



NALE CZ INSTITUTE OF BIOCYBERNETICS
AND BIOMEDICAL ENGINEERING
POLISH ACADEMY OF SCIENCES

Nalecz Institute of Biocybernetics and Biomedical Engineering Polish Academy of Sciences

SHORT STORY AND ACHIVEMENTS

DIRECTORS: PROF. PIOTR ŁADYŻYŃSKI, PhD, DSc
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ASSOC. PROF. PIOTR SAWOSZ , PhD, DSc

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[HTTPS://WWW.IBIB.WAW.PL](https://www.ibib.waw.pl)

Location



University of Warsaw

- 10. Faculty of Chemistry
- 11. Faculty of Biology
- 12. Laboratory of Heavy Ions
- 13. Faculty of Geophysics
- 14. Faculty of Geology
- 15. Faculty of Mathematics, Informatics and Mechanics
- 16. Interdisciplinary Center for Mathematical and Computer Modeling



Polish Academy of Sciences

- 1. International Institute of Molecular and Cell Biology (MIBMiK)
- 2. Nencki Institute of Experimental Biology Polish Academy of Sciences (IBD PAN)
- 3. Mossakowski Medical Research Centre Polish Academy of Sciences (IMDiK PAN)
- 4. Institute of Biochemistry and Biophysics of the Polish Academy of Sciences (IBB PAN)
- 5. **Nałęcz Institute of Biocybernetics and Biomedical Engineering Polish Academy of Sciences (IBIB PAN)**
- 6. Institute of Fundamental Technological Research Polish Academy of Sciences (IPPT PAN)



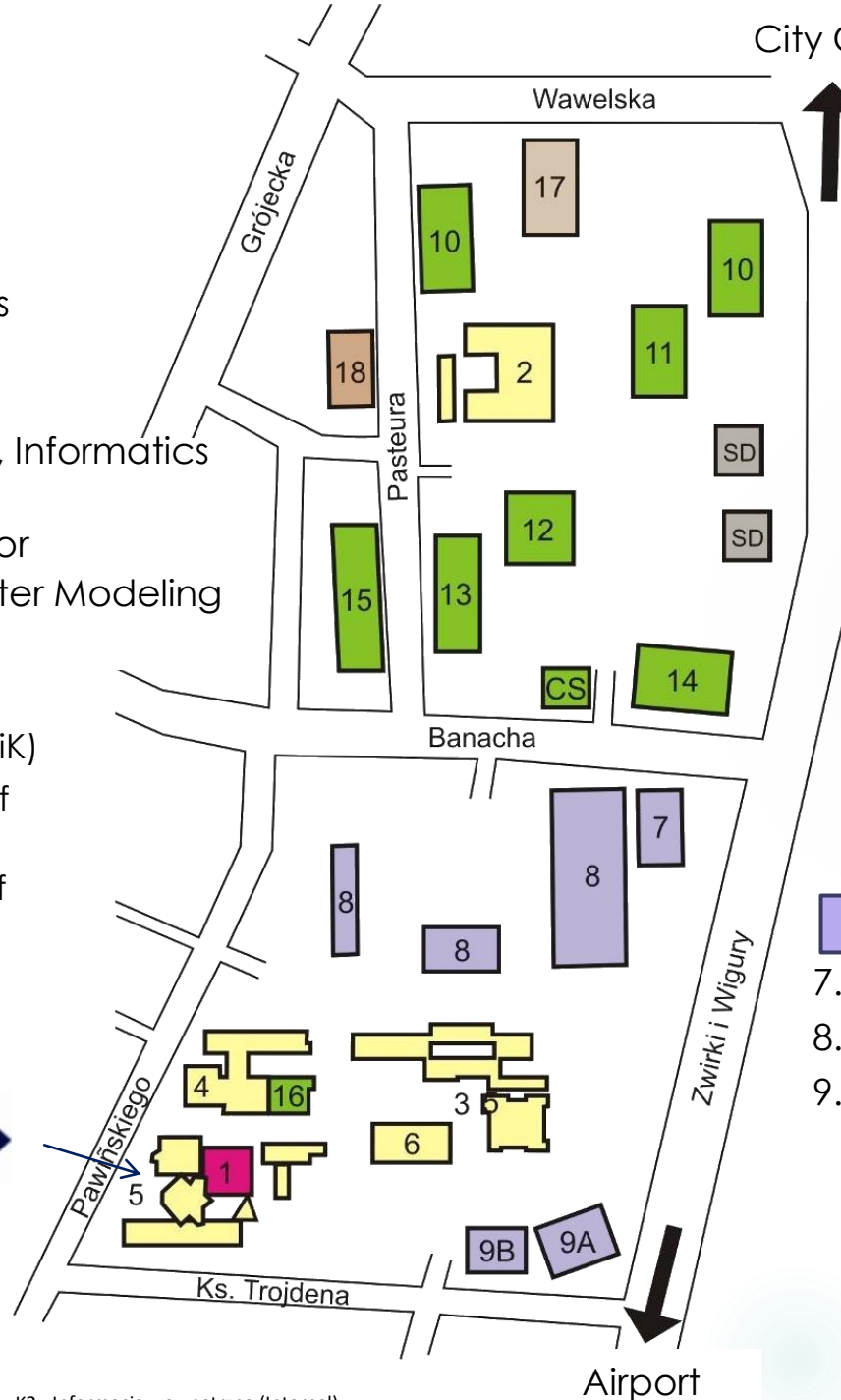
- 17. Oncological Hospital (MSC)
- 18. Hospital for Lung Diseases

SD - Student's dormitories
CS - Sport Center



Warsaw Medical University

- 7. Faculty of Farmacy
- 8. Clinics
- 9. The main buildings – Didactics Center





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IBBE PAS established in 1975

- the first institute in Poland devoted to biomedical engineering

Mission

- ▶ The IBBE PAS mission is to develop and implement new technologies, devices and supportive theoretical tools for medical diagnosis and treatment aimed at prolonged and improved quality of life of patients with chronic and civilization diseases.
- ▶ The research carried out in the Institute is focused on fusion of engineering and the life sciences that promotes scientific discoveries and the invention of new biomedical technologies.
- ▶ The Institute also coordinates initiatives leading to advanced research and education in the field of Biocybernetics and Biomedical Engineering.

DEPARTMENT I: Hybrid and Analytical Microbiosystems

Head: Assoc. Prof. Anna Korzyńska, PhD, DSc

Tissue and cell engineering; microbioanalytics: biosensors, lab-on-chip; digital pathology;

DEPARTMENT II: Biomaterials and Biotechnological Systems

Head: Prof. Ludomira Granicka, PhD, DSc

Cells encapsulation; membrane techniques; scaffolds for 3D cell culture; drug delivery system

DEPARTMENT III: Methods of Brain Imaging and Functional Research of Nervous System

Head: Prof. Adam Liebert, PhD, DSc

Optical techniques for medical diagnosis, electroencephalography

IBIB-WIML Laboratory: Interinstitute Laboratory of new diagnostic applications of MRI

Head: Assoc. Prof. Piotr Bogorodzki, PhD, D.Sc.

MRI brain imaging, hyperpolarised contrast agents

DEPARTMENT IV: Modeling and Supporting of Internal Organs Functions

Head: Assoc. Prof. Tomasz Gólczewski, PhD, DSc

*Assessment and treatment of diabetes; cardio-respiratory system hybride models;
modeling of physiological processess*



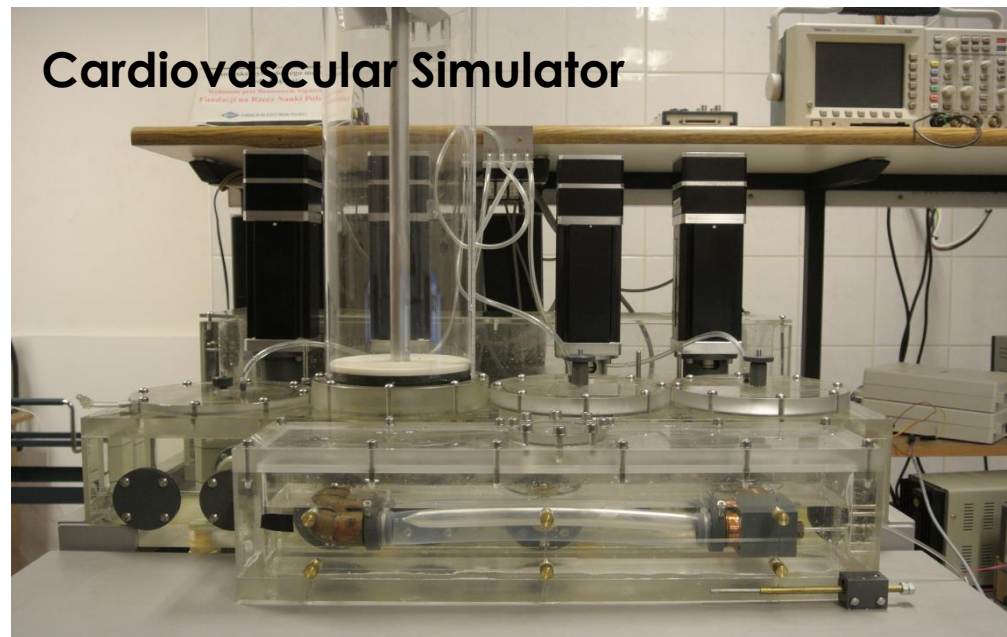
Modeling and Supporting Internal Organs Functions

6

Hybrid Simulators

- They enable simulation of various pathophysiological conditions
- **The physiological cardiovascular real-time closed loop model** contains left/right heart, coronary, systemic and pulmonary arterial and venous circulation.
- Used at: Katholieke Universiteit Leuven, Leuven, BE; currently at Twente University, Enschede, NL
- **The physiological respiratory real-time model** enables simulation of various pathophysiological conditions like:
 - Obstructive ventilatory disturbances (e.g. COPD).
 - Restrictive ventilatory disturbances (e.g. ARDS).

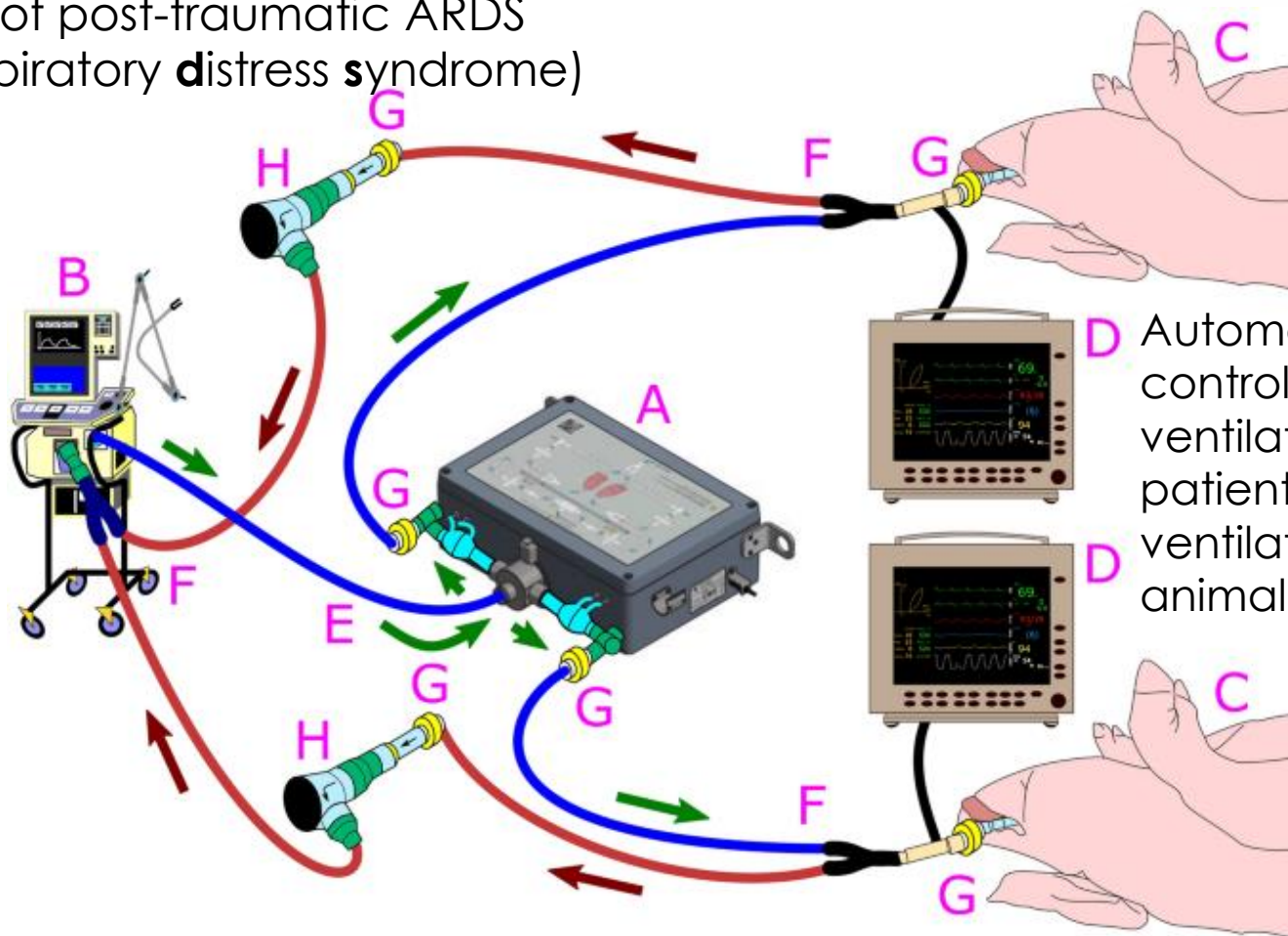
Team: T. Gólczewski, M. Michnikowski, A. Stecka, K. Zieliński, M. Kozarski, P. Okrzeja, M. Darowski





Prof. Marek Darowski

Independent lung ventilation for treatment of post-traumatic ARDS (**a**cute **r**espiratory **d**istress **s**yndrome)



D Automatic air volume control system for ventilation of two patients using a single ventilator: a large animal model study



NARODOWE CENTRUM NAUKI



Maestro



Opus



Sonata



Sonata bis



Preludium bis



European
Commission

MSCA Doctoral Networks



Taiwanese-Polish Joint Research
Project



Department of
Clinical Science, Intervention and Technology

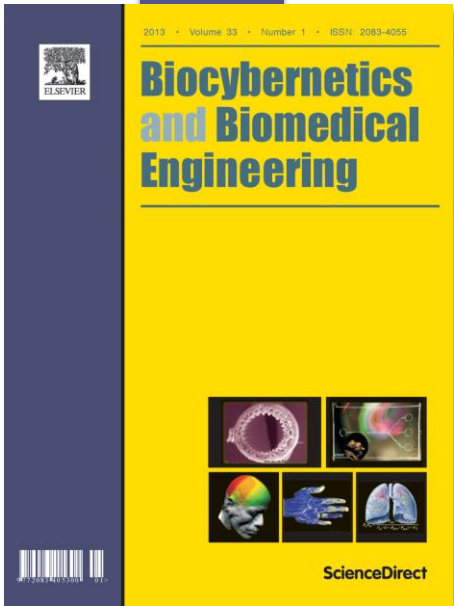
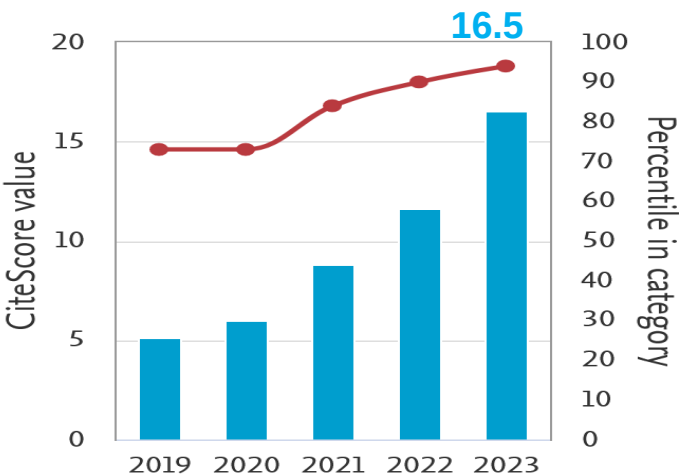
Bilateral project Division of Renal Medicine,
the Section Baxter Novum and IBIB PAN

Biocybernetics and Biomedical Engineering

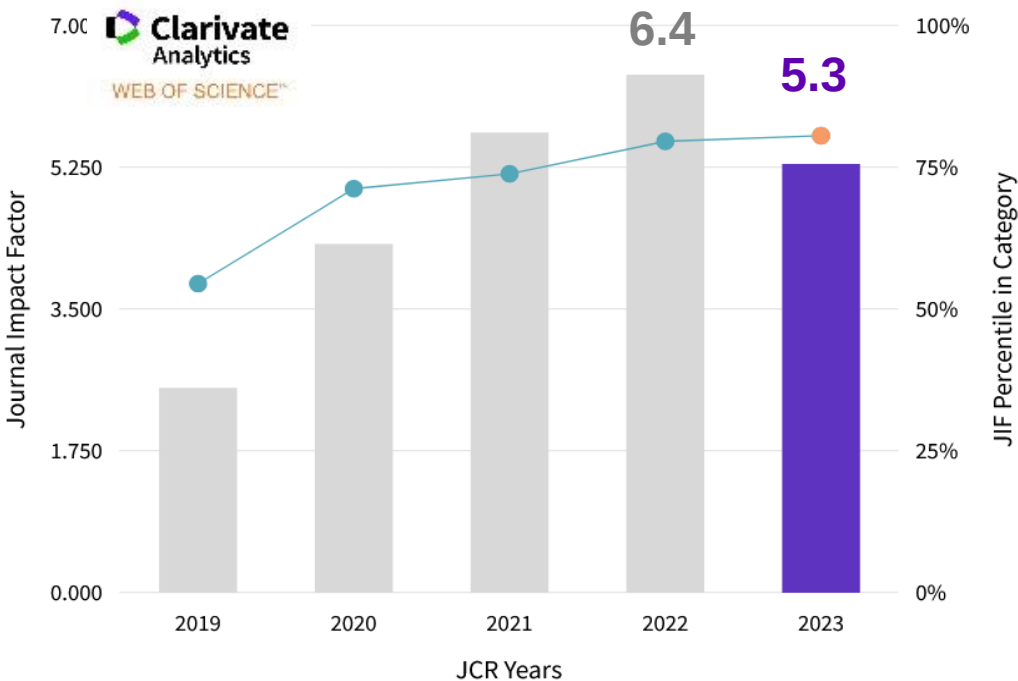
- a journal owned by the institute
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CiteScore
Scopus



Journal Impact Factor



CATEGORY

ENGINEERING, BIOMEDICAL

24/122

JCR YEAR	JIF RANK	JIF QUARTILE	JIF PERCENTILE
2023	24/122	Q1	80.7
2022	20/96	Q1	79.7
2021	26/98	Q2	73.98