

**Biofabrication: an integrated bioengineering approach for the automated
fabrication of biological structures for clinical and research applications**

XL School of GNB (National Bioengineering Group)

13-16 September 2021 – Bressanone (Bolzano, Italy)



Organized by:

Valeria Chiono (Politecnico di Torino), Silvia Farè (Politecnico di Milano), Paolo Netti (University of Naples Federico II), Giovanni Vozzi (University of Pisa).

Program

Monday 13 September

Morning

Introduction to Biofabrication

9.00-9.30 General Presentation (Organizers: V. Chiono, S. Farè, P. Netti, G. Vozzi)

9.30-10.30 *The Basic Principles of Histogenesis, cell plasticity and tissue homeostasis*, Prof. Monica Mattioli Belmonte Cima, Università Politecnica delle Marche

11.00-11.45 *Mimicking the nature with biofabrication*, Prof. Wojciech Swieszkowski, Warsaw University of Technology, Poland

11.45-12.30 *Methodological approaches for Biofabrication*, Prof. Marcy Zenobi-Wang, ETH, Switzerland

Afternoon

Bioinks and their characterisation

14.00-14.30 Official opening (V. Chiono, S. Farè, P. Netti, G. Vozzi)

14.30-15.30 *Bottom-up design of bioinks as a tool to overcome current challenges in bioprinting*, Prof. Gianluca Ciardelli, Politecnico di Torino.

15.30-16.30 *Material testing and mechanical modelling in bioprinting*, Prof. Michele Conti, Università di Pavia

17.00 Attribution of case studies to students

Tuesday 14 September

Morning

3D BioPrinting

9.00 -10.00 *3D printing technologies for biomedical applications*, Dr. Nicola Contessi Negrini, Imperial College London (UK)

10.30-11.30 *Computer-Aided Design for Biofabrication: basic procedures and open challenges*, Dr. Michele Marino, Università di Roma Tor Vergata

11.30-12.30 Students working to case studies

Afternoon

Industrial Perspectives

14.30-15.15 *Development of biomaterials relevant for biofabrication of 3D bioprinted tissue models*, Dr. Itedale Namro Redwan, Chief Scientific Officer, Cellink, Sweden

15.15- 16.00 *Creating biopolymers-based bioinks: an industrial approach*, Dr. Riccardo Beninatto, Fidia, Italy

16.00-16.45 *Next-Generation Bioprinting for Manufacturing Tissue-Engineered Products*, Dr. Fabien Guillemot, Poietis, France

16.45- 17.30 *Innovative models in biomedicine: the future challenge*, Dr. Laura Gribaldo, Joint Research Center-European Commission

17.30-18.00 Discussion

Wednesday 15 September

Morning

In vitro Models

9.00-9.30 *Physiology and Pathophysiology of bone: impact on preclinical models and translational research*, Dr.ssa Milena Fini, Istituto Ortopedico Rizzoli, Italy

9.30- 10.0 *Tailoring Melt Electrowritten Electroconductive Biomaterial Patches and Scaffolds to Match the Mechanical Anisotropy of Human Myocardium: Next Generation Platforms for Medical Devices and Tissue Engineering*, Prof. Michael Monaghan, Trinity College, Dublin, Ireland.

10.00-10.30 *Brain-on-a-chips: engineered neuronal populations and microtransducer arrays*, Prof. Sergio Martinoia, Università di Genova

Break

11.00-11.45 *Multiorgan tissue on chip for health: pathologies and mental disorder*, Prof. Carmen Giordano, Politecnico di Milano

11.45-12.30 *Multiorgan tissue on chip for wellness: Food, Safety, Environment and Cosmetics*, Prof. Giorgia Imperato, Università Napoli Federico II

Afternoon

In silico models

14.30 -15.15 *Mathematical Cell Biology: insight into the dynamics of in silico models of cellular systems*, Prof. Morten Gram Pedersen, Università di Padova

15.15 – 16.00 *Computational modelling of molecular and cellular biology: new perspectives in tissue engineering*, Prof.ssa Francesca Cordero, Università degli Studi di Torino

16.00-16.15 Celebration of 40 years of GNB

16.15-17.00 Award ceremony

17.00-18.00 *Lectio Magistralis, "Biofabrication: where we have been and where we are going"*, Jjurgen Groll, Wurzburg University

Thursday 16 September

Morning

Novel Research Trends in Biofabrication

9.00-9.45 *Conformable electronics for unperceptible sensors*, Prof.ssa Annalisa Bonfiglio, Università di Cagliari

9.45-10.30 *4D bioprinting: smart materials, technologies and applications*, Dr. Carmelo De Maria, Unviersità di Pisa

Break

11.00-11.45 *In situ Bioprinting*, Prof. Vladimir Mironov, 3D Bioprinting Solutions, Russia

11.45-12.30 *3D printing of biomimetic and biohybrid systems*, Prof. Alberto Rainer, Campus Biomedico, Roma

14.00-16.30 Evaluation of students' activity

16.30-17.00 End of the School and greetings