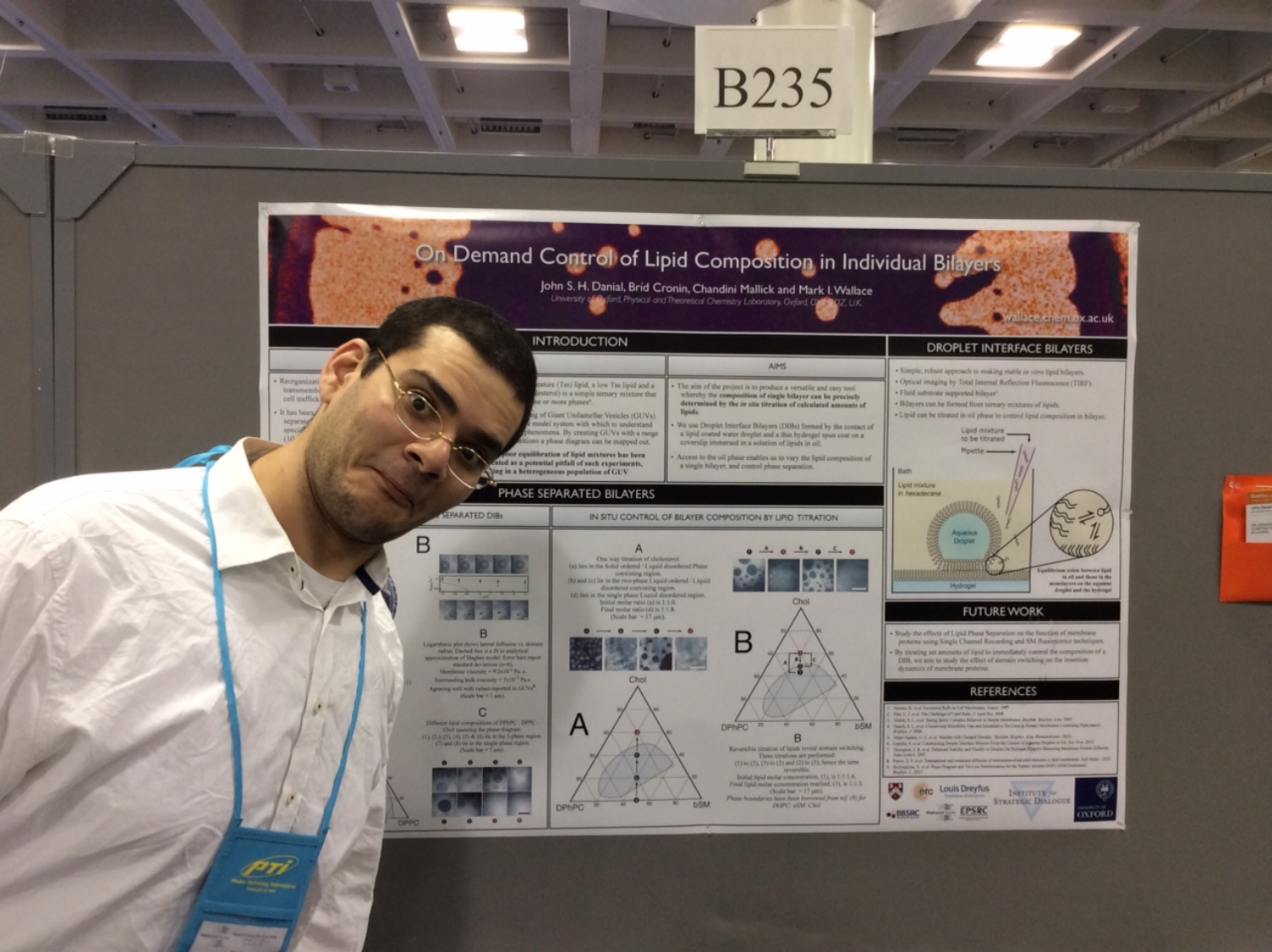
B235
On Demand Control of Lipid Composition in Individual Bilayers
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INTRODUCTION
AIMS
The aim of the project is to produce a versatile and easy tool whereby the composition of single bilayer can be precisely determined by the in situ titration of calculated amounts of lipids.
We use Droplet Interface Bilayers (DIBs) formed by the contact of a lipid coated water droplet and a thin hydrogel span coat on a coverslip immersed in a solution of lipids in oil.
Access to the oil phase enables us to vary the lipid composition of a single bilayer, and control phase separation.
DROPLET INTERFACE BILAYERS
Simple, robust approach to making stable in vitro lipid bilayers.
Optical imaging by Total Internal Reflection Fluorescence (TIRF).
Fluid substrate supported bilayer.
Bilayers can be formed from ternary mixtures of lipids.
Lipid can be titrated in oil phase to control lipid composition in bilayer.
Lipid mixture to be titrated
Pipette
Bath
Lipid mixture in hexadecane
Aqueous Droplet
Hydrogel
Equilibrium exists between lipid in oil and those in the monolayers on the aqueous droplet and the hydrogel
PHASE SEPARATED BILAYERS
IN SITU CONTROL OF BILAYER COMPOSITION BY LIPID TITRATION
Chol
DPhPC
bSM
DPPC
FUTURE WORK
Study the effects of Lipid Phase Separation on the function of membrane proteins using Single Channel Recording and SM fluorescence techniques.
By titrating set amounts of lipid to immediately control the composition of a DIB, we aim to study the effect of domain switching on the insertion dynamics of membrane proteins.
REFERENCES
Louis Dreyfus
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UNIVERSITY OF OXFORD
BBSRC
EPSRC