

# Harnessing protein biotechnology for synthetic biology

13-15 March 2024

## Wednesday March 13

*Synthetic biology in a canonical molecular motor complex (flagellar).* (chair: Matt Baker)

09:00 – 09:10	Welcome and Introductions	Prof. Matthew Baker, Dr. Giorgos Gouridis
09:10 – 09:40	Bacterial flagellar motor as a multimodal biosensing chip.	Prof. Teuta Pilizota (UK/HR)
09:40 – 10:10	Scale-free dynamic fluctuations of a molecular bearing, from microseconds to minutes.	Prof. Richard Berry (UK)
10:10 – 10:40	Spatial and temporal dynamics of the proton motive force in <i>E. coli</i> .	Dr. Ashley Nord (FR/USA)
10:40 – 11:10	5:2 motors from bacterial motility to phage defense.	Prof. Nicholas Taylor (DK/BE)
11:10-12:00	Coffee break	

*Molecular evolution* (chair: Matt Baker)

12:00 – 12:30	Evolvability of membrane proteins using genetics.	Prof. George Diallinas (GR)
12:30 – 13:00	Emergence of fractal geometries in the evolution of a metabolic enzyme.	Prof. Georg Hochberg (DE)
13:00 – 13:30	Exploiting protein evolution for protein engineering.	Dr. Giorgos Gouridis (GR)
13.30-15.00	Lunch	

*SynBio Funding Opportunities and Collaboration* (chair: Matt Baker)

15:00 – 15:30	Q&A with ONR: What is synthetic biology? Funding molecular evolution work and biophysics through ONR.	Panel: Teuta Pilizota, Scott Walper (ONR Global). <i>Moderator: Matt Baker.</i>
15.30 – 16.00	Small group discussions – “what is the problem your shared skills could solve?”	<i>Moderator: Matt Baker.</i>
16:00 – 17:00	Poster Session (with refreshments)	All Participants
17:00	Dinner on Terrace IMBB (posters available)	All Participants
20:30	Bus to Speakers’ Hotel.	

## Thursday March 14

### *Protein biophysics in protein engineering and biomanufacturing (chair: Giorgos Gouridis)*

09:00 – 09:30	Single Molecule Studies in Artificial Cells - Unravelling and harnessing molecular complexity.	Dr. Oliver Castell (UK)
09:30 – 10:00	Machine learning and artificial intelligence for protein dynamics and engineering.	Dr. Giannis Pantazis (GR)
10:00 – 10:30	Exploring Protein aggregation, condensates and phase separation: Unleashing potential for innovative materials.	Dr. Emanuella Filipidi (GR)
10:30-11:30	Coffee break	

### *Protein dynamics in enzyme engineering (chair: Giorgos Gouridis)*

11:30 – 12:00	Navigating Metabolic Landscapes: Biased Ligands, Targeting Dynamics, by Single Molecule Insights through Machine Learning	Prof. Nikos Hatzakis (DK/GR)
12:00 – 12:30	The solute-binding protein repertoire of SAR11 marine bacteria: environmental and evolutionary significance	Ben Clifton (AU/JP)
12:30	Speakers to Knossos (with lunch-box), then to Museum.	
19:00	Speakers' Dinner.	

## Friday March 15

### *Methodologies Session – Structural Biology, Phylogenetics and Biophysics*

09:00 – 10.00	Panel: <i>How do we harness structural biology and biophysics to elucidate molecular processes underlying evolution?</i>	Georg Hochberg, Nicholas Taylor, Ashley Nord, Ben Clifton. <i>Moderator: Matt Baker</i>
10:00 – 10:30	Coffee break	
10:30 – 11:00	Panel: Europe – Asia – US collaborations	Nikos Hatzakis, Ashley Nord, George Garinis, Oliver Castell. <i>Moderator: Matt Baker</i>
11:00	End. Lunch-box for speakers to take to Airport.	