Dear Members of European Society for Artificial Organs,

I am very glad to introduce the sixth edition of the ESAO Newsletter prepared thanks to the great efforts of our Secretary General Sunny Eloot. Our aim, together with the excellent communication work provided by Ms Anita Aichinger and our Office in Krems, is to build links among our community.

First, I would like to focus on our next major event: the 45th ESAO Annual Congress organised in Madrid (Sept 12-15, 2018) by Prof Juan F del Cañizo and our Spanish colleagues. The motto of the congress is ‘New organs for life’.

The program is very promising, with 313 accepted abstracts in symposia and regular oral and poster sessions. In addition, for the first time, we propose a round table discussion with the Corporate Members on “Unmet Clinical Needs: Pending Issues regarding Vascular Access for Artificial Organs” that will take place on Friday 14 at lunch time (see p 2). If you did not register yet, check the website: www.esao2018.org. Looking for answers to our concerns about the new regulations in Europe for medical devices, we followed a meeting in Brussels from the European Society of Cardiology about the challenges and opportunities of this new European regulatory landscape for medical devices (see p2).

The yESAO community has been, as usual, very active in preparing the yESAO meeting taking place just before Madrid’s congress (see p3), as well as building a database for their members (see p5). I also would like to point out their commitment to edit a Special Issue of the International Journal of Artificial Organs. This issue focuses on innovation and advancement by young researchers in the field of organ support, replacement of artificial organs, tissue engineering and regenerative medicine, as presented during the last ESAO congress in Vienna (see p6).

Our society has also been involved in the links with our partners such as the International Federation of Artificial Organs (IFAO). Our past president Thomas Groth reports in this issue on the meeting held in Washington during the past ASAIO congress (see p8). Alessandra Molteni, newly elected as ESAO representative at EAMBES, informs us about the action of the association representing Medical and Biological Engineering & Science in Europe (see p6).

In this issue and in the future, we would also like to highlight large projects in which our members are involved. We launch this section with a new grant on ‘Mechanisms of Cardiovascular Complications in Chronic Kidney Disease’ obtained by Prof Jankowski from Aachen (see p7). If you are interested in announcing such programs in the field of artificial organs, please contact us!

Finally, I would like to remind you about the elections for General Secretary and five Governors of ESAO. You recently received the information by mail, and it is still time to vote, either by mail or during the congress. We need all your feedback to maintain or even improve our actions!

With my best personal regards,

Cécile Legallais, ESAO President

ESAO Newsletter
July 2018

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New! Round Table Meeting on Unmet Clinical Needs @ESAO Madrid 2018

During the past year, we discussed with our Corporate Members on the way to better interact with each other. One expectation was to improve exchanges among clinicians, scientists and companies on generic issues in the field of artificial organs. To avoid specialised discussions around the replacement of one specific organ, we proposed to address transversal ‘Unmet Clinical Needs’ during a round table discussion at the ESAO congress in Madrid, September 12-15, 2018.

For this first meeting, we decided to propose the following subject:

‘Pending Issues regarding Vascular Access for Artificial Organs’.

Indeed, vascular accesses are needed for most of the artificial organs (kidney, liver, heart, pancreas, apheresis,…). Requirements and solutions might be different, but common features are interesting to study, such as blood flow dynamics (in the access and around), haemocompatibility, infections risks, …

Cécile Legallais, as ESAO president, accepted to act as moderator of the round table discussion, which will take place on Friday September 14 @ lunch time, during the ESAO congress in Madrid. Be there!

The following participants from companies already confirmed:

- dr Joerg Kurz, Getinge Maquet
- dr John Woodard, Berlin Heart
- dr Michael Hulko, Baxter
- dr Peter Mandry, B.Braun Avitum Saxonia

We will also invite clinicians from different specialities (nephrology, cardiovascular, apheresis,…) to participate, as well as scientists from different fields (biocompatibility, biofluid dynamics, surface treatment and functionalisation, …)

We hope that you will find interest in attending such discussions, which could result in further research topics, clinical practice or innovative devices.

New European regulatory landscape for medical devices

During previous Board Meetings, several Board Members as well as Corporate Members expressed their concerns about the new European regulations for medical devices. Are they really a threat for innovations in small companies?

On 21 March 2018, the European Society of Cardiology invited leading scientists, representing some twenty medical associations in Europe, to discuss the safety and performance of the medical devices they use to diagnose and treat their patients, how the new European regulatory landscape impacts that, and what opportunities lie ahead for the involvement of experts in the regulatory process. They were joined in Brussels by EU and national regulators currently involved in preparing to implement the landmark regulation.

It became a day of contrasts with a closing dose of optimism.

The full report can be read on their website:

All young researchers are invited to our next meeting in Madrid 11-12 September 2018 “Remedies to shared challenges in Artificial Organs”. The meeting is free to attend for ESAO congress attendees, or 20€ meeting registration fee and yESAO membership.

The meeting will be centred on failures, problems, challenges in the field of Artificial Organs, and there will be very productive conversations, workshops and round tables with invited speakers on in vivo bio-interaction, exchange of data as well as experimental and computational modelling. Following last year workshop success, and all the requests for more dedicated time, this year workshop “Lights, camera, ACTION” will run on 2 days, starting on the 11th afternoon and concluding on the 12th morning. Further to this, on the 11th afternoon, there will be an opportunity to talk with local innovators in artificial organs together with a clinical experience. Networking activities will be organised for the 11th night following a tour of the enchanting Madrid.

Invited speakers

Among our speakers, we will have the pleasure of hosting Prof Joerg Vienken, former Vice President BioSciences in Fresenius Medical Care and Board Member of Nephro-Solutions AG. His keynote will be about ‘Medical devices and ATMPs on the run: Current concepts and their disqualification by Floppy Science & Fake news’. Prof Vienken has been awarded the “Emil-Bücherl-Award” for lifetime achievement in the realm of Artificial Organs from our society ESAO, he was a long-lasting Board Member of our ESAO society and is currently the chair of the working group ‘Albunet’ within ESAO. He is a distinguished fellow of ERA-EDTA, the European Dialysis and Transplantation Association, and Past President of the International Federation of Artificial Organs (IFAO). Prof Joerg Vienken still teaches Biomaterials and Artificial Organs at several German and European Universities and has published more than 300 scientific publications.

Dr Jo Pauls, Postdoctoral Research Fellow at the University of Queensland. He is going to talk about the mission of the ‘Open Heart Project’ (openheartproject.org) which aims to promote improved collaboration between researchers and laboratories in the field of Mechanical Circulatory Support through the implementation of an open-source online research platform. Dr Pauls research is primarily focused on the development of a passive physiological control system for rotary ventricular assist devices. Other areas of his research include the investigation of the native hearts response to changes in patient status, in vitro testing, in vivo evaluation and numerical simulations. He has presented his research at various national and international conferences.

Dr Jesus Barea Mendoza, critical care medicine specialist and chief of residents of the hospital 12 de Octubre, Madrid. His talk will be on ‘Clinical implementation of developed medical devices: application, impact and discussion’. He will bring on the table a new point of view about the implementation of new devices in hospitals going beyond the development and analysing the impact on the clinicians, in details, learning curve, ethics, psychological aspects, and budgets. One psychologist of the hospital 12 de Octubre ICU will support Dr Mendoza explaining the psychological impacts.
The Instituto Mario Negri (Villa Camozzi, Bergamo) hosted the second yESAO Symposium, where the yESAO Madrid meeting organisers had the opportunity to finalise the Madrid program. This year meeting organisers are the yESAO coordinators, Alessandra Molteni and Marc Mueller, together with the yESAO local organising committee for the ESAO-Congress 2018, Lucía Gullón, Robert Torres and Judit Gutiérrez, and the yESAO core team 2018 eso.org/young-esao/about-us

**yESAO workshop 2018: ‘Lights, camera, ACTION!’**

The purpose of yESAO meetings is to bring together young, passionate and driven researchers in the field of Artificial Organs, aiming to foster innovation and advancement. Over the years, the practical 2-day yESAO workshops have become a highly anticipated and important event. This is where the best moments take place, where ideas and experiences are shared among engineers, scientists, clinicians, and where students form collaborative networks from various institutes worldwide. This year, more than 100 participants will attend the workshop and each of them will be encouraged to contribute with stimulating and fruitful discussions about the ‘remedies to shared challenges in artificial organs’, which is the inspiring motto of the 2 days meeting.

Attendees will share ideas and solutions in different research fields, including: computational fluid dynamics, *in vitro* and *in vivo* experiments relating to blood and tissues, as well as challenges in pre-clinical and clinical studies.

To facilitate discussions, small groups will be formed. There will be a total of 4 hours discussions: 2 hours on the first day and 2 hours on the following day. At the end of the second day, every group will contribute a gift to the yESAO community! We do not want to reveal much, the title of the workshop is talking itself. Come and join us, we will have a wonderful time together!

Eric, Michela, Adrian and Sam
The organisers of yESAO workshop 2018
yESAO – Database

The yESAO community has the aim to encourage international and interdisciplinary cooperation, to exchange ideas and experiences while producing innovation and advancement in the field. To fulfil this aim, we are creating the yESAO Database, which collects the main areas of research and core competencies of the yESAO members and their affiliations, so laboratories, hospitals and companies. The yESAO Database is a LinkedIn-like WebApplication, reserved to the yESAO members: users can login and fill in 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, of which affiliation, location, research area, and core competencies. Paolo Branchi is our yESAO Database developer (pbranchi@gmail.com | linkedin.com/in/paolo-branchi), and this is the yESAO Database as it looks today, and it will be launched at the yESAO meeting in Madrid 11-12 September 2018:

The yESAO Database is technically a full-fledged modern WebApplication. The front-end, the web-pages, is written in pure HTML/CSS to ensure high customisation potential and responsiveness, nowadays a must-have to cope with the large variety of screen sizes. The back-end, the engine, is written in Django, one of the best web frameworks used also by Google, YouTube, Dropbox, just to name a few. Being python-based, Django can also be easily integrated with some of the cutting-edge technologies in data-analysis and machine learning, providing wide space for further developments, of which file sharing. This tool will certainly favour new collaborations in the field of Artificial Organs and push forward the knowledge of the society as a unit, in an enjoyable atmosphere without the limitations of conventional organisations.
yESAO – Focus issue in the IJAO

The yESAO coordinators Alessandra Molteni and Marc Mueller have the honour to be Guest-Editors of the first ‘Focus issue on the Young European Society for Artificial Organs (yESAO) from the 44th ESAO & 7th IFAO Congress’ which will be published in the International Journal of Artificial Organs (IJAO). We received fascinating submissions, which address specific topics in the field of organs support, replacement and regeneration based on artificial organs, tissue engineering and regenerative medicine. The manuscripts present studies about the bio-interaction of implant materials (in vitro / in vivo), fabrication techniques for novel medical devices as well as numerical modelling of medical flows and biological tissues.

The submissions underwent an official review process and 14 were finally accepted for publication. The yESAO focus issue will be soon published in the IJAO. The Guest-Editors would like to express their gratitude to the reviewers of this issue, to Ms Zucchetti and Ms Nolli from the IJAO office, together with the ESAO Editor Prof Groth and the IJAO Editor in Chief Prof Remuzzi for their constant support!

New Councillor for Industrial Affairs in EAMBES

Alessandra Molteni has been nominated as Councillor for Industrial Affairs for the European Alliance for Medical and Biological Engineering & Science (EAMBES - eambes.org) representing the ESAO society. EAMBES supports and promotes Biomedical and Medical Engineering and Sciences research and development, education, training and accreditation of scientific programmes, as a strong one voice at the European level. In this framework, Alessandra’s vision is to achieve credit and visibility to advancements in European in vitro diagnostic and medical devices industry. The major points of her missions are to: First, strengthen collaboration among academia, industry and national and international societies. Secondly, prevent valley of death during in vitro diagnostic and medical devices development. Lastly, promote actions to support investments in biomedical engineering (BME). EAMBES Members are scientific societies, Universities or Research Institutions in Europe. Today EAMBES represents 26 national & transnational societies and 33 institutions, and through them around 8,000 biomedical engineers and scientists working primarily in research and higher education. It is affiliated to the International Federation of Medical and Biological Engineering (IFMBE).

EAMBES board meeting, London 2018
The Grants Committee of Deutsche Forschungsgemeinschaft (DFG) has approved funding (approximately 10 million euros) for Collaborative Research Centre (CRC) / Transregio ‘Mechanisms of Cardiovascular Complications in Chronic Kidney Disease’ for the next four years; a total term of 12 years is planned.

The here presented CRC/Transregio is a coproduction between RWTH Aachen and Saarland University, and Univ-Prof dr Joachim Jankowski from the Institute of Molecular Cardiovascular Research (IMCAR) at the RWTH will supervise this project. CRC/Transregio is based on the perception that CKD patients have a significantly increased risk of cardiovascular events (CV). In addition to the high risk of atherosclerosis-related serious complications such as heart attack or stroke, cardiac death in patients with chronic kidney disease is often caused by heart failure and arrhythmias. The pathophysiological processes of cardiovascular diseases in CKD patients seem to differ from the corresponding processes in the general population. This can explain why traditional approaches to improve cardiovascular events are less successful in chronic kidney disease. Knowledge of the underlying pathological mechanisms of cardiovascular diseases in patients with chronic kidney disease is therefore essential in order to reduce the increased cardiovascular mortality rate in these patient populations through new therapeutic approaches.

Changes in circulation and heart tissue contribute crucially to increased cardiovascular risks in patients with chronic kidney disease. Nevertheless, molecular mechanisms are mostly not investigated. Therefore, the aim of the present project is to evaluate multifactorial aspects of chronic kidney disease induced cardiovascular morbidity and mortality in circulation and heart tissue within experimental und clinical studies.

In addition to the fundamental scientific investigations of the pathological mechanisms of cardiovascular diseases in the context of chronic kidney disease, translational aspects of cardiovascular pathology in CKD patients will be investigated by establishing and evaluating new therapeutic approaches and diagnostic tests.

The 18 research teams contribute their experience from the fields of cardiology, nephrology, biophysics and molecular biology into the CRC/Transregio. A special characteristic of this CRC is that it has three integrated service projects:

1. standardisation of animal models, histopathological analyses and morphological protocols
2. bioinformatics and statistical methods for correlation studies
3. combining chromatography, mass spectrometry and MALDI imaging

The graduate school (integrated in the CRC/Transregio) offers the involved students exemplary support and a networking opportunity within and outside the CRC for the strengthening of their scientific and social skills.
An interdisciplinary training program will be established for the PhD students of the CRC/Transregio to train the next generation of innovative, independent, and translational, field-experienced scientists studying the diverse aspects of cardiovascular disease in chronic kidney disease. This structured teaching concept comprises an individual research project, personnel exchange between the consortium partners, a practical training module as well as specific modules for the development of basic scientific competences and interdisciplinary skills.

Contact: Joachim Jankowski (jjankowski@ukaachen.de)

Report from last IFAO Board Meeting – ASAIO Washington June 2018

During the past IFAO Board Meeting in Washington, a discussion was held about the IFAO sessions at other annual society meetings on the different continents. These sessions emphasise the important role of IFAO, and also add unique topics and perspectives to the agenda of the meetings in a transcontinental manner.

Next scheduled IFAO sessions will be organised during the:
   - ESAO Congress in Madrid from Sep 12-15 2018
   - JSAO Congress in Tokyo, Nov 1-3 2018
   - ASAIO Congress in San Francisco in June 2019

The President of the next joint JSAO-IFAO congress in Osaka in 2019, Prof Toda, provided a short report on the preparations of this meeting. There will be grants for young investigators to attend the meeting, and a focus on overseas attendees.

A further important topic of the Board meeting was a discussion on various society initiatives to spur innovations in dialysis therapy and develop new technology to support patients with ESRD:

   - Prof Wieringa from The Netherlands discussed the KIDNEW proposal, submitted by ESAO member Bernd Stegmayr and other European stakeholders in the frame of the Horizon 2020 program.
   - Prof Sheldon from ASAIO discussed the Kidney Health Initiative sponsored by ASN and FDA, which now includes over 90 agencies and other stakeholders in renal therapy.
   - Prof Sheldon also discussed the KidneyX project, which will lead to the next generation dialysis and alternatives to dialysis, with the possible support from CMS and NIH.

Report by Prof Dr Thomas Groth
It is a great honour for us to invite you to the upcoming congress of the European Society for Artificial Organs - ESAO 2019. The congress will take place at the Leibniz University Hannover in Hannover, Germany, from Sept. 4 to 7, 2019.

The motto of our congress ‘Smartificial Devices for our Future’ is dedicated to current trends in active implant materials and intelligent medical devices, which will have a great impact on medical care in the next decades.

Prof Birgit Glasmacher, Congress President ESAO 2019