

A multidisciplinary workshop

MEMBRANE BIOLOGY FRONTIERS:

DYNAMICS, ENERGY, STRUCTURE AND TECHNOLOGY

FRIDAY 29 MAY – MONDAY 1 JUNE 2009

(Arriving on Thursday 28 May & Departing on Tuesday 2 June)

Mykonos & Delos, Greece

Organizers:

Bengt Nordén, Chalmers University of Technology, Sweden

Shuguang Zhang and Andreas Mershin, M.I.T., USA

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Day 1, Friday, May 29 2009

8:30 AM-1:30 PM

8:30-8:50 AM

Introductory remarks. Introduce the workshop, the sponsors, information about the hotel and the Mykonos, Delos.

Bengt Nordén, Andreas Mershin & Shuguang Zhang, & Mykonos city council member Yiannis Daktilidis and others

Session:

Membrane protein organizations (Chair, Bengt Nordén)

8:50-9:30 Hartmut Michel, Max-Planck Institute, Frankfurt
TBA

9:30-10:00 Gunnar von Heijne, Stockholm University
Membrane protein topology

10:00-10:30 Eva Pebay-Peyroula, Institute of Biological Structure, Grenoble
Structural approaches of mitochondrial carriers

Break 10:30-11:00

New technology for working on membrane proteins (Chair, Andrew Marshall)

11:00-11:30 Horst Vogel, EPFL, Switzerland
GPCR signaling by micro- and nanotechnologies

11:30-12:00 Robert Stroud, UCSF
Approach to effective expression of human and eukaryotic membrane proteins

12:00-12:30 Alan Fersht, MRC-Protein Engineering Center, Cambridge, UK
Tumor suppressor p53: Structure and drug targeting

12:30-1:00 Yael Maguire, MIT & Thing Magic
Miniature NMR microslot waveguide probe

1:00-1:30 David Kong, MIT-Center for Bits & Atoms
Design microfluidic device to produce olfactory receptors

1:20-8:00 PM Small group self-assemblies

Evening session 8:00-10:00 PM

Some aspects of structural biology (Chair, Anders Liljas)

8:00-8:30PM Vittorio Luzzati, CNRS, Gif-sur-Yvette, France
Synchrotron diffraction of single neuronal axon

8:30-9:00 Marina Garber, Russian Academy of Science, Pushchino, Russia
Crystallization and the crystal structure of the heterotrimeric archaeal complexes

9:00-9:30 Martin Egli, Vanderbilt University
Orchestration of a circadian system by a nanomachine

9:30-10:00 Alexander Rich, MIT-Biology
Virus infection & the innate immunity

Day 2, Saturday, 30 May 2009

Morning 8:30 AM-1:00 PM

Membrane dynamics (Chair, Astrid Gräslund)

8:30-9:00 Astrid Gräslund, Stockholm University
The amyloid beta peptide: structure & aggregation in membrane mimetic media.

9:00-9:30 Yechiel Shai, Weizmann Institute
Peptide-peptide interaction in the membrane: design modulators of membrane proteins

9:30-10:00 Bengt Nordén, Chalmers University of Technology
Significance & mechanisms of slow processes in bio-molecular contexts

10:00-10:30 Uwe Sleytr, Austrian Academy of Sciences, Austria
Nanobiotechnology with monomolecular protein lattices (S-layers)

Break 10:30-11:00

Membrane protein transports (Chair, Eva Pebay-Peyroula)

11:00-11:30 Poul Nissen
The formation of gradients and potentials by Na⁺, K⁺-ATPase and related pumps

11:30-12:00 Marten Vos, Ecole Polytechnique, Paris
Mechanisms of fast charge transfer in membrane proteins

12:00-1:00 Satoshi Murakami, Osaka University
Multidrug efflux transporter - the pumping mechanism

2:00-7:00 PM Delos Tour (Small group self-assemblies)

Evening, 7:00-11:00 PM

The Jack & Florence Aviv Foundation Banquet

Day 3, Sunday, 31 May 2009

Morning 8:30 AM- 1:00 PM

Solar energy molecular machines (Chair, Nathan Nelson)

8:30-9:00 James Barber, Imperial College
The big bang of evolution and engine of life

9:00-9:30 Nathan Nelson, Tel Aviv University
Plant photosystem I: from single photon detection to hydrogen production

9:30-10:00 Wolfram Saenger, Freie University, Berlin
New insights on the structure of cyanobacterial photosystem II at 2.9Å resolution

10:00-10:30 Giovanni Giacometti, University of Padova, Italy
Artificial photosynthesis: will it be possible?

10:30-11:00 Break

Nanobiotechnology of membrane proteins (Chair, Shuguang Zhang)

11:00-11:30 Michael Graetzel, EPFL
Nanocrystalline solar cells

11:30-12:00 Andreas Mershin, MIT
Biosolar energy nanodevice from photosystem I

12:00-12:30 Joel Schnur, Naval Research Labs
Photo-induced electron transfer at bio-inorganic interfaces

12:30-1:00 Joel Sussman, Weizmann Institute
Proteopedia - a Scientific 'Wiki' Bridging the Rift Between 3D Structure and Function of Biomacromolecules

1:00-8:00 PM Small group self-assemblies

Day 3, 8:00-10:00 PM

The unexpected (Chair, Andreas Mershin)

8:00-8:30 Stavros Hamodrakas, University of Athens
Computational analysis of GPCRs, G-proteins, effectors & their interactions

8:30-9:00 Luca Turin, Flextral & MIT
Molecular electronics of tranquilizers

9:00-9:30 Makis Skoulakis, Alexander Fleming Institute, Greece
Unambiguous discrimination of odorant isotopes by olfaction of flies

Day 4, Monday, 1 June Morning

8:30 AM-1:00 PM

Membrane protein structure & function (Chair, Poul Nissen)

8:30-9:00 Stephan White, University of California, Irvine
Making sense of ion channel voltage sensors

9:00-9:30 Joanne Yeh, University of Pittsburgh
Structure of glycerol-3-phosphate dehydrogenase: modulation of respiration & energy

9:30-10:00 Margarida Archer, ITQB, Portugal
Structure of cytochrome C quinol dehydrogenase NrfH

10:00-10:30 Richard Neutze, Göteborg University
Aquaporins: structure, function & regulation

10:30-11:00 TBA

11:00-11:30 Break

Membrane biology (Chair, Martin Egli)

11:30-12:00 Jan Kubicek, Qiagen, Germany
High throughput methods for membrane protein crystallizations

12:00-12:30 Bonnie Wallace, Birkbeck College, UK
Circular dichroism & synchrotron radiation CD for the study of membrane proteins

12:30-1:00 Andrew Marshall, Nature Biotechnology
Trends in membrane protein biotechnology

Afternoon 3:00-6:00 PM

Simple methods, tools and materials (Chair, Andrew Marshall)

3:00-3:30 Brian Cook, MIT
Large scale productions of functional human olfactory receptors

3:30-4:00 Manu Prakash, MIT
Microfluidic bubble logic device

4:00-4:30 Liselotte Kaiser, Attana Technology
Attana A200, new technology for determine protein-protein interactions

4:30-5:00 Joanke Graveland-Bikker, Leiden University
Production of GPCRs in Pichia

5:00-5:30 Hanna Eriksson, Stockholm University
Production of membrane proteins in E.coli

5:30-6:00 Shuguang Zhang
Designer lipid-like detergents

The finale 6:00-7:00PM

Introduction by Ander Liljas

Ada Yonath, Weizmann Institute
From the ribosome to the ER membrane

The workshop adjourns

OTHER INVITED PARTICIPANTS

*Charlotte Hauser, IBN,

*Jack Aviv, Aviv Biomedical

*Keiji Nagano, New Media Japan

*Jiro Takei, 3DM-Japan

*Kentaro Takamura, 3DM-Japan

Mouad Lamrani, Menico, Co. LTD

GPCRs

New circular dichroism tools

New peptide surfactants

New peptide surfactants

New peptide surfactants

General interest