Newsletter

of the European Society for Artificial Organs

Letter from the president

ESAO Newsletter
February 2019

Inside this issue:

Contact ESAO office:
anita.aichinger@donau-uni.ac.at
sunny.eloot@ugent.be

More information:
www.esao.org

Edited by:
Sunny Eloot

Dear Members of European Society for Artificial Organs,

I am again very pleased to write this editorial for the 7th ESAO Newsletter, whose size is dramatically increasing at each new number. This means that colleagues like to contribute, and that Sunny Eloot, our Secretary General is very efficient in her editing activity! In return, we expect that you will enjoy reading it…

First, you will find some details about the three new governors who were elected last September and join the board. By chance, or may be not (?), they represent the three types of stakeholders we aim to reach within ESAO: a clinician, an academic scientist, and an engineer in a Medtech company, representing at least five different European states. I let you discover who is who… (pages 2 & 3). I would like also here sincerely thank the leaving board members for their contributions : Maria Trivella, Tim Kaufmann and Francesco Moscato.

As always, congresses and winter school are the best occasions to gather and to exchange around our results in R&D. Thanks to our past President Thomas Groth and other colleagues, ESAO actively participated to IFAO actions (page 10).

The annual meeting organised by Juan Del Canizo and his team in Madrid was again a real success. If you attended, you will remember in the following pages the friendly atmosphere during the sessions. If you were not able to join us, we hope that the report will give you some good reasons to come to the next one. We were very happy to deliver several awards and prizes to "always young" researchers and clinicians (see pages 3-5). The first round table organised around "Unmet clinical needs" was also a success, thanks to the involvement of our Corporate Members.

The number and activity of yESAO keeps growing, which depicts the vitality of our society. As networking is very important nowadays, you will discover on page 7 a new tool developed by the youngsters.

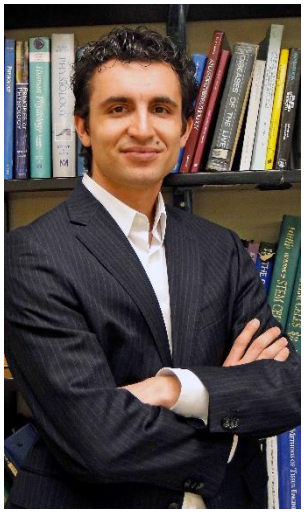
Viktoria Weber and her group in Krems found an excellent location for our recent Winter School in Baden. The program was very interesting around science, but also soft skills (pages 8-9). If you have a good idea or wish to organise the next ESAO Winter School, please get in touch with her (viktoria.weber@donau-uni.ac.at), since she is in charge of the ESAO Education Working Group.

Finally, I would like to invite you to our next major event: the **46th ESAO Annual Congress prepared in Hannover (Sept 3-7, 2019)** by Birgit Glasmacher and her group. Please have a look at the website and think about your abstracts! I really expect to meet all of you there.

With my best personal regards,
Cécile Legallais, ESAO President

Update on the ESAO Board of Governors

During the ESAO Meeting in Madrid (September 12-15th, 2018) our President of the Society, Cécile Legallais, expressed her thanks to the **governors leaving the Board:** Tim Kaufman (Germany), Francesco Moscato (Austria), and Maria Trivella (Italy).
At the same occasion, we could welcome Pedro Baptista, Alessandra Molteni and Tom Verbelen as **new Board Governors**, while Ariana Di Molfetta and Joachim Jankowski were elected for a **second term** in the board, and Sunny Eloot was re-elected as **Secretary General** of the Society.



Pedro Baptista (Spain), is currently a Group Leader and the founder of the Organ Bioengineering and Regenerative Medicine Laboratory at the Aragon Health Research Institute (IIS Aragon) in Zaragoza, Spain. He is also a Visiting Assistant Professor at the Biomedical and Aerospace Engineering Department of University Carlos III of Madrid, Spain and a ARAID Foundation Researcher.

He is a pharmacist by training and obtained his PhD from the University of Lisbon, after performing his ground-breaking work on the first bioengineered human liver ever made in the lab at the Wake Forest Institute for Regenerative Medicine, under the direction of dr Anthony Atala and dr Shay Soker.

His current research focus on investigating liver stem cell biology and the development of novel methods to expand adult human stem/progenitor cells to the required large numbers necessary for organ bioengineering, and in making the long-term transplantation of these lab-grown organs a reality. Pedro Baptista is also interested in applying bioengineered hepatic tissues and organs to study developmental biology, physiology and in drug discovery. He has authored two books, several book chapters and multiple papers and reviews published in prestigious scientific journals. He is the recipient of multiple national and international prizes and he is now funded by the Spanish and Portuguese governments, and the European Commission to perform his organ bioengineering research in Zaragoza.

"After gaining your trust as a Board Member of ESAO, my ambition is to put into our service my large network of scientific contacts in Europe and overseas with the single goal of helping our society grow and evolve into novel fields. To accomplish this, I propose and seek a larger involvement with novel expanding technologies like organ bioengineering, extracorporeal organ perfusion/maintenance machines and robotic bio-integration – a natural evolution for a society with our rich heritage and history. This will require unconditional determination, energy and motivation to lure and bring other scientists into our community, making it larger and more diverse. Hence, as a new Board of Governors' member, I'll work to earn your confidence, and to make the difference."

Alessandra Molteni (UK) is a passionate results-oriented biomedical engineer, who strives to always influence healthcare future and improve its effectiveness. She is currently Global Product Manager, contributing to new medical device development to launch and life-cycle management in the field of urology. To that end, she is coordinating tech and clinical teams, and working closely with manufacturing and local markets. She previously worked for 6 years as a product engineer in the heart pump field, contributing to developing state-of-the-art cardiac pumps through numerical models and market analyses.
In September 2018, she was elected governor of the European Society for Artificial Organs (ESAO). As a board member, she promotes advancement in the field of artificial organs by supporting cooperation among scientists and contributing to the organisation of the ESAO annual congress. Since 2016, she is coordinating yESAO, organising and promoting meetings to offer forefront discussions to boost innovation among young researchers (< 38 yrs) in artificial organs. In February 2018, she was appointed

councillor for industrial affairs for the European Alliance for Medical and Biological Engineering and Science (EAMBES), with the goals of facilitating collaboration amongst academia, industry and national and international societies and promoting activities to support investments in medical technology and science.

She completed her double Master Degree in Biomedical Engineering at Politecnico di Milano and Torino, for which she also pursued the Diploma in Management of Innovation as an Alumni of Alta Scuola Politecnica (ASP). Since 2015, she is an ASP student mentor, and she also coordinates the ASP Alumni network in the UK.

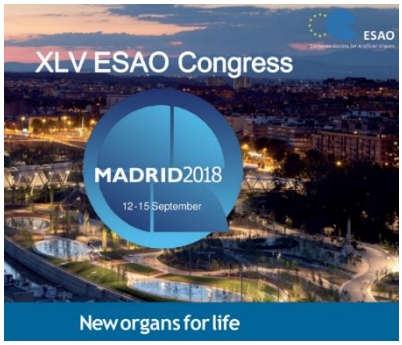
"The key goals I would pursue as a member of ESAO Board of Governors are: 1) facilitating collaboration among academic and industrial ESAO members via networking events; 2) promoting activities to support investments in medical technology and science, of which providing more focus to start-up and small sized companies in the field of artificial organs; 3) organising mentorship programs for young ESAO investigators and networking events with senior academic and industrial ESAO members; and 4) support the publication of ESAO reports and journals, and promote ESAO conferences and meetings to foster advancement in artificial organs."

Tom Verbelen (Belgium) graduated as a medical doctor in 2009 and graduated as a general surgeon at the KU Leuven in 2016. Since 2017, he's been a staff member within the department of Cardiac Surgery at the University Hospitals Leuven. He obtained his PhD at the laboratory of Experimental Cardiac Surgery at the KU Leuven in 2017 with a doctoral project focused on mechanical support of the right ventricle for pulmonary arterial hypertension.

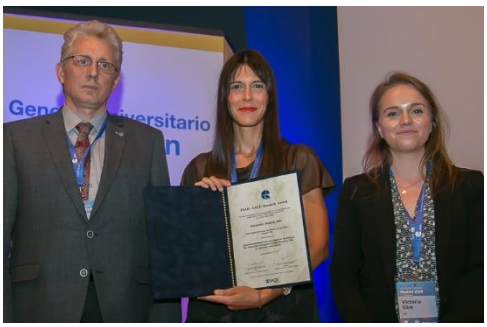
Scientifically, he focusses on new and experimental technology to surgically treat different forms of pulmonary hypertension. Clinically, he performs all types of cardiac surgery, with a focus on mitral and tricuspid valve surgery and on pulmonary endarterectomies for the treatment of chronic thromboembolic pulmonary hypertension.

"Since 2012, I have presented my work at every annual ESAO meeting and took my responsibility as a yESAO coordinator during the 2015 and 2016 annual meetings. I am very pleased and honoured that I can continue this involvement in the ESAO as a board member. One of my challenges will be to make the ESAO more visible and known within the clinical world and to attract more clinicians to actively participate at ESAO meetings. I will also contribute to the organisation of the working group Heart with a session organised at every annual meeting. Furthermore, I also hope to stimulate young (clinical) researchers to present their work and to actively cooperate with basic researchers and engineers from the start of their career. Hence, I am convinced the ESAO can act as bridge between different disciplines to stimulate translational and interdisciplinary research, and this can be achieved in the most durable way when it is already implemented at the start of a scientific career"

ESAO 2018 - Madrid (Spain)



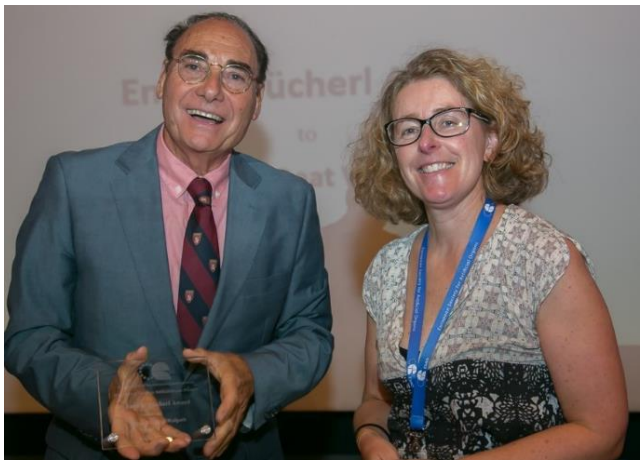
The **ESAO 2018** conference took place in Madrid (Spain), was organised by Juan Del Canizo and co-workers, and has been attended by around 400 participants from 27 different countries. The meeting was characterised by a strong **scientific program** with almost 400 conference contributions in plenary sessions and symposia, and as oral and poster presentations based on accepted abstracts.



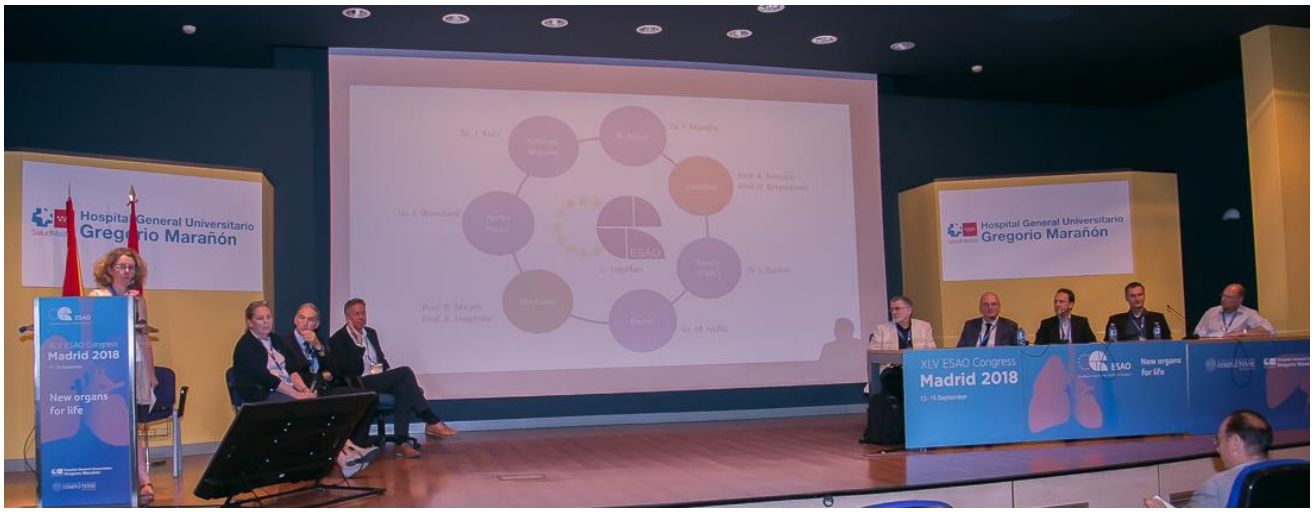
During the Opening Ceremony, Alessandra Molteni (UK) and colleagues got the **ESAO-SAGE Research Award** (certificate and check of 2.500€) for her research on 'Experimental Measurement and Numerical Modelling of Dye Washout for Investigation of Blood Residence Time in Ventricular Assist Devices' (Int J Artif Organs 41(4): 201-212).

The PhD-committee overhanded the **'Gold ESAO PhD award'** to Tom Verbelen (Leuven, Belgium) for his excellent work and important international track. His PhD book is titled: '*Right Ventricular Mechanical Support for Pulmonary Arterial Hypertension. The Low Flow Concept'*.
Three **'Silver ESAO PhD awards'** were overhanded to Francesco De Gaetano (Milan, Italy), Sebastian Victor Jansen (Aachen, Germany), and Lena Wiegmann (Zurich, Switzerland).

Our president, Cécile Legallais, overhanded the most prestigious award of our Society, i.e. the **Emil-Bücherl Award**, to Beat Walpoth (Switzerland) for his commitments to our Society and his life-long contributions to the field of Artificial Organs. He was involved in the first in-man use of haemofiltration during cardiopulmonary bypass ('78-'79), the first surviving paediatric xeno-heart transplantation ('84), the successful rewarming of deep accidental hypothermic victims by cardiopulmonary bypass ('97), and the first in-man coronary blood flow measurement ('99), and is still involved in the development of tissue-engineered vascular grafts. Since 1978, he nearly participated all ESAO congresses. He was ESAO president in the period 2006-2008, organised twice the annual ESAO conference (2000 in Lausanne and 2008 in Geneva), as well as several Winter Schools (2006 in Kitzbuhl, 2007 in Gstaad, 2008 in Cortina, 2010 in Semmering, and 2012 in Catania). Currently, he holds the presidency of the International Symposium on Vascular Tissue Engineering (ISVTE) and has created the TERMIS Thematic Group on Vascular Tissue Engineering. In the Board, he will also be remember as the one who amazed each board member by speaking everyone's mother tongue!



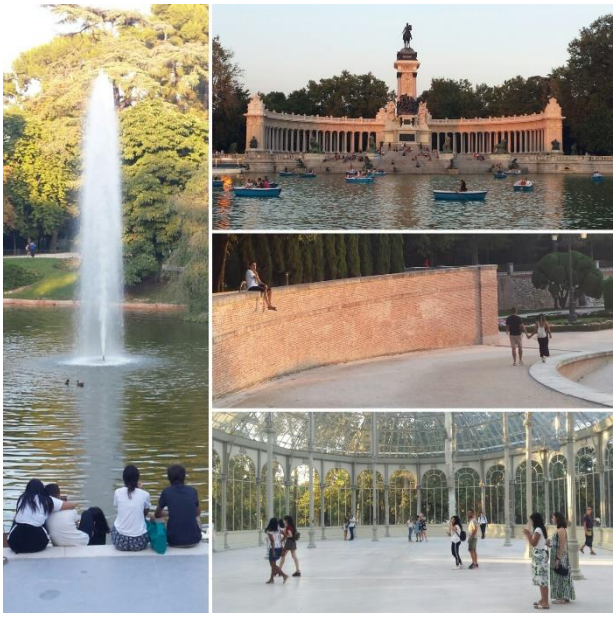
On Friday September 14th, the first **Round Table** discussion was organised about **'Unmet clinical needs: pending issues regarding vascular access for artificial organs'.**



The session was moderated by our president Cécile Legallais and, around the table, we had clinicians (Bart Meyns and Bernd Stegmayr), scientists (Helga Bergmeister and Andrea Remuzzi), and people from industry: i.e. Peter Mandry (B. Braun), John Woodard (Berlin Heart), Michael Hulko (Baxter), and Joergen Boehm (Xenios, Fresenius Medical Care). From everyone's thoughts, it was clear that the major bottleneck in extracorporeal treatments is the **cannula**. Two big **challenges** that were brought up during the discussion are the possibility of using higher flows even with reduced size (**miniaturisation**), and simple long-term access without the risk of **infection**. Although different serious solutions were investigated in the past, progress in this regard is rather disappointing and attempts most often result in only small improvements. This might be

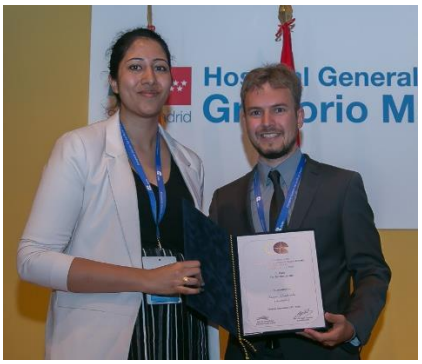
due to the 'gap' between industry, who performs research and produces the product, and the clinicians, who should be driving the research, since a lot has to do with all the practicalities of vascular access (e.g. handling by the clinicians & patients). In our attempt to come to solutions, cooperation between clinicians and industry seems to play a key role! But we should not forget that research is still expected in the field, once the expectations are clearly identified.

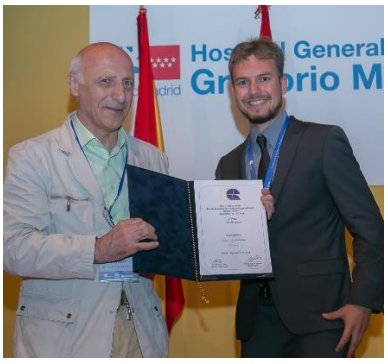
Beside the scientific part of the meeting, several **social events** were organised, such as the welcome reception on Wednesday, the walking tour on Thursday in the Retiro Park, a green and romantic oasis of over 125ha in the heart of Madrid, and the congress diner in the emblematic room La Redacción (1929), which was the writing area of the Spanish ABC newspaper, providing beautiful views to the Paseo de la Castellana.

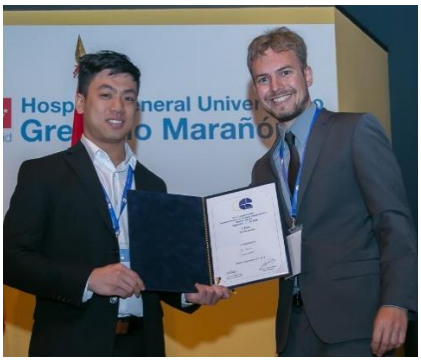


During the closing ceremony on Saturday, the chair of the poster award committee, Simon Sonntag, overhanded the three best **poster awards** to:

1. Kamini Divakarla (Australia): *'Ion-implanted trojan horse surfaces with antimicrobial activity and anti-inflammatory potential'*
2. Levan Ichkitidze (Russian Federation): *'The layers of composite nanomaterials as electrodes in an artificial muscle'*
3. Jo P Pauls (Australia): 'Openheart project – improving international collaboration in the field of mechanical circulatory support *through an open-source research community'*



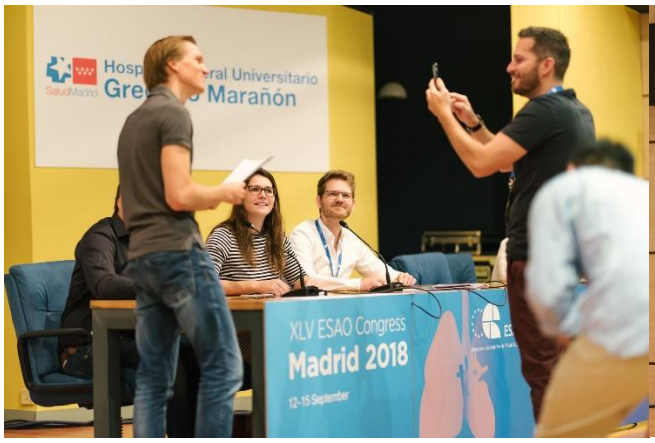


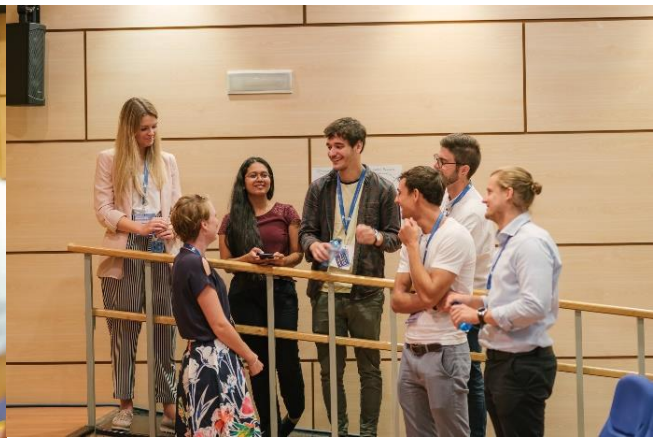


yESAO 2018 - Madrid (Spain)

120 young researches from all over the world attended the annual yESAO conference in Madrid with the motto "**Remedies to shared challenges in Artificial Organs**". The meeting focused on failures, problems and challenges in the field of Artificial Organs. Three keynote speakers opened the sessions on Computational Modelling, Experimental data and Bio-interaction. Selected abstracts for each of the 3 topics provided practical examples and stimulating discussions.

The workshop "Lights, camera, ACTION" started on September 11th, in the afternoon and concluded on the 12th, in the morning. Groups were separated according to interests, and common challenges were identified within a multinational, multidisciplinary team. The same team then worked on recording a brief video, detailing the problem as well as the proposed solution. These videos were screened on the subsequent day and made available to the yESAO members via a protected YouTube channel. In addition, a presentation and lab visit of the startup CORIFY was organised on the afternoon of the 11th.



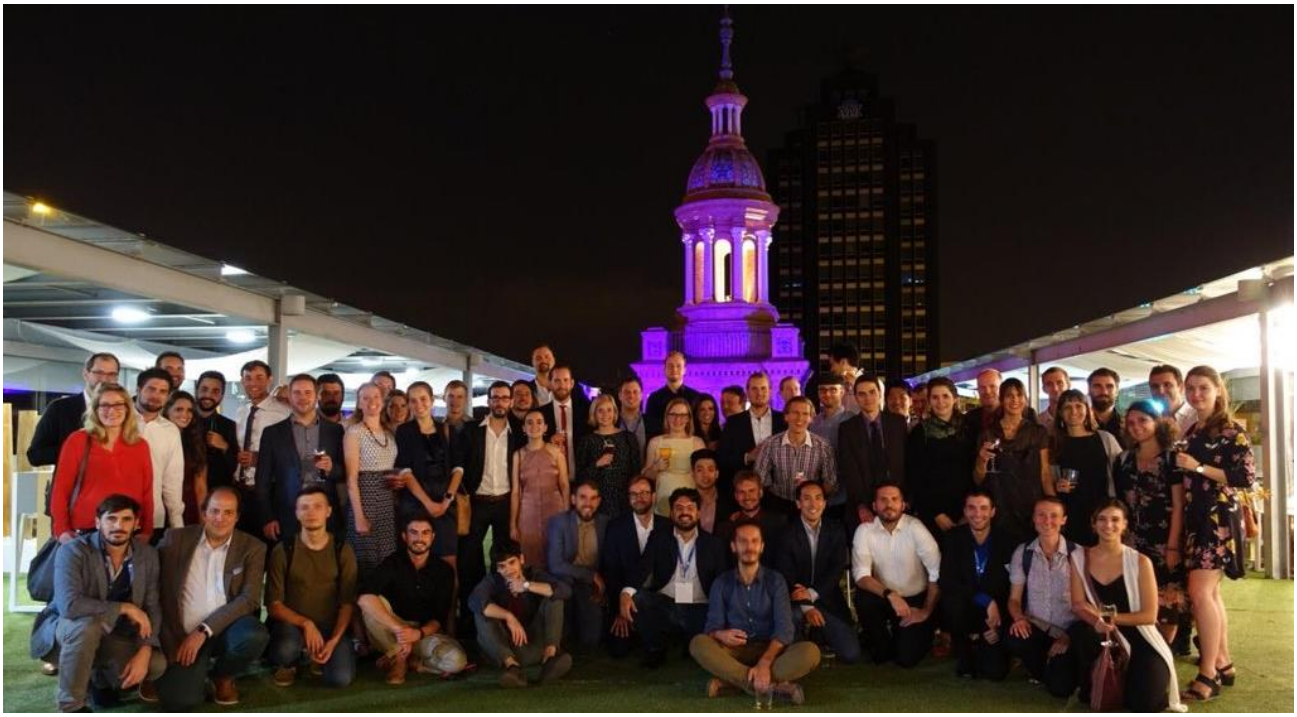


For the yESAO meeting night, a guided city tour was organised followed by a dinner at Museo del Jamón. Multiple other social events were organised throughout the congress week.

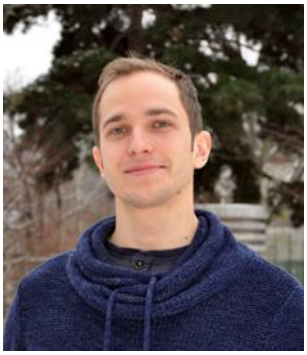
During the congress, the winners of the fifth edition of the yESAO Exchange Award, who finished their exchange during 2018, presented their work:

- **H. Al-Khoury** (Halle, Germany) & **E. Espinosa-Cano** (Madrid, Spain)
  'Immobilization strategies with glycosaminoglycans- polymeric drug conjugate on biomaterials for anti-inflammatory purposes'
- **Seraina Dual** (Zürich, Switserland) & **Leonie Korn** (Aachen, Germany)
  'Left ventricular volume measurement from a VAD cannula perspective'

All young researchers are invited to our next meeting in Hannover 3-4 September 2019. The meeting is free to attend for ESAO congress attendees.



yESAO news



Martin Maw has taken up office as **new yESAO coordinator**. He will join Marc Mueller and Alessandra Molteni in order to coordinate the activities of the yESAO. Martin works on the monitoring and physiological control of Left Ventricular Assist Devices at the Medical University of Vienna, under supervision of Francesco Moscato and Heinrich Schima. His declared aim for his role in the yESAO is ***to help bridge the gaps between subspecialties and institutes***.

The yESAO coordinators are happy to have a constant support from a multi-disciplinary **yESAO core team**. The core team for 2018/19 consists of 12 young researchers from all over the world: Philipp Aigner (Austria), Michael Bode (Germany), Michela Bozetto (Italy), Lucia Gullón (Spain), Lucas Konigk (Germany), Sam Liao (Australia), Caglar Öztürk (Turkey), Anna Stecka (Poland), Bente Thamsen (Germany), Ben Torner (Germany), Adrian Wisniewski (Germany) and Eric Wu (Australia).

It is a great pleasure for the yESAO coordinators to announce the publication of the **first yESAO focus issue**! The focus issue is dedicated to the scientific works and ideas which were presented or evolved during the annual yESAO meeting and ESAO Congress 2017 in Vienna, Austria. The contributions can be classified into two groups – bio-interaction and theoretical modelling.

The permanent link for the issue is: **https://journals.sagepub.com/toc/jaoa/41/11**

The Guest-Editors Alessandra Molteni and Marc Mueller would like to express their gratitude to the authors and reviewers of this issue, to Ms Zucchetti and Ms Nolli from the IJAO office, together with the ESAO Editor Thomas Groth and the IJAO Editor in Chief Andrea Remuzzi for their constant support!

The **yESAO database** was officially launched in October 2018! The yESAO database is a unique platform, which collects information on the main areas of research and core competencies of the yESAO members and their affiliations: i.e. laboratories, hospitals and companies. Users can log in and fill their profiles with their professional information. These profiles can then be searched by other members to find the best-matching one based on a list of features, such as affiliation, location, research area, core competencies. This could be

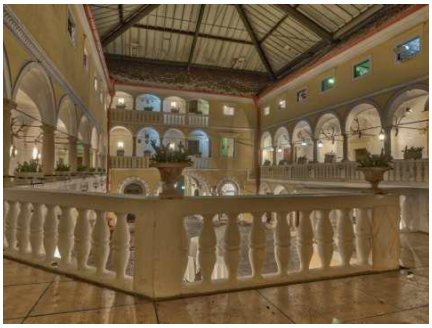
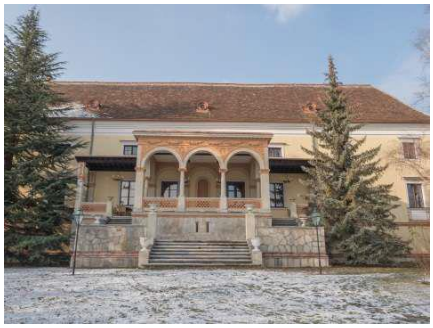
used, in case you need some support with a certain technology, or want to discuss some idea pertaining to a certain field.

To access the yESAO database visit **https://yesao-database.esao.org**. We created **personalised log-ins** for every yESAO member. To obtain your login data, please request it at yesao@esao.org with the subject line '<Yourname> yESAO Database login data'. For security reasons, it is not possible to register to the database on your own.

Finally, the yESAO coordinators would like to express their sincere thanks to **Paolo Bianchi** (linkedin.com/in/paolo-branchi), who was responsible for the technical realisation of the database!

ESAO Winter School 2019 – Baden (Austria)

On January 24 - 26, 2019, Baden, 26 km south of Vienna, Austria, was the venue of the 10th ESAO Winter School entitled *Bioartificial Organs, Organ Support & Stem Cell Based Therapies*. The event was attended by 48 participants - scientists, engineers, clinicians, as well as doctoral students - from 10 different countries.

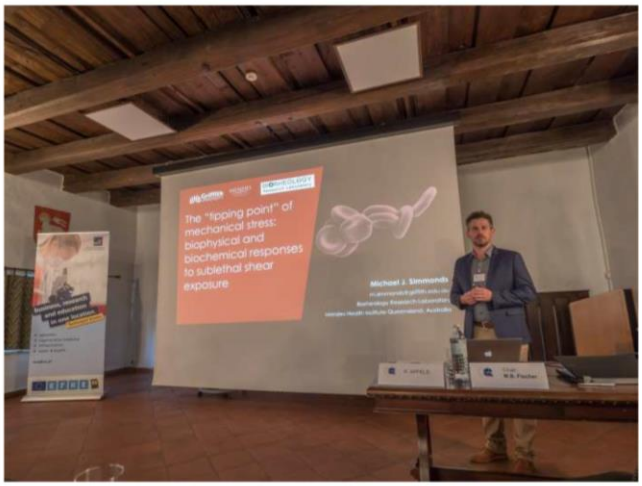
The program was compiled by Viktoria Weber and Michael B. Fischer (both from Danube University Krems, Austria), Ulrich Kertzscher (Charité Berlin, Germany), Dimitrios Stamatialis (University of Twente, Enschede, Netherlands), Andrea Remuzzi (Mario Negri Institute for Pharmacological Research, Bergamo, Italy), and Volker Witt (St. Anna Children´s Hospital, Vienna, Austria).

The Winter School started with two opening lectures on the first afternoon, followed by six sessions during the next two days:

Artificial & Bioartificial Organs I
Artificial & Bioartificial Organs II
Rheological Aspects and Damage of Blood Cells
Young Researcher´s Session
Organs on a Chip and Organoids
Stem Cells

The opening lectures were delivered by Michael Simmonds (Griffith University, Southport, Australia), and Andrea Remuzzi. Michael Simmonds talked about *Contributors to Poor Outcomes in Mechanical Support Patients: Biophysical and Physiological Changes* and Andrea Remuzzi gave a presentation on *(Bio)artificial Organs: Future Developments from an Editor's Point of View*.

The program of the Winter School provided an excellent overview of the progress, current challenges, and future aims in the context of bioartificial organs. Moreover, with a session organised by Emanuele Gatti (Danube University Krems) and Giuliana Gavioli (Mirandola, Italy), it highlighted the perspective of industry, addressing topics such as funding, regulations, and challenges in the translation of scientific results into clinical application.



The **Young Researcher´s Session**, organised by Jens Hartmann and Carla Tripisciano (both from Danube University Krems, Austria), offered young research fellows the opportunity to share and discuss their work by poster presentations, and to receive valuable comments and suggestions from experts from different scientific contexts.

Three **poster prizes** were awarded to:

1. Sandra Clara Trujllo (Polytechnic University of Valencia, Spain): *A novel 3D Culture Microsphere-base Platform*
2. Maria Teresa Guillot Ferriols (Polytechnic University of Valencia, Spain): *Electroactive Freeze-Extraction Poly(vinylidene fluoride) Membranes for Cell Cultures*
3. Luis Martins (University of Minho, Portugal): *Biodegradable Piezoelectric Materials for Tissue Engineering Applications*

In the evening lecture that followed the poster session, Dimitrios Stamatialis superbly discussed key points for the successful management and dissemination of science with his talk *Survival Skills for a Scientist*.
During a guided evening walk through Baden, the Winter School attendants visited one of the hot sulphur water springs, Austria's largest rose garden, as well as one of the summer houses of Ludwig von Beethoven.

Report from last IFAO Board Meetings – Madrid & Tokyo 2018

IFAO Board Meetings were organised by the Chairman Toru Masuzawa during the congress of European (Madrid) and Japanese (Tokyo) societies in 2018 to discuss organisation of IFAO Sessions during upcoming congresses and other items.

The discussion focussed first on the IFAO symposium program to be held at the ASAIO congress in San Francisco that will take place from June 26-29, 2019. A 2 hour slot may be available for IFAO Symposium with speakers from all member societies. It was agreed that the main principle of the sessions should be to bring up intercontinental experiences and conditions in the specific field. For the ASAIO meeting in San Francisco it was decided to speak on regulatory issues in the various continents for biomaterials implantable in the field of artificial organ, medical devices and biomedical technology. The IFAO Board member from ASAIO mentioned that FDA representative could be addressed to present in San Francisco on behalf of the US conditions. Society members from ESAO and JSAO should be invited to present the situation in Europe and Japan and will be suggested by the Boards of corresponding societies.

The next IFAO Session during the upcoming ESAO congress in Hannover shall focus on myocardial recovery and will organised in collaboration between IFAO and ESAO Congress, particularly Heinrich Schima and Congress President Birgit Glasmacher. It has been also suggested to report on the content of IFAO Session as Communication in the journal Artificial Organs. The next joint JSAO-IFAO Congress will be held in 2019 Osaka from November 12-15, 2019 with Koichi Toda as Congress President. An International Programming Committee has been appointed already and will start to prepare for JSAO-IFAO Congress soon. An IFAO session is planned and will be organised by IFAO Board members.

Thomas Groth,
Member of Board of Trustees of IFAO

Announcements