



UNIVERSITY OF
OXFORD

Systems Biology

Doctoral Training Centre



A presentation by 14 students in 14 parts



University of Oxford

Doctoral Training Centres

Welcome to the portal page for Doctoral Training Centres within the University of Oxford.

LSI DTC



[Life Sciences Interface Doctoral Training Centre](#)



The LSI DTC provides a tailored training programme for graduates from primarily physical science backgrounds who wish to conduct research in the clinical and life sciences.

Sysbio DTC



[Systems Biology Doctoral Training Centre](#)



The research focus of the Systems Biology DTC is in developign a systems approach to "bridging the gap" between theoretical and experimental knowledge from the level of the individual protein to the level of the whole cell/organism.

SABS-IDC



[Systems Approaches to Biomedical Science Industrial Doctorate Centre](#)



The SABS-IDC profices a comprehensive training programme to prepare physical and life sciences graduates to undertake research careers in drug discovery and medical imaging at the industrial interface.

Medical Sciences DTC

[Medical Science Doctoral Training Centre](#)



The Medical Sciences DTC offers six Wellcome Trust funded programmes, each with a distinct intellectual flavour. Students carry out research projects with scientists at the forefront of their fields in addition to receiving outstanding training.

IBME CDT

[Institute of Biomedical Engineering Centre for Doctoral Training](#)



We are looking for bright, talented students with excellent grades in their first degree in engineering OR a physical sciences subject to join a new and exciting DPhil in Healthcare Innovation graduate training and research programme.

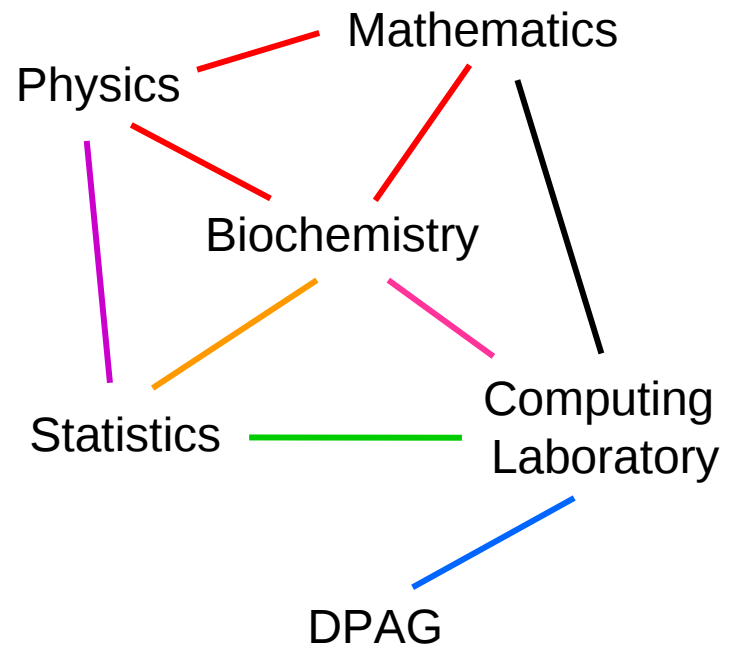
The Systems Biology Doctoral Training Centre

EPSRC

Engineering and Physical Sciences
Research Council

- **Systems Biology DTC (2007)** – for life sciences or physical sciences students, who wish to take a ‘systems’ approach to the following research themes:

- Detailed Pathway Modelling
- Larger Scale Network Modelling
- Cellular Modelling
- Physiome Modelling



Programme Structure

4 years

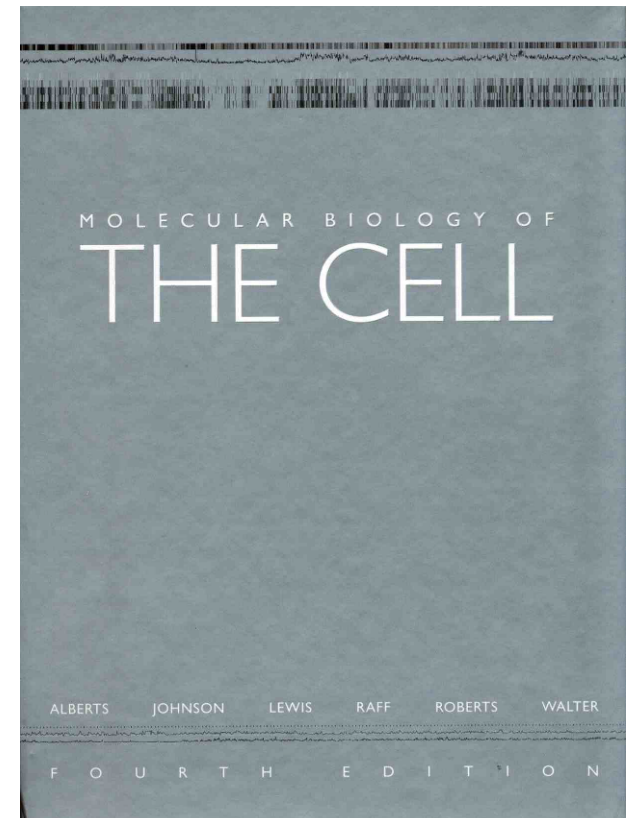
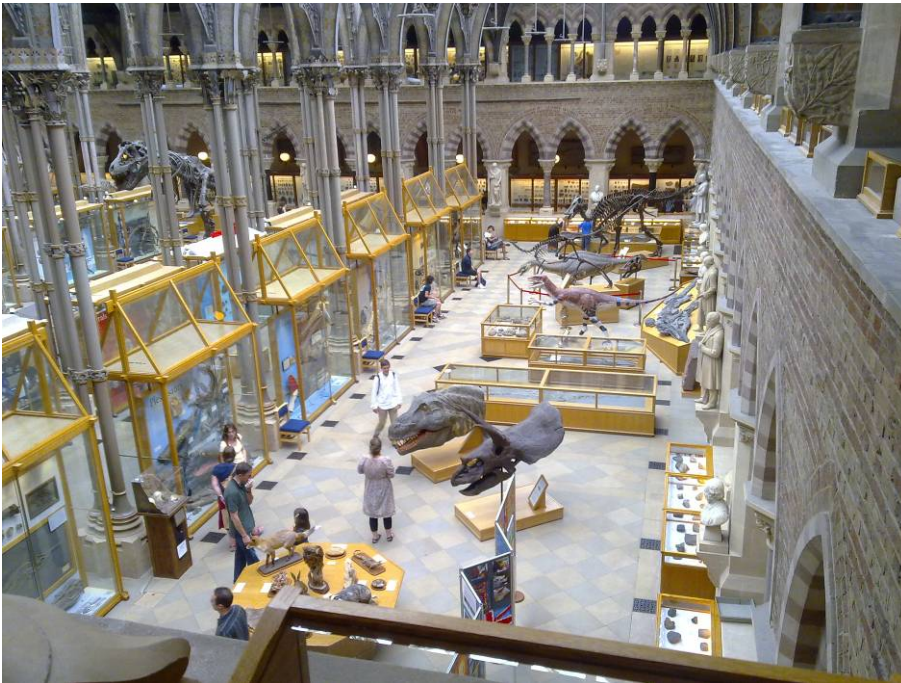
Just over 2 terms of intensive courses in core skills taught in an interactive, team-based, problem-oriented learning style:

- directed reading
- interactive lectures
- problem solving classes
- laboratory-based experimental work
- programming practicals
- workshops
- journal clubs
- student-led presentations
- discussion groups
- research skills

- 2 extended (10 week) research projects, one of which will (typically) lead onto the D.Phil. project
- 9 term doctoral research project
- Support from the DTC throughout the 4 years

First year highlights: I

Biological Systems; Molecular Genetics and Cell Biology

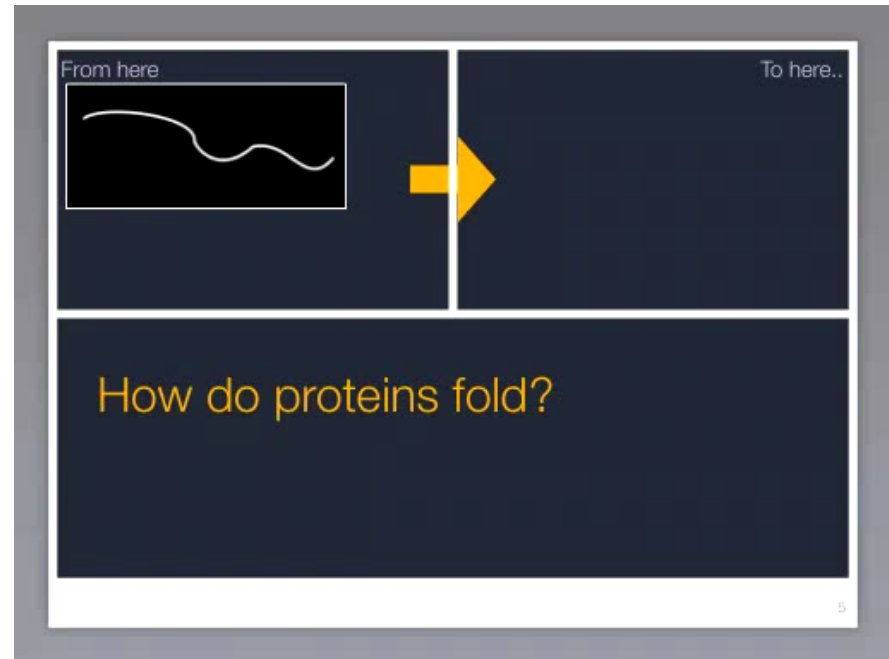


First year highlights: II

Computational Structural Biology: the cinematic experience



Parallel or anti-parallel β -sheets?



Experimental techniques to study protein folding

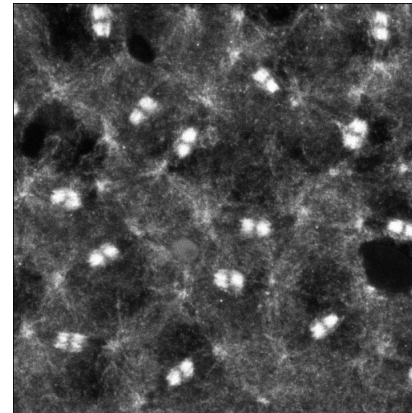
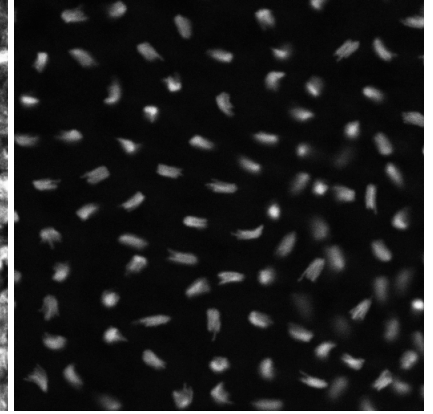
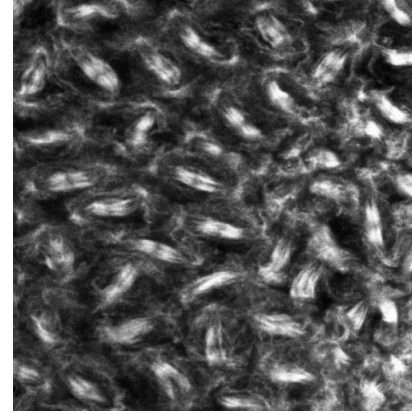
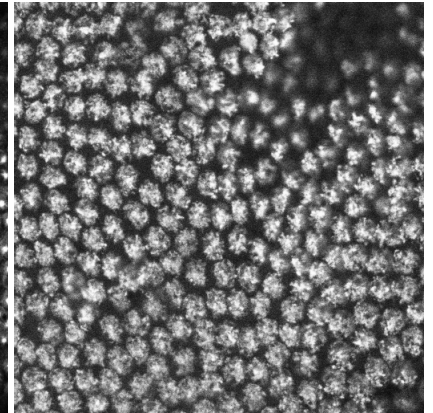
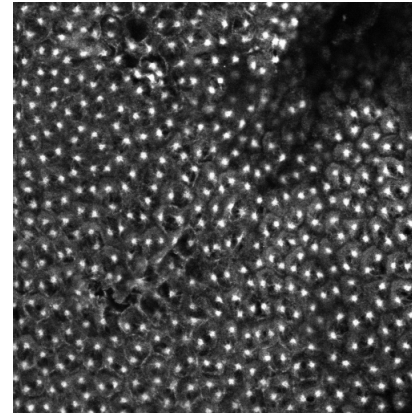
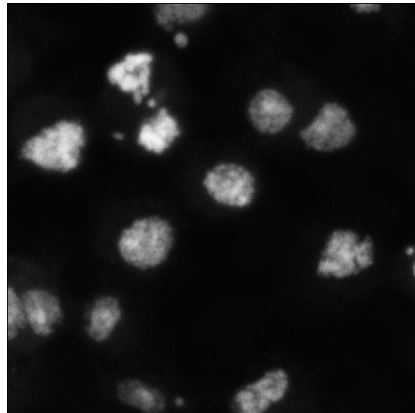
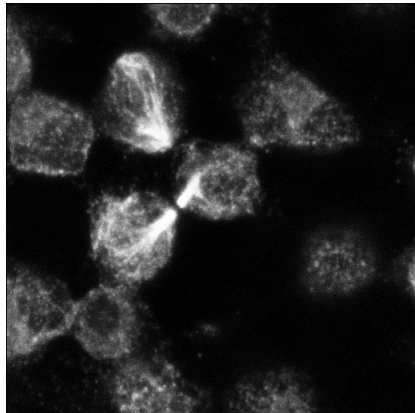
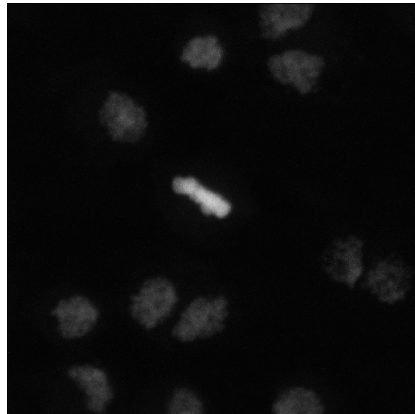
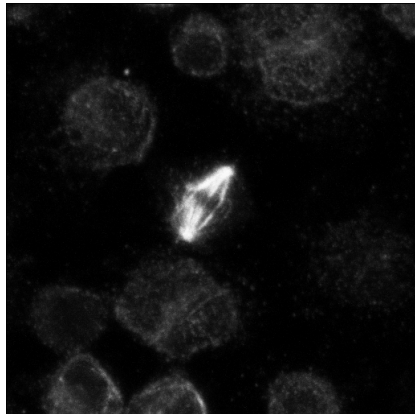
First year highlights: III

Biological Experimental Techniques

Drosophila tissue culture cells

Microtubules

DNA

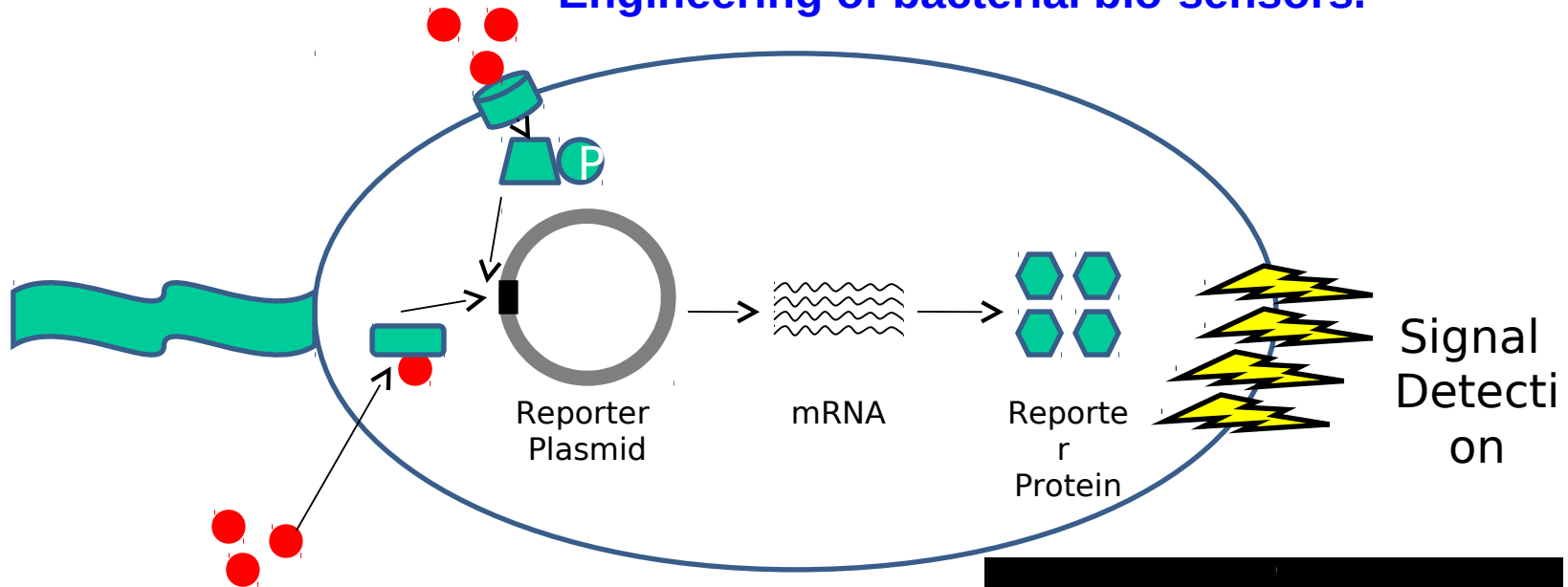


**Drosophila
embryo nuclei**

Research snapshots: I

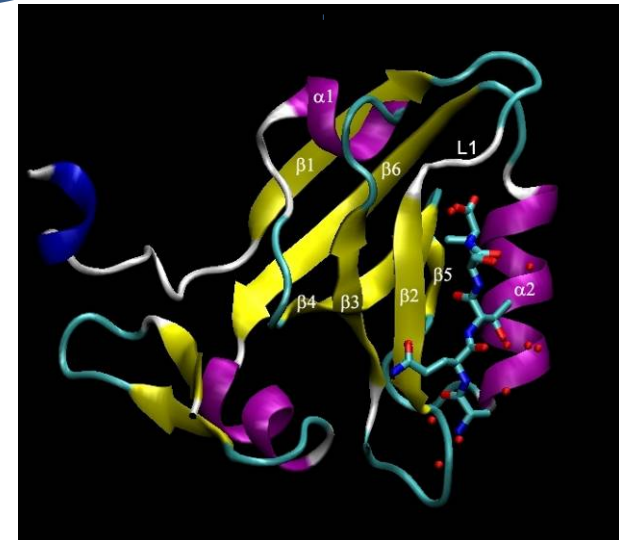
Engineering of bacterial bio-sensors.

Gareth
Davies



Developing novel approaches for the comparative analysis of Molecular Dynamics trajectories of small proteins with the aim of quantifying their dynamic similarity and detecting similar patterns in their conformational dynamics.

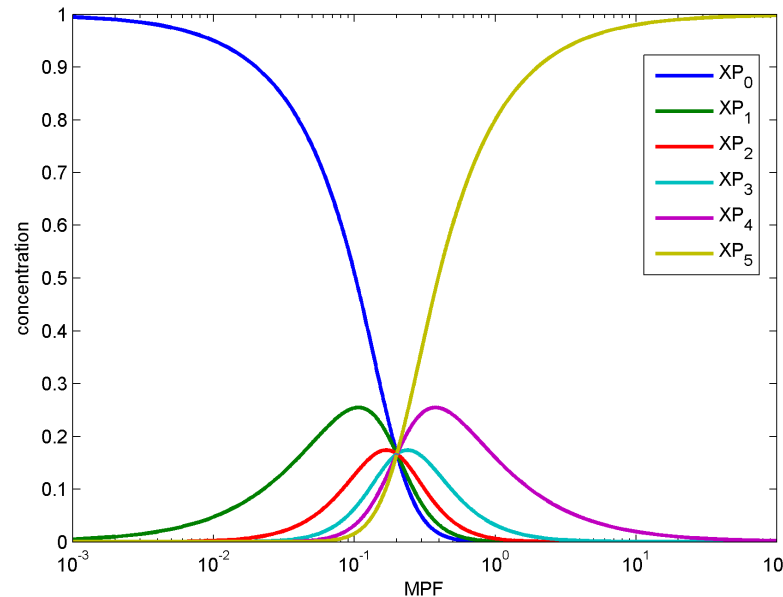
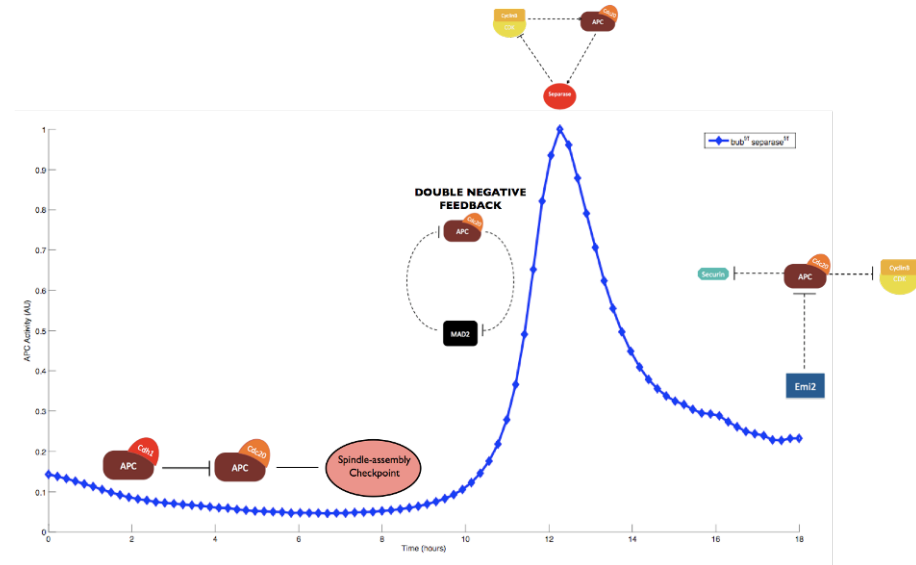
Márton Münz



Research snapshots: II

Quantifying Anaphase Promoting Factor/Cyclosome (APC/C) activity in live mouse oocytes. Elucidating details of APC/C activation and APC regulation during meiosis.

Ahmed Rattani

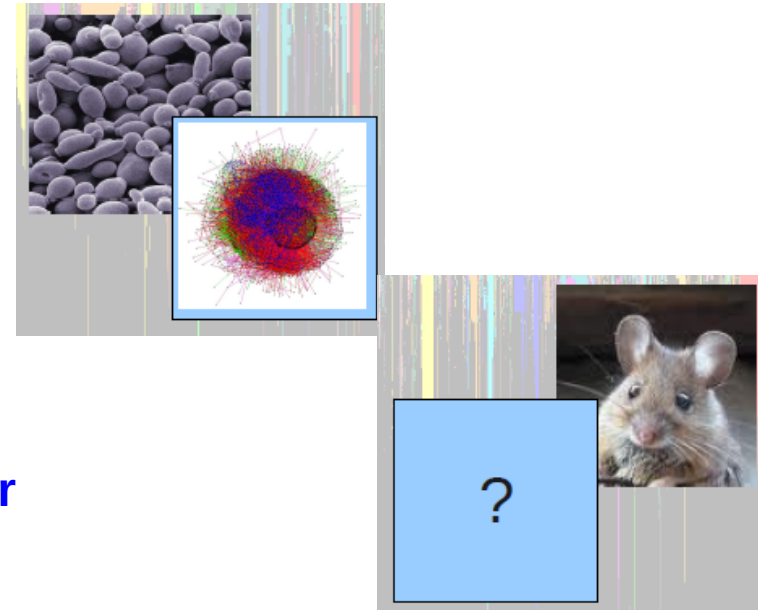


Mathematical analysis of regulation by phosphorylation and dephosphorylation, using the eukaryotic cell cycle as an example.

Maria Rosa
Domingo Sananes

Research snapshots: III

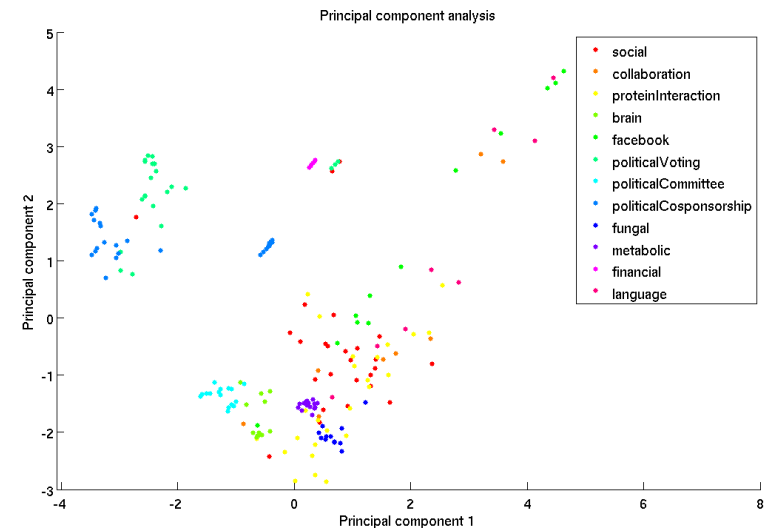
What can we learn from protein interaction networks? Currently working on a model for what sorts of interactions are most likely conserved during evolution, with the aim of inferring the interactomes of species for which we have no data.



Anna Lewis

How does network structure relate to function or phenotype? Can we use features of network organisation to characterise different kinds of networks?

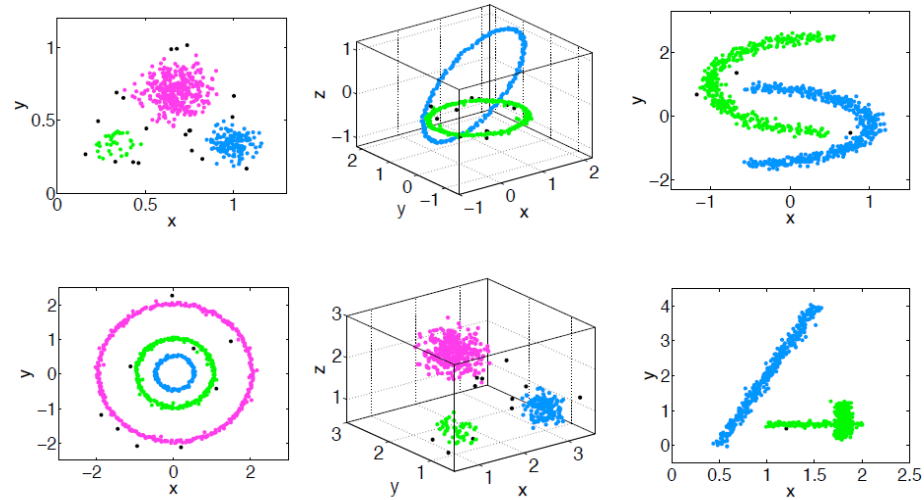
Sumeet Agarwal



Research snapshots: IV

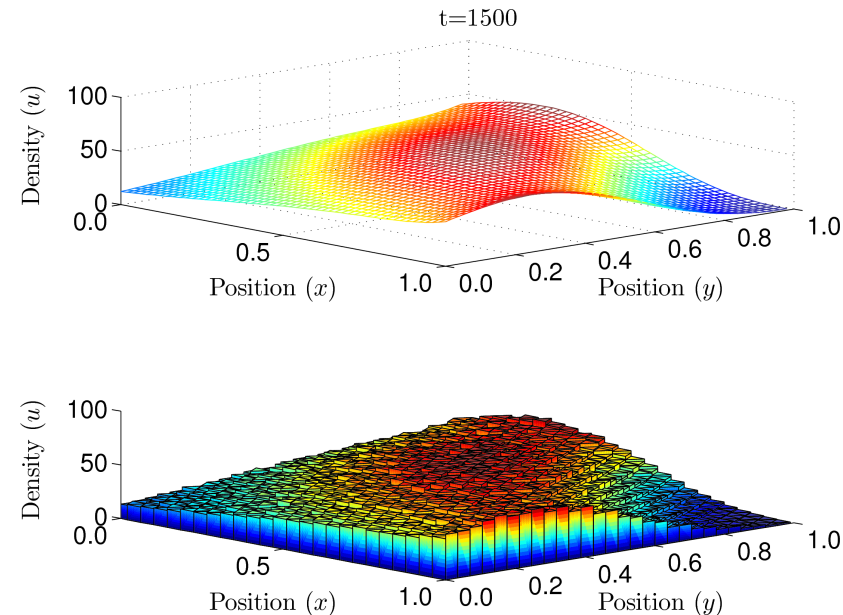
Development of a fuzzy clustering algorithm for complex data sets and its application towards cancer microarray data analysis.

Ornella Cominetti



Going rigorously from discrete individual-based microscopic models of cell migration to continuum macroscopic population based models on non-standard domains.

Christian Yates



More research topics

Matthew Gibb

Cardiac mechanics

Guido Klingbeil

**Parallel stochastic
simulation**

Yaseen Ladak

**Mitosis in
*Drosophila***

Philip LoCascio

**GPCRs as functional
probes in *E. coli***

Ayse Ozhan

**Bacterial motility
and behaviour**

Alexander Robson

**Membrane transport
and micro-structure**

Acknowledgements

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DTC Director

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DTC Deputy Director

Dr. Gail Preston
SysBio Prog. Director

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- Ransom Khanye
- Everyone in the LSI DTC
- All our tutors and supervisors

