

European postgraduate students and postdoctoral researchers are invited to apply to attend a Masterclass in

Systems approaches to membrane proteins

Sponsored by EMBN-Train, MPSi & E-MeP-Lab

Institute for Membranes and Systems Biology and the
Astbury Centre, University of Leeds, Leeds, UK

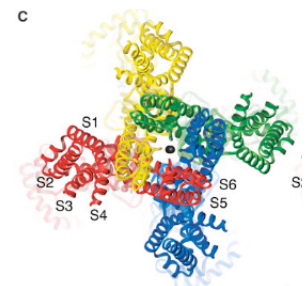
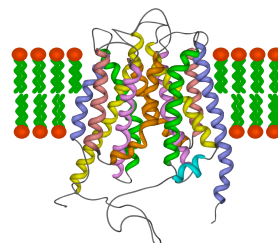
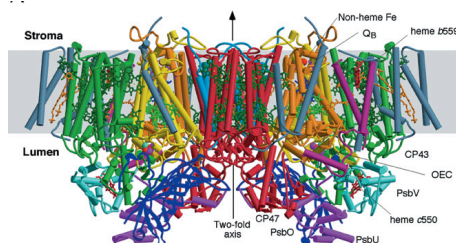
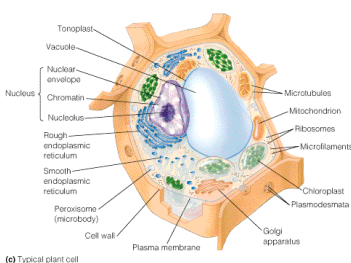
3rd – 11th March, 2007

Hosted by Professor Peter Henderson

This workshop brings together renowned scientists expert in membrane biology. They will share their knowledge and expertise in a wide range of membrane studies. The workshop will include lectures, demonstrations and appropriate practical work. Participants will be encouraged to discuss their own research interests during the course.

Places are limited so prospective students are encouraged to apply as soon as possible. To apply please send one A4 page summarising career details and reasons you wish to undertake the course and submit before 26th January, 2007 to Sue Wright, susan.c.wright@leeds.ac.uk Tel: 44 (0)113 343 3029

For additional information see: <http://www.ebi.ac.uk/e-mep/emep/lab.php>



A. A plant cell and its membranes B. Structure of the photosystem II membrane protein complex C. Model of a membrane transport protein D. Model of an ion channel

Core Master Class on systems approaches to membrane proteins – summary of topics

- Bioinformatics and membrane proteins across species
- Membrane proteins in bacteria
- Membrane proteins in fungi
- Membrane proteins in parasites
- Membrane proteins in plants
- Membrane proteins in animals and man
- Relevance of membrane proteins to human health and to the development of therapeutics;
- Data protection, IPR issues, due diligence, record keeping and patents.

- Structural Genomics of membrane proteins;
- Theoretical aspects of membrane protein structure and topology
- Targeting of membrane proteins
- Experimental determination of membrane protein structure and topology

- Functional assays
- Amplified expression of membrane proteins
- High throughput expression screening techniques
- Membrane protein purification

- Biophysical approaches to structure determination
2D arrays and electron diffraction; 3D crystals and X-ray diffraction; TROSY/CRINEPT and solution state NMR; CD; FTIR spectroscopy

Examples will be offered from the following throughout the course, and students can suggest their own. ion channels; 7-trans-membrane helix proteins and GPCR's; 12-helix membrane transport proteins and ABC transporters; ATP-ADP exchanger and mitochondrial transporters; aquaporins; porins; Ca²⁺ATPase; F₀F₁ ATPase; TolC/AcrB complex; dehydrogenases; oxidases and respiratory electron transfer reactions; photosynthetic light-harvesting and electron transfer complexes

The training methods will include quizzes, and each student making a presentation on one topic to the group

Demonstrations may include

high throughput cloning and expression techniques
high throughput crystallisation and visualisation techniques
assay of membrane channels in oocytes
cloning and expressing a prokaryote membrane protein
purification of a membrane protein
mass spectrometry
electron microscopy
NMR, solution and solid state

Problem clinics, quizzes and tutorials are programmed throughout the course

Experts on EU mobility and employment trends will be available for consultation

Feedback from students will be invited

There will be opportunities for some local tours and sight-seeing