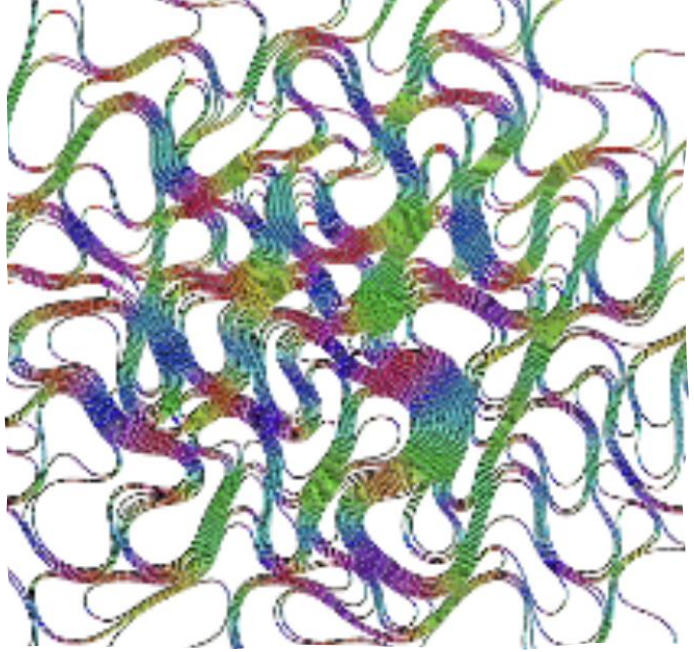
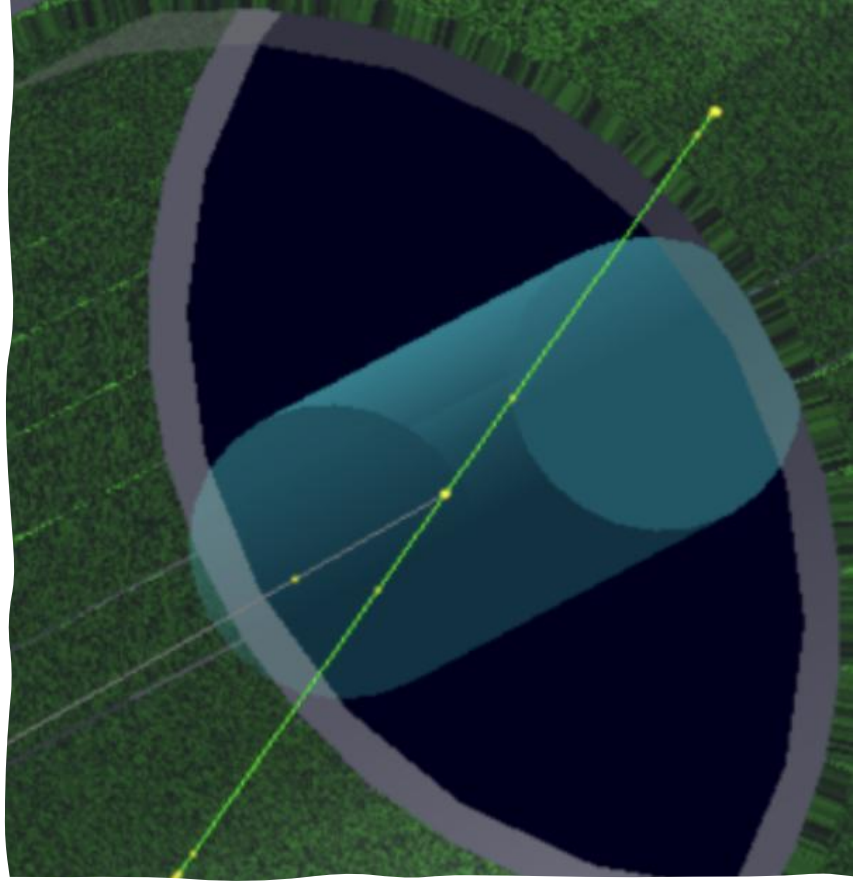
Flash talks session 2





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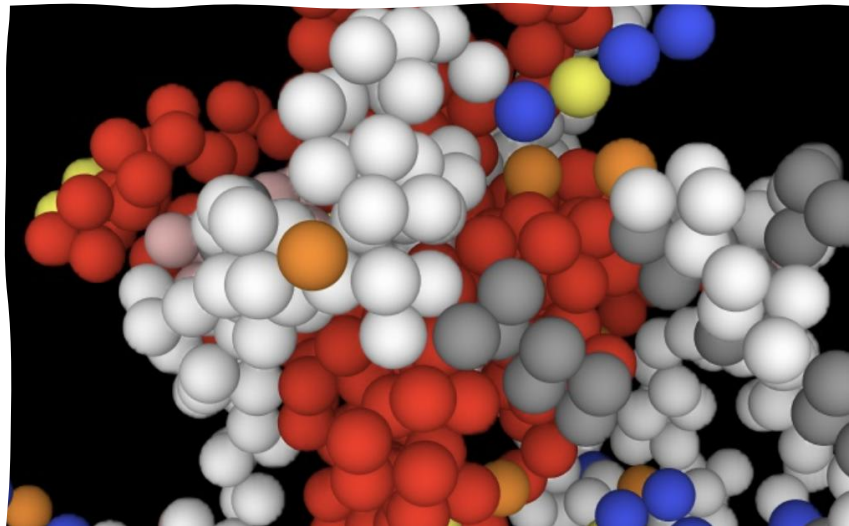
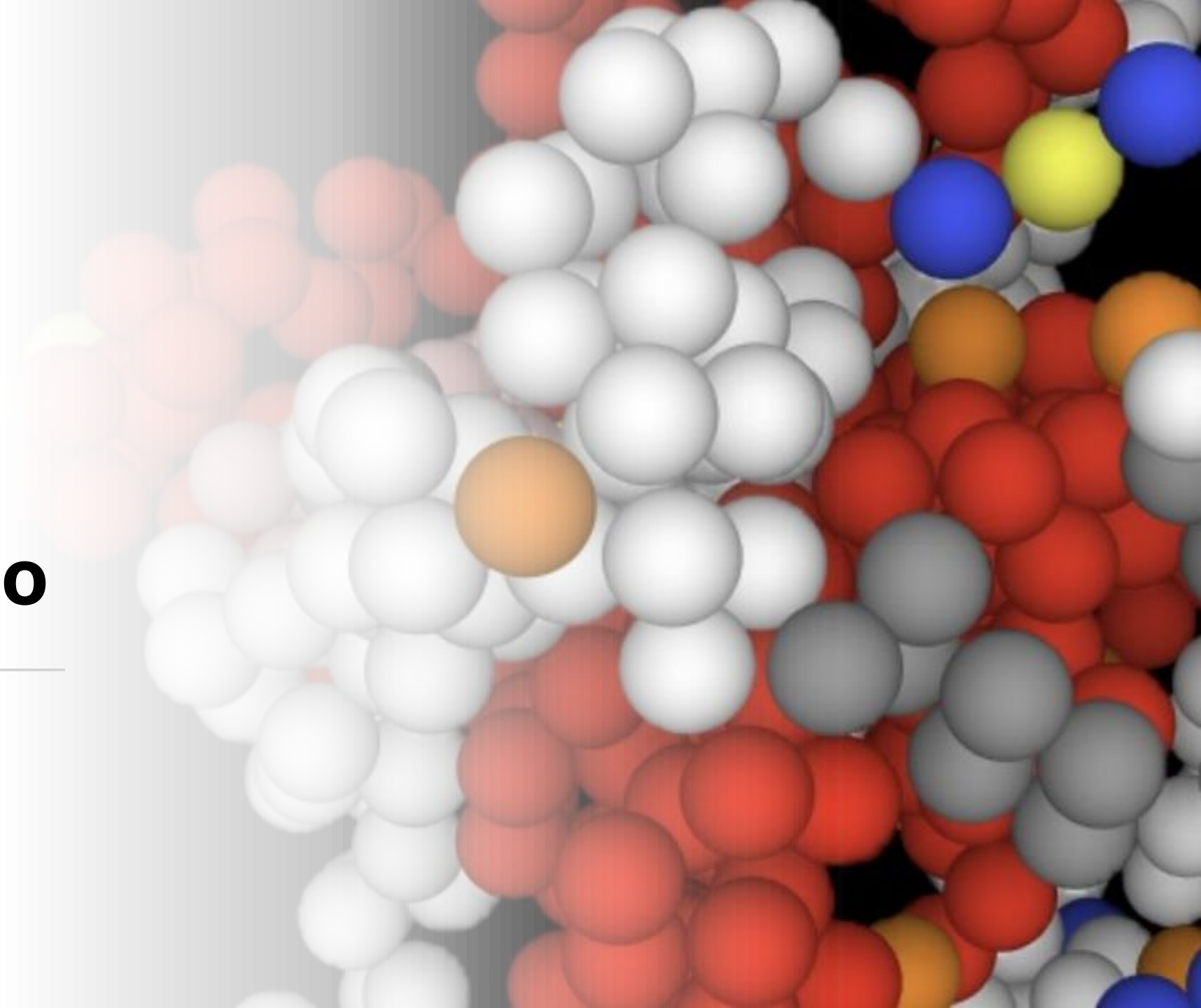
Edinburgh Centre for Biomedical Physics



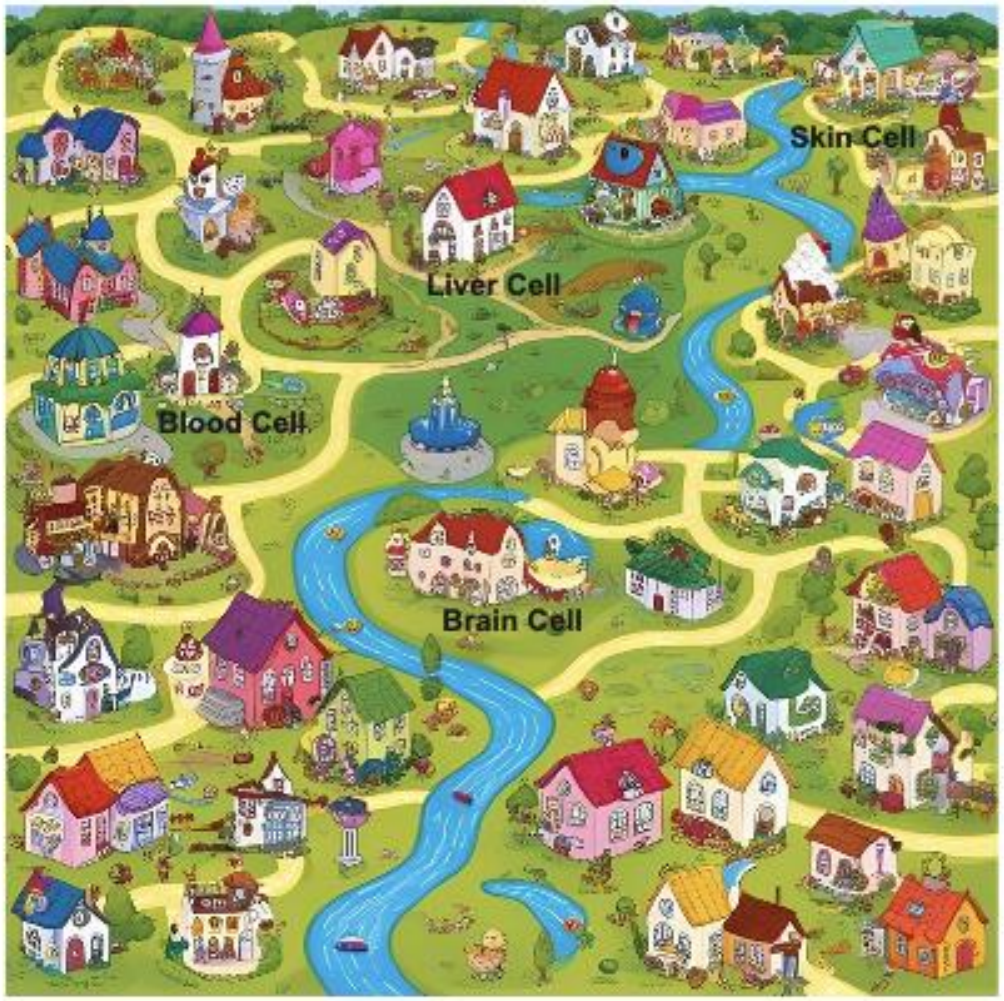
Sara Buonomo



The Buonomo lab little story….

How do we copy ALL the information that is in our genome?

Clue: the information is not only in “the words”….



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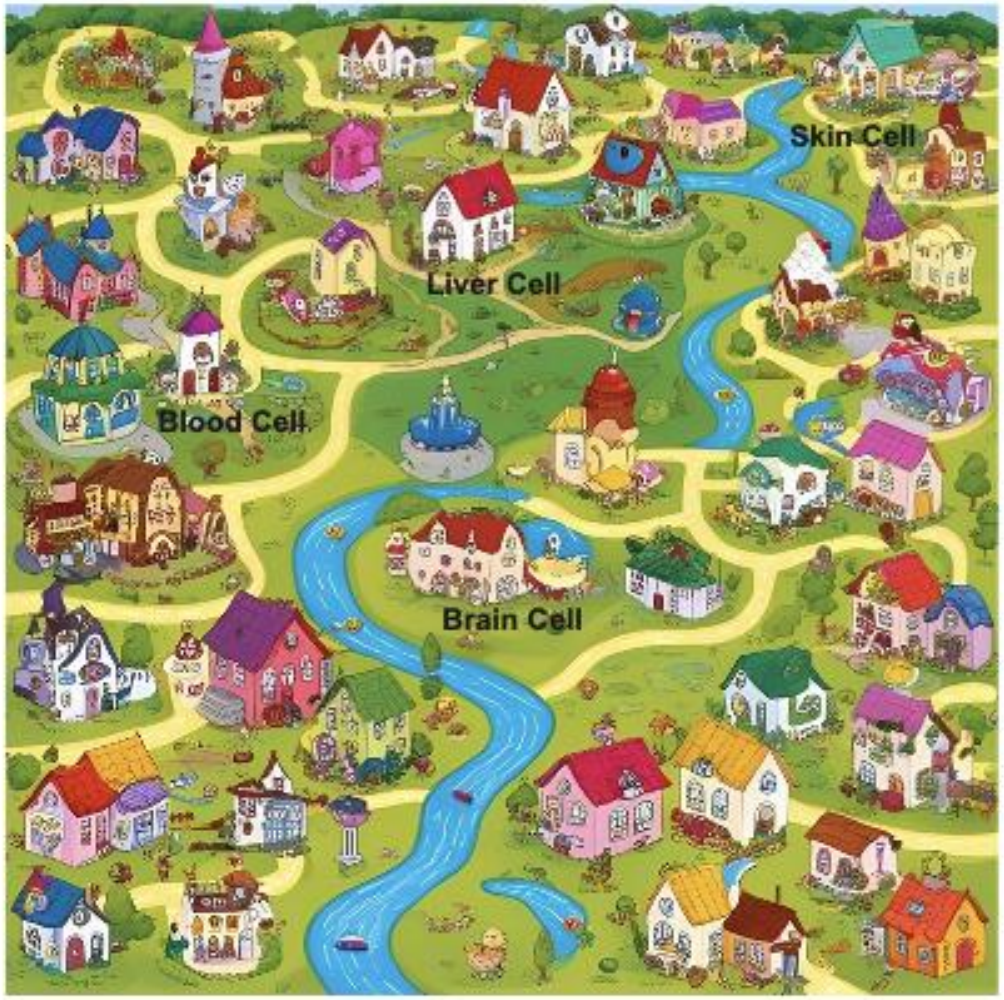
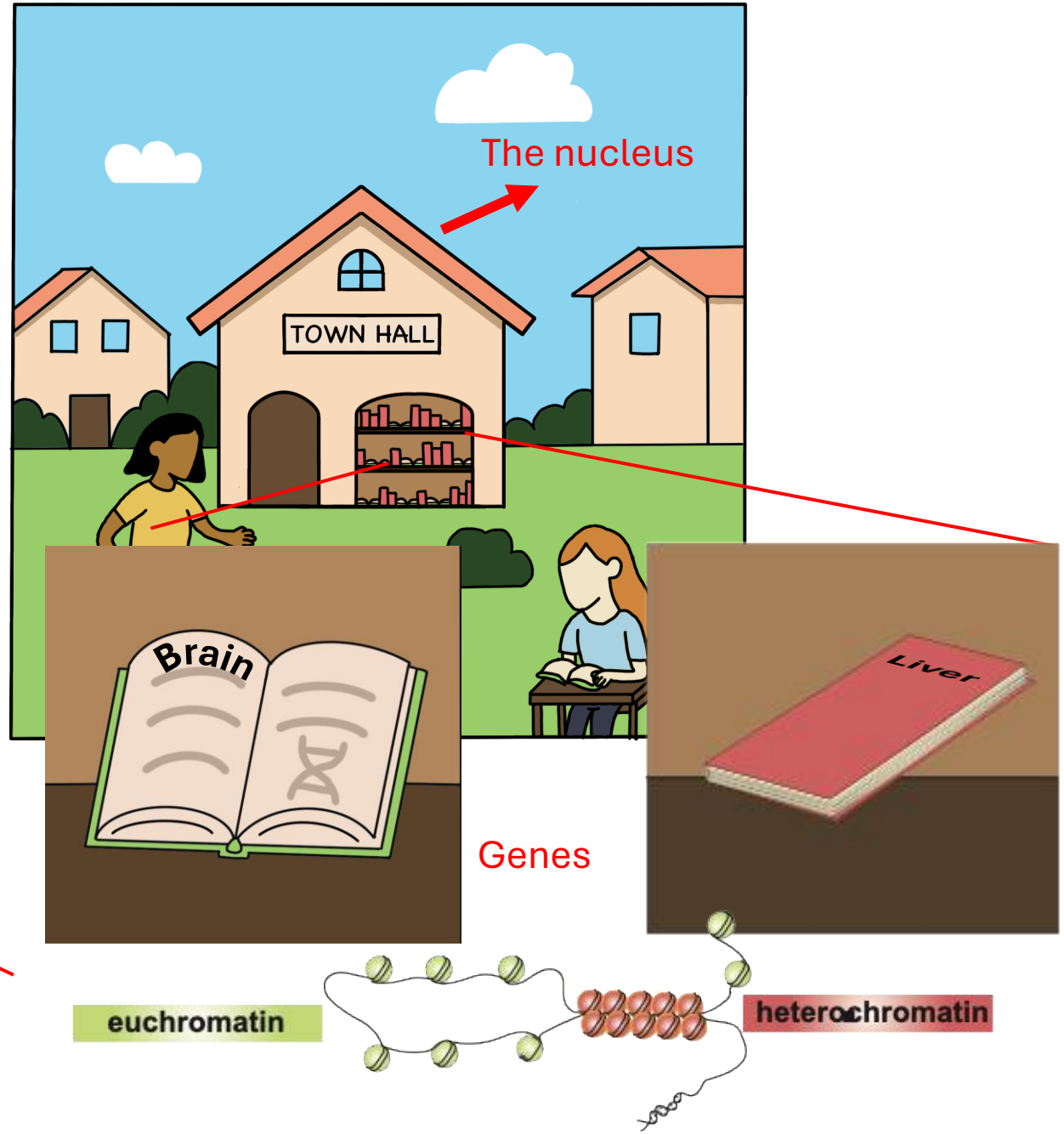
Brain Cell Town

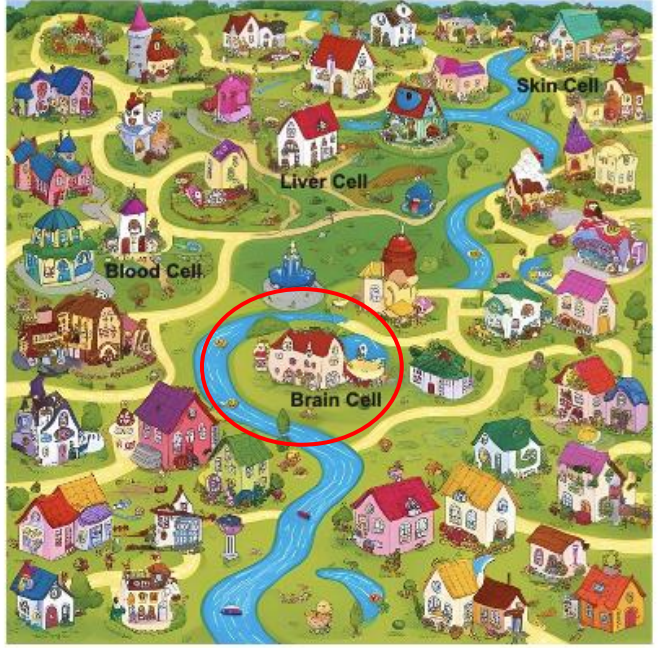




Cartoon by Nathan Law

Duplicate Brain Cell Town: 1. copy

If we want to duplicate our town “Brain Cell” and reproduce it EXACTLY, we first need to copy ALL the books.



Cartoon by Nathan Law

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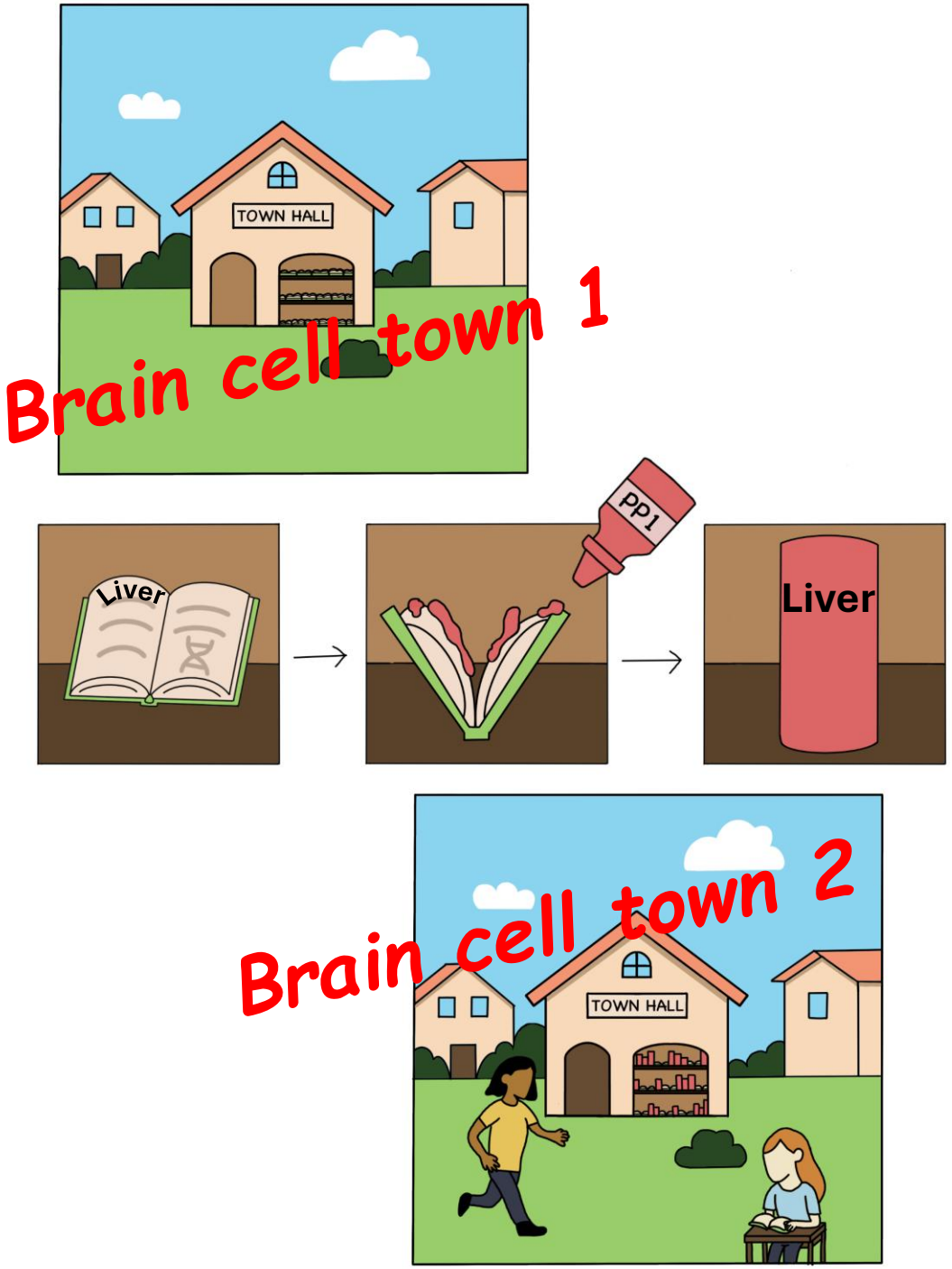
Duplicate Brain Cell Town:
2. Glue back non-brain books



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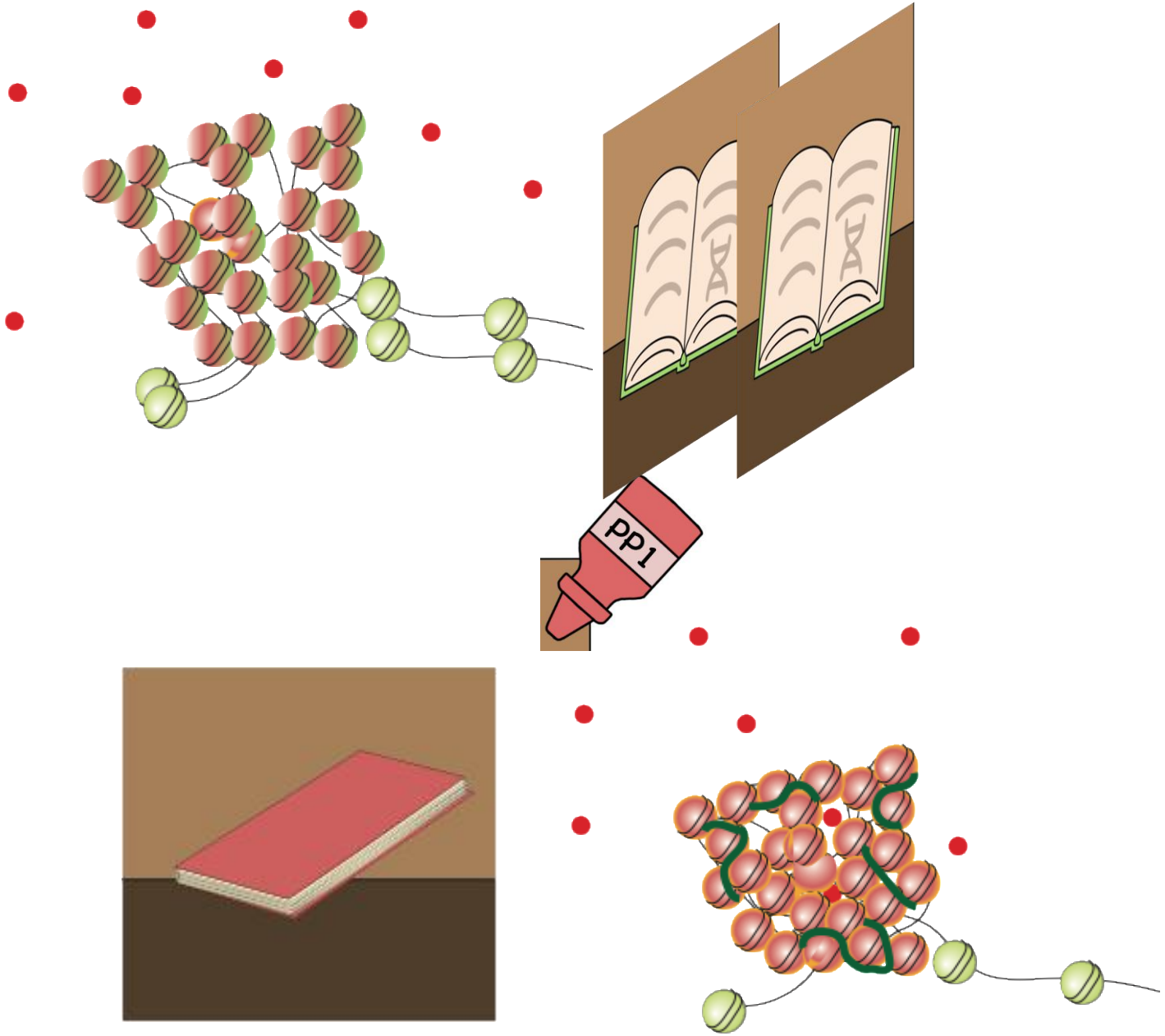
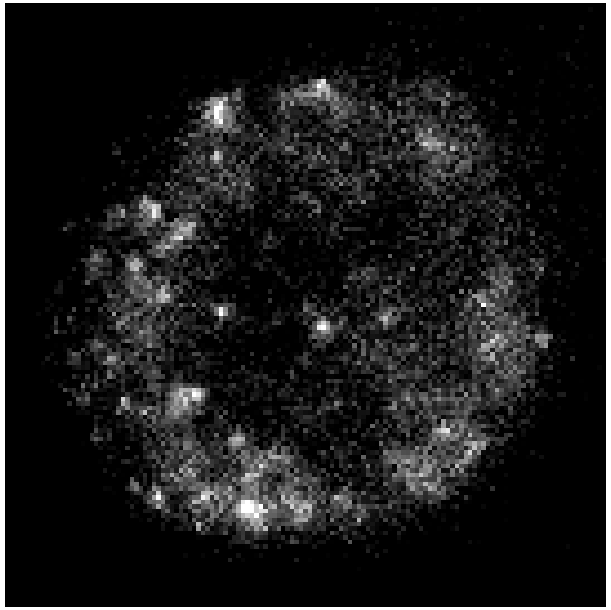
Heterochromatin as "autocatalytic substrate"?





PP1 halo in mouse embryonic stem cells

Sophia Tcherkova and Bram Prevo, unpublished

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School of Biological Sciences

European Research Council
Established by the European Commission

Buonomo Group
Reshma Ravindran
Sophia Tcherkova
Nathan Law
Tina Karagyozova
Susanna Aslop
Jose Las Heras
Shaunak Burse
Anett Ladanyi

Earnshaw Group
Bram Prevo

Arulandandam (JP) group

Wilson group
James Watson

University of Dundee

Alabert Group
Susanne Bandau
Vanesa Alvarez

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

BBSRC
bioscience for the future

International nucleome consortium

School of Physics
Giada Forte
Davide Marenduzzo

School of Inormatics
Hakan Bilen

San Diego BioMed

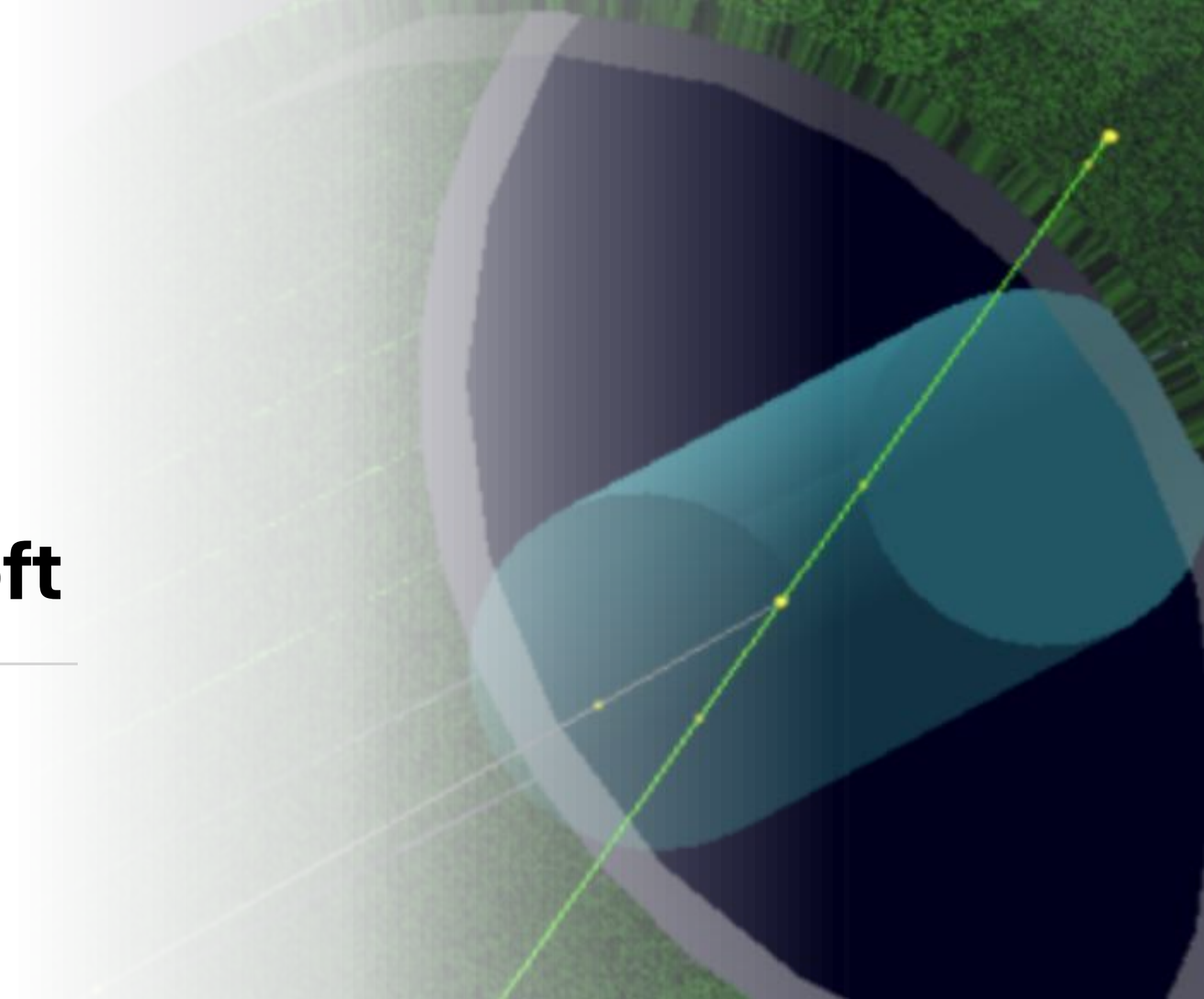
Gilbert Group
Takayo Sasaki

UK Centre for Mammalian Synthetic Biology

COIL imaging
David Kelly

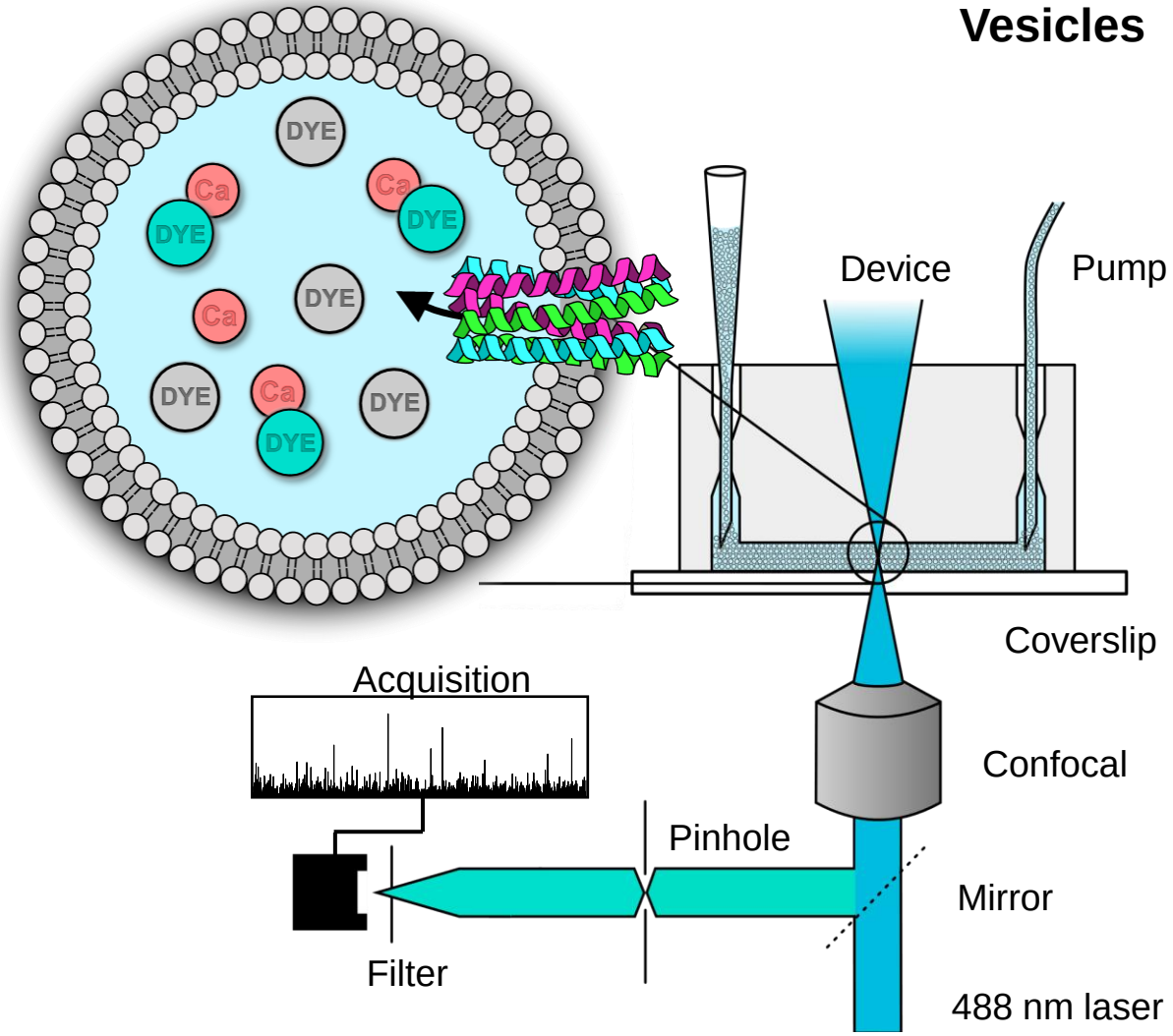
Flow cytometry
Marie Goepp

Scott Cockroft



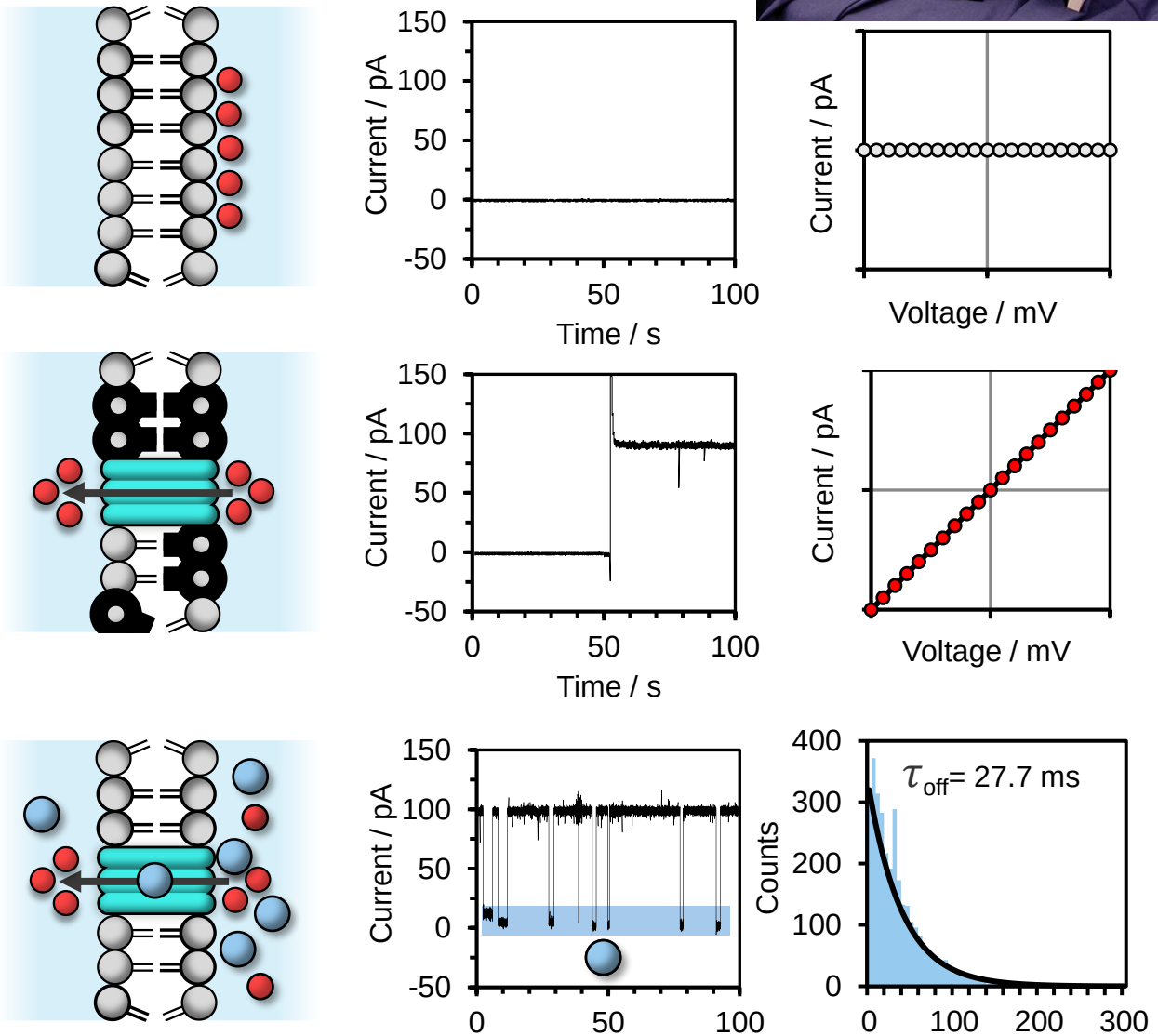
Scott Cockroft group – School of Chemistry – Single-Molecule Studies of Membranes

Vesicles



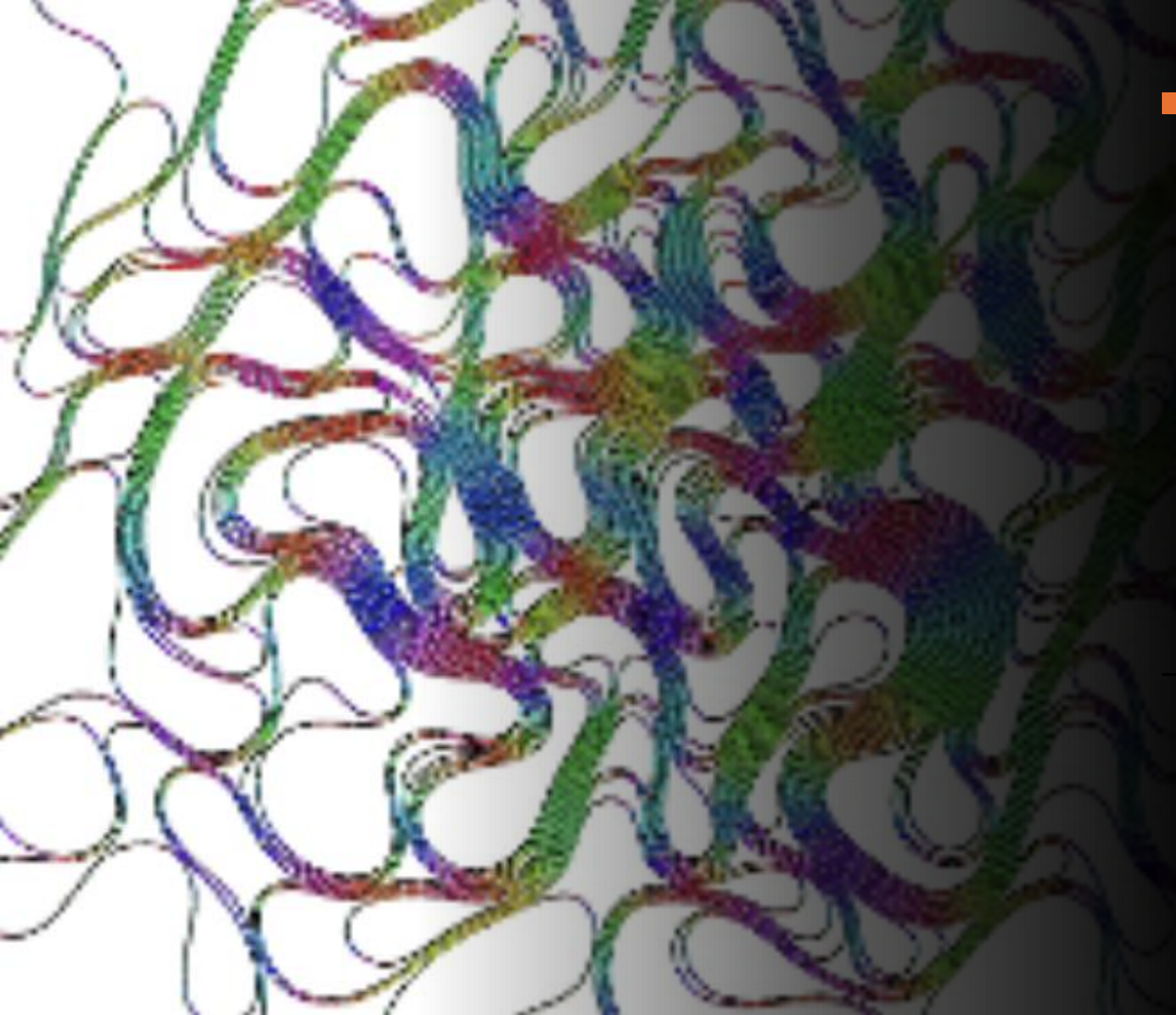
with Mathew Horrocks

Planar bilayers



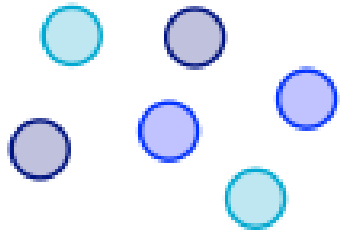
Angew. Chem. Int. Ed., DOI: 10.1002/anie.202503678 (2025)

Phys. Chem. Chem. Phys., *26*, 17745–17752 (2024)



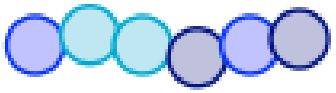
Chris Coxon

Chemical & Peptide Synthesis



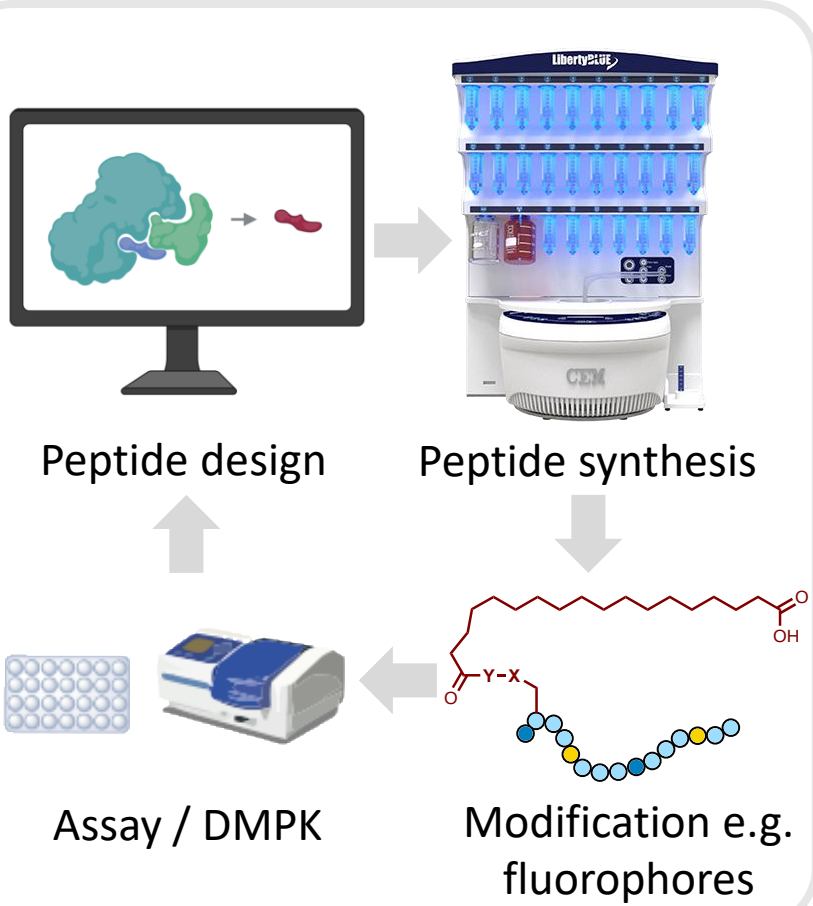
Amino acids

combine in sequence



Peptide

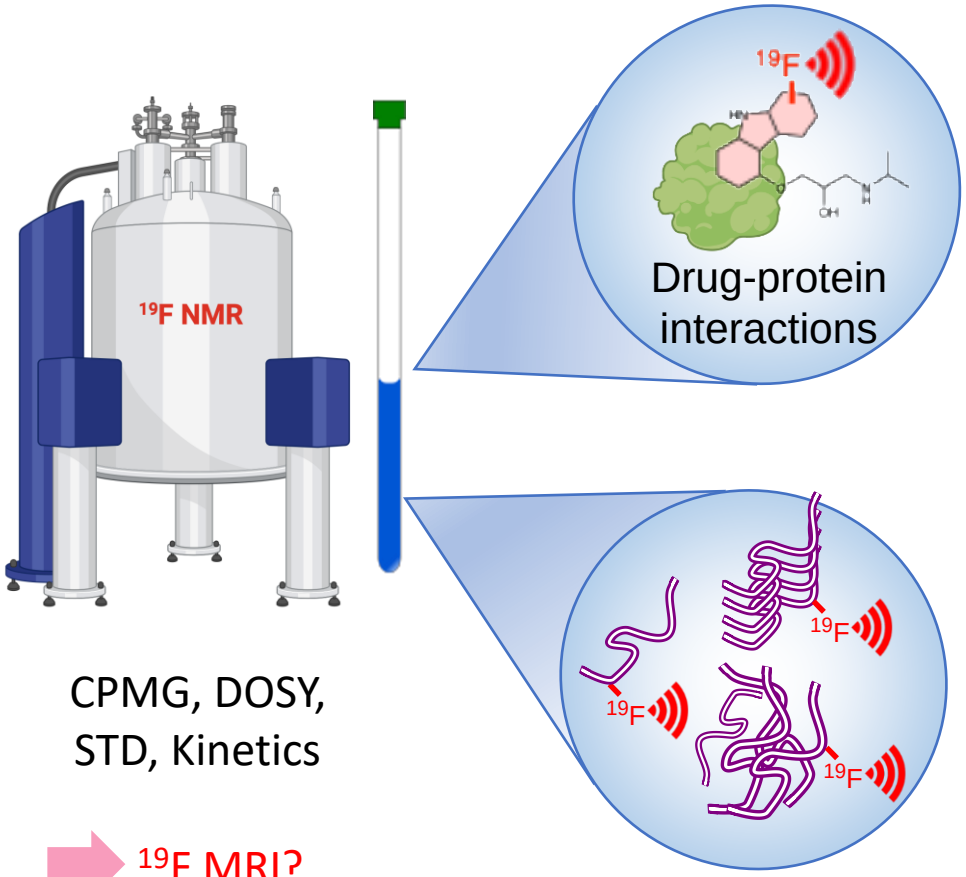
up to > 50 amino acids



PepMoTec

info@pepmotec.com

^{19}F NMR to Study Biology / Diagnostics

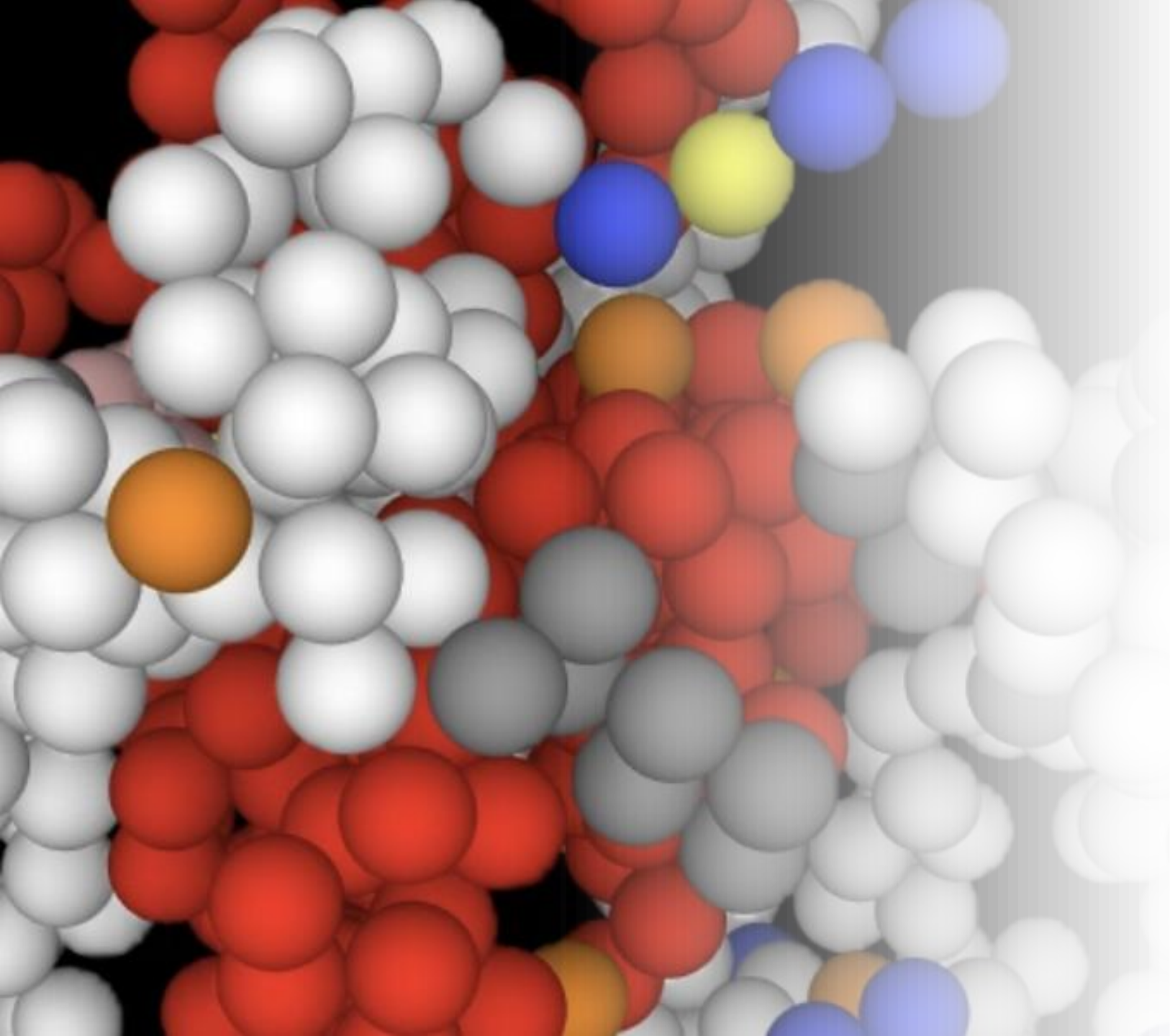


CPMG, DOSY, STD, Kinetics

→ ^{19}F MRI?

Drug targets: GPCRs, transcription factors, PPIs, enzymes

Probe: structural biology, dynamics, interactions, metabolism

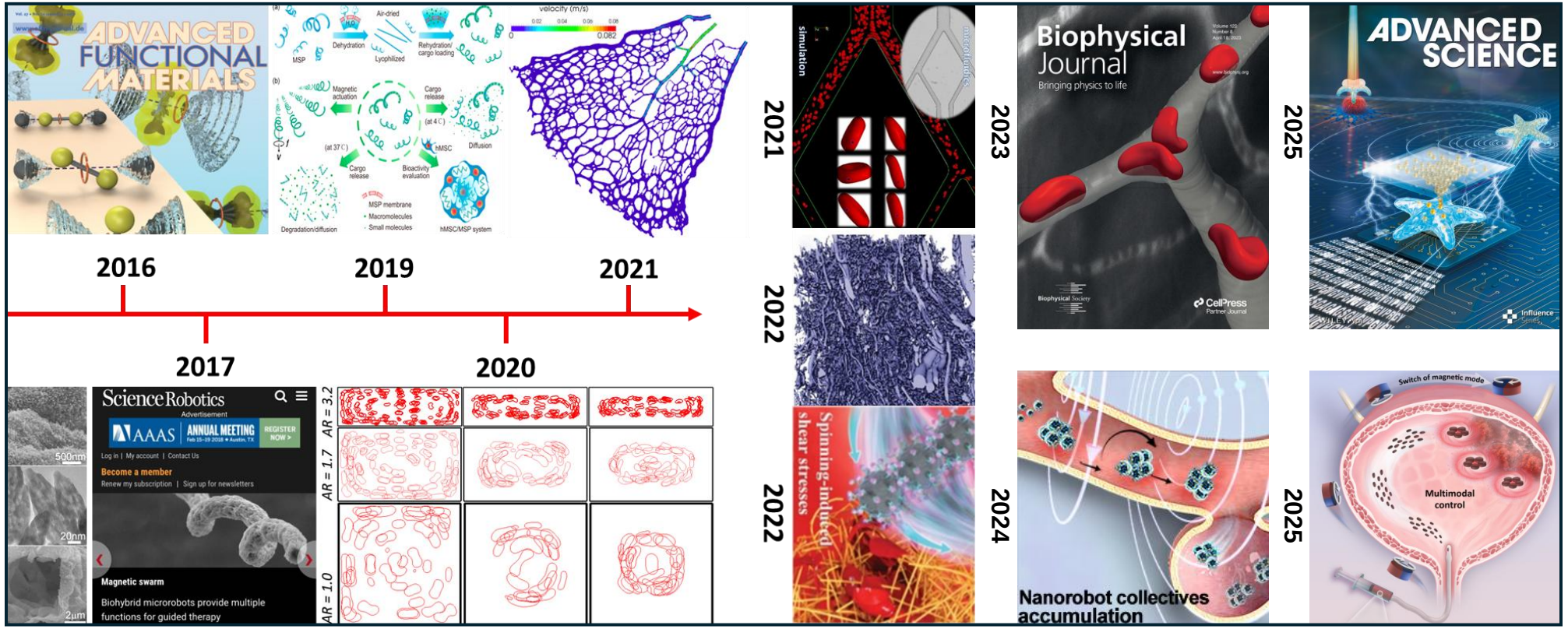


Qi Zhou

❑ Dr. Qi Zhou (Charles), Lecturer in Biomedical Informatics, BMS@CMVM-EMS

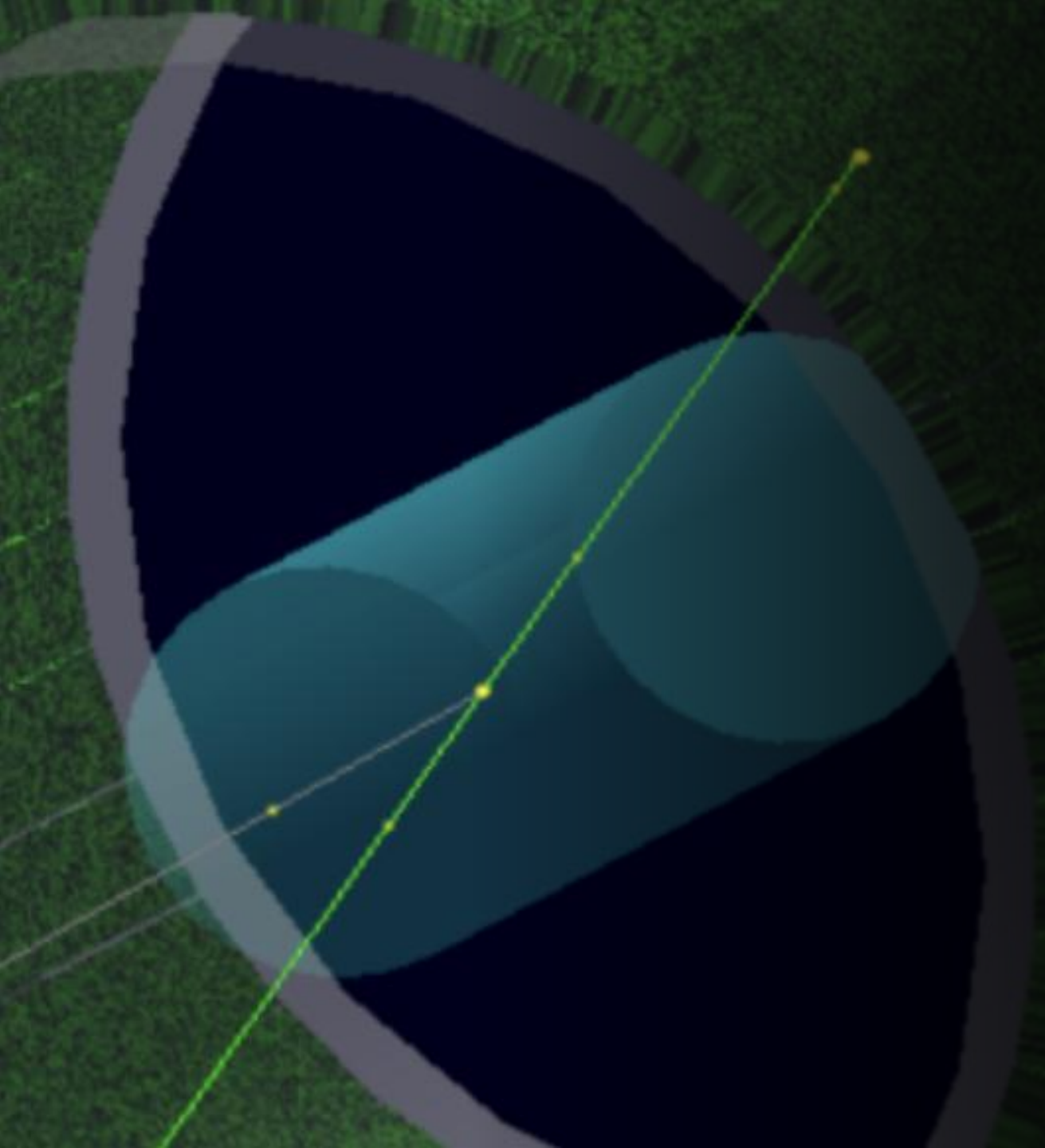
visiting researcher, School of Engineering, College of Science and Engineering

- ❑ **Computational biophysics and ML**
- ❑ **Biological flows & solute transport**
- ❑ **Biomedical micro/nanorobots**



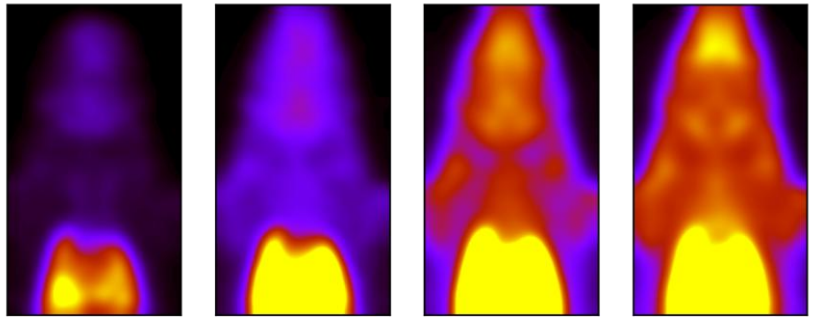
Expertise: *Haemodynamics, Image-based simulation, Fluid-structure interaction, Multiphysics modelling, Parallel computing*

Applications: *Microcirculatory disorders, Placental dysfunction, Blood clot removal, Aneurysm embolisation, Cancer therapy*

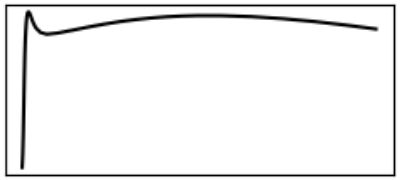


Jan Kutos

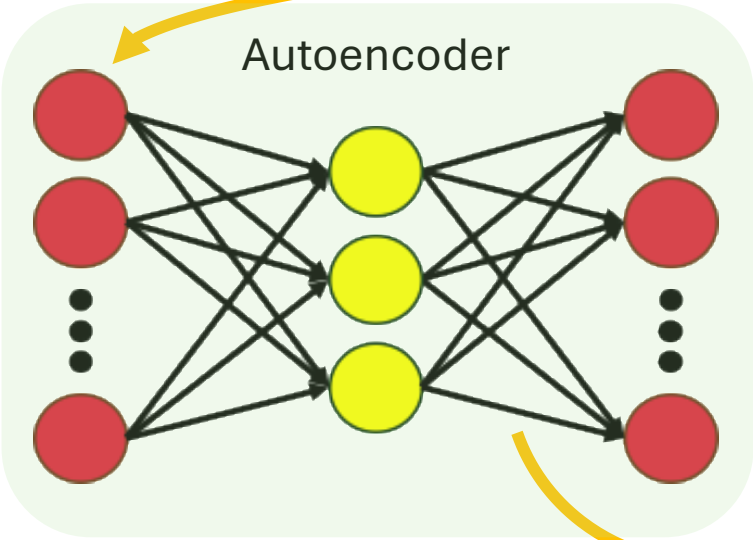
Machine Learning for **Input Functions** in **Dynamic PET**



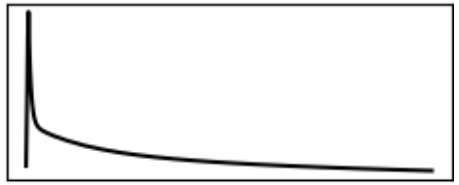
Dynamic PET scan

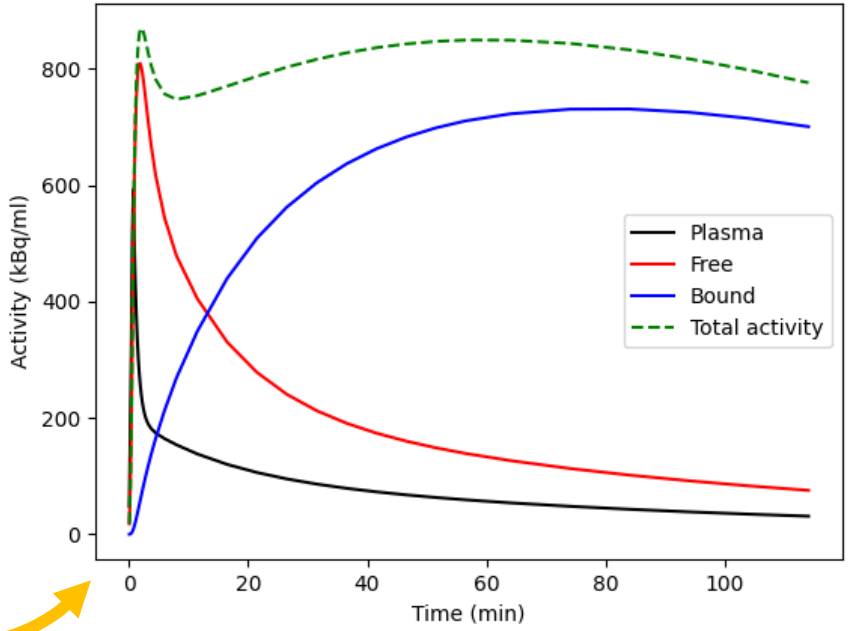


Voxel time-activity curve



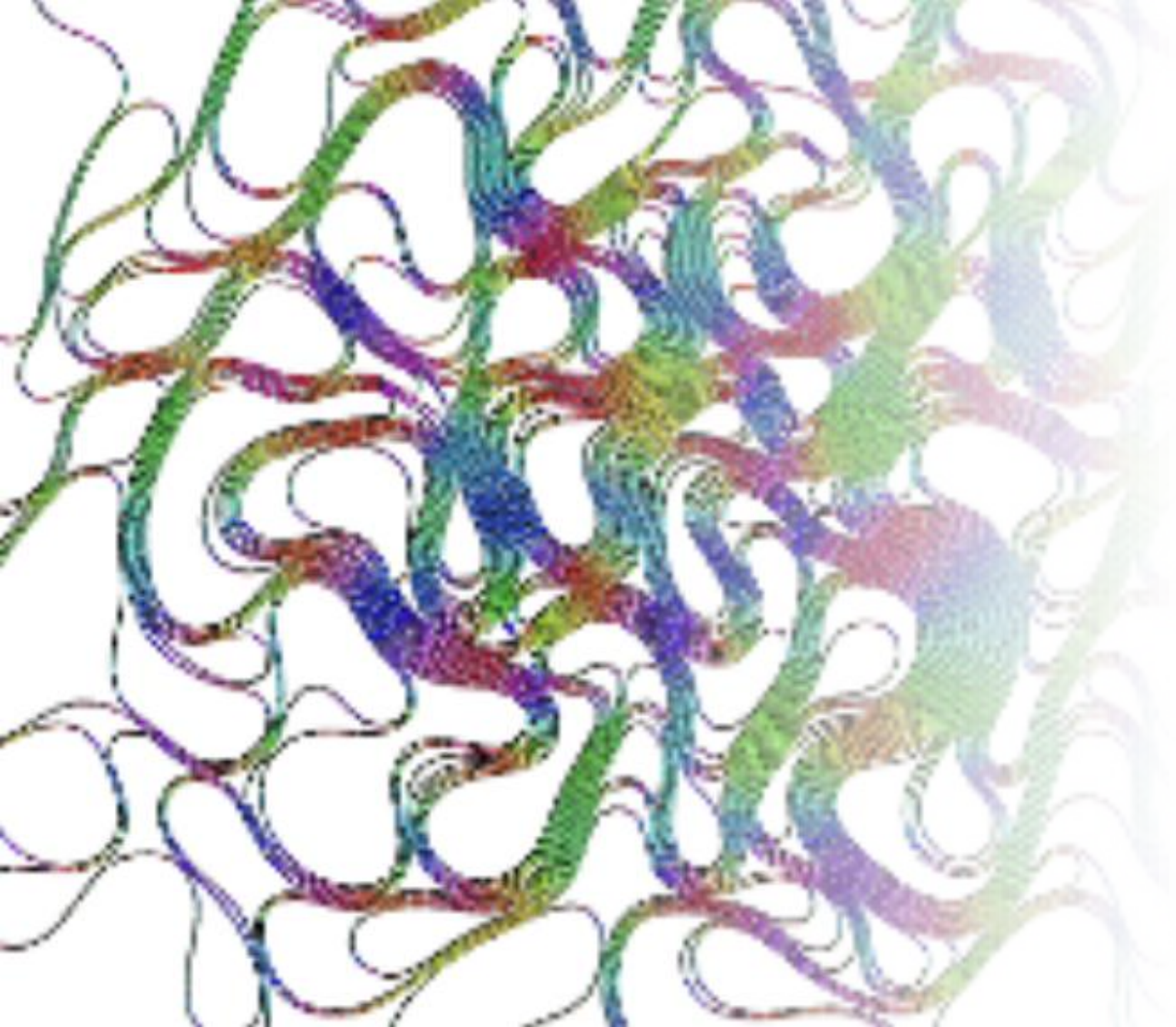
Input function
(tracer in plasma)





Pharmacokinetics

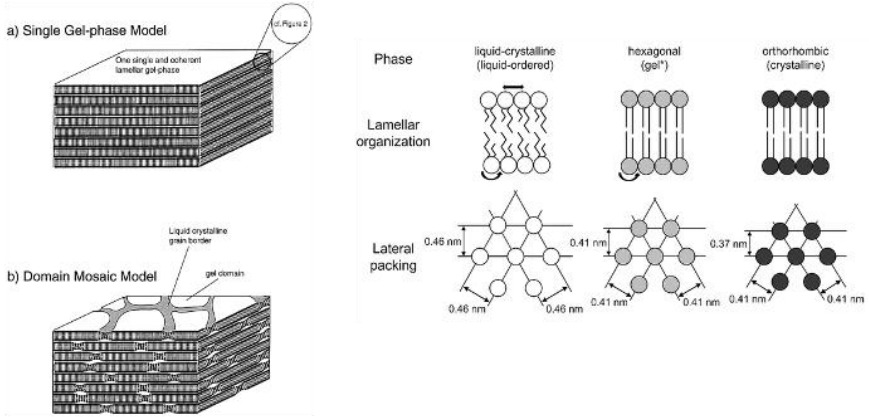
Jan Kutos, Jan.Kutos@ed.ac.uk

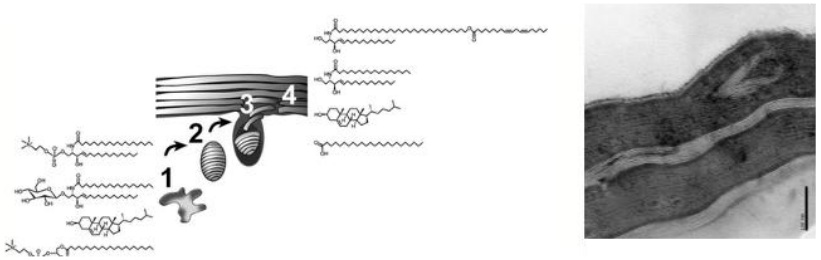


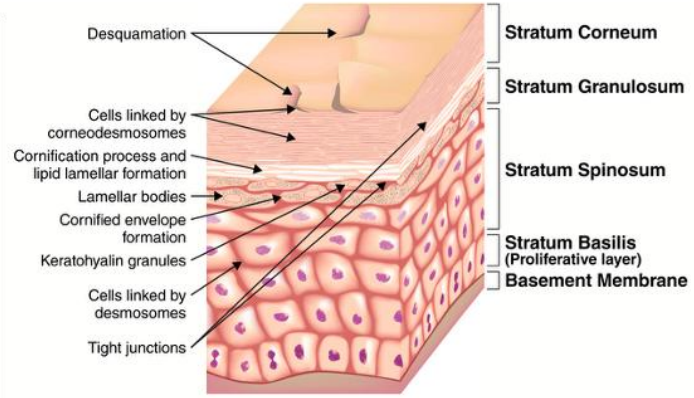
David Moore

Vibrational Spectroscopy of Biological Membranes

David J Moore



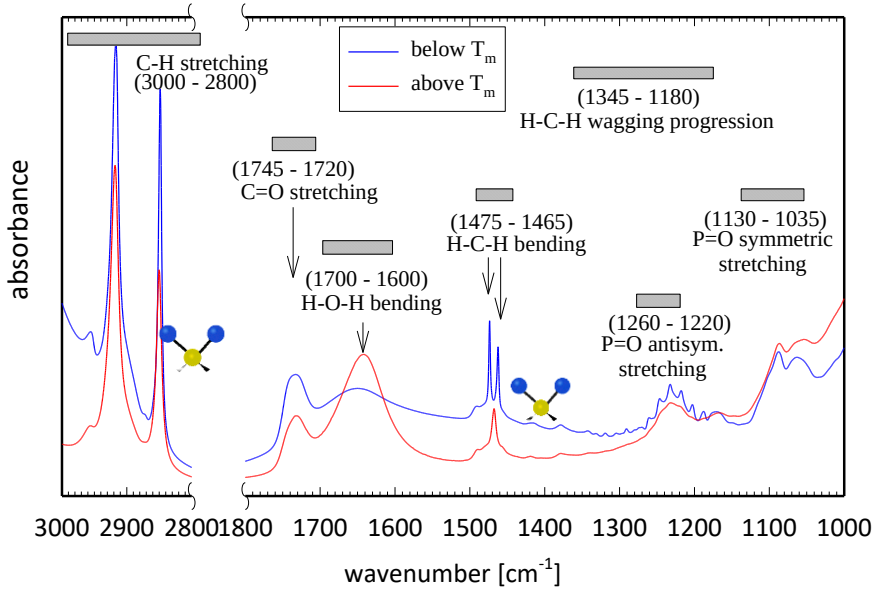


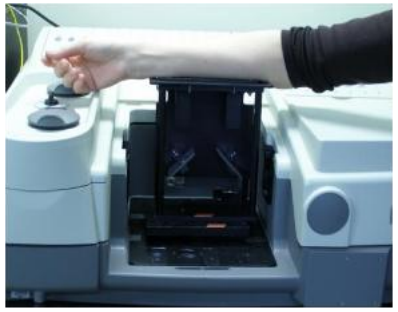


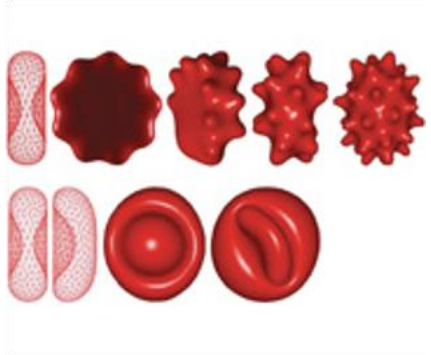
Molecular changes w/ disease or damage
Topical & transdermal drug delivery

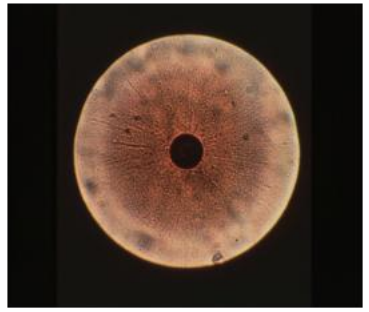
Erythrocyte pathology (sickle cell disease)
Membrane lipid domains (leaflets)

Mycoplasma membrane "fluidity"
Homeoviscous adaptation and viability









lipids – proteins - membranes – cells – tissue

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