SUPA Physics Scotland

SUPA IAC Meeting – 11th May 2017

Physics and Life Sciences

Theme Leader: Gail McConnell since 2016

Speaker: Gail McConnell

Key points regarding theme: all HEI partners involved. 65 T&R academics, 85 research fellows/associates and 90 graduate research students. Major sources of funding are RCUK & H2020, though also some industrial funding.

Several relevant DTCs at present, e.g. Optima programme in Optical Medical Imaging (joint Edinburgh & Strathclyde), PHOQUS (Dundee), Integrative Sensing and Measurement (Glasgow).

Existing Scope of Theme

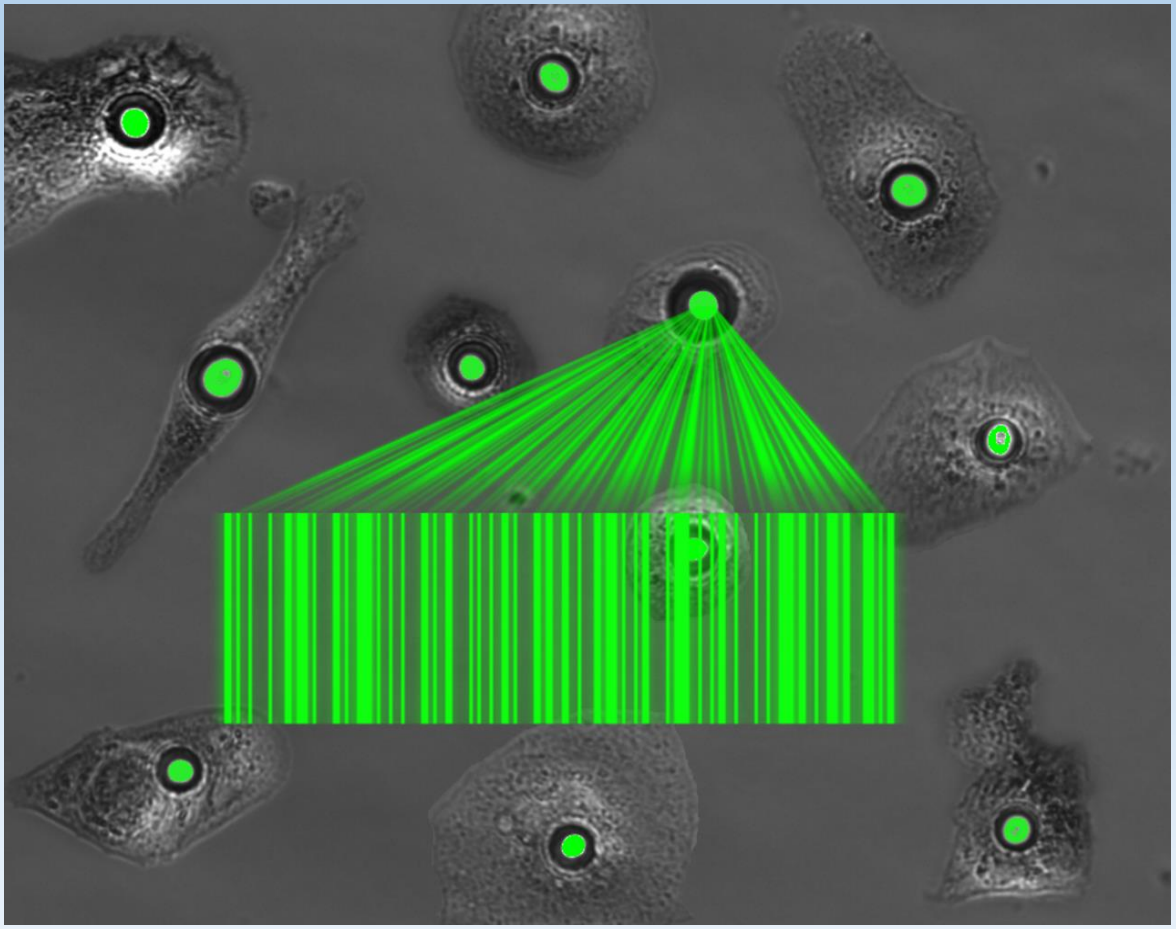
The research within PALS can be classified into three broad themes:

Structure and Dynamics
Protein folding and interactions
Water and hydrogen-bonding interactions

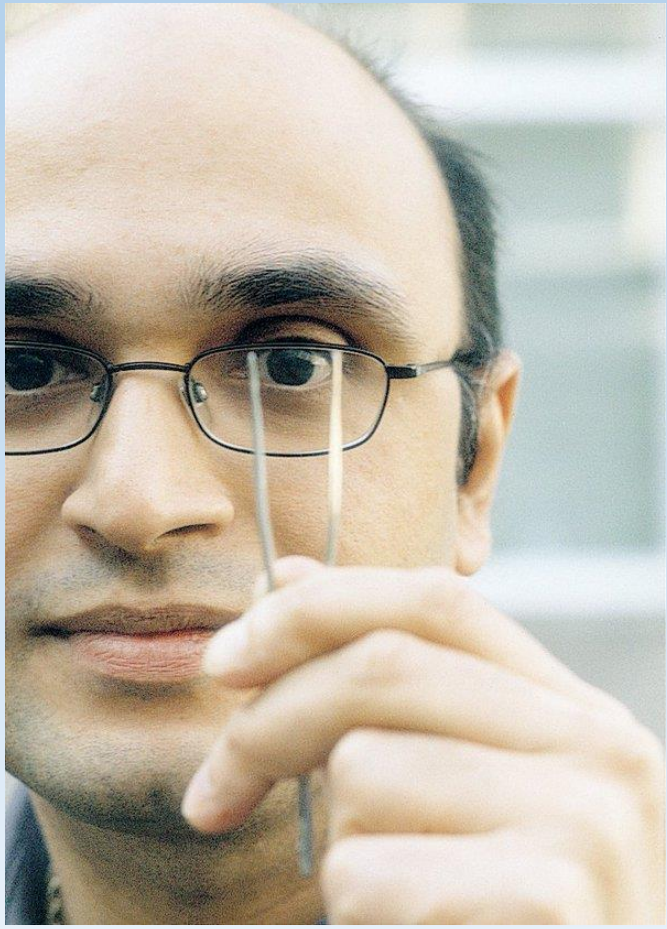
Enzymes and model enzyme systems
Studies of Model Biological Systems
Interactions in their cellular context
Evolving ecosystems and environments
Cell motility

Optical Imaging and Cellular Interactions
Micro-photonics for life sciences
Imaging and Spectroscopy
Nano and Targeted Therapeutics

Illustrative Examples



Schubert et al., Lasing in Live Mitotic and Non-Phagocytic Cells by Efficient Delivery of Microresonators. *Sci. Rep.* 2017.



Prof. K. Dholakia, R.W. Wood Prize 2016 for "his pioneering research into optical micromanipulation using shaped light for interdisciplinary photonics-based applications".

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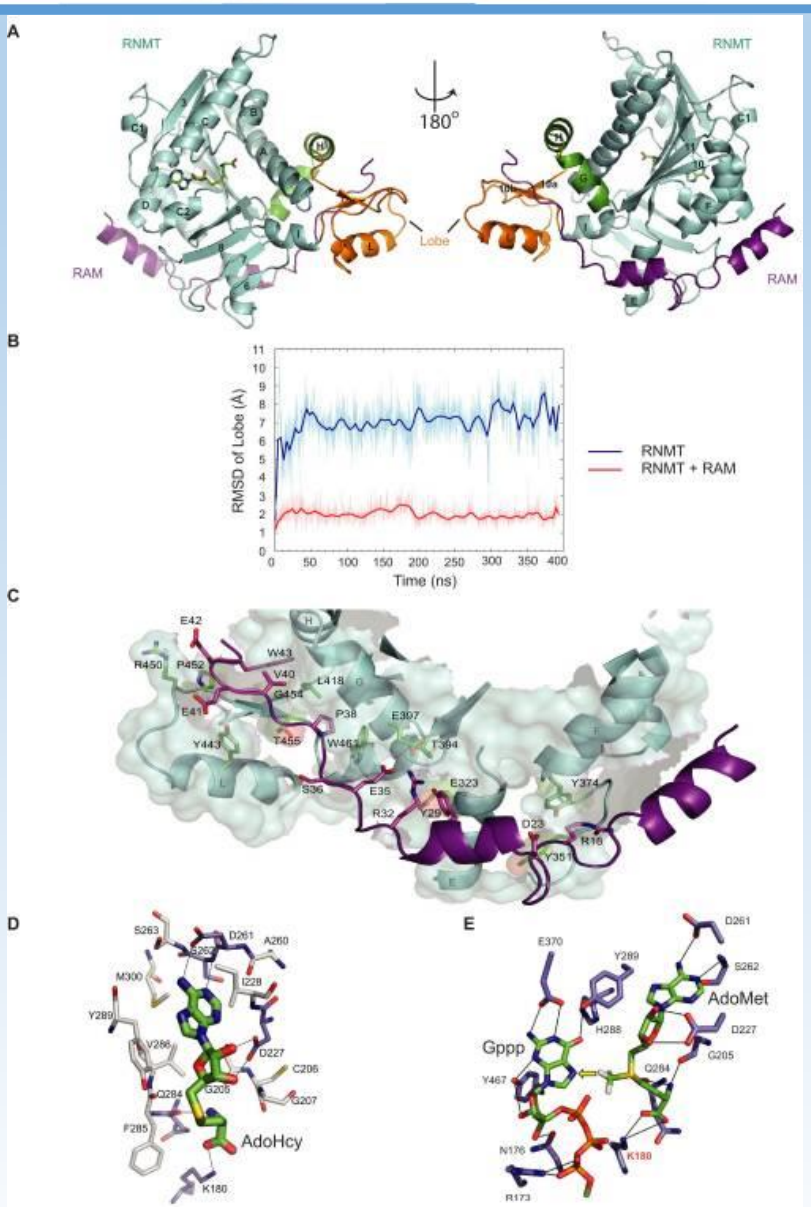

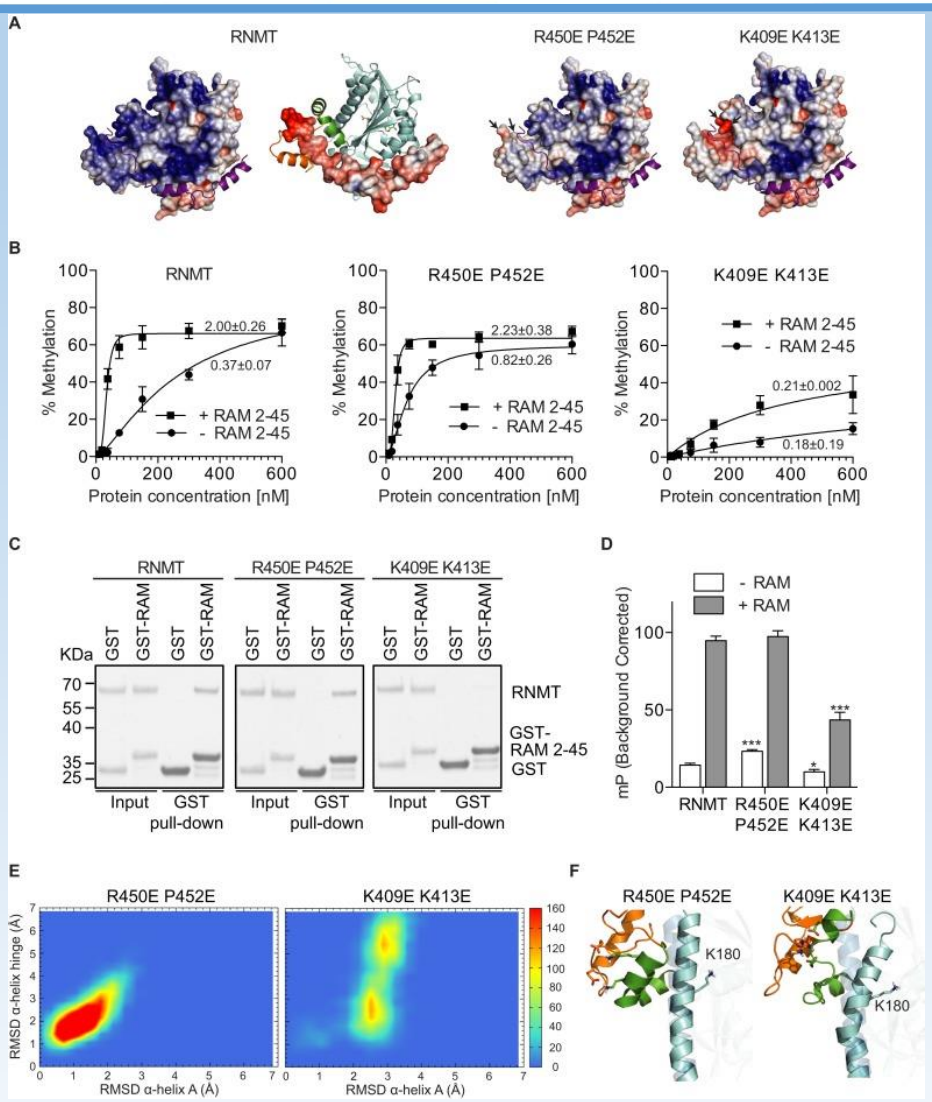

Molecular basis of RNA guanine-7 methyltransferase (RNMT) activation by RAM. Varshnev. Nucleic Acids Res. (2016).

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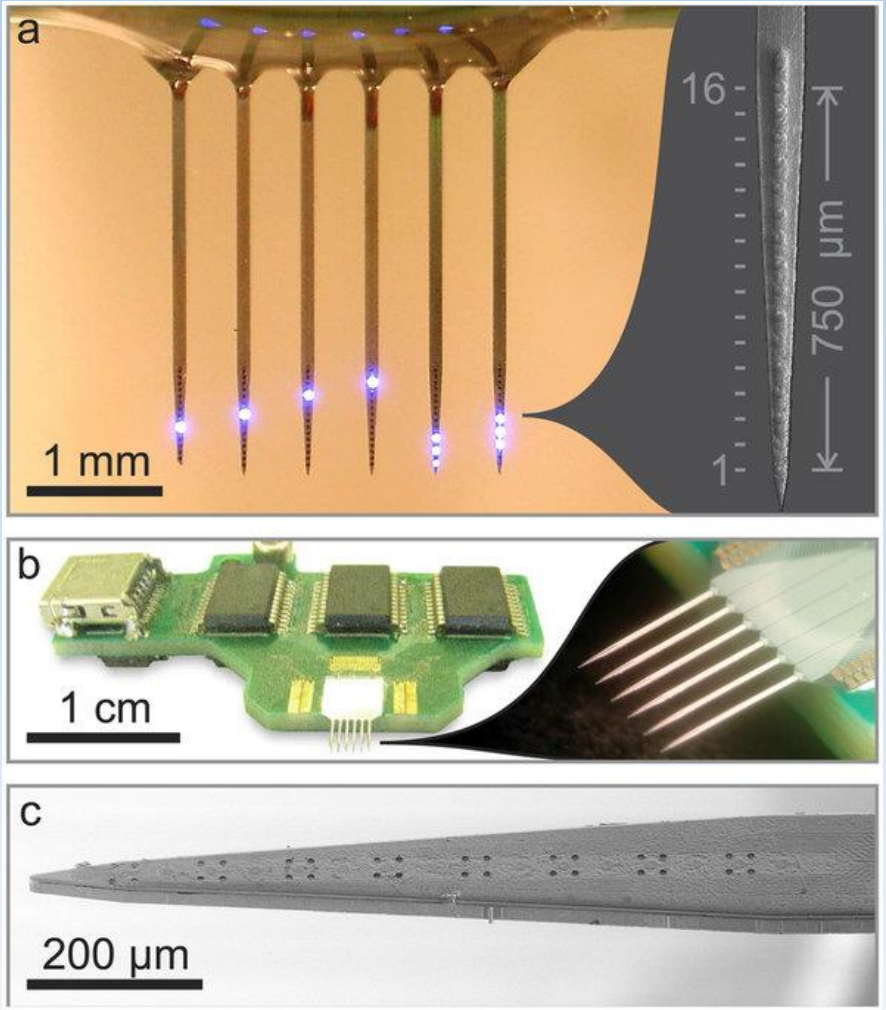

Scharf *et al.*,. Depth-specific optogenetic control *in vivo* with a scalable, high-density µLED neural probe. Sci. Rep (2016).

Dr Brian Patton
(from U. Oxford)

Dr Sebastian van de Linde
(from U. Wuerzburg)

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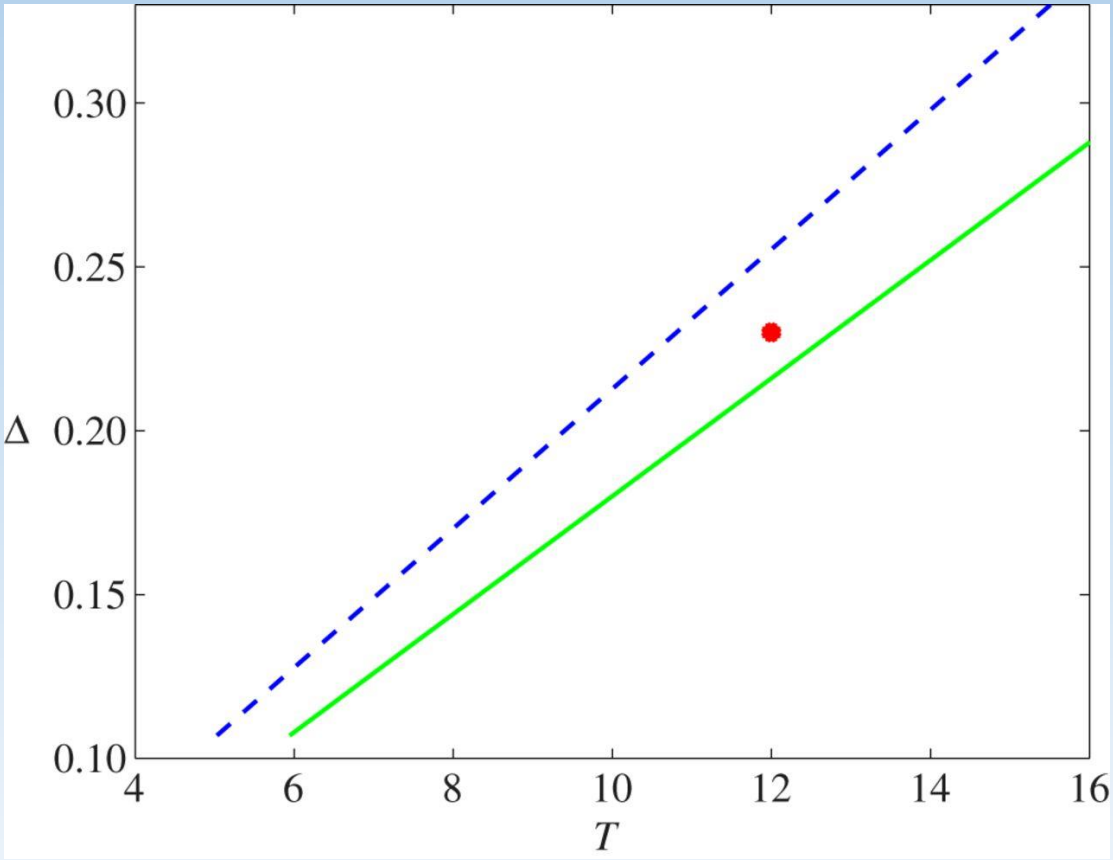

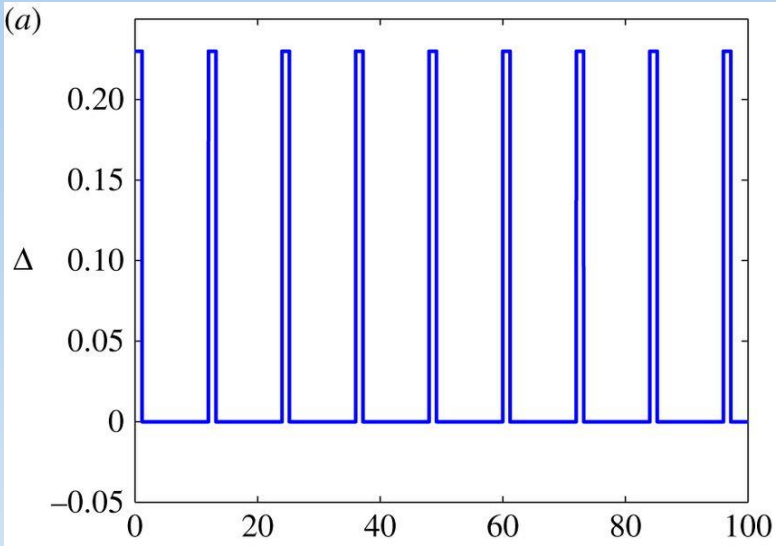

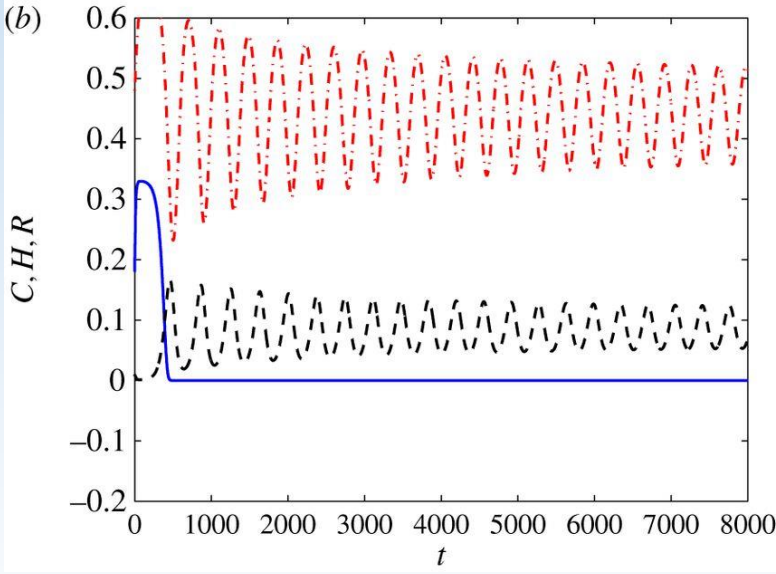

Ren *et al.*, Tumour chemotherapy strategy based on impulse control theory. Phil. Trans. Royal Soc. A. (2017).

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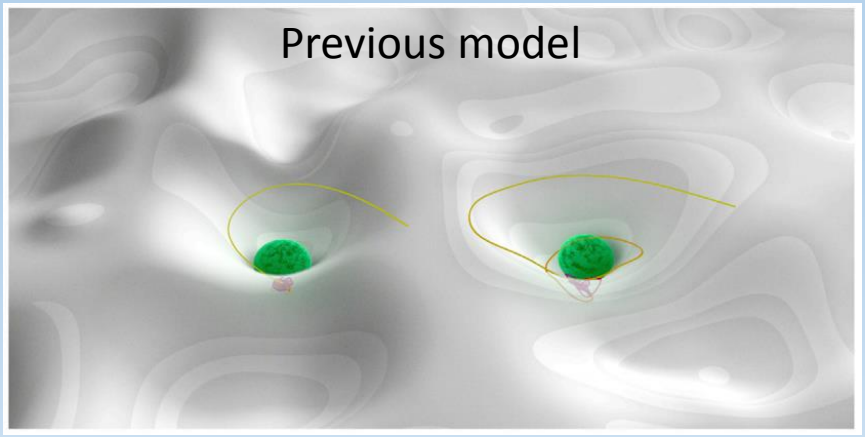
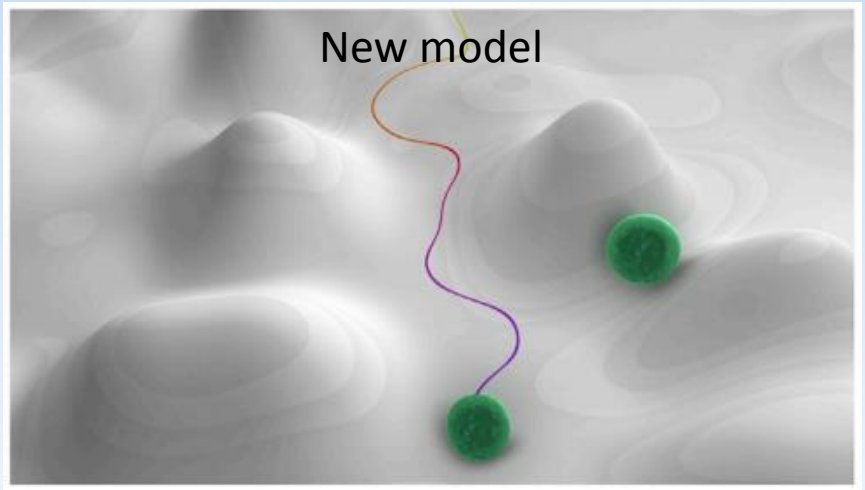
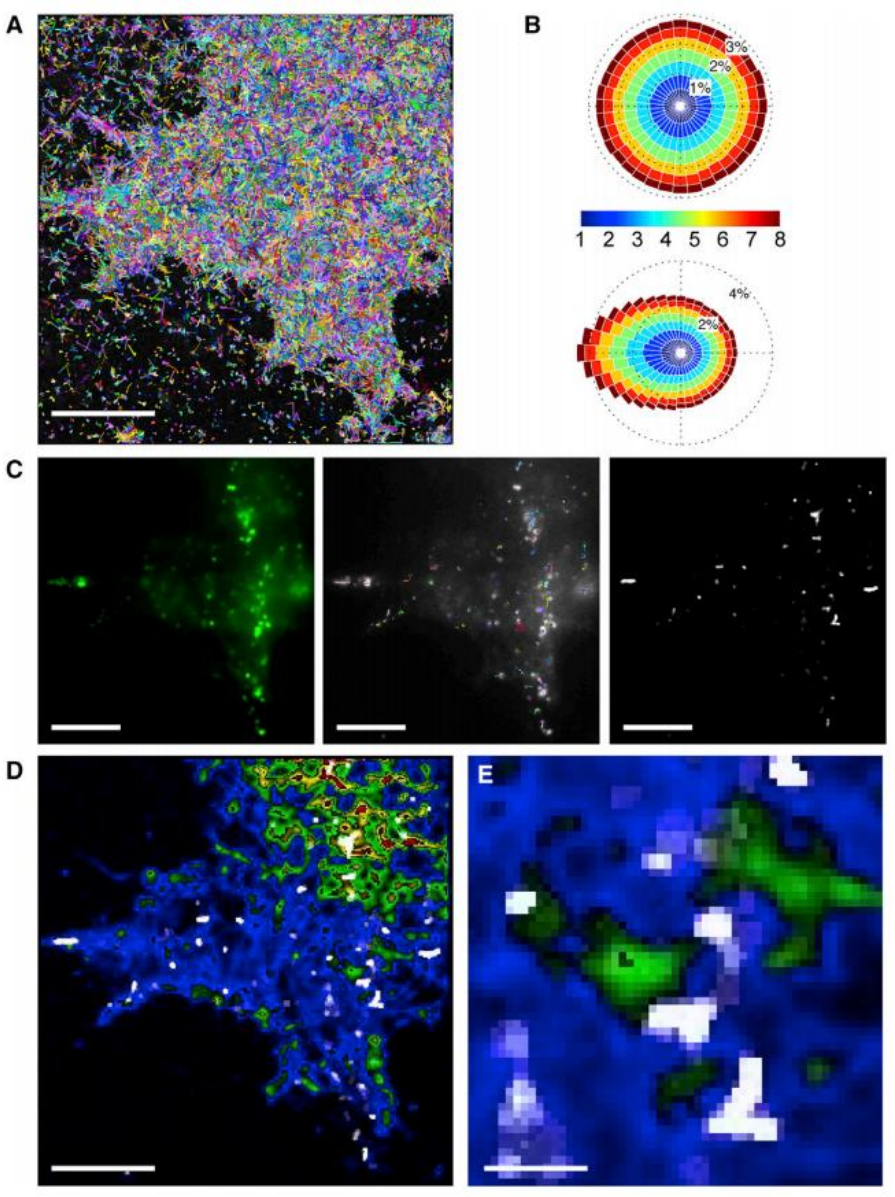




Dun *et al.*, Navigation through the Plasma Membrane Molecular Landscape Shapes Random Organelle Movement, Curr. Biology (2017).



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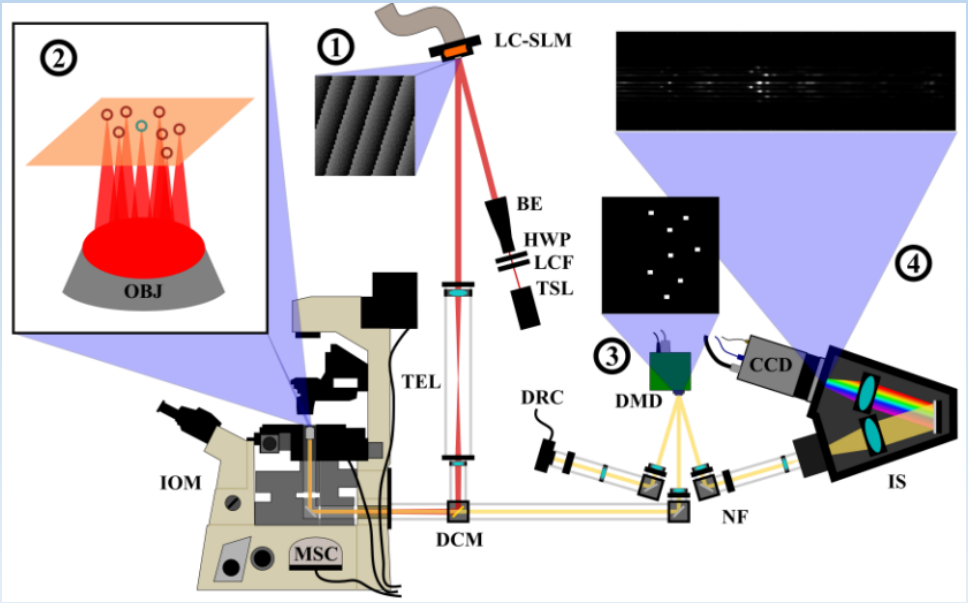

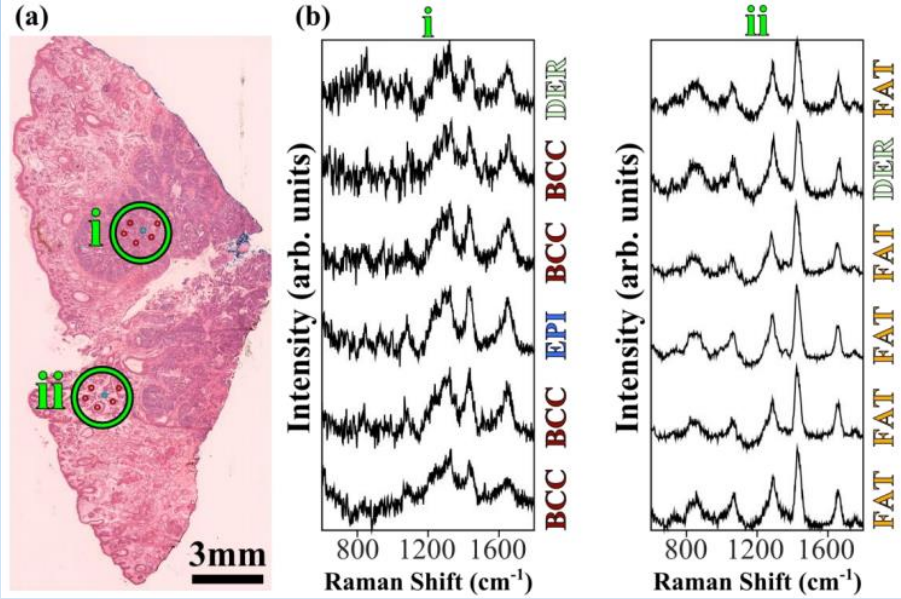

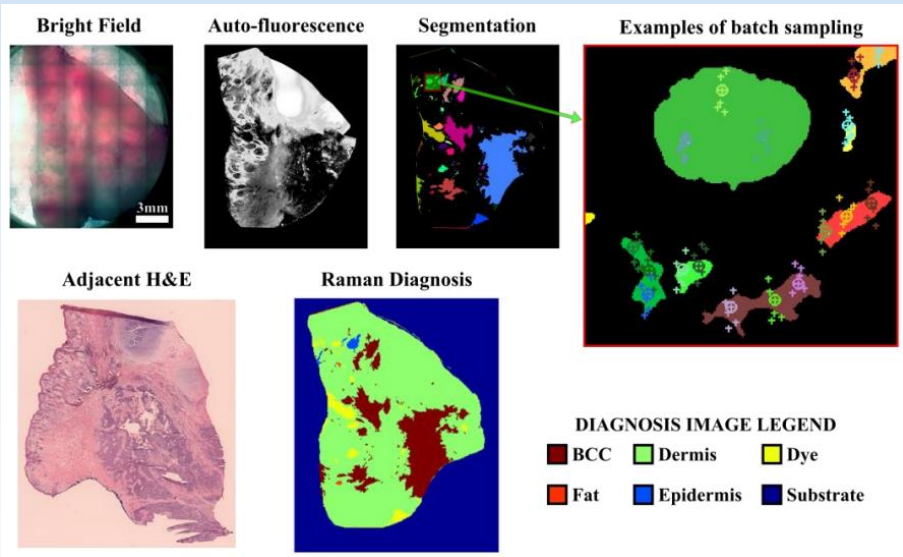

Sinjab *et al.*, Tissue diagnosis using power-sharing multifocal Raman micro-spectroscopy and auto-fluorescence imaging. Biomedical Opt. Exp. (2016).

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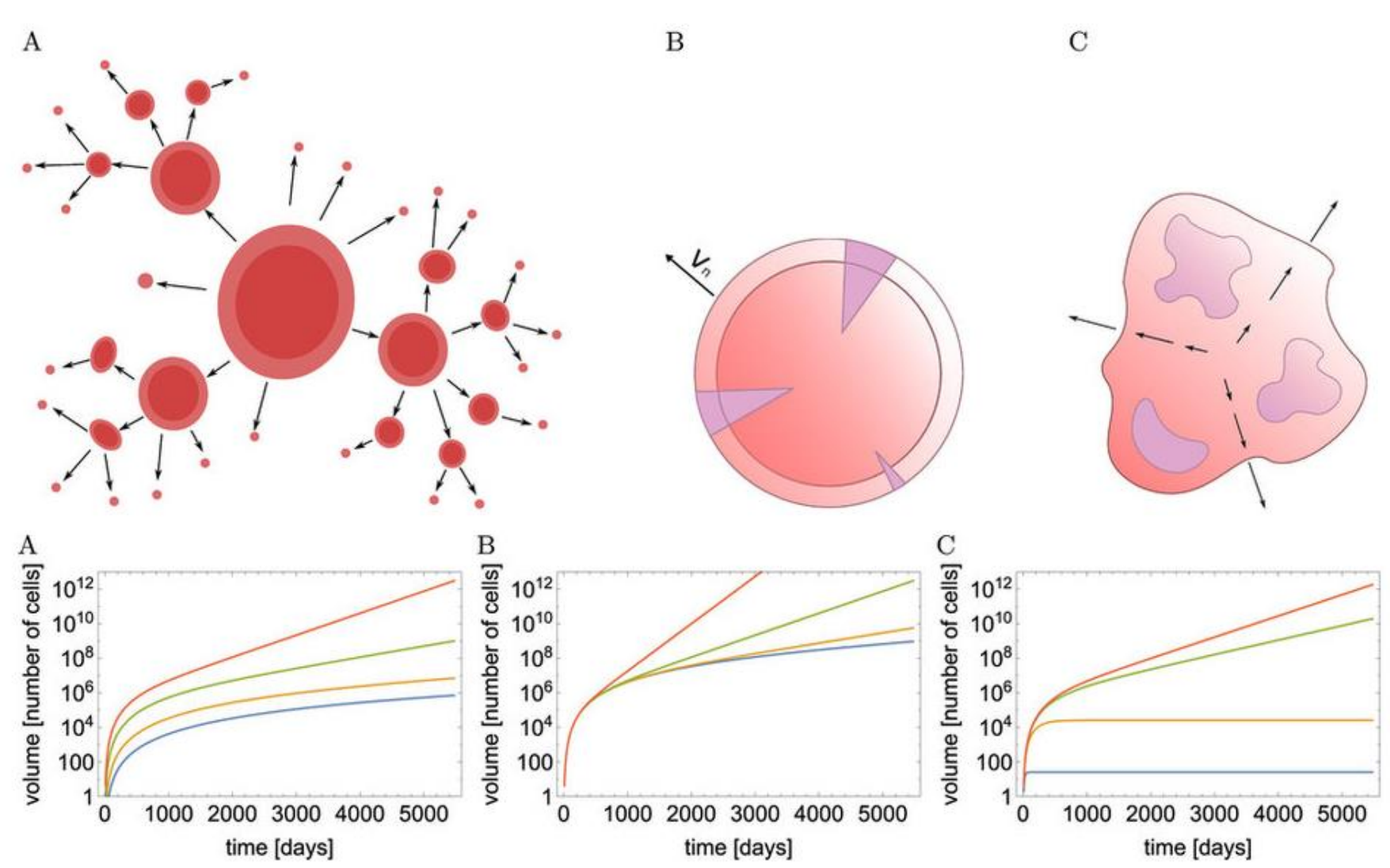

Paterson *et al.*, An exactly solvable, spatial model of mutation accumulation in cancer. Sci. Rep. (2016)