morgner	mass spectrometry on membrane proteins
FRET/dynamics	Thorben Cordes	single molecule FRET on membrane proteins/temporal dynamics
cryoET/in cells	Misha Kudryashev	cryoET to study membrane protein in cells
EPR/dynamics	Inga Hänel	Structure and Function of Transporters/EPR to study spatial dynamics of IMPs



## **Organization I:**

### **Flash talk session:**

Day 1: Posters with odd numbers (P01, P03, ...)

Day 2: Posters with even numbers (P02, P04, ...)

Pleased upload your presentation latest during the lunch break (max. 5 min); via USB stick, or email me, label file with Poster number P01, P03, etc.

### **Poster session in CSSB café, 1<sup>st</sup> floor:**

Day 1: Posters with odd numbers (P01, P03, ...)

Day 2: Posters with even numbers (P02, P04, ...)

## **Organization II:**

### **Meet the expert session (seminar room in 48E/outside):**

- 10 experts; 10 tables (Nr. 1 – 10)
- participants are grouped in pairs of two (see booklet page 6) – total of 10 groups
- experts stay at their table, participants move every 5 min

Group A: Table 1 → Table 2

Group B: Table 2 → Table 3

...

Group J: Table 10 → Table 1

## Organization III:

- Coffee breaks, lunch and dinner as indicated in the program
- Coffee in the EMBL area in CSSB (2<sup>nd</sup> floor)
- Wifi connection: see booklet page 67 (48e and CSSB)  
(Science Hotspot, Eduroam, EMBL\_GUEST)
- Sharing information: Google drive (presentations, practical info, pictures etc.)
- DESY side entrance (closes after 7pm and on week-ends; door can be opened from the main gate - use the bell)
- Online safety briefing: 16/20

## Time:

- Lecture/Practical start at **9:00** means **9:00** and not **9:05** or **9:10 !**

# Health and safety guidelines

- Please keep 1.5m distance
- Regular hand washing
- FFP2 or medicinal masks are required at all times, unless eating or drinking during the breaks



## Covid rules (concept provided last week)

- Wear a surgical/FFP2 mask at all times when indoors, or a FFP2 mask on public transport
- You will be provided with antigen self-tests. Please, take one for each day that you are involved in the course.

## Twitter



**Tweet #EMBOmpepc2**

- consent from speaker/participant/etc. required

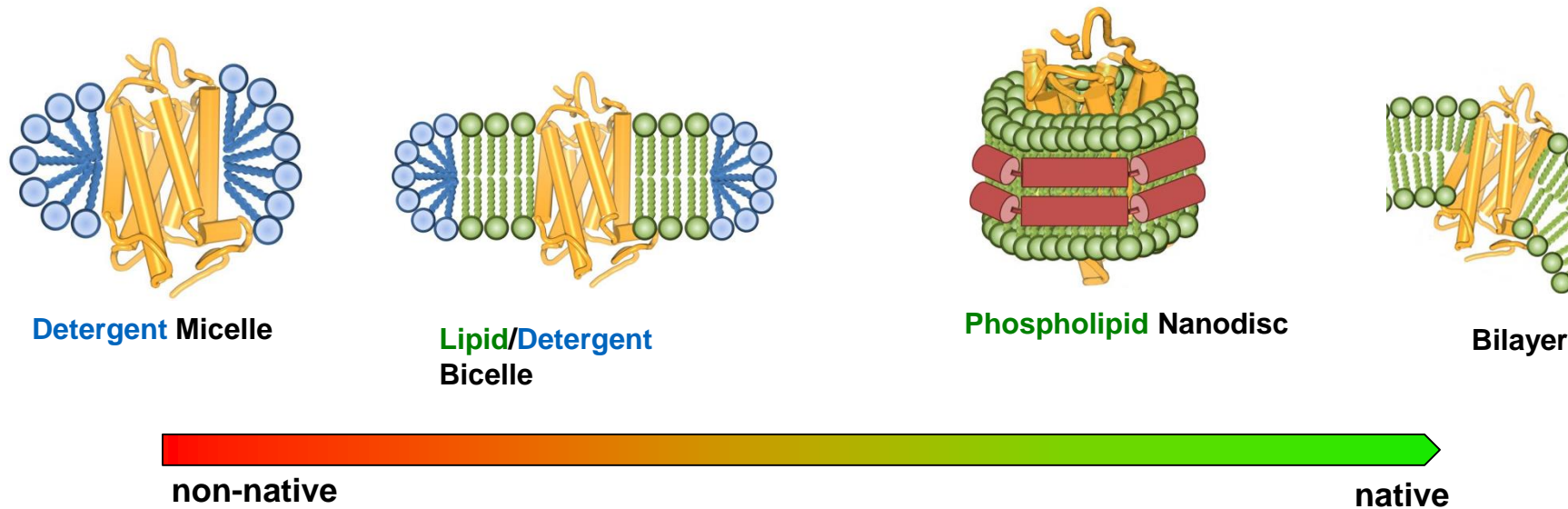
# Thanks to our sponsors !!





”... the importance of learning everything there is to know about a specific membrane protein and really getting to know the subtle chemical and biological nuances that exist.”

Christopher G Tate and Raymond C Stevens; Current Opinion in Structural Biology, 2010



**This is our course !!!**