

Amphipols are an innovative class of surfactants developed with the view of improving the stability of membrane proteins in aqueous solutions. They are short and flexible amphipathic polymers that carry many alkyl chains. They can substitute for detergents at the transmembrane surface of membrane proteins and remain associated to them even at extreme dilutions. After trapping in amphipols, membrane proteins are as a rule more stable biochemically than in detergent solutions, which increases the lifetime of fragile membrane proteins for the purpose of proteomics, structural and functional studies, and therapeutics. The relatively large size and rich chemistry of amphipols makes it possible to tag or label them without affecting their solution behavior, generating a library of molecules that expand the scope of applications. This mini-symposium will introduce the theory and practice for an efficient use of these unusual surfactants, drawing on the expertise of internationally recognized speakers.

An introduction to the design, properties and applications of amphipols is available on [Amphipol website](#). This is the fifth Amphipol Workshop. Previous editions took place in Paris in 2010 and 2013, in Copenhagen in 2011 and in Cleveland in 2012.

Main organizer.

Prof. Matthias Wolf,
*Molecular Cryo-Electron Microscopy Unit,
OIST*

Co-organizers.

Fadel Samatey,
Transmembrane Trafficking Unit, OIST
Manuela Zoonens & Christel Le Bon,
Institut de Biologie Physico-Chimique CNRS Paris

Outline. The workshop will comprise two parts: **Lectures** and **Practicals**.

Lectures. Open up to 50 attendees.

Will include presentations about membrane protein structure, the use of detergents, membrane protein (in)stability in aqueous solution, structure and properties of amphipols, functionalized amphipols, trapping membrane proteins with amphipols, structure and properties of membrane protein/amphipol complexes, amphipol-assisted membrane protein folding and cell-free expression, amphipol-mediated membrane protein immobilization, NMR, mass spectrometry and cryo-EM studies of amphipol-trapped membrane proteins, amphipol-assisted crystallization of membrane proteins in lipid 3D phase and the use of amphipols to formulate vaccines.

Speakers: Shin-ichi Aizawa, Melanie J. Cocco, Jörg Kleinschmidt, Werner Kühlbrandt, Martin Picard, Jean-Luc Popot, Fadel Samatey, Tom Watkinson, Manuela Zoonens.

Practicals. Open up to 20 attendees.

Practicals will include training on membrane protein trapping with amphipols, amphipol-assisted membrane protein folding, characterization by size exclusion chromatography and thermal stability studies of membrane protein/amphipol complexes and membrane protein immobilization onto solid supports.

Teachers: Christel Le Bon & Manuela Zoonens.

We would like to thank our sponsors for their generous support:



Amphipol Mini Symposium

OIST, Okinawa, Japan, Feb. 15-17 2016

Applications of Amphipols to Membrane Protein Studies

Confirmed speakers:

Shin-ichi Aizawa,
Melanie J. Cocco,
Jörg Kleinschmidt,
Werner Kühlbrandt,
Martin Picard,
Jean-Luc Popot,
Fadel Samatey,
Tom Watkinson,
Manuela Zoonens.

Deadline for registration:

December, 15 2015

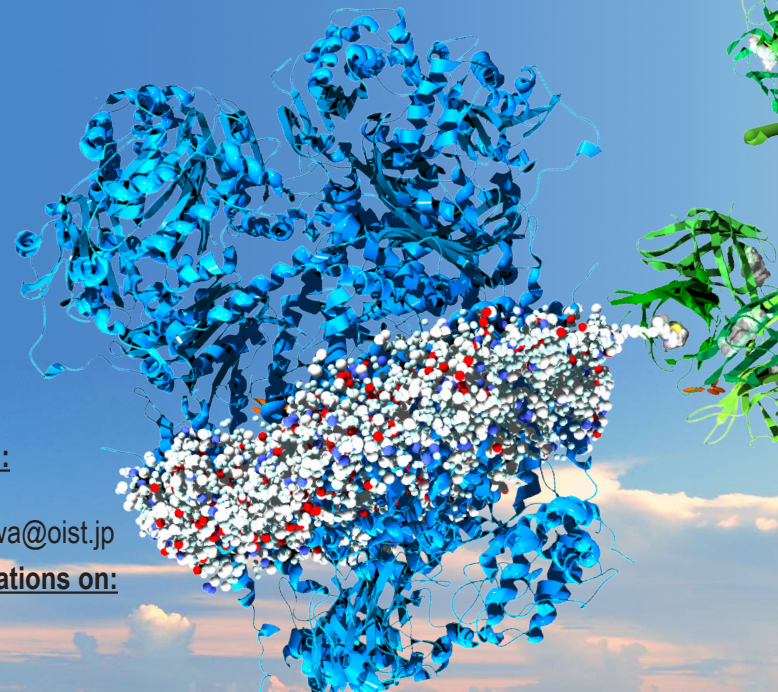
Contact: amphipol.okinawa@oist.jp

More on amphipol applications on:

www.ibpc.fr/amphipol

Program on:

<https://groups.oist.jp/cws/event/amphipol-symposium-2016>



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Amphipol Mini Symposium 2016

Monday, February 15, 2016

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- 09:00 Welcome & Presentation of the workshop. 15'
Organizers of the workshop
- 09:15 A general introduction to membrane protein structure, function and stability. 20' + 10' discussion
Fadel Samatey (OIST, Japan)
- 09:45 Destabilization of membrane proteins by detergents and overview of alternatives. 45' + 15' discussion
Manuela Zoonens (CNRS, Paris, France)
- 10:45 Coffee break
- 11:15 Structure and properties of amphipols. 45' + 15' discussion
Applications of amphipols to membrane protein studies.
Manuela Zoonens (CNRS, Paris, France)
- 12:15-14:00 Lunch
- 14:00 Folding and stability of integral membrane proteins in amphipols. 30' + 15' discussion
Jörg Kleinschmidt (University of Kassel, Germany)
- 14:45 Mass spectrometry. 30' + 15' discussion
Tom Watkinson (University of Leeds, UK)
- 15:30 Coffee break
- 16:00 On the way to crystallization. 30' + 15' discussion
Martin Picard (CNRS, Paris, France)
- 16:45 Interactive discussion group 30' discussion
with a guest of honour, Jean-Luc Popot
- 18:00 Dinner
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Amphipol Mini Symposium 2016

Tuesday, February 16, 2016

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- 09:00 An introduction to electron microscopy. 30' + 15' discussion
Shin-ichi Aizawa (Hiroshima Pref. University, Japan)
- 09:45 Cryo-EM for membrane protein studies. 30' + 15' discussion
Werner Kühlbrandt (MPI, Frankfurt, Germany)
- 10:30 Coffee break
- 11:00 Vaccination application. 30' + 15' discussion
Melanie Cocco (University of California, Irvine, USA)
- 11:45 General discussion. 30' discussion
- 12:15-14:00 Lunch
- 14:00 Practical part 1: Amphipol-assisted folding of a membrane protein (bacteriorhodopsin) from its denaturated state to its native state.
Christel Le Bon & Manuela Zoonens (CNRS, Paris, France)
- 18:00 Dinner
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Wednesday, February 17, 2016

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- 09:00 Practical part 2: Amphipol-assisted immobilization of a membrane protein onto a solid support.
Christel Le Bon & Manuela Zoonens (CNRS, Paris, France)
- 12:30-14:00 Lunch
- 14:00 Practical part 3: Trapping of a membrane protein in amphipol.
Practical part 4: Thermostability of membrane proteins trapped in amphipols
Christel Le Bon & Manuela Zoonens (CNRS, Paris, France)
- 18:00 Dinner
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