



# Single-Cell Omics

EMBO PRACTICAL COURSE



**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 The content below is no longer being updated.**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

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### Day 1 - Sunday 12 May 2019

Time	Speaker	Location
10:00-10:15	<b>Arrival &amp; Welcome</b>	Flex Lab A&B
10:15-10:30	<b>Laboratory safety introduction</b>	Flex Lab A&B

Time	Speaker	Location
10:30-11:15	<b>Ice breaking activity</b>	Flex Lab A&B
11:15-12:00	<b>Lecture: Flow Cytometry and single-cell sampling</b> Malte Paulsen - EMBL Heidelberg, Germany	Flex Lab A&B
12:00-13:00	<b>Lunch break</b>	Rooftop Lounge
13:00-14:00	<b>Practical work: Cell sampling by FACS</b>	Training Lab B
14:00-15:30	<b>Practical (scBS-Seq) Purification of BS converted DNA and Pre-amplification</b>	Training Lab B
15:30-16:00	<b>Coffee break</b>	Outside Courtyard Rooms
16:00-16:45	<b>Lecture: Introduction to single cell analysis and applications</b> Anders Ståhlberg - Sahlgrenska Cancer Center, Sweden	Flex Lab A&B
16:45-17:30	<b>Lecture: Single-cell Epigenomics</b> Stephen Clark - Babraham Institute, UK	Flex Lab A&B
17:30-19:00	<b>Practical (scBS-Seq) Purification and adapter 2 tagging for library preparation</b>	Training Lab B
19:00-20:00	<b>Dinner</b>	EMBL Canteen
20:00-21:00	<b>Flash talks by participants</b>	Flex Lab A&B
21:00	<b>Return to Hotel</b>	

## Day 2 - Monday 13 May 2019

Time	Speaker	Location
09:00 - 09:15	<b>Overview of the day</b>	Flex Lab A&B
09:15-10:00	<b>Lecture: Single-cell transcriptomics – newest advantages in the field</b> Vladimir Benes - EMBL Heidelberg, Germany	Flex Lab A&B
10:00-10:15	<b>Coffee break</b>	Outside Courtyard Rooms

Time	Speaker	Location
10:15-11:15	<b>Practical (scBS-Seq) Purification and library amplification</b>	Training Lab B
11:15-13:00	<b>Practical (scRNA-Seq) GEM generation and barcoding incl. workflow overview: from cell preparation o reverse transcription set-up</b>	Training Lab B
13:00-14:00	<b>Lunch break</b>	EMBL Canteen
14:00-14:45	<b>Lecture: Innovations in single-cell epigenomics</b> Stephen Clark - Babraham Institute, UK	Flex Lab A&B
14:45-15:00	<b>Coffee break</b>	Outside Courtyard Rooms
15:00-17:00	<b>Practical (scRNA-Seq): Post Gem RT clean up –and cDNA aplification</b>	Training Lab B
17:00-17:45	<b>Lecture: Single cell analysis in tracking embryo development</b> Qiaolin Deng - Karolinska Institutet, Sweden	Flex Lab A&B
17:45-18:30	<b>Interactive Lecture: Experimental design for single-cell analysis</b> Anders Ståhlberg	Flex Lab A&B
18:30-21:00	<b>Poster Session with Pizza and drinks &amp; Discussion I</b>	Bottom of Helix B
21:00	<b>Return to Hotel</b>	

## Day 3 - Tuesday 14 May 2019

Time	Speaker	Location
09:00-09:15	<b>Overview of the day</b>	Flex Lab A&B
09:15-10:00	<b>Lecture: Single-cell analysis using Mass Cytometry (CyTOF) technology</b> Susanne Heck - NIHR Biomedical Research Centre, UK	Flex Lab A&B

Time	Speaker	Location
10:00-10:15	<b>Coffee break</b>	Outside Courtyard Rooms
10:15-12:00	<b>Practical (scRNA-Seq) Library preparation</b>	Training Lab B
12:00-13:00	<b>Lunch break</b>	EMBL Canteen
13:00-13:45	<b>Lecture: Single-cell protein analysis</b> Caroline Gallant - Uppsala University, Sweden	Flex Lab A&B
13:45-15:00	<b>Practical (scRNA-Seq): Library preparation continues</b>	Training Lab & Core Facilities
15:00-15:15	<b>Coffee break</b>	Outside Courtyard Rooms
15:15-16:00	<b>Lecture: Spatial transcriptomics – and comparisons to single-cell RNA-Seq</b> Lars Borm - Karolinska Institutet, Sweden	Flex Lab A&B
16:00-16:45	<b>Lecture: Single-cell metabolomics</b> Orane Guillaume-Gentil - ETH Zürich, Switzerland	Flex Lab A&B
16:45-17:45	<b>Discussion-round: Challenges of single-cell omics applications</b>	Flex Lab A&B
17:45-18:45	<b>Dinner</b>	EMBL Canteen
18:45-21:00	<b>Poster Session with drinks and discussion II</b>	Bottom of Helix B

## Day 4 - Wednesday 15 May 2019

Time	Speaker	Location
09:00 - 09:15	<b>Overview of the day</b>	Flex Lab A&B
09:15 - 10:00	<b>Lecture: Integrating Single cell epigenomics with Single cell RNA seq analysis</b> Oliver Stegle - EMBL-EBI, UK	Flex Lab A&B
10:00 - 10:45	<b>Lecture: Strand-Seq technology introduction and applications</b> Ashley Sanders - EMBL Heidelberg, Germany	Flex Lab A&B

Time	Speaker	Location
10:45 - 11:00	<b>Coffee break</b>	Outside Courtyard Rooms
11:00 - 12:30	<b>Practical: Strand-seq sample prep (nuclei isolation and FACS analysis)</b>	Training Lab B/ FACS
12:30 - 13:30	<b>Lunch break</b>	EMBL Canteen
13:30 - 15:30	<b>Practical continued: Strand-seq MNase digestion with sample clean up</b>	Training Lab B
15:30 - 16:30	<b>Practical (Strand-Seq): Robotics demonstration of MNase protocol</b>	Training Lab B
16:30 - 16:45	<b>Coffee break</b>	Outside Courtyard Rooms
16:45 - 18:00	<b>Lecture: Data-preprocessing (focus on generated scRNA-seq datasets)</b> Raffaele Calogero - University of Torino, Italy	Computer Training Lab
18:00-19:30	<b>Bus downtown and guided tour through Heidelberg</b>	downtown Heidelberg
	<b>Course dinner in local restaurant</b>	Restaurant, downtown Heidelberg

## Day 5 - Thursday 16 May 2019

Time	Speaker	Location
09:00 - 09:15	<b>Overview of the day</b>	Computer Training Lab
09:15 - 10:00	<b>Lecture: Single-cell RNA Seq data analysis</b> Raffaele Calogero - University of Torino, Italy	Computer Training Lab
10:00 - 10:15	<b>Coffee break</b>	Outside Computer Training Lab
10:15 - 12:30	<b>Computational practical: Single-cell RNA Seq data analysis</b>	Computer Training Lab
12:30 - 13:30	<b>Lunch break</b>	EMBL Canteen

Time	Speaker	Location
13:30 - 15:00	<b>Computational practical continued: Single-cell RNA Seq data analysis</b>	Computer Training Lab
15:00 - 15:30	<b>Coffee break</b>	Outside Courtyard Rooms
15:30 - 16:15	<b>Lecture: Single-cell ATAC Sequencing and applications</b> James Reddington - EMBL Heidelberg, Germany	Computer Training Lab
16:15 - 17:15	<b>Group activity: Critical steps in single-cell data analysis</b>	Computer Training Lab
17:15	<b>Free evening</b>	

## Day 6 - Friday 17 May 2019

Time	Speaker	Location
09:00 - 09:15	<b>Overview of the day</b>	Computer Training Lab
09:15 - 10:00	<b>Lecture: Single-cell genomics data analysis</b> Hyobin Jeong - EMBL Heidelberg, Germany David Porubsky - University of Washington, USA	Computer Training Lab
10:00 - 10:15	<b>Coffee break</b>	Outside Computer Training Lab
10:15 - 12:30	<b>Computational practical: Single-cell genomics data analysis</b> Hyobin Jeong - EMBL Heidelberg, Germany	Computer Training Lab
12:30 - 13:30	<b>Lunch break</b>	EMBL Canteen
13:30 - 15:00	<b>Computational practical continued: Single-cell genomics data analysis</b> David Porubsky - University of Washington, USA	Computer Training Lab
15:00 - 15:30	<b>Coffee break</b>	Outside Computer Training Lab

Time	Speaker	Location
	<b>Lecture: Analysis of epigenetic single-cell datasets</b>	
15:30 - 16:15	Davis McCarthy - The University of Melbourne & St Vincent's Institute of Medical Research, Australia	Computer Training Lab
16:15 - 18:00	<b>Computational practical: scBS-Seq data analysis – Data pre-processing and first analysis steps</b>	Computer Training Lab
18:00	<b>Bus to ISG</b>	
19:00	<b>BBQ Dinner</b>	ISG Hotel

## Day 7 - Saturday 18 May 2019

Time	Speaker	Location
09:00 - 09:15	<b>Overview of the day</b>	Computer Training Lab
09:15 - 10:30	<b>Computational practical continued: scBS-Seq data analysis</b>	Computer Training Lab
10:30 - 10:45	<b>Coffee break</b>	Outside Computer Training Lab
10:45 - 12:30	<b>Computational practical: Data integration tools</b>	Computer Training Lab
12:30 - 13:30	<b>Lunch break</b>	EMBL Canteen
13:30 - 14:30	<b>Data analysis discussion round</b>	Computer Training Lab
14:30 - 15:00	<b>Wrap up, Poster-prize and feedback</b>	Computer Training Lab
15:00	<b>End of course</b>	