



**MIĘDZYNARODOWE CENTRUM BIOCYBERNETYKI**

INSTYTUT BIOCYBERNETYKI I INŻYNIERII BIOMEDYCZNEJ

im. Macieja Nałęcz  
POLSKIEJ AKADEMII NAUK

**INTERNATIONAL CENTRE OF BIOCYBERNETICS**

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## **158<sup>th</sup> ICB SEMINAR**

# **MECHANICAL SUPPORTS TO LIFE: BIOENGINEERING MEETS CLINICAL ARENA (MODELLING AND PATIENTS' DATA)**

### Chairmen:

**Krzysztof Zieliński, PhD**

Institute of Biocybernetics and Biomedical Engineering PAS, Warsaw, Poland

**Libera Fresiello, PhD**

Katholieke Universiteit, Leuven, Belgium

**Maria Giovanna Trivella, MD**

Institute of Clinical Physiology CNR, Pisa, Italy

**Warsaw, 21-23 May 2018**

## PROGRAMME OF THE SEMINAR

**MONDAY, 21 May 2018**

### **OPENING OF THE SEMINAR**

**15:30 – 15:45**

**WELCOME ADDRESS** by **Piotr Ładyżyński** (*Poland*)  
*Director of the International Centre of Biocybernetics*

### **Session I: Clinicians and biomedical engineers: challenges & opportunities**

Chairmen: prof. Marek Darowski, dr. Maria Giovanna Trivella

**15:45 – 16:15** **Gianfranco Ferrari** (*Rome, Italy*)

*“Cardiovascular modelling and its synergies with clinical arena: the paradigm of mechanical circulatory support”*

**16:15 – 16:45** **Khosrow Mottaghy** (*Aachen, Germany*)

*“Haemorheological effects of red cell distribution in artificial organs”*

**16:45 – 17:00** *COFFE BREAK*

**17:00 – 17:30** **Maria Giovanna Trivella** (*Pisa, Italy*)

*“SensorART project coordination: lights and shadows”*

**17:30 – 18:00** Round table discussion

**18:00** *GET TOGETHER*

<b>TUESDAY, 22 May 2018</b>
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**09:00 – 10:50 Session I: Clinical area 1**

Chairmen: prof. Piotr Wilczek, dr. Steven Jacobs

- **Maria Frigerio** (*Milan, Italy*)

*“Life on a leash: LVAD technology improvements and limitations from patients’ perspective”*

- **Antonio Amodeo** (*Rome, Italy*)

*“Mechanical circulatory support in pediatrics: present, past and future”*

- **Jeremi Mizerski** (*Warsaw, Poland*)

*“Cardiac arrhythmias detection”*

**10:00 – 10:50** Round table discussion

**10:50 – 11:20** *COFFE BREAK*

**11:20 – 12:30 Session II: Clinical area 2**

Chairmen: dr. Jeremi Mizerski, prof. Antonio Amodeo

- **Aldo Cannata** (*Milano, Italy*)

*„Haemodynamic performance in different configurations of Left Ventricular Device: ascending vs descending aorta outflow graft anastomosis”*

- **Piotr Wilczek** (*Zabrze, Poland*)

*“Bioengineering of heart valve prosthesis - the preclinical study”*

**12:00 – 12:30** Round table discussion

**12:30 – 13:00** *LABORATORY VISIT*

**13:00 – 14:00** *LUNCH BREAK*

**14:00 – 16:00 Session III: Modelling in-silico**

Chairmen: dr. Arianna Di Molfetta, dr. Krzysztof Zieliński

- **Libera Fresiello** (*Leuven, Belgium*)

*“An example on the use of cardiovascular modeling: from the understanding of human physiology to the support of VAD design optimization”*

- **Steven Jacobs** (*Leuven, Belgium*)

*“Mechanical supports to live: Can biomarkers help to improve patient simulation?”*

- **Michał Kopacz** (*Cracow, Poland*)

*“Simulation of the resistance of mitral and aortal valves in the aspect of pharmacological patients treatment and cardiovascular support”*

- **Martin Maw** (*Vienna, Austria*)

*“Statistical modeling of pump data timeseries for adverse event detection in left ventricular assist device patients”*

**15:20 – 16:00** Round table discussion

**16:00 – 16:30** COFFE BREAK

**16:30 – 18:00 Session IV: Modelling and measuring in-vitro and in-vivo**

Chairmen: dr. Libera Fresiello, dr. Gianfranco Ferrari

- **Krzysztof Zieliński** (*Warsaw, Poland*)

*“Hydro-numerical cardiovascular simulators: a brief history, current state and future prospective”*

- **Roland Graefe** (*Aachen, Germany*)

*“The effect of LVAD pressure sensitivity on left ventricular unloading”*

- **Arianna Di Molfetta** (*Rome, Italy*)

*“Merging clinical and engineeristic knowledge in the field of*

*pediatric VAD: A new echocardiographic approach to Berlin Heart and the development of the new Infant Jarvik 2015”*

**17:30 – 18:00** Round table discussion

**18:00** *SOCIAL EVENT*

<b>WEDNESDAY, 23 May 2018</b>
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**09:00 – 11:00** **Session I: Circulatory and respiratory support: from device to methodologies**

Chairmen: prof. Khosrow Mottaghy, prof. Marek Darowski

- **Arianna Di Molfetta** (*Rome, Italy*)

*“Left ventricular unloading during ECMO: Atrial septal defect vs Impella. A simulation study”*

- **Katarzyna Kramek-Romanowska** (*Warsaw, Poland*)

*“Delivery of inhalable drugs during independent lung ventilation – interesting opportunities and challenging constraints”*

- **Alen Karabegovic** (*Vienna, Austria*)

*“Intracorporeal membrane oxygenator – design, limits and control”*

- **Anna Stecka** (**Warsaw, Poland**)

*“Therapeutic thoracentesis of real and virtual patients – an example of engineering full support to medical research”*

**10:20 – 11:00** Round table discussion

**11:00 – 11:15** **Final Remarks**

**11:15** *COFFE BREAK*