



Optogenetics: From Design to Cell Signalling to Tissue Morphogenesis

EMBO PRACTICAL COURSE



We have moved our website to embl.org/events. The content below is no longer being updated.

EMBL Courses and Conferences during the Coronavirus pandemic

With the onsite programme paused, many of our events are now being offered in virtual formats.

Registration is open as usual for many events, with back-up plans in place to move further courses and conferences online as necessary. Registration fees for any events affected by the COVID-19 disruption are fully refundable.

More information for participants of events at EMBL Heidelberg can be found [here](#).

Programme

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Day 1 - Monday 25 March 2019

Time	Speaker	Location
09:00 - 09:30	Registration	Courtyard Room A & B

Time	Speaker	Location
09:30 - 10:00	Welcome and introductions	Courtyard Room A & B
10:00 - 11:00	Lecture: Introduction to photoreceptors: structure and function of LOV domains and phytochromes Andreas Möglich - University of Bayreuth, Germany	Courtyard Room A & B
11:00 - 11:30	Coffee break	Courtyard Room A & B
11:30 - 12:30	Lecture: Hi-jacking photoreceptor diversity Harald Janovjak - Monash University, Australia	Courtyard Room A & B
12:30 - 13:30	Lunch break	EMBL Canteen
13:30 - 15:30	Practical session: Database searches to identify photoreceptors and in silico structural analysis	Computer Training Lab
15:30 - 16:00	Coffee break	Courtyard Room A & B
16:00 - 17:00	Practical session: Preparation of E. coli cultures expressing engineered optogenetic gene expression systems (break out in groups)	Training Lab A
17:00 - 18:30	Group activity: Short flash talk presentations by participants	Courtyard Room A & B
18:30 - 19:00	Bus to downtown	
19:00	Dinner downtown	

Day 2 - Tuesday 26 March 2019

Time	Speaker	Location
09:00 - 10:00	Practical session: Analysis of E. coli cultures from day 1 and discussion	Training Lab A
10:00 - 10:30	Coffee break	Courtyard Room A & B

Time	Speaker	Location
10:30 - 11:30	Lecture: Discovery and engineering of novel photoreceptors and sensory proteins Brian Chow - University of Pennsylvania, USA	Courtyard Room A & B
11:30 - 12:30	Lecture: Cell-type specific optogenetics for vision restoration: engineered light-activated GPCRs, cell-specific enhancer/promoters and synthetic adeno-associated viruses Sonja Kleinlogel - University of Bern, Switzerland	Courtyard Room A & B
12:30 - 13:30	Lunch break	EMBL Canteen
13:30 - 15:30	Practical session: Designing functional proteins containing optogenetic modules using in silico genetic engineering/bioinformatics (break out in groups)	Computer Training Lab
15:30 - 16:00	Coffee break	Courtyard Room A & B
16:00 - 18:00	Poster session even numbers	Helix A & Rooftop Lounge
18:00 - 19:00	Dinner	EMBL Canteen
19:00 - 20:00	Lecture: Optogenetic tools for subcellular optogenetics Lorena Benedetti - Janelia Research Campus, USA	Courtyard Room A & B
20:00 - 21:30	Group activity/discussion: Which photoreceptor is right for me?	Courtyard Room A & B
21:30	Bus back to the ISG Hotel	

Day 3 - Wednesday 27 March 2019

Time	Speaker	Location
09:00 - 09:30	Practical session: Prepare yeast cultures and plate mammalian cells for afternoon	Training Lab A

Time	Speaker	Location
09:30 - 10:30	Lecture: Input control to uncover new principles in cell signaling Jared Toettcher - Princeton University, USA	Courtyard Room A & B
10:30 - 10:45	Coffee break	Courtyard Room A & B
10:45 - 11:45	Lecture: Using optogenetics to probe cell polarity and cytokinesis Michael Glotzer - University of Chicago, USA	Courtyard Room A & B
11:45 - 12:45	Lecture: Light sensitive proteins as molecular building blocks Seraphine Wegner - Max Planck Institute for Polymer Research, Germany	Courtyard Room A & B
12:45 - 13:30	Lunch	EMBL Canteen
13:30 - 15:30	Practical session: Using light to generate "giant" budding yeast and release them back into the cell cycle (break out in groups)	Training Lab A
15:30 - 17:30	Practical session: Combining optogenetics and live-cell microscopy: visualizing optogenetic tool activity in mammalian cells (break out in groups)	Training Lab A
17:30 - 18:00	Lecture: Optogenetics-based biomaterials for the control and analysis of cell-matrix interactions Maximilian Hörner - University Freiburg, Germany	Courtyard Room A & B
18:30 - 19:30	Dinner	EMBL Canteen
19:30 - 21:00	Poster Session odd numbers	Helix A & Rooftop Lounge
21:00	Bus back to the ISG Hotel	

Day 4 - Thursday 28 March 2019

Time	Speaker	Location
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Time	Speaker	Location
10:00 - 11:00	Lecture: Spatiotemporal manipulation of Rho GTPases and cell polarity with optogenetics Mathieu Coppey - Institute Curie, France	Courtyard Room A & B
11:00 - 11:30	Coffee	Courtyard Room A & B
11:30 - 12:30	Lecture: Spatiotemporal control of intracellular trafficking Lukas Kapitein - Utrecht University, The Netherlands	Courtyard Room A & B
12:30 - 13:30	Lunch break	EMBL Canteen
13:30 - 17:30	Practical: Optogenetic tools in vitro: controlling protein binding/unbinding from beads with light	Training Lab A
17:30 - 18:00	Coffee break	Courtyard Room A & B
18:00 - 19:00	Lecture: Using optogenetics to control nuclear import and export Barbara Di Ventura - University of Freiburg, Germany	Courtyard Room A & B
19:00 - 20:30	Pizza and Beer + group activity/discussion: Which light source is right for me?	Helix A & Rooftop Lounge
20:30 - 22:00	Poster session all	Helix A & Rooftop Lounge
22:00	Bus back to the ISG Hotel	

Day 5 - Friday 29 March 2019

Time	Speaker	Location
09:00 - 10:00	Practical: Optogenetic tools in vitro: controlling protein binding/unbinding from beads with light (Group D)	Courtyard Room A & B

Time	Speaker	Location
10:00 - 11:00	Lecture: TAE1: An optogenetic gene expression system optimized for zebrafish embryos Stephanie Woo - University of California Merced, USA	Courtyard Room A & B
11:00 - 12:30	Lecture: A size-invariant bud-duration timer enables robustness in yeast cell size control Brian Graziano - UCSF, USA	Miscroscopy Room A
12:30 - 13:30	Lunch break	EMBL Canteen
13:30 - 16:30	Practical session I: Optogenetic modulation of gastrulation movement during Drosophila embryogenesis (break out in groups)	Training Lab A
13:30 - 16:30	Practical session II: Reversible manipulation of subcellular protein localization in live zebrafish embryos using the Phytochrome system (break out in groups)	Training Lab A
17:00 - 18:00	Lecture: Wavefront-engineering microscopy Emiliano Ronzitti - Université Paris Descartes, France	Courtyard Room A & B
18:00 - 19:00	Lecture: Feedback control with optogenetics Mustafa Khammash - ETH Zurich, Switzerland	Courtyard Room A & B
19:00 - 20:00	Course Dinner	EMBL Canteen
20:00 - 20:30	Group activit: Course Summary / Future Perspectives	Courtyard Room A & B
20:30 - 00:00	Party with live music by "Crimson Veil" band	Helix A & Rooftop Lounge
00:00	Bus back to the ISG Hotel	