SUPA IAC Meeting – 30th May 2019

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

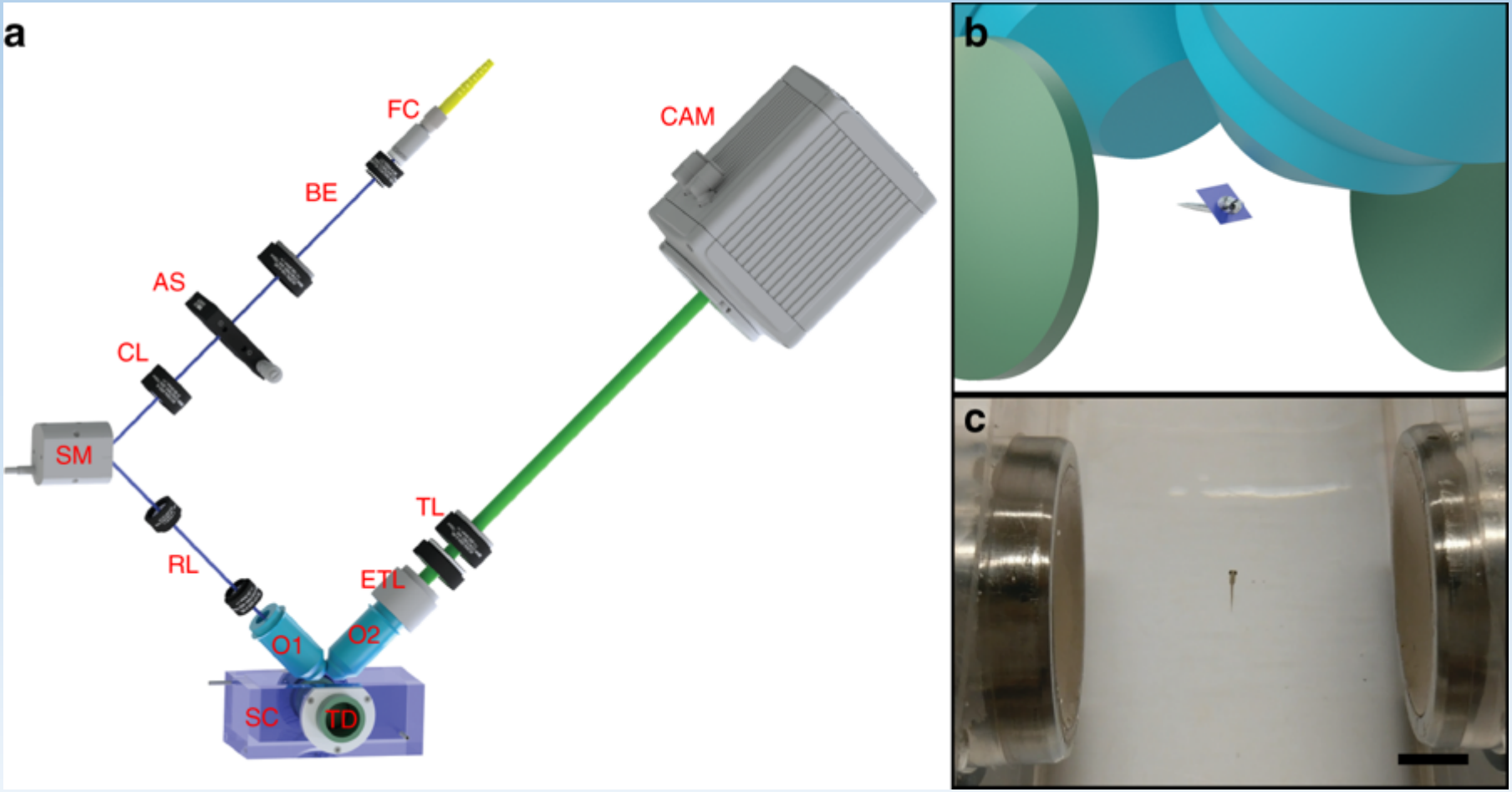
The research within PALS can be classified into three broad themes:

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



Light sheet microscopy with acoustic sample confinement
Z. Yang et al. *Nature Communications* **10**: 669 (2019)

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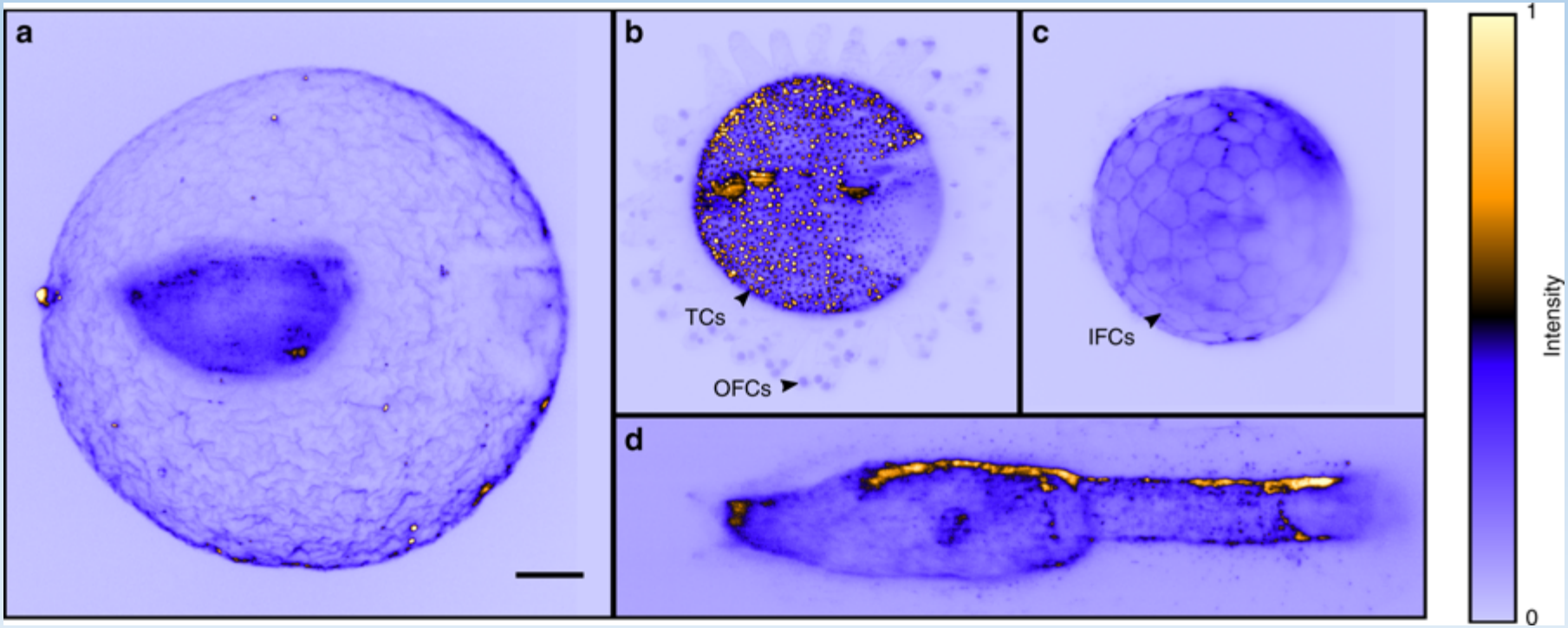

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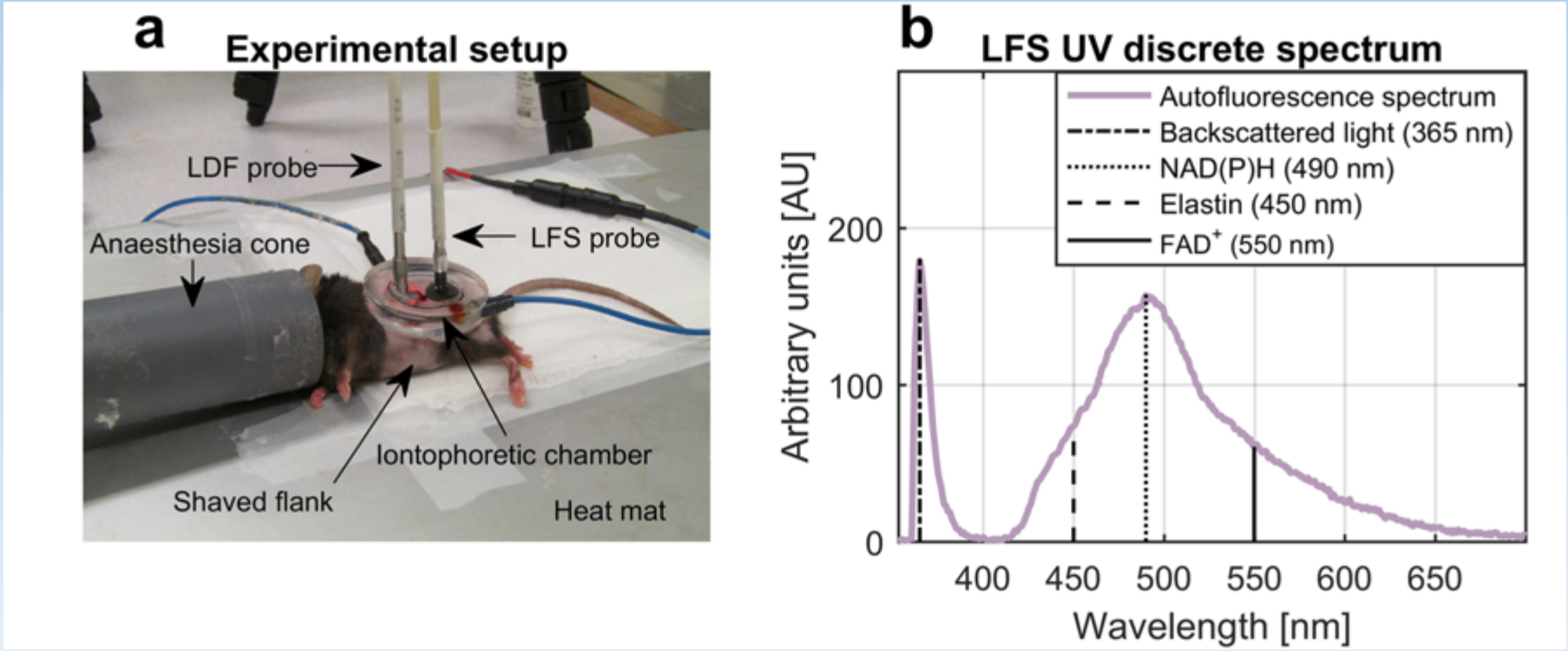

In-vivo correlations between skin metabolic oscillations and vasomotion in wild-type mice and in a model of oxidative stress, S. Smirni et al. *Scientific Reports* **9**: 186 (2019)

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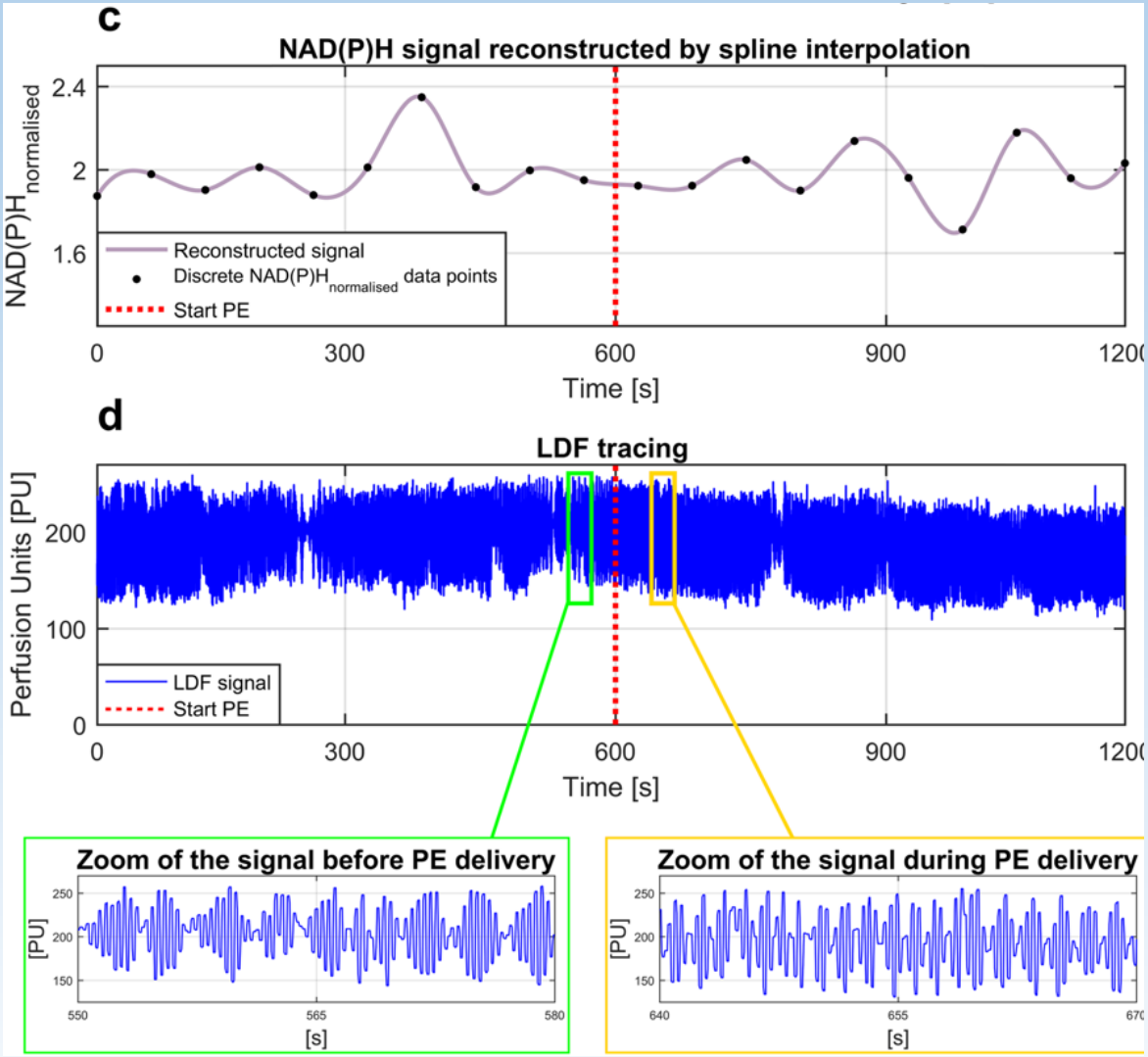

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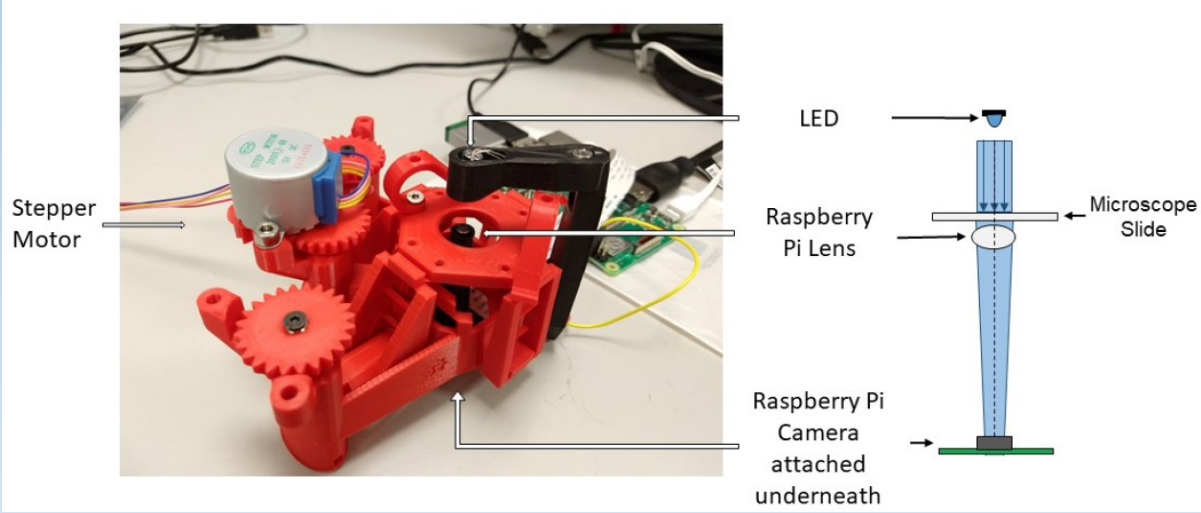

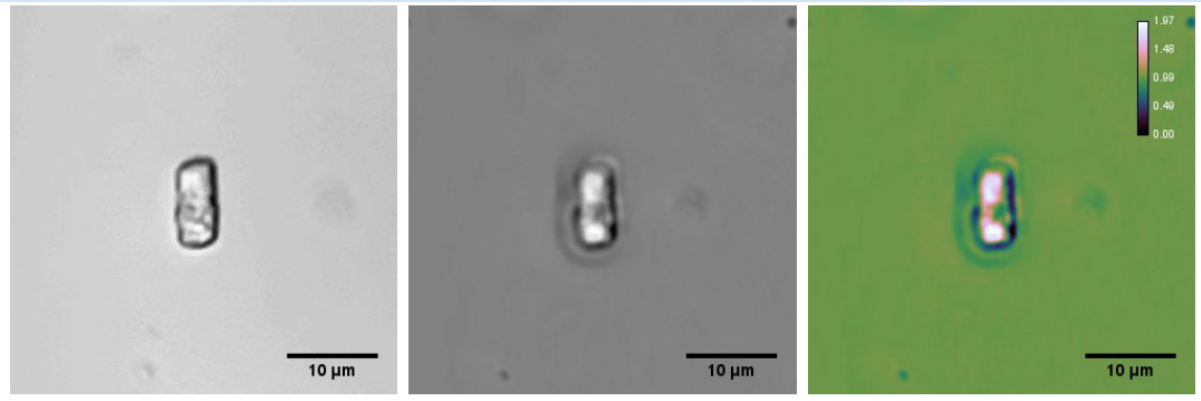

Low-cost, open-access refractive index mapping of algal cells using the transport of intensity equation. S. Grant et al, Biorxiv (2019).

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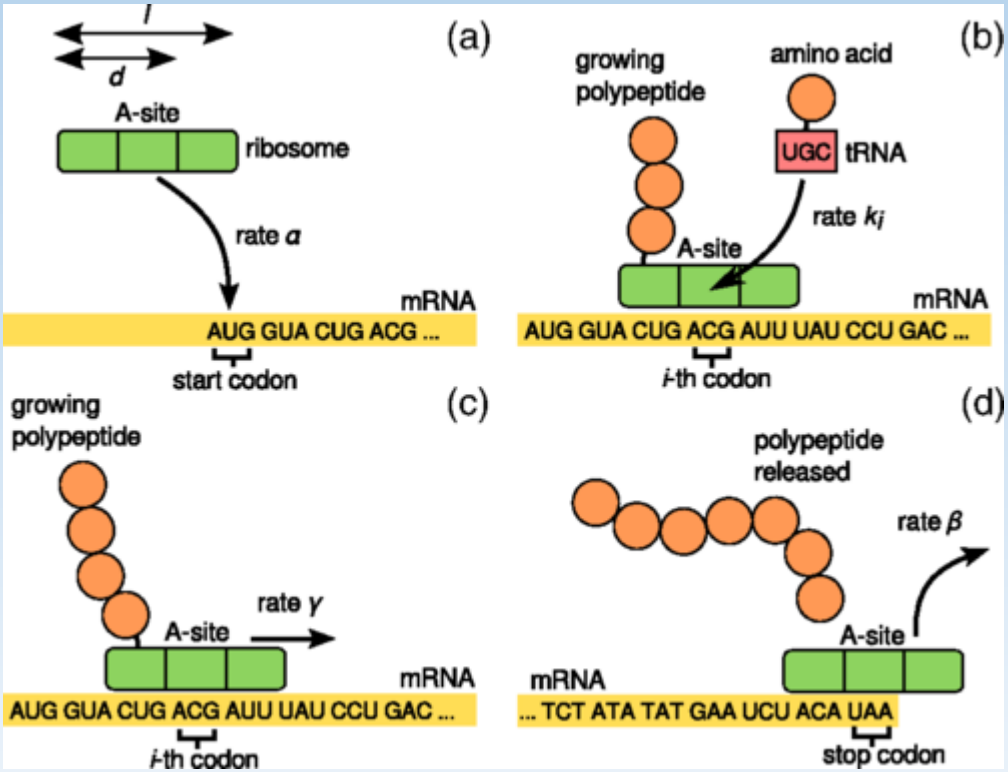

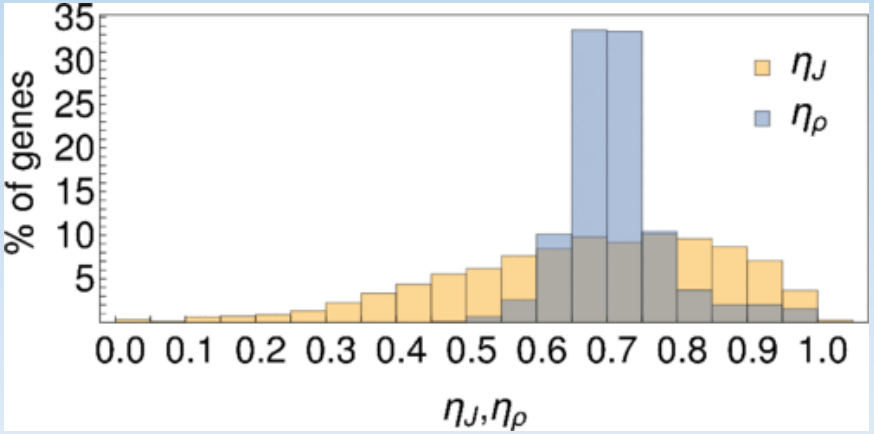

J. Szavits-Nossan. Deciphering mRNA Sequence Determinants of Protein Production Rate. Phys. Rev. Lett. **120**, 128101 (2018).

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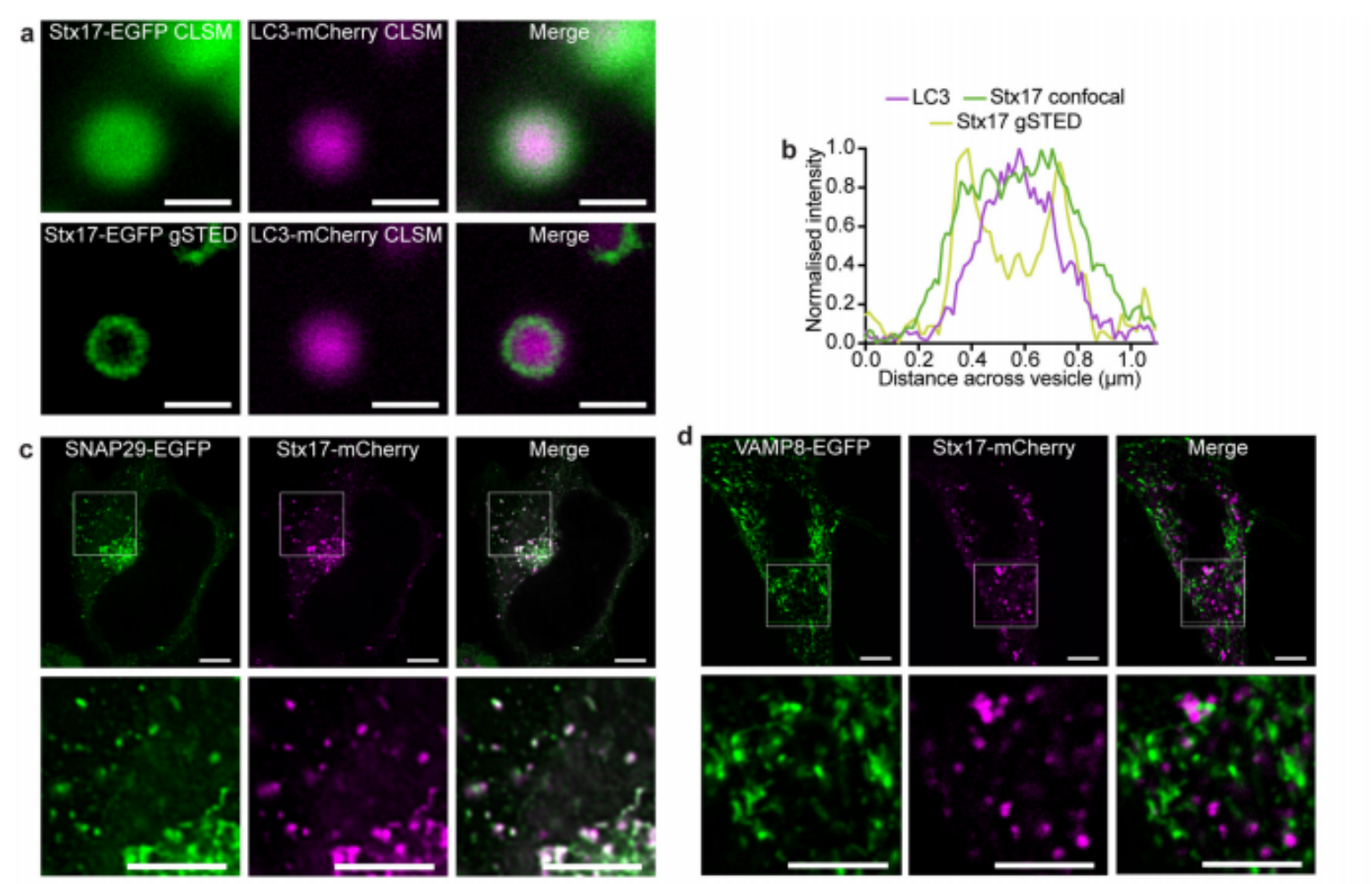

R. Saleeb et al. A VPS33A-binding motif on syntaxin 17 controls autophagy completion in mammalian cells. J. Biol. Chem. 294: 11 4188 (2019).

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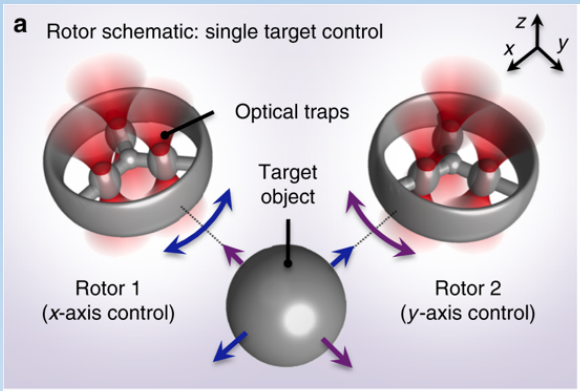

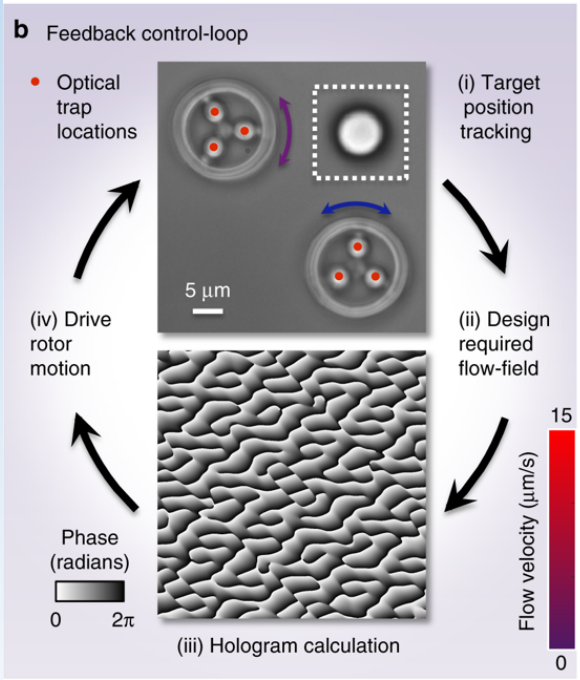

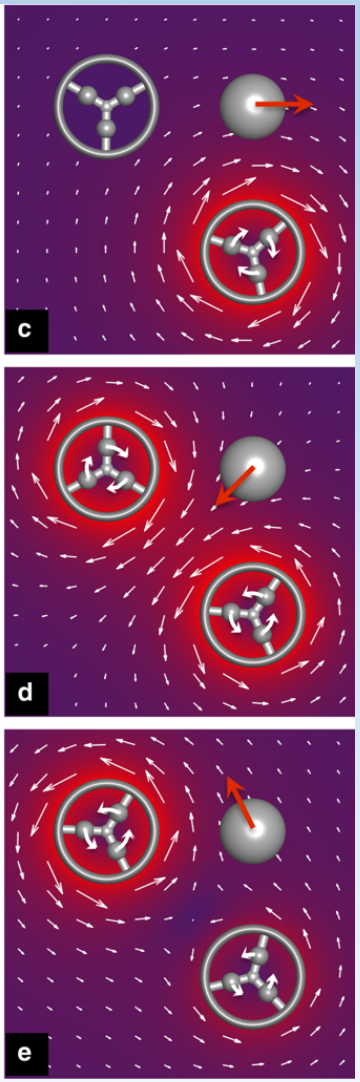

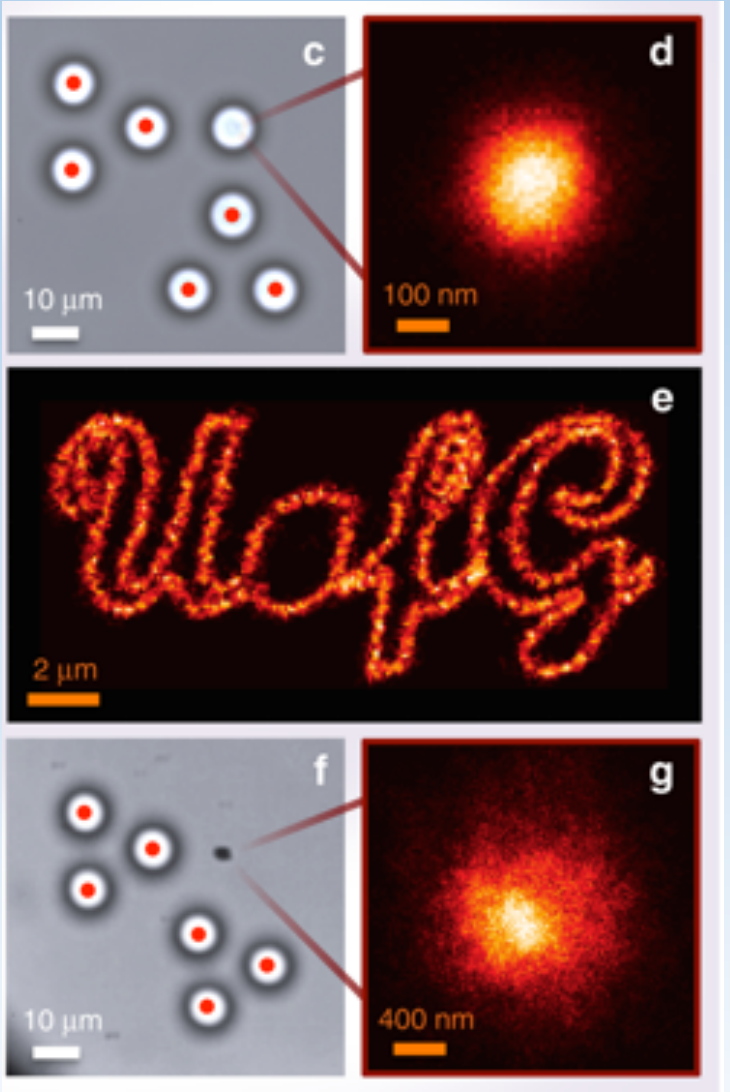

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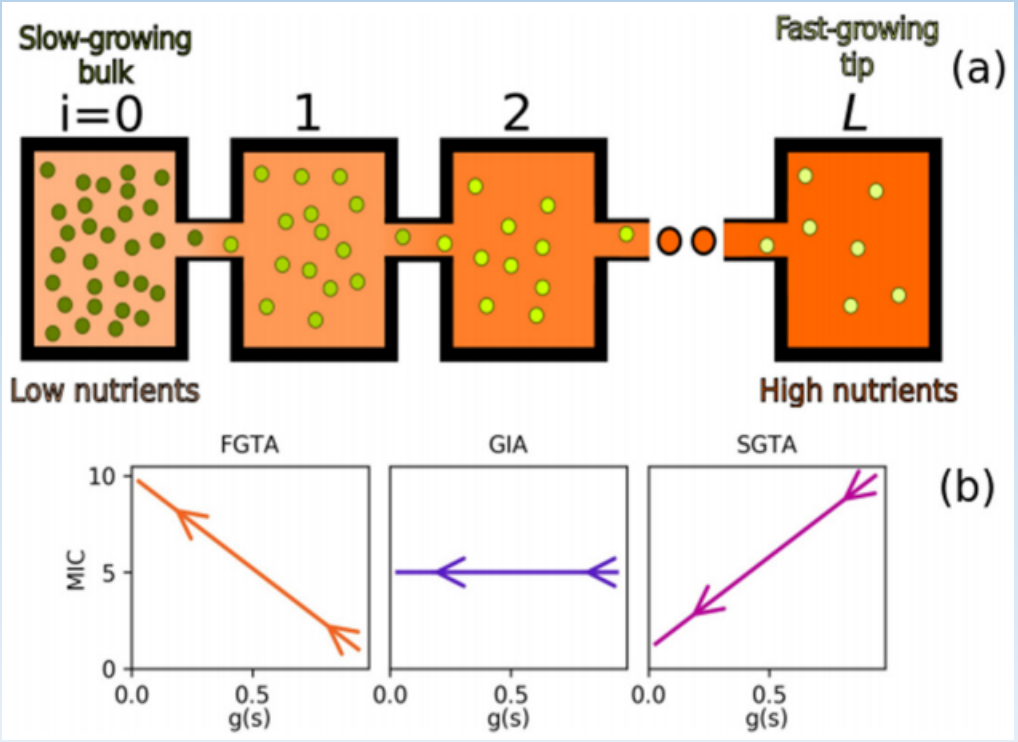

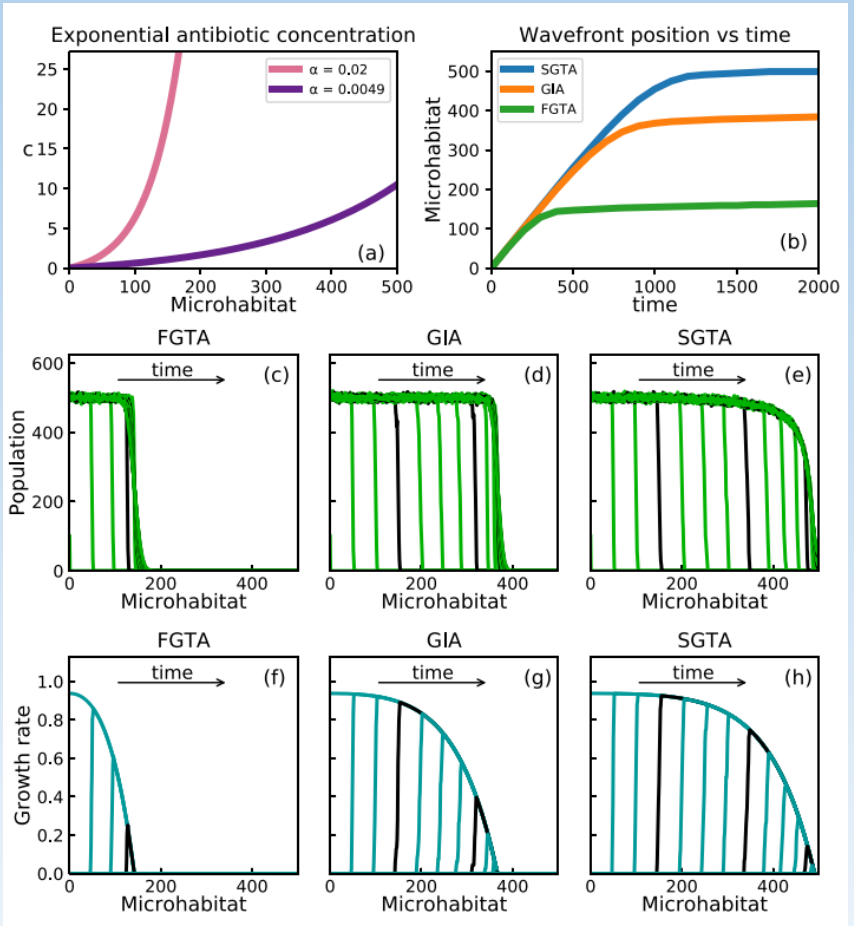

P. Sinclair et al. Growth-dependent drug susceptibility can prevent or enhance spatial expansion of a bacterial population. Phys. Biol. 16: 046001 (2019).