

# 5th International EUROMBR Training Course on Medical Applications in Microfluidics

Monday 9<sup>th</sup> September 2024

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

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

*G. Cuda, Rector of the University of Catanzaro, Italy*

*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 10<sup>th</sup> 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 11<sup>th</sup> 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 12<sup>th</sup> 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 13<sup>th</sup> 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 9<sup>th</sup> September 2024

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

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

*G. Cuda, Rector of the University of Catanzaro, Italy*

*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 **An appetizer for CFD in chemical and biochemical engineering (MAGNA C)**

*U. Krühne, Technical University of Denmark, Denmark*

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 10<sup>th</sup> 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 **Introduction to innovative microbioreactor application in bioprocesses (GIOVANNI PAOLO II)**

*P. Žnidaršič Plazl, University of Ljubljana, Slovenia*

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 11<sup>th</sup> 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 12<sup>th</sup> 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 13<sup>th</sup> 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.