

ESAO/TERMIS-EU Winter School 2021

*The Bionic Human: Biomaterials, (Bio)Artificial
and Bioengineered Organs, and Cybernetics for
the Future of Regenerative Medicine*

ONLINE

February 24-26th, 2021



Scientific Committee

Pedro M. Baptista (ESAO)	Heinrich Schima (ESAO)
Cecile Legallais (ESAO)	Nuno Neves (ESAO)
Piotr Ladyzynski (ESAO)	Martijn van Griensven (TERMIS-EU)
Bart Spee (ESAO)	Zuzana Koci (TERMIS-EU)
Gloria Gallego Ferrer (ESAO)	Fokko Wiering (IMEC, EKHA, KIDNEW)

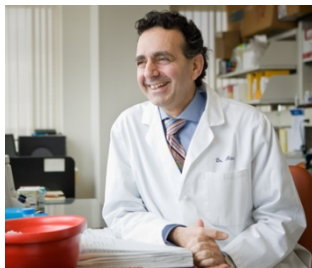
Organizer

Pedro M. Baptista (ESAO)

The next Winter School was initially planned to be held in the town of Jaca, Spain the first capital of the Kingdom of Aragon and a skiing hotspot in the Pyrenees. However, the current pandemic situation made us switch it to an ONLINE event.

This year's school is centered on "*The Bionic Human: Biomaterials, (Bio)Artificial and Bioengineered Organs, and Cybernetics for the Future of Regenerative Medicine*". It will cover, in a bottom-up approach, **1)** the fundamentals in biomaterial science, stem cells and organoids that are making possible the creation and implantation of more complex structures like **2)** (bio)artificial and bioengineered organs, and **3)** cybernetic parts, enabling the future of regenerative medicine and the generation of Bionic Humans.

As usual, we count with a strong and diverse program with internationally acclaimed scientists. As keynote speakers, we will have Dr. Anthony Atala from the Wake Forest Institute for Regenerative Medicine, a pioneer in translational regenerative medicine, and Neil Harbisson, the first legal human cyborg, from the United Kingdom.



Dr. Anthony Atala, WFIRM, USA



Neil Harbisson, UK

This is also the first Winter School co-organized by the European Society for Artificial Organs (ESAO) and the Tissue Engineering and Regenerative Medicine International Society (TERMIS), bringing together the prowess and unique perspectives of these two organizations into one single program, providing a broad view of regenerative medicine and implantable medical parts/devices/organs. There will be also a special session organized by KIDNEW, the Kidney Health Initiative and The European Kidney Health Alliance that will go in-depth into the need of new kidney dialysis innovations and implantable (bio)artificial kidneys.

The meeting will also provide a nice platform for the presentation of the participants' work during two online poster sessions. There will be 3 prizes for the best posters!

The Winter School will take place from February 24-26th 2021. Registration and abstract submission will end on **January 31st 2021** with reduced fees for yESAO and ESAO, and TERMIS members at our website <https://www.esao.org/events/winterschool/>.

Registration with a higher fee will be available until the day before the event. We invite you heartily to join our next ESAO/TERMIS Winter School 2021 and hope to see you soon in The Cloud!

With warm regards from the Scientific Committee,

Pedro M. Baptista, Cecile Legallais, Piotr Ladyzinski, Bart Spee, Nuno Neves, Gloria Gallego-Ferrer, Heinrich Schima, Martijn van Griensven, Zuzana Koci and Fokko Wiering.

Scientific Program

Wednesday, February 24th, 2021

15:00 - 15:30 *Welcome & Opening of Winter School*

Chair: Pedro M. Baptista, IIS Aragon, Spain

15:30 - 16:20 *Regenerative Medicine: Current Concepts and Changing Trends*

Anthony Atala, WFIRM, USA

16:20 - 17:10 *The Renaissance of our Species*

Neil Harbisson, world's first legal human cyborg, United Kingdom

Coffee Break

17:30 - 19:00 **Poster Session I**

Chair: Gloria Gallego Ferrer (ESAO)

Thursday, February 25th, 2021

Session 1 “Organoids and Stem Cells I”

Chair: Kerstin Schneeberger (ESAO)

09:00 - 09:50 *Engineering Epithelial Organoids*

Matthias Lutolf, EPF Lausanne, Switzerland

09:50 - 10:30 *From Organoids to Organs – Tissue Engineering the Liver*

Kerstin Schneeberger, Utrecht Univ., The Netherlands

10:30 - 11:10 *Translational research with stem cells in cystic fibrosis*

Jeffrey Beekman, Utrecht Univ., The Netherlands

Session 2 “Organoids and Stem Cells II”

Chairs: Zuzana Koci and Martijn van Griensven (TERMIS-EU)

11:10 - 11:50 *Engineering non-invasive tools to profile cell metabolism in differentiation and disease*

Michael Monaghan, Trinity College Dublin, Ireland

11:50 - 12:30 *Generating organoids and 3D constructs from pluripotent stem cells*

Susan Kimber, University of Manchester, UK

Lunch Break

Session 3 “Biomaterials and bioprinting”

Chair: Nuno Neves and Zuzana Koci (ESAO/TERMIS-EU)

14:00 - 14:50 *Bioengineered matrices as major therapeutic and diagnostic agents*

Mario Barbosa, I3S Institute, Portugal

14:50 - 15:30 *Surface Functionalization as a Tool to Fine Tune the Bioactivity of Cells for Advanced Therapies*

Nuno Neves, University of Minho, Portugal

15:30 - 16:10 *Biofabrication for regenerative medicine applications: from acellular instructive scaffolds to bioprinted tissues*

Lorenzo Moroni, Maastricht University, The Netherlands

Session 4 “(Bio)artificial Organs”

Chair: Cecile Legallais (ESAO)

16:30 - 17:20 *Bioartificial Livers*

Jean-Charles Duclos-Vallee, Hospital Paul Brousse, France

17:20 - 18:00 *Artificial Pancreas*

Thierry Berney, University of Geneva, Switzerland

Coffee Break

18:00 - 19:30 **Poster Session II**

Chair: Gloria Gallego Ferrer (ESAO)

Friday, February 26th, 2021

Session 5 “Current cardiovascular implantable medical devices and human integration”

Chair: Heinrich Schima (ESAO)

09:00 - 09:30 *The pump and the blood - Simulation of blood trauma and thrombogenicity*

M. Lommel, Charite, Germany

09:30 - 10:00 *The interaction of pump and heart - Monitoring and simulation of unloading and suction*

Libera Fresiello, KU Leuven, Belgium

10:00 - 10:30 *The pump reacting to the patient - Control algorithms*

Martin Maw, University of Vienna, Austria

10:30 - 11:00 *The patient and the system: Usability of cardiac assist devices*

Thomas Schlöglhofer, University Vienna, Austria

Coffee Break

Session 6 “Current cybernetic technology and human integration”

Chair: Piotr Ladyzinski and Martijn van Griensven (ESAO/TERMIS-EU)

11:20 - 12:10 *A cochlear implant (CI) as an artificial sensory organ and the most advanced prosthetic device*

Artur Lorens, World Hearing Center of the Institute of Physiology and Pathology of Hearing, Poland

12:10 - 13:00 *Bionic Extremity Reconstruction*
Oskar Aszmann, University of Vienna, Austria

Lunch Break

Session 7 “Bioengineered Organs”
Chair: Pedro M. Baptista (ESAO)

14:00 - 14:50 *Biofabrication of human livers*
Alejandro Soto-Gutierrez, Pittsburgh University, USA

14:50 - 15:30 *Organ Bioengineering: A Transplant Perspective*
Giuseppe Orlando, WFIRM, USA

15:30 - 16:10 *Regeneration and Repair: Moving towards patients*
Paolo De Coppi, University College London, UK

Coffee Break

Session 8 “Special Session on (Bio)artificial Kidneys”
Chair: Fokko Wieringa (EKHA/KIDNEW)

17:30 - 18:00 *Membranes for dialysis therapy: needs, challenges and new developments*
Dimitrios Stamatialis, TU-Twente, The Netherlands

17:00 - 17:30 *The Kidney Project*
Shuvo Roy & Bill Fissel, UCSF/VUMC, USA

16:30 - 17:00 *RegMedXB Kidney Moonshot*
Karin Gerritsen, Utrecht University, the Netherlands

Poster Award Ceremony and Closing remarks

18:00 - 18:30 **Pedro M. Baptista, IIS Aragon, Spain**

Registration & fees

Online by bank transfer only:

www.esao.org/registration-form-esao-winter-school-2021/

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Registration fee

before/after Jan 31, 2021

ESAO/TERMIS-EU Member

€ 100,- / € 150,-

Non-Member

€ 150,- / € 225,-

Student

€ 50,- / € 75,-

Abstract Submission

Abstracts for poster presentations are open until January 31st 2021. Poster presentations will be carried out in 2 virtual sessions with 3-5 minutes “rapid-fire” presentations.

Winners for 3 Poster Awards will be selected (1st prize: 500 EUR; 2nd prize: 300 EUR and 3rd prize: 200 EUR)!

Guidelines for poster submission:

- Abstract max. 400 words including title
- Send your abstract to anita.aichinger@donau-uni.ac.at
- Deadline: January 31st, 2021

Sponsors

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