COST Action CA21135 IMMUNO-model

Microphysiological Systems Training School

20-21-22 September 2023

Izmir Institute of Technology (IZTECH), Turkey

This training school aims to provide an introduction to microphysiological systems (MPS). MPS mimic the *in vivo* microenvironment and present great *in vitro* models, contributing to the 4Rs. Trainees will attend lectures and hands-on sessions. With the theoretical and practical information gained, the trainees will be able to adopt MPS to their research in line with the COST Action. There will also be a design challenge where trainees are encouraged to work on their own MPS designs.

Eligibility

Applicants must be part of a PhD programme, or a postdoctoral fellow or can be employed by an institution or organization performing research.

- The Home institution of the applicant should be any of the below:
  - Legal Entity in a COST Full Member/ COST Cooperating Member
  - Legal Entity in a COST Near Neighbour Countries (NNC)
  - Specific European RTD Organisation

Please see Appendix 1 for details and the **COST ANNEX I – LEVEL A: COUNTRY AND ORGANISATIONS TABLE**.

Application Process (Deadline June 30, 2023)

Please fill in the form at this link:

https://docs.google.com/forms/d/e/1FAIpQLSdVeCdacZSE63_ZtHPKmIx_cRvKiRkAoEmo2EbMcffzsHsPHA/viewform?usp=sf_link

Once the applicant is determined to be eligible, applications will be accepted on a first come first serve basis for a maximum of 15 trainees. In case there are more applications than places available, priority will be given to PhD students, followed by post-docs and finally to all other candidates.

Selected participants will receive an official invitation from e-COST.

Please find Frequently Asked Questions regarding Training Schools here.

Reimbursement

After the event, trainees will be reimbursed for travel (up to 350 €) and will receive a daily allowance of 191 € per day to cover expenses of meals, accommodation and local transport.

For more information please see the COST Travel Reimbursement Rules.

Please contact ghm_immunomodel@igtp.cat for further details and any other issues pertaining to travel costs.

Acknowledgements

This training school is supported by COST (European Cooperation in Science and Technology). COST is a funding agency for research and innovation networks. Their Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation (www.cost.eu).

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

IMMUNO-model Modelling immunotherapy response and toxicity in cancer

Funded by the European Union

Training School Schedule

Day1

Morning 10:00 – 13:00

Welcome & IMMUNO-model COST Action introduction & Design challenge intro (15 min)

3 lectures (45 min + 10 min Q&A)

Speaker	Title of talk
Ender Yildirim	Fabrication of microfluidic devices as microphysiological systems
Middle East Technical University, Ankara, Turkey	
Cumhur Tekin	3D Cell Culture in Microfluidic Devices by Leveraging Magnetic Techniques
Izmir Institute of Technology, Izmir, Turkey	
Devrim Pesen Okvur	Tumor on chip models
Izmir Institute of Technology, Izmir, Turkey	

Lunch 13:00 – 14:30

Afternoon 14:30 – 17:30

3 hands-on sessions (45 min lab + 15 min break)

3D printing	Group1	Group2	Group3
Clean room	Group2	Group3	Group1
Casting & assembly	Group3	Group1	Group2

Trainers: Cumhur Tekin, Ozden Yalcin Ozuysal, Devrim Pesen Okvur

Evening

Social Dinner 18:00 – 21:00 (participation is encouraged, tickets need to be purchased)

Day2

Morning 10:00 – 13:00

3 lectures (45 min + 10 min Q&A)

Speaker	Title of talk
Sinan Guven	On-chip disease models
Izmir Biomedicine and Genome Center, Izmir, Turkey	
Ozden Yalcin Ozuysal	Metastasis on chip models
Izmir Institute of Technology, Izmir, Turkey	
Ozlem Yesil Celiktas	The convergence of microphysiological systems and assembloids
Ege University, Izmir, Turkey	

Lunch 13:00 – 14:30

Afternoon 14:30 – 17:30

3 hands-on sessions (45 min lab + 15 min break)

Loading chips	Group1	Group2	Group3
Set-up experiment	Group2	Group3	Group1
Imaging	Group3	Group1	Group2

Trainers: Cumhur Tekin, Ozden Yalcin Ozuysal, Devrim Pesen Okvur

Evening free time

Day3

Morning	10:00 – 13:00

<u>3 hands-on sessions (45 min lab + 15 min break)</u>

Viability assay	Group1	Group2	Group3
Simulations	Group2	Group3	Group1
Image analysis	Group3	Group1	Group2

Trainers: Cumhur Tekin, Ozden Yalcin Ozuysal, Devrim Pesen Okvur

Lunch	13:00 – 14:30
Afternoon	14:30 – 16:30

<u>Design challenge presentations (5 min per participant + 3 min Q&A)</u>

Venue: Izmir Institute of Technology, Izmir, Turkey

https://goo.gl/maps/YenDrLNQqy64hajEA?coh=178573&entry=tt

Travel: There are direct flights to Izmir from many EU cities by Sunexpress and Flypgs.

Accommodation: There are options in Urla. Shuttle to IZTECH Campus will be provided.

Izmir Institute of Technology (IZTECH)

• Established in 1992, is located in the third largest city in Turkey and lies on the coast of the Aegean Sea.

• Offering 18 undergraduate, 30 master's and 17 doctorate programs.

• Enrollment of over 5,000 students and 626 faculty and staff.

IZTECH is ranked 1st for publications per faculty member among 129 public universities in Turkey and ranked 1st for student satisfaction among public universities in Turkey. With its more than 100 bilateral agreements with other international universities, IZTECH aims to be a truly international university.

As a Research University, IZTECH is formed by the combination of high-targeted graduate programs and expert researchers from different disciplines and is directed towards strategic research areas such as energy, biotechnology and nanotechnology. In order to assist IZTECH in this endeavour, 11 thematic research centers have been established since 2001 including:

• Center for Materials Research (http://mam.iyte.edu.tr/en/)

• Geothermal Energy Research and Application Center (http://geocen.iyte.edu.tr/en)

• Environmental Development Application and Research Center (http://cevrearge.iyte.edu.tr/)

• Biotechnology and Bioengineering Application-Research Center (http://biyomer.iyte.edu.tr/en)

• National Mass Spectroscopy Center (http://biomassspec.iyte.edu.tr)

Appendix 1 – Eligibility (Please refer to the COST ANNEX I – LEVEL A: COUNTRY AND ORGANISATIONS TABLE)

COST Full Members

The 41 COST Full Members are: Albania, Armenia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Republic of Moldova, Montenegro, The Netherlands, The Republic of North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom.

COST Cooperating Member

Israel is a Cooperating Member. A Cooperating Member implies non-voting rights in the COST CSO. However, researchers from COST's Cooperating Member enjoy member rights in COST Action participation.

COST Partner Member

South Africa is a Partner Member of COST. A Partner Member implies no rights to attend the COST CSO. However, researchers from COST's Partner Members enjoy observer rights in COST Action participation.

COST Near Neighbour Countries

Algeria, Azerbaijan, Belarus, Egypt, the Faroe Islands, Jordan, Kosovo3, Lebanon, Libya, Morocco, Palestine, Syria, and Tunisia.

European RTD Organisations (please see the **COST ANNEX I – LEVEL A: COUNTRY AND ORGANISATIONS TABLE**)

Appendix 2 – Published papers by trainers:

Ender Yildirim
Development of a microfluidic platform to maintain viability of micro-dissected tumor slices in culture
Microfluidic-based blood immunoassays
Assessment of silicon, glass, FR4, PDMS and PMMA as a chip material for acoustic particle/cell manipulation in microfluidics

Cumhur Tekin
Spheroid engineering in microfluidic devices
System and method for cell levitation and monitoring
Magnetic levitation assisted biofabrication, culture, and manipulation of 3D cellular structures using a ring magnet based setup

Ozden Yalcin Ozuysal
SEMA6D Differentially Regulates Proliferation, Migration, and Invasion of Breast Cell Lines
On-chip determination of tissue-specific metastatic potential of breast cancer cells
Refractive index sensing for measuring single cell growth

Sinan Guven
Bioengineering bone-on-a-chip model harnessing osteoblastic and osteoclastic resolution
Microvascular networks and models: in vitro formation
Development of lacrimal gland organoids from human iPSC derived ocular cells

Ozlem Yesil Celiktas
Spatio-temporal dynamics enhance cellular diversity, neuronal function and further maturation of human cerebral organoids
Biosensor integrated brain-on-a-chip platforms: Progress and prospects in clinical translation
A 3D in vitro co-culture model for evaluating biomaterial-mediated modulation of foreign-body responses

Devrim Pesen Okvur
Breast cancer cells and macrophages in a paracrine-juxtacrine loop
On-chip determination of tissue-specific metastatic potential of breast cancer cells
A new drug testing platform based on 3D tri-culture in lab-on-a-chip devices