



MIĘDZYNARODOWE CENTRUM BIOCYBERNETYKI

INSTYTUT BIOCYBERNETYKI I INŻYNIERII BIOMEDYCZNEJ

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158th 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*

TUESDAY, 22 May 2018

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*

WEDNESDAY, 23 May 2018

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*