



UNDERSTANDING THE Physics of Life

November 2017 Newsletter

EPSRC

Pioneering research
and skills

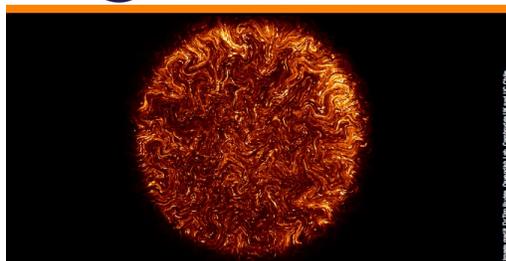


Physics of Life Events

18-19

Dec

Quantitative Methods in Gene Regulation IV, Corpus Christi College, Cambridge



This multidisciplinary meeting now in its fourth edition, aims to showcase and discuss recent discoveries that are radically changing the picture of gene and chromatin regulation, as system level organisational mechanisms emerge to play key roles.

Contributions exploiting quantitative approaches both in experiment and modelling, from biology and medicine to chemistry, computer science, engineering, mathematics and physics are welcomed. Topics will include cellular decision-making (cell division, death, differentiation, plasticity), single cell and population physiology, chromatin & protein machines (molecular focus), stem cells, development (tissues and organism), high-throughput genomics, large-scale views of the regulatory code, chromatin and epigenetics

Workshop organiser: Pietro Cicuta

[Find out more and register for QMGR IV here](#)

Physics of Life News

[News from Physics of Life Town Meeting](#)



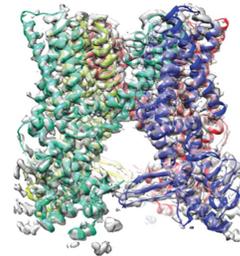
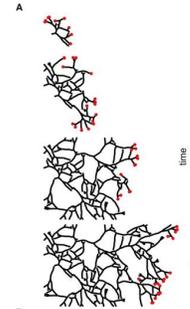
The first Physics of Life Town meeting took place at the Royal Society in London on October 2 with over 100 researchers registering for the event. The meeting was opened by network chair, Tom McLeish FRS, who introduced the plans, objectives and opportunities of PoLNET2 over the next 2.5 years.

Plenary talks were given by Ben Simons (Cambridge University) and Helen Saibil FRS (Birkbeck College).

The talk given by [Ben Simons](#) titled 'a unifying theory of branching morphogenesis', elegantly explained how branching morphogenesis follows simple conserved statistical rules in multiple organs. The talk perfectly described a physicist's approach to a biological problem. Ben's excellent paper on this topic was very recently published in Cell, see [Hannezo et al., \(2017\) Cell, 171: 242-255.](#)

[Helen Saibil's](#) talk on '3D cry-electron microscopy of macromolecular machines' demonstrated the enormous power of this method for structural biologists. Helen detailed how her research has applied single particle analysis and tomography to macromolecular and cellular systems involved in protein folding and reversal of misfolding.

It was fantastic to see that in the same week that Helen gave her talk to the Physics of Life the three biophysicists who developed cryo-electron microscopy were awarded the 2017 Nobel Prize for Chemistry!



Procter and Gamble's Head of Global Life Sciences Open Innovation **Elena Lurie-Luke** flew in from Singapore to join the Physics of Life Town meeting and discuss how industry can interact with science research. Specifically, Elena used the example of a recent sandpit ran in collaboration with Physics of Life and P and G on examining the impact of airborne pollution on the skin.

Talks were also given by past recipients of PoLNET1's collaboration funding.

[Giovanni Sena](#) (Imperial College, London) presented research on the use of a newly developed assay to image living roots in real time experiencing mechanical stress as they enter glass capillaries.

[Daniel Frankel](#) (Newcastle University) discussed the presence of the extracellular matrix molecule, hyalouran, which may provide the secret to the naked mole rat's resistance to cancer. Daniel explained how he initiated an important collaboration for this project with Cambridge University's Ewan St John Smith via Tiwtter, promoting the use of social media!

Finally, [Rhoda Hawkins](#) presented research on investigations on the mechanism of energy consumption in ATPase proteins.



The Final session of the day saw 5 of the main science UK RCs (EPSRC, BBSRC, MRC, Wellcome and CRUK) present an overview on the opportunities available to interdisciplinary researchers.

Specific mention was given to [Technology Touching Life](#) (the recent joint initiative between EPSRC, BBSRC and MRC) which will be of direct relevance to the Physics of Life community. Network members also had the



opportunity to ask the panel of RC representatives questions and make suggestions related to their own experiences with interdisciplinary research.

Other activities of interest

EVENTS

2017

[Engineering multicellular self organization](#), 13-14 November 2017, EPFL, Lausanne, Switzerland.

[Early Career Researcher workshop on diagnostics for antimicrobial resistance](#), 20 November 2017 London.

An interdisciplinary workshop aimed at early career scientists to share knowledge, encourage networking and explore the barriers and opportunities facing the development of rapid diagnostics for infectious disease. Join our invited experts to hear some of the clinical challenges and latest advances in molecular diagnostics, analytical technologies, biosensors and metrology for AMR. Registration deadline **6 November 2017**.

[Systems out of equilibrium- Maths meets Physics](#) 27 November, Warwick

[MOFs and membranes: beyond scale up and stability](#) 8 December, Bath

2018

[Physics in Food Manufacturing](#), 10 - 11 January, University of Edinburgh

[Reson8 Biophysical and Biochemical Symposium](#), 12 January, Manchester.

[Photoinduced Processes in Nucleic Acids and Proteins: Faraday Discussion](#), 11 - 13 January, Kerala, India.

[The Science and Application of soft Materials in Hard\(er\) Environments](#), Gordon Research Conference February 4 - 9, Ventura, California.

[Mechanics of development](#), 5-7 February, Kavli Centre Royal Society, Bucks, UK.

[Royal Society Theo Murphy: The Artificial Cell](#), 26-27 February, Kavli Centre Royal Society, Bucks, UK.

This meeting brings together a multidisciplinary mix of cell biology, membrane biophysics, soft matter and bottom-up synthetic biology scientists to discuss the challenges and state of the art in assembly of compartmentalised soft materials inspired by and mimicking biological cells. A limited number of early career bursaries are available (by emailing organisers at theartificialcell@gmail.com or via CBMNet <http://cbmnetnibb.group.shef.ac.uk/funding/travel-grants/>

[49th IFF Spring School 2018: Physics of Life](#), Physics of Life, 26 Feb-09 March, Forschungszentrum Juelich, Germany. The Spring School 2018 will provide an introduction to and an overview of current research topics in biophysics of living systems, with an emphasis on understanding biological structure, dynamics and function. Application deadline: 20 December 2017.

[Changing views of translation: from ribosome profiling to high resolution imaging of single molecules in vivo](#), 5-7 March, Kavli Centre Royal Society, Bucks, UK.

[The Astbury Conversation](#), 16-17 April 2018, University of Leeds.

The event will bring together some of the world's most prominent molecular/chemical/structural biologists for a two day symposium and public event, with our keynote speaker being Stanford University's Nobel Laureate Professor Brian Kobilka. The registration fee is just £49 (no accommodation) or £139 (including overnight accommodation). This includes access to all talks, event materials and meals, including beer and pizza at the poster night. Places are limited, and the event is now being advertised both nationally and internationally- so please book your place ASAP.

For a full list of events of interest to PoLNET2 members go here:

<http://www.physicsoflife.org.uk/other-events.html>

JOB OPPORTUNITIES

[Lecturer in Theoretical and Computational Soft Matter, Non-equilibrium & Emergent Phenomena](#)

The Department of Physics at the University of Bath is seeking to appoint a Lecturer with an established research profile in one or more of the fields of Theoretical and Computational Soft Matter, Non-equilibrium Statistical Mechanics, and Emergence. Closing date: Tuesday 31 October 2017

[Postdoctoral positions on prostate cancer metastasis and tumour microenvironment](#)

The College of Medicine and Veterinary Medicine, University of Edinburgh are looking to appoint two postdocs with experience in at least one area of: cytokine/chemokine signaling; bioengineering; cancer biology; bone biology; intra-vital imaging. Experience in bioinformatics analysis and R programming is also an advantage. See job references: 040735 (closing date 17 November) and 038963 (closing date 15 November).

If you would like to advertise an event of interest or opportunity of relevance to Physics of Life members, please email: k.h.baker@dur.ac.uk.

[Visit Physics of Life Website](#)

