

2nd programmable nucleases (CRISPR/Cas9) Transgenesis Course

Date: 3rd – 7th April, 2017
Czech Centre for Phenogenomics, Prague-Vestec (BIOCEV)

Preliminary program

Day 1 – Monday 3rd April 2017

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| 10:45 – 11:00 | Arrival and Registration |
| 11:00 – 11:15 | Welcome and Introduction to the course and teaching material Introduction of team members <i>Radislav Sedlacek (IMG/CCP)</i> |
| 11:15 – 13:15 | Participants: presentation individual projects <i>Radislav Sedlacek (IMG/CCP) and all instructors</i> |
| 13:15 – 14:15 | Lunch |
| 14:15 – 14:45 | Lecture: <i>Pros-and-cons</i> of programmable nucleases <i>Radislav Sedlacek (IMG/CCP)</i> |
| 14:45 – 16:15 | Practical training session: gRNA validation I <i>Jana Kopkanová & Björn Schuster (IMG/CCP)</i> |
| 16:15 – 17:00 | Lecture: Historical perspective - how we came to nucleases <i>Lluís Montoliu (CNB, Spain)</i> |
| 17:00 – 18:00 | get together with time for discussions with the speaker and instructors |

Day 2 – Tuesday 4th April 2017

- 08:00 – 08:45 Lecture: Breaking-Cas, a new guide designing program and CRISPR/Cas function
Lluis Montoliu (CNB, Spain)
- 08:00 – 08:15 Daily agenda and outcomes overview
- 09:00 - 10:00 Practical training session: gRNA preparation I
Jana Kopkanová & Björn Schuster (IMG/CCP)
- 10:00 – 10:15 **Tea and Coffee**
- 10:15 – 13:15 Practical training sessions:
- A. Zygote injection – *Ronald Naumann (MPI-CBG, Dresden) and Inken Beck (IMG/CCP)*
 - B. Genotyping, digital PCR - *Jana Kopkanova (IMG/CCP) and Guillaume Pavlovic (IBGMC, Strasbourg)*
 - C. Bioinformatics, gene targeting and CRISPR design - *Björn Schuster (IMG/CCP), Marie-Christine Birling (IBGMC, Strasbourg), Lluis Montoliu (CNB, Spain), Bernd Zetsche (Broad Institute, USA)*
- 13:15 – 14:15 **Lunch**
- 14:15 –14:45 Lecture: gRNA validation and genotyping of Indel mutations
Björn Schuster (IMG/CCP)
- 14:45 - 16:15 Practical training session: gRNA preparation II
Jana Kopkanová & Björn Schuster (IMG/CCP)
- 16:15 – 17:00 Lecture: CRISPR technology in cell culture
Speaker: tba (Sigma)
- 17:00 –18:00 get together with time for discussions with the speaker and instructors
- 18:00 **End of Day**

Day 3 – Wednesday 5th April 2017

- 08:00 – 08:45 Lecture: repertoire of gene targeting methods in rodents
Guillaume Pavlovic (IBGMC, Strasbourg), Marie-Christine Birling (IBGMC, Strasbourg)
- 08:45 – 09:00 Agenda for the day with tea and coffee
- 09:00 - 10:00 Practical training session: gRNA preparation III
Jana Kopkanová & Björn Schuster (IMG/CCP)
- 10:00 – 10:15 **Tea and Coffee**
- 10:15 – 13:15 Practical training sessions:
- A. Zygote injection – *Ronald Naumann (MPI-CBG, Dresden) and Inken Beck (IMG/CCP)*
 - B. Genotyping, digital PCR - *Jana Kopkanova (IMG/CCP) and Guillaume Pavlovic (IBGMC, Strasbourg)*
 - C. Bioinformatics, gene targeting and CRISPR design - *Björn Schuster (IMG/CCP), Marie-Christine Birling (IBGMC, Strasbourg), Lluís Montoliu (CNB, Spain), Bernd Zetsche (Broad Institute, USA)*
- 13:15 – 14:15 **Lunch**
- 14:15 –14:45 Lecture: Targeting vector design
Björn Schuster (IMG/CCP)
- 14:45 - 16:15 Practical training session: gRNA validation II
Jana Kopkanová & Björn Schuster (IMG/CCP)
- 16:15 – 17:00 Lecture: Expanding the Research Applications for CRISPR
Guillaume Pavlovic (IBGMC, Strasbourg)
- 17:00 –18:00 get together with time for discussions with the speaker and instructors
- 18:00 **End of Day**

Day 4 – Thursday 6th April 2017

- 08:00 – 08:45 Lecture: Lecture: Development CRISPR-Cas9 & Cpf1 technology
Bernd Zetsche (Broad Institute, USA)
- 08:45 – 09:00 Agenda for the day with tea and coffee
- 09:00 - 10:00 Practical training session: gRNA validation III
Jana Kopkanová & Björn Schuster (IMG/CCP)
- 10:00 – 10:15 **TEA AND COFFEE**
- 10:15 – 13:15 Practical training sessions:
- A. Zygote injection – *Ronald Naumann (MPI-CBG, Dresden) and Inken Beck (IMG/CCP)*
 - B. Genotyping, digital PCR - *Jana Kopkanova (IMG/CCP) and Guillaume Pavlovic (IBGMC, Strasbourg)*
 - C. Bioinformatics, gene targeting and CRISPR design - *Björn Schuster (IMG/CCP), Marie-Christine Birling (IBGMC, Strasbourg), Lluís Montoliu (CNB, Spain), Bernd Zetsche (Broad Institute, USA)*
- 13:15 – 14:15 **LUNCH**
- 14:15 –14:45 Lecture: CRISPR/nuclease troubleshooting and genotyping
Bjorn Schuster and Jana Kopkanova (IMG/CCP)
- 14:45 - 16:15 Practical training session: collection of results and time for discussion/ trouble shooting
All instructors
- 16:15 – 17:00 Lecture: genome editing using nucleases: new possibilities and application to reveal gene function in diseases
Marie-Christine Birling (IBGMC, Strasbourg)
- 17:00 –18:00 get together with time for discussions with the speaker and instructors
- 19:00 **Course Dinner 2**

Day 5 – Friday 7th April 2017

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| 08:00 – 08:45 | Lecture: “from genotype to phenotype” Yann Herault (<i>IBGMC, Strasbourg</i>) or invited speaker |
| 08:45 – 09:00 | Agenda for the day with tea and coffee |
| 09:00 - 10:00 | Collection of results and preparation of short presentations <i>All instructors</i> |
| 10:00 – 10:15 | Tea and Coffee |
| 10:15 - 12:30 | Short group presentations Summary & Conclusions |
| 12:30 - 13:15 | LUNCH |
| 13:15 | End of course |

Optional:

13:15 – 15:00 Tour through Czech Centre for Phenogenomics (phenotyping and breeding)

The lecturers and instructor team

The participants of the **2nd programmable nucleases (CRISPR/Cas9) Transgenesis Course** will be trained by the experienced team of people who are also equipped with the experience of organizing the “hands-on nuclease course’ accompanying the *Transgenic technology meeting TT2016*.

The team members are:

Guests:

Lluís Montoliu (CNB, Spain)
Bernd Zetsche (Broad Institute, USA)
Ronald Naumann (MPI-CBG, Dresden)

IBGMC, Strasbourg

Yann Herault
Marie-Christine Birling
Guillaume Pavlovic

Czech Centre for Phenogenomics (IMG/BIOCEV)

Radislav Sedlacek
Björn Schuster
Inken M Beck
Jana Kopkanova
and all other members of Transgenic and Archiving Module of CCP