

April 22, 2022 10:00

Online Pre-Lecture: Introduction to Flow Cytometry (1-2 h)
(Optional: for ESR, which are not familiar with the technology)

Monday, April 25, 2022

09:45-10:00 Dial-in of the participants

Part 1: Principles of Flow Cytometry

Chairs: **Maria Gonzales** (ESR Madrid)
Federico Fondelli (ESR Barcelona)

10:00-10:15 **Welcome & Introduction**
Birgit Sawitzki, Berlin

10:15 – 11:00 **Basic principles on flow panel design – pitfalls**
Michael Kapinsky, Beckman Coulter

11:10 – 11:55 **Challenges in clinical flow cytometry (pre-analytical factors: sample source & age, standardization)**
Birgit Sawitzki, Berlin

11:55 – 12:45 **Break**

12:45 – 13:30 **Whole blood preservation for flow cytometry-based immune phenotyping and functional analysis**
Regis Josien, Nantes

13:40 – 15:00 **Early Stage Researcher (ESR) flow panel development examples**
4 presentations (each 15 min) from ESR projects on panel design, problem, pitfalls
Feedback by Michael Kapinsky & Christina Iwert (AG Sawitzki)

“Stratification of patient responses using an immunological biomarker model”
Jorge Torres (KCL, London, UK)

“Immunophenotyping of tolerogenic dendritic cells”
Tomislav Kostevc (Charité, Germany)

“Studying the effect tolerogenic dendritic cells have on antigen specific T cells”
Ioana Nicorescu (Newcastle University, UK)

“Effects of small molecule modulators of the electron transport chain on cytokine production in macrophages”
Alessia Zotta (Trinity College Dublin, Ireland)

Tuesday, April 26, 2022

09:45-10:00 Dial-in of the participants

Part 2: ESR project examples & applications

Chairs: **Antonia Peter** (ESR CiMaas, Maastricht)
Jorge Torres (ESR London)

- 10:00 – 10:25 **Antigen-specific T cells (tetramers & AIM assay)**
Christine Kreher (supervised by Marieke van Ham), Sanquin, Amsterdam
- 10:25– 10:45 **Bead-based degranulation assay**
Philipp Georg, Berlin
- 10:45 – 10:55 Break**
- 10:55 – 11:40 **Profiling of antigen-specific B cells applying spectral flow cytometry**
Amélie Bos, Amsterdam
- 11:50 – 12:35 **Unsupervised clustering to identify alterations in the T cell space in severe COVID-19**
Rosario Astaburuaga-García, Berlin
- 12:35 - 13:15 Break**
- 13:15 – 15:00 **Basics of clustering & implementation / differences between algorithms**
group work/ analysis by ESR
guided by Gunther Glehr, Rosario Astaburuaga-García, Lev Petrov
- Group 1 - Gunther Glehr: Zahra, Alessia, Maria, Christine, Antonia, Jordi
Group 2 - Rosario Astaburuaga-García: Ayesha, Tomi, Maaïke, Federico, Tamara
Group 3 - Lev Petrov: Benjamin, Konstantina, Jorge, Laura, Ioana

Wednesday, April 27, 2022

09:45-10:00 Dial-in of the participants

Part 3: Cytometry Data-Analysis

Chairs: Ayesha Sahar (ESR Newcastle)
Zarah Nozari (ESR Regensburg)

- 10:00 – 10:45 **Cytobank platform (UMAP, tSNE-CUDA and opt-SNE)**
Zaida Vergara, Beckman Coulter
- 10:55 – 11:40 **Applications to determine and model differences in cell signaling**
Nils Blüthgen, Berlin
- 11:40 – 11:50 **Break**
- 11:50 – 12:35 **Machine Learning & neuronal networks / classifiers**
Gunther Glehr, Regensburg
- 12:35 – 13:15 **Break**
- 13:15 – 14:45 **Presentation of clustering results by ESR - groups**
ESR (each group 30 minutes) guided by Gunther Glehr, Rosario Astaburuaga-García,
Lev Petrov
- 14:45 – 15:00 **End of the course & farewell**