Physics of Life 2025

Thursday 27 March

9:00 AM - 11:00 AM	Auditorium	**Physics of Disease** (Session sponsored by the Rosetrees Trust) **9:00 AM - 9:30 AM Sally Peyman:** Dismantling the fibrotic fortress: modelling the biophysical barriers to drug delivery in Pancreatic Cancer **9:30 AM - 9:45 AM Katharina Beck:** Shedding light on lipid order in frozen COVID-19 vaccines using fluorescence spectroscopy **9:45 AM - 10:00 AM Helen Chappell:** Ab initio molecular dynamics of phospholipid-mineral interactions suggest a critical role for organic material in the growth of kidney stones **10:00 AM - 10:15 AM David Bensimon:** In vivo targeted and deterministic single cell cancer induction **10:15 AM - 10:30 AM Alexis Farman:** Enhancing immunotherapies: Insights from the mathematical modelling of a microfluidic device **10:30 AM - 11:00 AM Julia Yeomans:** Self organisation of invasive breast cancer driven by the interplay of active and passive nematic dynamics
	Queen A Queen's Suite	**Cell Metabolism and Growth** **9:00 AM - 9:30 AM Riki Eggert:** Lipid composition defines Endoplasmic Reticulum morphology and function **9:30 AM - 9:45 AM Julien Hurbain:** Cellular prediction during variation in carbon availability **9:45 AM - 10:15 AM Maria Makarova:** Coevolution of diplopterol and asymmetric acyl tails enables eukaryotic survival in oxygen-deprived niches through metabolic adaptation **10:15 AM - 10:30 AM Yoselin Benitez-Alfonso:** Untangling plant cell walls biophysics and the regulation of intercellular communication **10:30 AM - 11:00 AM Marco Cosentino-lagomarsino:** Laws for cellular growth, and models to frame them

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	Queen B Queen's Suite	**Natural and Synthetic Molecular Machines** **9:00 AM - 9:30 AM Jonathan Heddle:** Progress towards programmable biological matter **9:30 AM - 9:45 AM Roger Rubio Sanchez:** Lipid membrane biophysics and bioengineering with DNA nanostructures **9:45 AM - 10:00 AM Harrison Laurent:** Bionanomachine Networks - Development of functional all-enzyme hydrogels for responsive biomaterials in healthcare **10:00 AM - 10:15 AM Francisca D'Rozario:** Surface-immobilized, pH-responsive DNA Nanoswitches for electronic actuation **10:15 AM - 10:30 AM Jocelyn Etienne:** Mechanics of entropic biopolymer networks from the thermodynamics of molecular motors **10:30 AM - 11:00 AM Atlanta Cook:** Seeing double: using integrative structural methods to understand dsRNA recognition by nuclear factor proteins
11:00 AM - 11:30 AM	Studio One	**Morning Break**
11:30 AM - 12:15 PM	Auditorium	**Keynote Speaker Margaret Gardel:** Mechanical Information Processing in Adherent Cells
12:15 PM - 12:30 PM	Auditorium	**Conclusions and Close**
12:30 PM - 1:30 PM	Studio One	**Lunch and Depart**