Programme (final version: 12 August 2022)

Sunday 21 August 2022

15:00 – Registration opens

17:00 – Welcome social

18:00 – 19:00 Welcome address (Conrad Mullineaux) and **plenary lecture** – Caroline Harwood. Phototrophs as models for bacterial longevity. **Room 3A**

Monday 22 August

9:00-10:30: Invited talks – Environment & Ecology. Chair: Dave Scanlan. Room 3A

9:00: Debbie Lindell. Coexistence and resistance among cyanobacteria and their phages in the ocean

9:30: Dennis Nürnberg. Diversity of far-red light photoacclimation responses in cyanobacteria

10:00: Christopher Gisriel. Structural bases of photoacclimation mechanisms that extend light utilization into the far-red region of the solar spectrum

10:30 – 11:10: Extended coffee break and poster mounting

11:10 – 12:30: Environment & Ecology (cont.) + Phylogeny, Taxonomy & Evolution. Chair: Chris Howe. Room 3A

11:10: Tom Bibby. Transcriptional responses of *Trichodesmium* to natural gradients of nutrient availability

11:40: Patricia Sánchez-Baracaldo. The evolution of ancestral cyanobacteria

12:10: Darius Kosmützky. The evolution of the cytochrome c_6 family of photosynthetic electron transfer proteins

12:30-13:30: Lunch (Exhibition Hall)

13:30 – 15:00: Invited talks – Phylogeny, Taxonomy & Evolution (cont) + Physiology, Metabolism, Sensory Transduction & Development. Chair: Niels-Ulrik Frigaard. Room 3A

13:30: Ferran Garcia-Pichel. Lifting phylogeny by its bootstraps: Interpretations, overinterpretations and misinterpretations

14:00: Vera Thiel. Anoxygenic phototrophic *Chloroflexota* – uncovering metabolic flexibility by in situ -omics analyses

14:30: Wolfgang Hess. Differential translation and novel small proteins and their functions in cyanobacteria

15:00 – 15:30 Coffee Break

15:30 – 18:00 Poster Session 1 (Exhibition Hall)

18:00-19:30 Parallel sessions – selected speakers

a. **Phylogeny, Taxonomy & Evolution + Environment & Ecology. Chair: Tina Summerfield. Room 3A**
   - Mohit Kumar Saini. Genomic and phenotypic characterization of *Chloracidobacterium* isolates provides evidence for multiple species
   - Laura Antonaru. The ancient evolution of far-red light photoacclimation
   - Michael Kühl. Ecological niche and importance of chlorophyll *f*-containing cyanobacteria in extreme beachrock biofilms
   - Pedro Cabello-Yeves. α-cyanobacteria possessing form IA RuBisCO globally dominate aquatic habitats

b. **Bioenergetics. Chair: Dirk Schneider. Room 4**
   - Jens Appel. Electron flow measurements enable determination of cyclic electron flow and redox state in cyanobacteria
   - Mike Jones. Expanded solar energy conversion by engineered biohybrid photosystems employing components from anoxygenic and oxygenic photosynthesis
   - Josef Komenda. Building the charge-separating D1/D2 assembly complexes of Photosystem II in cyanobacteria
   - Chihiro Azai. Charge separation induced by a lower-energy bacteriochlorophyll in the reaction center complex of *Heliobacterium modesticaldum*

Tuesday 23 August

9:00 -11:00 Invited talks – Physiology, Metabolism, Sensory Transduction & Development (cont) + Bioenergetics. Chair: Maria Fillat. Room 3A

9:00: Dan Canniffe. Assembly of a foreign photosynthetic antenna

9:30: Enrique Flores. Heterocyst-forming cyanobacteria endosymbiotic in marine diatoms

10:00: Annegret Wilde. The different functions of cellular appendages in cyanobacterial behaviour

10:30: Kevin Redding. Light-driven electron transport in Heliobacteria

11:00 – 11:30 - Coffee break

11:30 – 13:00 - Parallel sessions – selected speakers

a. Physiology. Chair: Amel Latifi. Room 3A

Iris Maldener. Architecture and components of the gated cell-cell communication system of filamentous cyanobacteria

Cheng-Cai Zhang. A proteolytic pathway coordinates cell division and heterocyst differentiation

Alicia Muro-Pastor. Regulatory RNAs involved in heterocyst differentiation and function

Rinat Arbel-Goren. Robust, coherent and synchronized circadian clock-controlled oscillations along multicellular filaments of *Anabaena* cyanobacteria

b. Environment & Ecology. Chair: Nicole Frankenberg-Dinkel. Room 4

Alberto Torcello-Requena. Psip1 is a high-affinity alkaline phosphatase in picocyanobacteria occupying P-deplete oligotrophic oceans.

Ralf Steuer. From single cell growth to productive ecosystems: Insights from mathematical modelling

Freddy Bunbury. Differential phototactic behavior of closely related cyanobacterial isolates from Yellowstone hot spring biofilms

Jack Meeks. The transcriptome of *Nostoc punctiforme* in endosymbiosis with a hornwort reveals its symbiotic growth state

13:00 -14:00: Lunch (Exhibition Hall) and ISPP international committee meeting (Room 4).

14:00 onwards: Free afternoon for tourism and sporting event (Shuffleboard at the Boston Pool Loft from 16:00 – 18:00)

19:00: Banquet at the Liverpool Maritime Museum

Wednesday 24 August

9:00 - 10:30: Invited talks – Bioenergetics. Chair: Peter Nixon. Room 3A

9:00: Wendy Schluchter. The role of bilin lyases and lyase-isomerases in Type IV chromatic acclimation in marine *Synechococcus*

9:30: David Swainsbury. Structures of *Rhodopseudomonas palustris* RC-LH1 complexes with open or closed quinone channels

10:00: Jenny Zhang. Stealing from the photosynthetic electron transport chain

10:30 – 11:00: Coffee break

11:00 - 12:30: Parallel sessions – selected speakers

a. Physiology. Chair: Elinor Thompson. Room 3A

David Russo: Exploring cyanobacterial protein secretion for ecology and biotechnology

Roman Sobotka: Regulatory crosstalk between tetrapyrrole and arginine biosynthetic pathways in cyanobacteria

Martin Hagemann: Regulation of carbon acclimation in cyanobacteria

Taina Tyystjärvi: A novel signaling cascade regulates growth of cyanobacteria according to carbon dioxide

b. Biotechnology. Chair: Paula Tamagnini. Room 4

Sila Arsin: Disjointed biosynthetic gene clusters for the shared production of two structural distinct microbial sunscreens

Robert Kourist: Photosynthesis-driven biocatalytic redox reactions for the synthesis of high-value chemicals

Abi Perrin: CyanoTag: High-throughput protein localisation in cyanobacteria

Jordan Twigg: Single-cell Raman spectroscopy of *Synechococcus* sp. PCC 7002 and *Synechocystis* sp PCC 6803

12:30-13:30: Lunch (Exhibition hall)

13:30 – 15:10: Parallel sessions (selected speakers)

a. Physiology. Chair: Toshio Sakamoto. Room 3A

Vladimir Yurkov: Another surprise from the aerobic anoxygenic phototrophs: Wide range of metallophores

Karl Forchhammer: Resuscitation from nitrogen chlorosis: Deciphering a program for maintenance of viability

Lucas Gewehr: Structure of a fusogenic cyanobacterial dynamin-like protein

Asunción Contreras: Association of the multitask regulator PipX with the ribosome-assembly GTPase EngA

b. Biotechnology/Bioenergetics. Chair: Jörg Toepel. Room 4

Paul Hudson: Metabolite interactions in the bacterial Calvin cycle and implications for flux regulation

Yaqi Sun: Decoding the stoichiometric composition and cargo organisation of carboxysomes

Paulo Oliveira: Cyanobacterial extracellular vesicles: from biology to biotechnology

Lauri Nikkanen: Controlling distribution of photosynthetic electron flux between flavodiiron proteins, NDH-1, CO_2 fixation, and exogenous sinks

15:10 – 15:40: coffee break

15:40-18:00: Poster session 2 (Exhibition Hall)

18:00-19:00: Plenary, and **EMBO Young Investigator Lecture.** Ben Engel: Exploring the molecular architecture of photosynthesis with cryo-electron tomography. Chair: Luke Mackinder. Room 3A

Thursday 25 August

9:00 – 11:00: Invited talks: Biotechnology & Synthetic Biology. Chair: Saul Purton. Room 3A

9:00: Kirstin Gutekunst: Glycolytic shunts replenish the Calvin-Benson-Bassham cycle

9:30: Alistair McCormick: CyanoSource: A foundry-generated barcoded plasmid and mutant library resource for *Synechocystis* sp. PCC 6803

10:00: Cheryl Kerfeld: Native and engineered functions of bacterial microcompartments in phototrophs

10:30: Lu-Ning Liu: Harnessing the fundamental understanding of self-assembling protein organelles for bioengineering

11:00 – 11:30: Coffee break

11:30 – 12:50: Parallel sessions – selected speakers

a. Physiology/Bioenergetics. Chair: Diana Kirilovsky. Room 3A

Gen Enomoto: Light-dependent induction of cell polarity and switching of moving direction in a rod-shaped cyanobacterium *Thermosynechococcus*

David Lea-Smith: Hydrocarbons induce cyanobacterial membrane curvature required for light-to-dark thylakoid remodelling

Thomas Hanson: Enabling synthetic biology for the *Chlorobiaceae*

Volha Chukhutsina: Light activation of Orange Carotenoid Protein reveals initial C8'-C7' double bond trans/cis isomerization

b. Bioenergetics. Chair: Andrew Hitchcock. Room 4

Michal Koblizek: Cryo-EM structure of the photosynthetic complex from *Gemmatimonas phototrophica* at 2.4 Å

Laura Bracun: Cryo-EM analysis of the macromolecular structures of photosynthetic RC-LH1 complexes in species of *Rhodobacter*

Matthew Proctor: Cryo-EM structure of the *Synechocystis* cytochrome b_6f complex with the regulatory PetP subunit

Laura Wey: Role of cytochrome c_M in *Synechocystis* sp. PCC 6803 to restart photoautotrophy after prolonged darkness

12:50 – final announcements, prizes and farewell. Room 3A