

5th International EUROMBR Training Course on Medical Applications in Microfluidics

Monday 9th September 2024

8:30 - 9:00 **Registration (AUDITORIUM)**

9:00 - 9:15 **Opening (AUDITORIUM)**

G. Perozziello, University of Catanzaro, Italy

9:15 - 10:00 **Introduction to micro/nano fluidics (AUDITORIUM)**

A. Dietzel, TU Braunschweig, Germany

10:00 - 10:30 **Coffee break (AUDITORIUM)**

10:30 - 11:15 **Cell Microenvironments and microfluidics (AUDITORIUM)**

G. Perozziello, University of Catanzaro, Italy

11:15 - 12:00 **Microfluidic single-cell cultivation: Introduction and application (AUDITORIUM)**

J. Schmitz, University of Bielefeld, Germany

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Microfabrication (AUDITORIUM)**

P. Candeloro, University Magna Graecia of Catanzaro, Italy

13:45 - 14:30 **Cell sorting by DEP array (AUDITORIUM)**

Donatella Malanga, University of Catanzaro, Italy

Massimo Scrobogna, Menarini Silicon Biosystems, Italy

15:00 - 18:00 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group B1)

Lab II: Flow Biocatalysis (group B2)

Lab III: Diffusion in Y-shaped microchannel (group B3)

Hands on CFD: Lecture 1 (group A4 + B4)*

18:30 **Welcome party (GARDEN OR AUDITORIUM)**

Tuesday 10th September 2024

9:30 - 10:15 **Biosensors: from principles to practical applications (SALVATORE VENUTA)**

C. Heuer, University of Augsburg, Germany

10:15 - 11:00 **Optical Chemicals Sensors - Basics and Applications (SALVATORE VENUTA)**

T. Mayr, Graz University of Technology, Austria

11:00 - 11:45 **Cell analysis by Raman Spectroscopy (SALVATORE VENUTA)**

P. Candeloro, University of Catanzaro, Italy

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Microfluidic systems for pharmaceutical production: from cell transfection to product purification (SALVATORE VENUTA)**

J. Bahnmann, University of Augsburg, Germany

13:45 - 14:30 **Cell-surface interactions (SALVATORE VENUTA)**

Francesco Gentile, University of Catanzaro

14:30 - 17:30 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group B2)

Lab II: Flow Biocatalysis (group B3)

Lab III: Diffusion in Y-shaped microchannel (group B1)

Hands on CFD: Lecture 2 (group A4 + B4)*

17:30 - 18:30 **Poster session I & Coffee break (AUDITORIUM)**

Wednesday 11th September 2024

9:30 - 12:30 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group B3)

Lab II: Flow Biocatalysis (group B1)

Lab III: Diffusion in Y-shaped microchannel (group B2)

Hands on CFD: Lecture 3 (group A4 + B4)*

12:30 - 13:45 **Lunch (CANTEEN)**

14:00 **Excursion**

Thursday 12th September 2024

9:00 - 12:00 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (Group B1)

Lab V: Cell sorting by DEP array (Group B2)

Lab VI: Microfabrication (Group B3)

Hands on CFD: Lecture 4 (group A4 + B4)*

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Organs on chip (MAGNA A)**

I. Constantinou, TU Braunschweig, Germany

13:45 - 14:30 **Microfluidics for Cell Therapies and Beyond (MAGNA A)**

N. Szita, University College London, UK

14:30 - 17:30 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (group B2)

Lab V: Cell sorting by DEP array (Group B3)

Lab VI: Microfabrication (Group B1)

Hands on CFD: Lecture 5 (group A4 + B4)*

17:30 - 18:30 **Poster session II & Coffee break (AUDITORIUM)**

Friday 13th September 2024

9:00 - 12:00 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (group B3)

Lab V: Cell sorting by DEP array (group B1)

Lab VI: Microfabrication (group B2)

Hands on CFD: Lecture 6 (group A4 + B4)*

12:00 - 12:30 **Closing remarks (MAGNA C)**

G. Perozziello, University of Catanzaro, Italy

* The attendance of the full 5 days computational fluid dynamics (CFD) lectures excludes the attendance of the laboratory lectures, since they are in parallel sessions.

5th International EUROMBR Training Course on Bioprocess Development in Microfluidics

Monday 9th September 2024

8:30 - 9:00 **Registration (AUDITORIUM)**

9:00 - 9:15 **Opening (AUDITORIUM)**

G. Perozziello, University of Catanzaro, Italy

9:15 - 10:00 **Introduction to micro/nano fluidics (AUDITORIUM)**

A. Dietzel, TU Braunschweig, Germany

10:00 - 10:30 **Coffee break (AUDITORIUM)**

10:30 - 11:15 **Introduction to innovative microbioreactor application in bioprocesses (MAGNA C)**

P. Žnidaršič Plazl, University of Ljubljana, Slovenia

11:15 - 12:00 **Whole cell cultivation in microbioreactors (MAGNA C)**

R. Krull, TU Braunschweig, Germany

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Microfabrication (AUDITORIUM)**

P. Candeloro, University Magna Graecia of Catanzaro, Italy

13:45 - 14:30 **Modelling-based design of bioprocesses at the micro scale (MAGNA C)**

I. Plazl, University of Ljubljana, Slovenia

15:00 - 18:00 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (Group A1)

Lab V: Cell sorting by DEP array (Group A2)

Lab VI: Microfabrication (Group A3)

Hands on CFD: Lecture 1 (group A4 + B4)*

18:30 **Welcome party (GARDEN OR AUDITORIUM)**

Tuesday 10th September 2024

9:30 - 10:15 **Biosensors: from principles to practical applications (SALVATORE VENUTA)**

C. Heuer, University of Augsburg, Germany

10:15 - 11:00 **Optical Chemicals Sensors - Basics and Applications (SALVATORE VENUTA)**

T. Mayr, Graz University of Technology, Austria

11:00 - 11:45 **An appetizer for CFD in chemical and biochemical engineering (GIOVANNI PAOLO II)**

U. Krühne, Technical University of Denmark, Denmark

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Immobilized enzymes as heterogeneous biocatalysts: Application in microreactors (GIOVANNI PAOLO II)**

J. Bolivar, Complutense University of Madrid,

13:45 - 14:30 **Biocatalysis in flow: Challenges and opportunities (GIOVANNI PAOLO II)**

M. Marques, University College London, United Kingdom

14:30 - 17:30 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (group A2)

Lab V: Cell sorting by DEP array (Group A3)

Lab VI: Microfabrication (Group A1)

Hands on CFD: Lecture 2 (group A4 + B4)*

17:30 - 18:30 **Poster session I & Coffee break (AUDITORIUM)**

Wednesday 11th September 2024

9:30 - 12:30 **(LABORATORY OF PHARMACY)**

Lab IV: Cell cultivation in a miniaturized reactor (group A3)

Lab V: Cell sorting by DEP array (group A1)

Lab VI: Microfabrication (group A2)

Hands on CFD: Lecture 3 (group A4 + B4)*

12:30 - 13:45 **Lunch (CANTEEN)**

14:00 **Excursion**

Thursday 12th September 2024

9:00 - 12:00 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group A1)

Lab II: Flow Biocatalysis (group A2)

Lab III: Diffusion in Y-shaped microchannel (group A3)

Hands on CFD: Lecture 4 (group A4 + B4)*

12:00 - 13:00 **Lunch (CANTEEN)**

13:00 - 13:45 **Nano and micromaterials for microbioreactors (MAGNA B)**

J. Fernández-Sánchez, University of Granada, Spain

13:45 - 14:30 **Microfluidics for Cell Therapies and Beyond (MAGNA A)**

N. Szita, University College London, UK

14:30 - 17:30 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group A2)

Lab II: Flow Biocatalysis (group A3)

Lab III: Diffusion in Y-shaped microchannel (group A1)

Hands on CFD: Lecture 5 (group A4 + B4)*

17:30 - 18:30 **Poster session II & Coffee break (AUDITORIUM)**

Friday 13th September 2024

9:00 - 12:00 **(LABORATORY OF PHARMACY)**

Lab I: Microfluidic single cell cultivation (group A3)

Lab II: Flow Biocatalysis (group A1)

Lab III: Diffusion in Y-shaped microchannel (group A2)

Hands on CFD: Lecture 6 (group A4 + B4)*

12:00 - 12:30 **Closing remarks (MAGNA C)**

G. Perozziello, University of Catanzaro, Italy

* The attendance of the full 5 days computational fluid dynamics (CFD) lectures excludes the attendance of the laboratory lectures, since they are in parallel sessions.