



# Genome Engineering: CRISPR/Cas

EMBL COURSE

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SCIENTIFIC

**We have moved our website to [embl.org/events](https://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 The content below is no longer being updated.**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

Got something to say? Tweet it with [#EMBLCRISPRcas](#)

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### Day 1 - Sunday 17 March 2019

Time	Speaker	Location
from 17:00	<b>Arrival &amp; Welcome</b>	ISG Hotel
	<b>Welcome round of organisers, trainers, speakers</b>	ISG Hotel

Time	Speaker	Location
	<b>Ice-breaker &amp; Flash Talks</b>	
18:30 - 19:30	<b>Introduction into CRISPR/Cas9</b> Sibylle Vonesch - EMBL Heidelberg, Germany	ISG Hotel
19:30	<b>Dinner</b>	ISG Hotel

## Day 2 - Monday 18 March 2019

Time	Speaker	Location
	<b>Welcome to EMBL</b>	
09:00 - 09:30	Yvonne Yeboah, Elisabeth Zielonka - EMBL Heidelberg, Germany	Flex Lab A&B
09:30 - 10:15	<b>Purification of Cas9 protein</b> Kim Remans - EMBL Heidelberg, Germany	Flex Lab A&B
10:15 - 10:45	<b>Coffee break</b>	Flex Lab A&B
10:45 - 11:45	<b>gRNA/Donor design (Intro to practical)</b> Thermo Fischer Scientific	Flex Lab A&B
11:45 - 12:30	<b>Practical 1-1</b> Guide RNA Synthesis – PCR for IVT templates	Flex Lab A&B
12:30 - 13:30	<b>Lunch break</b>	EMBL Canteen
13:30 - 14:30	<b>The 3Cs technology for CRISPR gRNA library generation</b> Manuel Kaulich - Goethe University, Germany	Flex Lab A&B
14:30 - 15:00	<b>Coffee break</b>	Flex Lab A&B
15:00 - 16:30	<b>Practical 1-2</b> PCR gel analysis and set up IVT	Training Lab B
16:30 - 18:00	<b>Practicals 2 &amp; 3 in groups</b> Transfection of 293FT cells with gRNA & Cas9mRNA lipofection Electroporation of 293FT with gRNA & Cas9protein Guide RNA design task	Training Lab B
18:00 - 19:00	<b>Dinner</b>	EMBL Canteen

Time	Speaker	Location
19:00 - 20:30	<b>Practicals 2 &amp; 3 in groups continues</b> Transfection of 293FT cells with gRNA & Cas9mRNA lipofection Electroporation of 293FT with gRNA & Cas9protein Guide RNA design task	Training Lab B

## Day 3 - Tuesday 19 March 2019

Time	Speaker	Location
09:00 - 09:45	<b>Genome and epigenome editing using CRISPR-Cas system</b> Claudio Mussolino - Medical Center -University of Freiburg, Germany	Flex Lab A&B
09:45 - 10:00	<b>Coffee break</b>	Flex Lab A&B
10:00 - 11:00	<b>Generation and validation of endogenously tagged cell lines</b> Birgit Koch - Max Planck Institute for Medical Research, Germany	Flex Lab A&B
11:00 - 12:00	<b>Lecture: Introduction to FACS sorting</b> Malte Paulsen - EMBL Heidelberg, Germany	Flex Lab A&B
12:00 - 13:00	<b>Lunch break</b>	EMBL Canteen
13:00 - 14:00	<b>Practicals in groups</b> a) FACS sorting of knock in cells – single cell sort b) Individual project discussion	Flex Lab A&B/ Flow Cytometry Core Facility
14:00 - 15:00	<b>Practicals in groups continues</b> a) Individual project discussion b) FACS sorting of knock in cells – single cell sort	Flex Lab A&B/ Flow Cytometry Core Facility
15:00 - 15:15	<b>Coffee break</b>	Flex Lab A&B
15:15 - 16:30	<b>Practicals 1-3 &amp; 4 in groups continues</b> IVT cleanup, quantitation and analysis of gRNA Transfection of 293FT-eBFP cells using CRISPR/Cas9 for SNP (RNPs)	Training Lab B

Time	Speaker	Location
16:30 - 16:45	<b>Coffee break</b>	Flex Lab A&B
16:45 - 18:00	<b>Practicals 1-3 &amp; 4 in groups continues</b> IVT cleanup, quantitation and analysis of gRNA Transfection of 293FT-eBFP cells using CRISPR/Cas9 for SNP (RNPs)	Training Lab B
18:00 - 20:00	<b>Poster session (odd numbers) and pizza</b>	Top of Helix B

## Day 4 - Wednesday 20 March 2019

Time	Speaker	Location
09:00 - 09:30	<b>High Efficiency Gene Editing using Programmable EnGen Ribonucleoprotein Complexes</b> Karl von Laer - New England Biolabs, Germany	Flex Lab A&B
09:30 - 10:00	<b>Basic CRISPR in mice</b> Neil Humphreys - EMBL Rome, Italy	Flex Lab A&B
10:00 - 10:15	<b>Coffee break</b>	Flex Lab A&B
10:15 - 12:00	<b>Practical 5-1 &amp; 5-2</b> GCD Cell Harvest and lysis, set up GCD PCR	Training Lab B
12:00 - 13:00	<b>Lunch break</b>	EMBL Canteen
13:00 - 13:45	<b>CRISPR/Cas in yeast</b> Sibylle Vonesch - EMBL Heidelberg, Germany	Flex Lab A&B
13:45 - 14:15	<b>Practical 5-3</b> CR analysis, set up GCD re-annealing reaction	Training Lab B
14:15 - 16:15	<b>Practicals 5-4 &amp; 5-5 in groups</b> Set up digestion for GCD, gel purification & sample submission for sanger sequencing Gel analysis of GCD	Training Lab B
16:15 - 16:30	<b>Coffee break</b>	Flex Lab A&B
16:30 - 18:30	<b>TIDE - rapid, powerful and easy analysis of CRISPR experiments</b> Victor Dillard - Desktop Genetics, UK	Flex Lab A&B

Time	Speaker	Location
18:30 - 21:30	<b>Poster session (even numbers) with tapas buffet</b>	Top of Helix B

## Day 5 - Thursday 21 March 2019

Time	Speaker	Location
09:00 - 10:30	<b>Practicals 6 in groups</b> Examine BFP cells via microscopy and FACS Knock-In cell validation - DNA Preparation	Training Lab B
10:30 - 12:00	<b>Practicals 6 in groups continues</b> Examine BFP cells via microscopy and FACS Knock-In cell validation - DNA Preparation	Training Lab B
12:00 - 13:00	<b>Lunch break</b>	EMBL Canteen
13:00 - 13:45	<b>Genome-wide and targeted screens using CRISPR/Cas9 system</b> Balca R. Mardin - BioMed X, Germany	Flex Lab A&B
13:45 - 15:00	<b>Practical</b> Knock-In cell validation – Set up Junction PCR	Training Lab B
15:00 - 15:30	<b>Coffee break</b>	Flex Lab A&B
15:30 - 16:30	<b>Optimizing CRISPR ribonucleoprotein components for precision genome editing</b> Justin Barr - Integrated DNA Technologies, United States of America	Flex Lab A&B
17:00	<b>Guided tour of Heidelberg</b>	
19:30	<b>Dinner downtown</b>	

## Day 6 - Friday 22 March 2019

Time	Speaker	Location
09:00 - 10:00	<b>CRISPR-Cas9 transgenic mice - applications</b> Neil Humphreys – EMBL Rome	Flex Lab A&B
10:00 - 11:00	<b>Practical</b> Knock-In cell validation (1) - Gel electrophoresis of junction PCR	Training Lab B

Time	Speaker	Location
11:00 - 11:30	<b>Coffee break</b>	Flex Lab A&B
11:30 - 12:15	<b>Practical</b> Knock-In cell validation (2) - Analysis of gel electrophoresis	Training Lab B
12:15 - 13:00	<b>Final Project Discussion</b>	Flex Lab A&B
13:00 - 14:00	<b>Lunch break</b>	EMBL Canteen
14:00 - 16:00	<b>Summary of results, final discussions, feedback session</b>	Flex Lab A&B
16:00 - 16:15	<b>Coffee break</b>	Flex Lab A&B
16:00 - 16:30	<b>Closing remarks &amp; wrap-up</b>	Flex Lab A&B