'Life in Context –
organismal sensing and adaptation in the natural environment'

8th International COS Symposium
July 22-23 2024

The Centre for Organismal Studies (COS) at Heidelberg University is hosting its biennial symposium 'Life in Context – organismal sensing and adaptation in the natural environment'. Life has a prodigious ability to adapt. Organisms interact with their environment at levels from molecules to cells, tissues, and behaviour and over time scales from milliseconds to years. Consequently, organisms are not just defined by their genomes, but equally by their environment. The symposium will bring together speakers who investigate the impact of the environment on organisms and how they adapt to it, from the genomic, cell-biological, developmental, behavioural and evolutionary perspectives. Topics include environmental sensing, inter-organismal interactions, and adaptation across scales. The symposium will also introduce new experimental systems for integrative biology and cover organismal responses in the context of anthropogenic environmental change. The COS welcomes all interested to attend the symposium in Heidelberg on 22nd-23rd of July 2024.

COS Symposium 2024
'Life in Context - Organismal sensing and adaptation in the natural environment'

Monday July 22nd

13:00 start, welcoming
Session 1

- **Thomas Richards, Luis Galindo Gonzalez – Oxford University, UK** – The group of Thomas Richards aims to understand how eukaryotic cellular complexity –which encompasses plants, animals, fungi and a vast diversity of microbial forms called protists– arose and diversified. To do this, they use phylogenomic approaches combined with cell biology and molecular experiments.
- **Rosa Lozano-Durán – ZMBP Tübingen, Germany** - The Lozano-Durán group wants to understand the interactions between plants and viruses at the molecular and cellular level, shedding light on how viruses manipulate and tailor plant development and physiology to favour the infection.
- **Magdalena Julkowska - Boyce Thompson Institute Ithaca, USA** – The focus of the Julkowska lab is to explore stress-induced changes in plant architecture across stress-tolerant species, including wild tomato, cowpea and tepary bean.

14:30 coffee break

15:15 session 2

- **Hanh Vu – EMBL, Heidelberg, Germany.** – The Vu group does comparative studies of planarian flatworms, and aims to understand the control principles that define animal body size.
- **Mitsuyasu Hasebe – NIBB, Japan** – The Hasebe lab wants to understand the key genetic changes that resulted in the evolution of influential novel traits in land plants, specifically carnivorous plants.
- **Janna Nawroth – TUM Munich, Germany** - The Nawroth lab explores the physics-based mechanisms by which animals locomote, feed, defend and interact in aquatic environments.

16:45 flash talks by selected poster abstracts

17:30 poster session + drinks

20:00 Invited speaker's dinner

Tuesday July 23rd

9:00 start session 3

- **Nicole Dubilier – MPI Bremen** – Nicole Dubilier leads the Department of Symbiosis which studies the biology and ecology of associations between bacteria and eukaryotes. The main emphasis is on marine invertebrates from chemosynthetic environments such as sulfide-rich coastal sediments, vents and seeps.
- Short talk: **James Saenz – B CUBE, TU Dresden, Germany** - Minimal cells as models for membrane sensing and adaptation
- **Francesco Licausi – Oxford University, UK** – The Synoxys lab investigates the signaling mechanisms that link oxygen availability to plant growth and development, to understand adaptations to oxygen fluctuations throughout evolution and to design novel biotechnological strategies.
- Short talk: **Nóra Szabó - Eötvös Loránd University Budapest, Hungary** - The development of the labyrinth organ in the air-breathing paradise fish (Macropodus opercularis)

10:30 coffee break

11:15 session 4

- **Kazuo Inaba - Shimoda Marine Station Japan** – The group of Prof. Inaba studies the structure, function and evolution of cilia and flagella by using marine organisms such as ascidian, sea urchin, fish, and comb jelly.
- **Tonni Grube-Andersen – MPIZ Cologne, Germany** – Roots are faced with constant stress both regarding nutrient/water availability and biotic factors such as pathogenic microbes, and needs to respond accordingly to survive. The lab of Dr. Grube-Andersen studies how roots communicate with their environment.
- Short talk: **Jiyan Qi – Northwestern Polytechnical University, Xian, China** – Single-Cell Transcriptome Atlas in Developing Multicellular Glandular Trichomes

12:30 lunch

14:00 session 5

- **Josefa Gonzalez - CSIC Barcelona, Spain –** The group of Josefa Gonzalez focuses on understanding how organisms adapt to their environments, using Drosophila. They combine *omics* approaches with detailed molecular and phenotypic analyses to get a comprehensive picture of adaptation.
- **Flora Vincent – EMBL, Heidelberg, Germany –** The Vincent group explores the diversity and impact of marine microbial interactions across different biological scales, with a focus on symbiosis within unicellular eukaryotes.
- **Schmeil Award Ceremony**

15:30 coffee break

16:15 Keynote speaker ***** THE EMBO LECTURE (16.15 – 17.30): Liam Dolan, GMI Vienna - "Early Land Plant Evolution" *****

Prof. Liam Dolan's research uses genetics to discover how plants and their cells develop and evolve with a main focus on the identification of mechanisms that control the development and differentiation of specialized plant cell types. His research on the adaptation of early plant life to the land encompasses environmental adaptation on the cellular and evolutionary scale.

17:30 poster prize, closing remarks
18:00 BBQ party