

NBC 2025 & PCBBE 2025

Warsaw, Poland, June 16–18, 2025

<https://nbc2025.ibib.waw.pl>



Joint
20th Nordic-Baltic Conference on Biomedical Engineering
and
24th Polish Conference on Biocybernetics and Biomedical Engineering



TENTATIVE SCIENTIFIC PROGRAM

**Joint 20th Nordic-Baltic Conference on Biomedical Engineering
and**

**24th Polish Conference on Biocybernetics
and Biomedical Engineering**

Warsaw, Poland, June 16-18, 2025

Coorganizers



Komitet
Biocybernetyki
i Inżynierii Biomedycznej



Endorsing Organization



Silver Sponsor



Financial Support

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allocated by the Minister of Science under
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Minister of Science
Republic of Poland



**Doskonała
Nauka**

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WELCOME MESSAGE

Dear Distinguished Guests, Colleagues and Friends,

It is our distinct pleasure to welcome you to the Joint 20th Nordic-Baltic Conference on Biomedical Engineering and the 24th Polish Conference on Biocybernetics and Biomedical Engineering (NBC 2025 & PCBBE 2025), taking place on June 16–18, 2025, in the vibrant and historic city of Warsaw, Poland.

This joint event marks a unique convergence of two long-standing traditions in biomedical science and technology. It brings together the communities of the Nordic-Baltic region, Poland, and the global biomedical engineering field. Held under the honorary patronage of Prof. Marek Konarzewski, President of the Polish Academy of Sciences, the conference is organized under the common umbrella of the International Federation for Medical and Biological Engineering (IFMBE), the Committee of Biocybernetics and Biomedical Engineering of the Polish Academy of Sciences (CBBE PAS), and the Polish Society for Biomedical Engineering (PSBE).

NBC 2025 & PCBBE 2025 provides a dynamic forum for researchers, clinicians, industry professionals, and students to share cutting-edge scientific achievements and explore emerging trends in biomedical engineering.

The scientific program, shaped by an esteemed International Advisory Board and Scientific Program Committee, upholds the highest academic standards. During the conference, you will have the opportunity to present your innovative work, engage in meaningful dialogue, and build collaborations across disciplines and borders. From academic challenges to industry applications, the conference aims to address a wide spectrum of topics. We welcome contributions on all aspects of medical and biological engineering – from research innovations and educational strategies to gender diversity in BME and the commercialization of scientific discoveries.

We extend our sincere gratitude to all authors, plenary and keynote speakers, reviewers, session chairs, and the members of the scientific and organizing committees for their dedication and hard work. We are also deeply thankful to IFMBE, CBBE PAS, and PSBE for their ongoing support in organizing the conference, setting the scientific program and publishing the proceedings.

The Joint NBC 2025 & PCBBE 2025 promises to be a truly memorable event. Whether you are an academic, an industry expert, or a healthcare practitioner, this conference offers a unique opportunity to connect, learn, and contribute to the engineering of a healthier future.

We look forward to welcoming you to Warsaw in June 2025!

Warm regards,

Prof. Piotr Ladyzynski

On behalf of the NBC 2025 & PCBBE 2025 Chairs and the Organizing Committee

ORGANIZATION

Honorary Patronage

Marek Konarzewski President of the Polish Academy of Sciences

Organizers

Committee of Biocybernetics and Biomedical Engineering
Polish Academy of Sciences (CBBE PAS)

Polish Society for Biomedical Engineering (PSBE)

Nalecz Institute of Biocybernetics and Biomedical Engineering
Polish Academy of Sciences (IBBE PAS)

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Piotr Ladyzynski IBBE PAS, Poland

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Simo Särkkä, Finland
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Mário Forjaz Secca, Portugal
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SCIENTIFIC CHALLENGE COMMITTEE

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Piotr Foltynski, Nalecz Institute of Biocybernetics and Biomedical Engineering PAS, Poland

Jorge Henriques, University of Coimbra, Portugal

Piotr Ladyzynski, Nalecz Institute of Biocybernetics and Biomedical Engineering PAS, Poland

Information on the IFMBE Scientific Challenge Competition can be found at:

<https://nbc2025.ibib.waw.pl/index.php/ifmbe-scientific-challenge-competition/>

CONFERENCE OBJECTIVES

The main objective of the conference is to present the latest achievements of researchers from Poland, the Baltic Sea region, and other parts of the world in the field of biomedical engineering as an interdisciplinary research area. This international scientific event focuses on a wide range of biomedical engineering subdisciplines that integrate engineering, natural and medical sciences to develop and implement new technologies, devices and theoretical tools to support medical diagnostics and treatment.

The interdisciplinary nature of the conference will foster the exchange of perspectives and the integration of achievements and research methods from various scientific fields. Bringing together experts from diverse disciplines—including biomedical engineering, materials science, robotics, electronics, computer science, biology, chemistry and medicine—will create a unique platform for establishing multidisciplinary collaborations. This extensive knowledge exchange will contribute to the development of new research ideas that could lead to groundbreaking discoveries and the advancement of innovative medical solutions.

A key aspect of the conference will also be to establish the international scientific connections, which have the potential to evolve into lasting networks of collaboration. Such international relationships can support securing research funding, developing joint research projects, enhancing publication effectiveness and—critically—implementing developed technologies and solutions in medical practice. In this way, interdisciplinary information exchange will not only support scientific development but will also influence global progress in healthcare and the quality of life for patients.

The conference also aims to disseminate knowledge by:

- providing PhD candidates, students, physicians, and representatives of biomedical technology enterprises – as well as researchers in specific areas of biomedical engineering – with the opportunity to directly engage with the latest scientific research results in all conference-related fields of biomedical engineering;
- familiarizing participants with the greatest challenges and achievements in biomedical engineering across scientific research, education, technology transfer, commercialization and equity in research and innovation (through invited plenary speakers and experts participating in discussion panels);
- preserving the full texts of selected presentations from the event as scientific publications within the Springer book series IFMBE Proceedings and archiving the remaining presentations as abstracts, making these texts available to the international community of biomedical engineers, students and researchers from various specialties either in print or electronic form, who are engaged in or interested in advancements in this interdisciplinary research area. Authors of selected works presented during the event will be invited to prepare and submit manuscripts for publication in the scientific quarterly *Biocybernetics and Biomedical Engineering* (Impact Factor = 5.3), owned by the Institute of Biocybernetics and Biomedical Engineering (IBIB PAN) and published by Elsevier.

By creating a space for the exchange of knowledge, ideas and experiences among scientists, physicians, entrepreneurs, PhD candidates and students from various countries and disciplines, the event will also indirectly fulfil culture-building functions, including: sharing intercultural knowledge, exchanging cultural perspectives, globalizing ideas and cultures—including the international promotion of Polish culture—creating an intellectual community that facilitates understanding among different scientific traditions and building a platform for the exchange of viewpoints that shapes scientific ethics.

CONFERENCE TOPICS

- Artificial and Bioartificial Organs
- Artificial Intelligence in Healthcare
- Assistive Technologies and Rehabilitation Engineering
- Biochemical Engineering
- Bioinformatics
- Biomaterials
- Biomeasurements
- Biomechanics and Biomedical Robotics
- Biomedical Engineering Education
- Biomedical Sensors and Instrumentation
- Biomedical Signal Processing
- Cellular and Molecular Engineering
- Clinical Engineering
- Health Technology Assessment
- Health Technology Transfer and Commercialization
- Imaging Modalities & Medical Image Fusion
- ICT in Medicine and IoMT
- Medical Image Processing
- Modeling of Physiological and Biological Systems
- Nanotechnology and Nanomedicine
- Neural Engineering
- Neuroinformatics
- Orthopedic Engineering
- Prosthetics
- Regenerative Medicine
- Surgical Techniques
- Tissue Engineering and Organ-on-Chip
- Women in Biomedical Engineering

CONFERENCE HISTORY

NBC 2025 & PCBBE 2025 is the first event in history that combine the two following conferences: **Nordic-Baltic Conference on Biomedical Engineering** and **Polish Conference on Biocybernetics and Biomedical Engineering**.

Nordic-Baltic Conference of Biomedical Engineering

The congress series of Nordic Meetings on Medical and Biological Engineering started in January 1970 at the Helsinki University of Technology, Espoo. The congresses were organized with 2 to 3 years intervals, and they were circulating around the Nordic countries. In 1996 the congress was organized at Tampere, Finland. Since the Baltic States had recently received their independence, they were actively encouraged to participate in the congress. Therefore for the congress series, it was given the name Nordic-Baltic Conference of Biomedical Engineering and Medical Physics.

More information about the history of NBC can be found in the following document *“50 Years of Nordic Meetings on Medical and Biological Engineering and Nordic-Baltic Conferences on Biomedical Engineering and Medical Physics”*, which is available at this link:

<https://www.researchgate.net/publication/351918835>

The webpage of the 19th Nordic-Baltic Conference on Biomedical Engineering and Medical Physics, which was held in Liepaja, Latvia, June 12-14, 2023 is available at this link:

<https://nbc2023.lmifb.lv>

Proceedings of a few previous NBC meetings can be downloaded at the following links:

<https://link.springer.com/book/10.1007/978-3-540-69367-3>, 14th Nordic-Baltic Conference on Biomedical Engineering and Medical Physics in Riga, Latvia, June 2008;

<https://link.springer.com/book/10.1007/978-3-642-21683-1>, 15th Nordic-Baltic Conference on Biomedical Engineering and Medical Physics, Aalborg, Denmark, June 2011;

<https://link.springer.com/book/10.1007/978-3-319-12967-9>, 16th Nordic-Baltic Conference on Biomedical Engineering, Gothenburg, Sweden, October 2014;

<https://link.springer.com/book/10.1007/978-981-10-5122-7>, Joint Conference of the European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC), Tampere, Finland, June 2017;

<https://link.springer.com/book/10.1007/978-3-031-37132-5>, 19th Nordic-Baltic Conference on Biomedical Engineering and Medical Physics in Liepaja, Latvia, June 2023.

Polish Conference on Biocybernetics and Biomedical Engineering

The biannual Polish Conference on Biocybernetics and Biomedical Engineering has been held for over four decades and attracted scientists and professionals from the fields of engineering, medicine, physics, and computer science. The format of the conference is the responsibility of the Committee of Biocybernetics and Biomedical Engineering of the Polish Academy of Sciences (CBBE PAN), which appoints a local organizer for each edition of the event and ensures its high scientific level. The Polish Society of Biomedical Engineering (PSBE) has been actively involved in organizing and sponsoring the Conference since the Society was founded in 1997.

First 19 conferences under the Polish name *Krajowa Konferencja Naukowa „Biocybernetyka i Inżynieria Biomedyczna”* were held in Warszawa (1976), Gliwice (1978), Wrocław (1979), Poznań (1980), Warszawa (1981), Warszawa (1983), Gdańsk (1985), Kraków (1987), Gdańsk (1992), Warszawa (1997), Warszawa (1999), Warszawa (2001), Gdańsk (2003), Częstochowa (2005), Wrocław (2007), Warszawa (2010), Gliwice (2011), Gdańsk (2013), Warszawa (2015).

Since 2017 the conference has been held as an international scientific event under English name Polish Conference on Biocybernetics and Biomedical Engineering (PCBBE). Until today, PCBBE was organized four times in: Kraków (2017), Zielona Góra (2019), Warszawa – online (2021), Łódź (2023).

The webpage of the 23rd Polish Conference on Biocybernetics and Biomedical Engineering, which was held in Łódź, September 27-29, 2023 is available at this link:

<https://pcbbe.p.lodz.pl/>

Proceedings of a few previous PCBBE meetings can be downloaded at the following links:

<https://link.springer.com/book/10.1007/978-3-319-66905-2>, Recent Developments and Achievements in Biocybernetics and Biomedical Engineering. Proceedings of the 20th Polish Conference on Biocybernetics and Biomedical Engineering, Kraków, Poland, September 20-22, 2017;

<https://link.springer.com/book/10.1007/978-3-030-29885-2>, Current Trends in Biomedical Engineering and Bioimages Analysis. Proceedings of the 21st Polish Conference on Biocybernetics and Biomedical Engineering, Zielona Góra, September 25-27, 2019;

<https://link.springer.com/book/10.1007/978-3-030-83704-4>, Biocybernetics and Biomedical Engineering – Current Trends and Challenges. Proceedings of the 22nd Polish Conference on Biocybernetics and Biomedical Engineering, Warsaw, Poland, May 19-21, 2021;

<https://link.springer.com/book/10.1007/978-3-031-38430-1>, The Latest Developments and Challenges in Biomedical Engineering. Proceedings of the 23rd Polish Conference on Biocybernetics and Biomedical Engineering, Lodz, Poland, September 27–29, 2023.

CONFERENCE INFORMATION

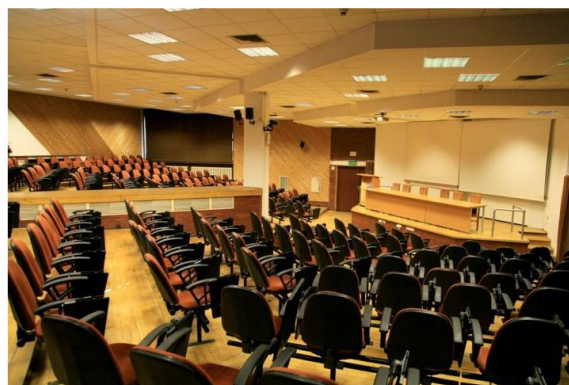
Conference Secretariat

Prof. Piotr Ladyzynski
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Polish Academy of Sciences
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Phone: +48 22 5925942, fax: +48 22 6597030
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Conference Venue

The Conference will be held at the premises of **the Nalecz Institute of Biocybernetics and Biomedical Engineering and International Centre of Biocybernetics, Polish Academy of Sciences, ul. Księcia Trojdena 4, Warsaw, Poland.**

The Institute is located at the corner of Księcia Trojdena Street and Pawińskiego Street. The main entrance to the Institute is located at Pawińskiego Street and the entrance to the paid parking is located at Księcia Trojdena Street (behind the barrier). The GPS coordinates of the Congress Venue are as follows: N 52° 12' 24" E 20° 58' 42"



Official Language

English will be the official language of the Congress.
No parallel translation will be provided.

Registration and Information During the Congress

Delegates are kindly requested to register at the Central Reception located in the Congress venue at the Nalecz Institute of Biocybernetics and Biomedical Engineering Polish Academy of Sciences, at the beginning of the Conference. Participants will be able to collect their badge and Conference documentation. Central Reception will be open at the following hours:

Monday, June 16, 08:00 – 18:00
Tuesday, June 17, 08:00 – 18:00
Wednesday, June 18, 08:00 – 17:00

REGISTRATION FEE AND PAYMENT REGULATIONS

Delegate Category	Early Bird Fee Until April 7, 2025	Regular Fee April 7 – May 31, 2025	On-site * June 16-18, 2025
IFMBE Members ¹	440 €	490 €	540 €
Non-Members	490 €	550 €	600 €
Students (IFMBE Members) ^{1,2}	225 €	265 €	300 €
Students (Non-Members) ²	250 €	290 €	340 €
One Day	250 €	290 €	340 €
Accompanying Person	250 €	250 €	250 €
One Day with Conference Gala included	340 €	390 €	450 €

* Due to limited number of places in the welcome reception and conference dinner venues, on-site registration for these events may not be available.

¹ IFMBE members, i.e. paid members of the IFMBE member societies have to provide a proof of membership in order to be eligible for the IFMBE Members fee during registration.

² Students have to provide proof of their status from their respective university or institute during registration.

For all regular full registrations, dinner is included in the fee.

Additional Abstracts/Papers

Two papers per delegate are included in the delegate registration. Third and any consecutive paper are charged at the rate specified below.

Additional Abstracts / Papers	Fee has to be paid before submission
IFMBE Members ¹ Students ²	100 €
Non-Members	120 €

¹ IFMBE members, i.e. paid members of the IFMBE member societies have to provide a proof of membership in order to be eligible for the members' fee during registration.

² Students have to provide proof of their status from their respective universities or institutes during registration.

Fees listed in the tables above are inclusive of tax and include VAT.

OTHER REGULATIONS

What's Included in Registration Fee

Delegate and Student Registration fee includes: up to two submissions (papers / abstracts), admittance to all the scientific sessions, conference kit, coffee breaks, working lunches, welcome reception, and conference dinner (except One Day fee).

Accompanying Person fee includes: welcome reception, conference dinner, guided tour of Warsaw.

Cancellation Policy

If in case of force majeure the conference needs to be cancelled we will refund 80 % of the paid registration fee.

In case of cancellation by the participant, 80 % of the paid registration fee is returned if cancelled by April 30, 2025. After this date, a refund is possible on a case-to-case basis.

Registrations remain valid if the event has to be postponed.

The conference program may be subject to change.

The signed order cancellation request should be sent by registered mail or courier to the following address:

NBC 2025 & PCBBE 2025
Nalecz Institute of Biocybernetics and Biomedical Engineering PAS
Trojdena 4, 02-109 Warsaw, Poland

All refunds will be made after the Conference.

In case of bank transfer payment, the reimbursement will be transferred directly to the account that was used to make the payment.

In case of card payment, the reimbursement will be transferred directly to the payment card account.

Withdrawal from the Agreement

Pursuant to the Consumer Rights Act of May 30, 2014 (Journal of Laws 2014, item 827, as amended) – Article 38, paragraph 1, point 12, the right to withdraw from the agreement concerning the purchase of participation in the NBC 2025 & PCBBE 2025 does not apply.

Return

Returns are not accepted due to the nature of the services ordered by the participants.

Warranty Disclaimer

All the best endeavors will be made by the Organizer to implement the program of the NBC 2025 & PCBBE 2025 as it will be announced on the Conference website at <https://nbc2025.ibib.waw.pl>. However, no warranty is given whatsoever that the final program will be in full agreement with the announced one. The Organizer reserve the right to alter or cancel, without prior notice, any of the arrangements, timetables, plans or other items relating directly or indirectly to the Conference, for any reasons beyond the Organizer's reasonable control.

INSTRUCTIONS FOR ORAL PRESENTATIONS

In most sessions, each oral presentation is allocated a 15-minute time slot. To allow time for Questions & Answers, the presentation itself should not exceed **12 minutes**.

Please note that deviations from the standard 15-minute format may occur, particularly in Special Symposia. Presenters are advised to consult the **Program** to confirm the duration of their specific presentation and to follow the instructions of the session chairperson.

Strict adherence to the allotted time is required for all speakers.

Presentation Setup

- Each lecture room will be equipped with a computer connected to a beam projector and running PowerPoint.
- Slides must be prepared in **16:9 format**.
- Presentations should be uploaded in the **Slide Room** at least **one hour** before the start of the session.
- Presenters are responsible for verifying that their slides display correctly and have been successfully transferred to the appropriate lecture hall.

Please note: Personal laptops cannot be connected in the lecture halls.

INSTRUCTIONS FOR RAPID FIRE POSTER PRESENTATIONS

Each poster presentation consists of two components:

- Oral Rapid Fire Presentation
- Poster display in the Poster Area

Oral Rapid Fire Presentation

Before discussing posters at the Poster Area, a brief oral presentation (2 minutes per poster, using 1–2 PowerPoint slides in 16:9 format) will be held.

- **Date & Time:** Tuesday, June 17, 2025, from 14:30 to 15:20
- **Location:** Lecture Hall A and Lecture Hall B

Presenting authors are kindly asked to check the Program for

- The number assigned to their poster
- The corresponding Rapid Fire session

PowerPoint presentations must be uploaded in the Slide Room **at least one hour** before the session begins.

Poster Preparation and Display

- **Poster Format:** A0 size (85 cm wide x 119 cm high), portrait orientation
- **Font Size:** All text should be large enough to read easily – letters should be no smaller than 1 cm in height

Mounting Instructions:

- Posters must be mounted by **10:00 on Monday, June 16, 2025**
- Ensure your poster is displayed at the board with the correct number, as listed in the program

Fixing materials will be provided, and onsite staff will be available to assist.

Author Availability:

Presenting authors are requested to be available at their posters during coffee and lunch breaks to engage with conference participants.

Removal:

Posters must be taken down **after 17:00 on Wednesday, June 18, 2025**. Any posters left behind will be removed and discarded by conference staff.

SCIENTIFIC PROGRAM AT A GLANCE

Monday, June 16, 2025				
Time		Lecture Hall A	Lecture Hall B	Lecture Hall C
09:00	10:00	Oral Session 01 Artificial Intelligence in Healthcare: Cardiovascular Applications OP001, OP002, OP003, OP004	Oral Session 02 Nanotechnology and Molecular Engineering OP005, OP006, OP007, OP008	Oral Session 03 Medical Image Processing OP009, OP010, OP011, OP012
10:00	10:10	Technical Break		
10:10	11:10	Special Symposium 01 Integrating Artificial Intelligence in Clinical Engineering: Perspectives For the Future OP013, OP014, OP015, OP016	Oral Session 04 Artificial and Bioartificial Organs OP017, OP018, OP019, OP020	EAMBES Symposium
11:10	11:30	Coffee Break		
11:30	13:35	OPENING CEREMONY & 50th ANNIVERSARY of IBIB PAN		
11:30	11:45	Welcoming the Invited Guests and Participants Prof. Adam Liebert, Prof. Marek Darowski, Prof. Piotr Ładyżyński, Chairs of the NBC 2025 & PCBBE 2025		
11:45	12:15	NBC 2025 & PCBBE 2025 Opening Address Prof. Ratko Magjarević, President of the IFMBE		
12:15	12:45	Musical Performance		
12:45	13:10	Lecture: 50 Years of IBIB PAN – The Past That Shaped the Future Prof. Piotr Ładyżyński, Director of the IBIB PAN		
13:10	13:30	Addresses by the Invited Guests		
13:30	13:45	Presentation of the Institute Medals		
13:45	14:45	Lunch		
14:45	15:35	Plenary Lecture 1 <i>Using Light Absorption and Laser Speckle Dynamics to Measure Human Brain Function</i> Prof. David A. Boas, PhD, Boston University College of Engineering (USA)		
15:35	16:25	Plenary Lecture 2 <i>AI-powered MRI: Towards an Omni Imaging Technology for Brain Mapping</i> Prof. Zhi-Pei Liang, PhD, University of Illinois at Urbana-Champaign (USA)		
16:25	16:45	Coffee Break		
16:45	17:45	Special Symposium 03 AI and Deep Learning in Medicine and Biology OP021, OP022, OP023, OP024	Panel Discussion 01 IFMBE, Women in Biomedical Engineering: Role Models in Biomedical Engineering	Special Symposium 04 Modern Therapeutic Technologies in Medicine OP025, OP026, OP027, OP028
17:45	19:45	<i>Transfer to the Welcome Reception</i>		
19:45	22:00	Welcome Reception <i>LookUp Skyevents, Skyliner building, floors 41-42, ul. Prosta 67</i>		

Tuesday, June 17, 2025				
Time		Lecture Hall A	Lecture Hall B	Lecture Hall C
09:00	09:50	Plenary Lecture 3 <i>European Medical Device CE Mark – Current Challenges and Future Opportunities</i> Dr. Bassil Akra, CEO, AKRA TEAM GmbH (Germany)		
09:50	10:00	Technical Break		
10:00	11:30	Special Symposium 05 Diverse Biomaterials, Unified Impact: Biomedical Progress Driven by Innovation KL01, OP029, OP030, OP031, OP032	Special Symposium 06a IFMBE, Biomedical Engineering Education: Challenges, Digital Health Technology and Learning Methodology KL02, IP01, OP033, OP034, OP035	Oral Session 05 Imaging Modalities and Medical Image Fusion KL03, OP036, OP037, OP038, OP039
11:30	11:45	Coffee Break		
11:45	13:15	Oral Session 06 Biomaterials OP040, OP041, OP042, OP043, OP044, OP045	Special Symposium 06b IFMBE, Biomedical Engineering Education: Challenges, Digital Health Technology and Learning Methodology OP046, OP047, OP048, IP02, Panel Discussion	Oral Session 07 Biomeasurements OP049, OP050, OP051, OP052, OP053, OP054
13:15	14:30	Lunch		
14:30	15:20	Rapid Fire Poster Presentations 1 Posters No. PP01 to PP25	Rapid Fire Poster Presentations 2 Posters No. PP26 to PP49	
15:20	15:30	Technical Break		
15:30	16:30	Oral Session 08 Biomedical Signal Processing: Brain and Physiological Function Analysis OP055, OP056, OP057, OP058	Special Symposium 07a IFMBE, Students and Recent Graduates Working Group: How Can We Bring Innovation to Socially Impactful Research Through the Effective Use of Emerging OP059, OP060, OP061, OP062	Special Symposium 08 Meet the Editor KL04, KL05
16:30	16:45	Coffee Break		
16:45	17:45	Oral Session 09 Modeling Physiological Systems in Health and Disease OP063, OP064, OP065, OP066	Special Symposium 07b IFMBE, Students and Recent Graduates Working Group: How Can We Bring Innovation to Socially Impactful Research Through the Effective Use of Emerging OP067, OP068, OP069, OP070	Oral Session 10 Assistive Technologies and Rehabilitation Engineering OP071, OP072, OP073, OP074
17:45	20:00	<i>Transfer to the Conference Gala</i>		
20:00	22:30	Conference Gala <i>Sheraton Grand Warsaw, ul. Bolesława Prusa 2</i>		

Wednesday, June 18, 2025				
Time		Lecture Hall A	Lecture Hall B	Lecture Hall C
09:00	09:50	Plenary Lecture 4 <i>High-Resolution Magnetoencephalography: A New Window to Human Brain Function?</i> Prof. Lauri Parkkonen, PhD, Aalto University School of Science (Finland)		
09:50	10:00	Technical Break		
10:00	11:30	Oral Session 11 Artificial Intelligence in Healthcare: Diverse Applications OP075, OP076, OP077, OP078, OP079, OP080	Special Symposium 09 IFMBE, Industry Committee – From Lab to Market: Bridging the Gap in Biomedical Innovation KL6, OP081, OP082, OP083, OP084	Special Symposium 10 Young Polish Society for Biomedical Engineering Meeting OP085, OP086, OP087, OP088, OP089, OP090, OP091
11:30	11:45	Coffee Break		
11:45	13:15	IFMBE Scientific Challenge Competition Segmentation Challenge: Wounds and Markers in Focus OP092, OP093, OP094, OP095, OP096, OP097	Special Symposium 11 Biosensing Devices IP03, OP098, OP099, OP100, OP101, OP102	Special Symposium 12 Information Content Analysis in Cardiovascular and Respiratory Systems OP103, OP104, OP105, OP106, OP107, OP108
13:15	14:30	Lunch		
14:30	15:30	Oral Session 12 Biomedical Signal Processing: Cardiovascular, Muscular and Cognitive Signals OP109, OP110, OP111, OP112	Oral Session 13 ICT in Medicine and Health Technology Assessment OP113, OP114, OP115, OP116	Oral Session 14 Neural Engineering and Neuroinformatics OP117, OP118, OP119, OP120
15:40	15:40	Technical Break		
15:40	16:15	CLOSING CEREMONY Presentation of the Conference Awards		
16:15	17:00	Farewell Snack		

**PLENARY LECTURES, SPECIAL SYMPOSIA,
DISCUSSION PANELS AND ORAL SESSIONS**

Monday, June 16, 2025**Oral Session OS01**

Artificial Intelligence in Healthcare: Cardiovascular Applications

Chairs: Virginia Ballarin(Argentina), Piotr Foltynski (Poland)

OP001–OP004

Lecture Hall A

- 09:00 – 09:15 **OP001** Automatic Text Classification in Cardiac Risk Management: A Pilot Study
Jacopo Vitale, Mark C.H. de Groot, Imo Höfer, Leandro Pecchia, Saskia Haitjema, Bram Van Es
- 09:15 – 09:30 **OP002** Echocardiographic Image-Based Classification of Cardiac Amyloidosis: A Proof of Concept
Maria Elisabetta Pagnano, Martina Sassi, Jacopo Vitale, Margherita A.G. Matarrese, Chiara Cirillo, Filippo Crispino, Giuseppe Limongelli, Leandro Pecchia
- 09:30 – 09:45 **OP003** Custom Attention in Transformer Architectures for Multiclass ECG Beat Classification
Elia Pattacini, Vaidotas Marozas
- 09:45 – 10:00 **OP004** The Influence of Color on Semantic Ulcer Segmentation Using Deep Learning Models
Muhammad Usman, Jacek Rumiński

Oral Session OS02

Nanotechnology and Molecular Engineering

Chairs: Marta Kopaczyńska (Poland), Kamila Sadowska (Poland)

OP005–OP008

Lecture Hall B

- 09:00 – 09:15 **OP005** Zinc Phosphate-Protein Hybrid Nanoflowers as New Local Drug Delivery Systems
Kornelia Bobrowska, Elżbieta Remiszewska, Aleksandra Głowacka, Piotr Golec, Kamila Sadowska
- 09:15 – 09:30 **OP006** Nanolayer of Monocrystalline Si Towards Nanodosimetry of Electron Radiation
Gałina Boka, Yuri Dekhtyar, Mirko Rocca, Elizabete Skrebele, Hermanis Sorokins
- 09:30 – 09:45 **OP007** The Role of Sphingosine Kinase 1 Pharmacological Modulation on Crucial Pro/Anti-Apoptotic Proteins in Alpha-Synucleintransduced Cells: The Promising Role of Siponimod and Ponesimod
Joanna Motyl, Agnieszka Wencel, Kinga Czubowicz, Robert Strosznajder
- 09:45 – 10:0 **OP008** The Insight into the Distinct Molecular Changes Induced by Methylation Inhibitors in Leukemia Cells in Relation to so far Well-Defined Mechanism of Action
Przemysław Sareło, Aleksandra Kaczorowska, Marlena Gąsior-Głogowska, Anna Licznarska, Kinga Godkiewicz, Ewa Ziolo, Wojciech Kałas, Halina Podbielska, Marta Kopaczyńska

Monday, June 16, 2025**Oral Session OS03**

Medical Image Processing

Chairs: Zhivko Bliznakov (Bulgaria), Lukasz Roszkowiak (Poland)

OP009–OP012

Lecture Hall C

- 09:00 – 09:15 **OP009** An Approach to Create a Computational Model of a Trabecular Bone
Kristina Bliznakova, Dimitar Trizlov, Nikolay Dukov, Stoyan Ivanov, Zhivko Bliznakov
- 09:15 – 09:30 **OP010** Assessment of Quality of Colorectal Endoscopic Images
Damian Pawłowski, Andrzej Żelowski, Klaudia Kozłowska, Mirosław Łątka
- 09:30 – 09:45 **OP011** Does Semi-Automatic Segmentation-Based Classification Enable AI-Assisted Detection of Sinusitis in an Equine Model?
Marta Borowska, Paweł Lipowicz, Hubert Asztęborski, Tomasz Jasiński, Bernard Turek, Małgorzata Domino
- 09:45 – 10:00 **OP012** Surface-Area-to-Volume Ratio as a Diagnostic Indicator in the Assessment of Avascular Necrosis of Femoral Head
Adam Patalas, Patryk Zych, Kacper Filipek, Paweł Zawadzki

Special Symposium SE01

Integrating Artificial Intelligence in Clinical Engineering: Perspectives For the Future

Chair: Fabiola Martinez-Licona (Mexico)

OP013–OP016

Lecture Hall A

- 10:10 – 10:25 **OP013** The Impact of Artificial Intelligence in Predictive Maintenance
Fabiola Martinez-Licona
- 10:25 – 10:40 **OP014** Artificial Intelligence for the Diagnosis and Treatment of Otosclerosis
Virginia Ballarin
- 10:40 – 10:55 **OP015** Early Prediction of ICU Readmissions Using Machine Learning in a Colombian University Hospital
Joel Andrés Lerma Pazos, J.E Camacho Cogollo, Jose Leonardo Mojica Peñaranda
- 10:55 – 11:10 **OP016** Artificial Intelligence Challenges for Medical Device Regulation
Fabiola Martinez-Licona

Monday, June 16, 2025**Oral Session OS04**

Artificial and Bioartificial Organs

Chairs: Loredana De Bartolo (Italy), Dorota D. Pijanowska (Poland)

OP017–OP020

Lecture Hall B

- 10:10 – 10:25 **OP017** Advance in Skin and Liver Tissue Engineering by Using Organotypic Membrane Systems and Mesenchymal Stem Cells
Simona Salerno, Loredana De Bartolo
- 10:25 – 10:40 **OP018** Characteristics of Dedifferentiated Human Hepatocytes Isolated from Liver Tissues
Monika Wiśniewska, Małgorzata Jakubowska, Agnieszka Wencel, Dorota Pijanowska, Krzysztof Pluta
- 10:40 – 10:55 **OP019** Tunable Isotropic TPMS-based 3D-Architected Scaffolds for Diabetic Bone Regeneration
Fátima Morales-Gómez, Fabiola Hernández-Rosas, Araceli Zapatero-Gutiérrez, Erick Ramírez-Cedillo, Josué García-Ávila
- 10:55 – 11:10 **OP020** Patterns of Relative Blood Volume Changes During Hemodialysis
Leszek Pstras, Mauro Pietribiasi

Special Symposium SE02

EAMBES Symposium

Chairs: TBA

Lecture Hall C

- 10:10 – 10:25 TBA
- 10:25 – 10:40 TBA
- 10:40 – 10:55 TBA
- 10:55 – 11:10 TBA

Monday, June 16, 2025**Plenary Lecture 1****Lecture Hall A**

14:45 – 15:35

PL1 Using Light Absorption and Laser Speckle Dynamics to Measure Human Brain Function

Professor (BME, ECE) Neurophotonics Center Boston University College of Engineering (USA)

Plenary Lecture 2**Lecture Hall A**

15:35 – 16:25

PL2 AI-powered MRI: Towards an Omni Imaging Technology for Brain Mapping

Prof. Zhi-Pei Liang, PhD, Franklin W. Woeltge Professor Department of Electrical and Computer Engineering, and Beckman Institute for Advanced Science and Technology University of Illinois at Urbana-Champaign (USA)

Special Symposium SE03

AI and Deep Learning in Medicine and Biology

Chair: Anna Korzyńska (Poland)

OP021–OP024

Lecture Hall A

16:45 – 17:00

OP021 Deep Learning for Centroblast Detection in H&E-Stained Whole Slide Images
Zaneta Swiderska-Chadaj, Adam Krawczyk, Aleksandra Osowska-Kurczab, Sławomir Pakuła, Wojciech Kotłowski

17:00 – 17:15

OP022 Tumor Morphological and Texture Feature Analysis to Classifying the Breast Cancer Molecular Subtypes in Digital Mammograms
Adnan Khalid, Hatem Rashwan, Domenec Puig

17:15 – 17:30

OP023 EGGS: Efficient Gathering and Structuring of Avian Egg Datasets
Łukasz Roszkowiak, Paweł Pstrokowski, Wojciech Wojcik, Krzysztof Damaziak, Anna Korzyńska

17:30 – 17:45

OP024 Reinforcement Learning with Graph Neural Networks for Gene Regulatory Network Control
Andrzej Mizera, Jakub Zarzycki

Monday, June 16, 2025**Panel Discussion PD01**

IFMBE, Women in Biomedical Engineering: Role Models in Biomedical Engineering
Chair / Moderator: Virginia Ballarin (Argentina)

Lecture Hall B

16:45 – 17:45 Li Li (the United Kingdom)
Dorota G. Pijanowska (Poland)
Leila Gurbeta Pokvic (Bosnia & Herzegovina)
Anna Stecka (Poland)

Special Symposium SE04

Modern Therapeutic Technologies in Medicine
Chair: Zbigniew Paszenda (Poland)

OP025–OP028

Lecture Hall C

16:45 – 17:00 **OP025** Strategies for Surface Coating of Implants in the Cardiovascular System
Anna Taratuta, Zbigniew Paszenda, Marcin Basiaga

17:00 – 17:15 **OP026** Modification of Titanium Surfaces with Circular and Hexagonal TiO₂ Nanotubes
Katarzyna Arkusz, Aleksandra Jędrzejewska, Ewa Paradowska, Mieczysław Jurczyk

17:15 – 17:30 **OP027** Analysis of the Possibility of Using the UR10e Cobot in Neurological Treatment
Sławomir Suchoń, Wojciech Wolański, Robert Michnik, Michał Burkacki, Miłosz Chrzan, Hanna Zadoń, Piotr Szaflik, Justyna Szeffler-Derela, Dagmara Wasiuk-Zowada

17:30 – 17:45 **OP028** Mental Workload and the Task Allocation for Collaborative Robot Systems with an Industry 5.0 Human-Centered Perspective - an Experimental Study
Anita Pollak, Sławomir Suchoń, Miłosz Chrzan, Michał Burkacki, Marek Ples, Patrycja Romaniszyn-Kania, Małgorzata Kożusznik

Tuesday, June 17, 2025**Plenary Lecture 3****Lecture Hall A**

09:00 – 09:50 **PL3** European Medical Device CE Mark – Current Challenges and Future Opportunities
Dr. Bassil Akra, CEO, AKRA TEAM GmbH (Germany)

Special Symposium SE05

Diverse Biomaterials, Unified Impact: Biomedical Progress Driven by Innovation

Chairs: Elżbieta Pamuła (Poland), Patrycja Domalik-Pyzik (Poland)

KL01, OP029–OP032

Lecture Hall A

- 10:00 – 10:30 **KL01** **Keynote Lecture:** Lipid Nanoparticles as Carriers for Antibacterial Peptides
Katarzyna Reczyńska-Kolman
- 10:30 – 10:45 **OP029** Biomedical Potential of the Methanolic Leaf Extract of *Verbesina persicifolia*: Antimicrobial Properties and Applications in Wound Healing
Carlos Alberto López-Rosas, Seojin Han, Margarita V. Saavedra Vélez, José Rafael Alanis Gómez, Fabiola Hernández-Rosas
- 10:45 – 11:00 **OP030** Synergy Between Antibiotics and α -Linolenic Acid as an Promising Sure for Biofilm Bacterial Infections
Konrad Kwiecień, Karolina Knap, Dorota Ochońska, Katarzyna Reczyńska-Kolman, Monika Brzychczy-Włoch, Elżbieta Pamuła
- 11:00 – 11:15 **OP031** Silver and Copper Nanoparticles Combined with Alginates for Ovarian Cancer Theranostics
Patrycja Domalik-Pyzik
- 11:15 – 11:30 **OP032** PEDOT:PSS Composite Integration with PDMS Substrate for Flexible Bioelectronics Applications
Natalia Zalewska, Izabela Lewandowska, Karolina Cysewska

Tuesday, June 17, 2025**Special Symposium SE06a**

IFMBE, Biomedical Engineering Education: Challenges, Digital Health Technology and Learning Methodology

Chairs: Nicolas Pallikarakis (Greece), Martha Zequera (Colombia)

KL02, IP01, OP033–OP035

Lecture Hall B

- 10:00 – 10:30 **KL02** **Keynote Lecture:** Biomedical Engineering Education – Challenges, Digital Health Technology and Learning Methodology
Ratko Magjarević
- 10:30 – 10:45 **IP01** TBA
Nicolas Pallikarakis
- 10:45 – 11:00 **OP033** Introduction of artificial intelligence, big data and data science in biomedical engineering and biomedical informatics
Lenka Lhotska
- 11:00 – 11:15 **OP034** Convergence in Science and Education: Enhancing Biomedical Research and Teaching Through Digital Innovations
Anna Korzynska
- 11:15 – 11:30 **OP035** BME Education in Portugal: Insights from the Highest-Ranked Programs and the Role of ANEEB
Martim Rocha, Margarida Lima

Oral Session OS05

Imaging Modalities and Medical Image Fusion

Chairs: Janis Spigulis (Latvia)

KL03, OP036–OP039

Lecture Hall C

- 10:00 – 10:30 **KL03** **Keynote Lecture:** Development of Connectome MRI Techniques and Their Applications on Neurological Disorders
Li-Wei Kuo
- 10:30 – 10:45 **OP036** Image Subtraction Versus Data Subtraction to Create the Dose Calibration Curve of Radiochromic Film for Onsite Dosimetry of CT Dose
Toshizo Katsuda, Nobuyoshi Tanki, Rumi Gotanda, Tatsuhiro Gotanda, Tadao Kuwano, Kouichi Yabunaka
- 10:45 – 11:00 **OP037** Speckle Contrast Optical Spectroscopy (SCOS) for Monitoring of Blood Flow Dynamics in Process of Diabetic Wound Healing Supported with Cold Plasma Therapy
Sara Fathollah, Stanislaw Wojtkiewicz, Wiktoria Kasprzak, Piotr Sawosz
- 11:00 – 11:15 **OP038** Visible-NIR Multispectral Imaging of Whole-Body Human Skin
Janis Spigulis, Edgars Kviesis-Kipge, Uldis Rubins, Ilze Irbe, Marta Skrastina, Jekaterina Tihomirova
- 11:15 – 11:30 **OP039** The Development of a Quadrature Surface Coil for Rat Brain MRI
Cheng-Che Wu, Ming-Jye Chen, Po-Hsun He, Hsuan-Han Chiang, Chang-Hoon Choi, Li-Wei Kuo, Kuan-Hung Cho

Tuesday, June 17, 2025**Oral Session OS06**

Biomaterials

Chair: Yuri Dekhtyar (Latvia)

OP040–OP045

Lecture Hall A

- 11:45 – 12:00 **OP040** Effect of Titanium-Doped Hydroxyapatite on Biofilm Formation of *Pseudomona aeruginosa*
Ángel Rodrigo Ortiz Juárez, Jimena Mariette Robledo Dorantes, Araceli Zapatero-Gutiérrez, Josué García-Ávila, José Rafael Alanis-Gómez, Fabiola Hernández-Rosas
- 12:00 – 12:15 **OP041** Electro-Assisted Nanodiamond Integration into Conducting Polymer as a Possible Drug-Delivery stent Platform
Karolina Cysewska, Anita Stoppel, Muhammad Saqib, Birgit Paul, Julia Kristin Hufenbach, Joerg Opitz, Natalia Beshchasna
- 12:15 – 12:30 **OP042** Oxygen-Enhanced Hybrid Systems: A New Frontier in Biomedicine
Agata Lipko, Anna Grzeczkwicz, Monika Drabik, Angelika Kwiatkowska, Tomasz Miłek, Ludomira Granicka
- 12:30 – 12:45 **OP043** Using Backscattered Electrons to Determine Surface Charge on Laser-Treated Titanium Alloys
Arturs Abolins, Alberta Aversa, Marks Gorohovs, Yuri Dekhtyar, Maris Dortiņš, Lyubomir Lazov, Arturs Mamajevs, Hermanis Sorokins, Edmunds Sprudz
- 12:45 – 13:00 **OP044** Thermal Modification of Hexagonal Titanium Dioxide Nanotubes
Aleksandra Jędrzejewska, Ewa Paradowska, Mieczysław Jurczyk, Katarzyna Arkusz
- 13:00 – 13:15 **OP045** The Development of (Ca/Zn)CO₃ Microparticles Loaded with Bacitracin as Antibacterial and Osteogenic Materials for Bone Tissue Engineering
Katarzyna Reczyńska-Kolman, Dorota Ochońska, Monika Brzychczy-Włoch, Elżbieta Pamuła

Tuesday, June 17, 2025**Special Symposium SE06b**

IFMBE, Biomedical Engineering Education: Challenges, Digital Health Technology and Learning Methodology

Chairs: Nicolas Pallikarakis (Greece), Martha Zequera (Colombia)

OP046–OP048, IP02

Lecture Hall B

- 11:45 – 12:00 **OP046** Current Landscape of Biomedical Engineering in Spain: Academic Opportunities, Professional Applications, and Technological Innovation
Jenny Haro, María Fernanda Cabrera
- 12:00 – 12:15 **OP047** Future Vision: A Strategic Model for Structured Cooperation Between Biomedical Engineers and Medical Physicists for Mutual Benefit
Carmel J. Caruana, Eric Pace, Sam Agius
- 12:15 – 12:30 **OP048** Combining MRI and Laser Doppler Flowmetry for Measurement of Cerebral Blood Flow in Neurointensive Care
Stina Mauritzon, Sofie Tapper, Fredrik Ginstman, Anders Tisell, Peter Zsigmond, Karin Wårdell
- 12:30 – 12:45 **IP02** How to Promote Innovation and Enterprenourship in the Classroom of Undergraduate Students
Martha Zequera
- 12:45 – 13:15 Panel Discussion

Oral Session OS07

Biomeasurements

Chairs: Halina Podbielska (Poland), Tilmann Sander-Thömmes (Germany)

OP049–OP054

Lecture Hall C

- 11:45 – 12:00 **OP049** A Blood Pressure Normalization Method for Aortic Pulse Wave Velocity
Kristina Kööts, Kristjan Pilt, Ivo Fridolin
- 12:00 – 12:15 **OP050** CT Assessment of the Hemidiaphragm Shape in Pleural Effusion and Its Association with Dyspnea
Anna M Stecka, Katarzyna Faber, Elżbieta M. Grabczak, Marcin Michnikowski, Rafał Krenke, Tomasz Gólczewski
- 12:15 – 12:30 **OP051** Magnetoencephalography in Hearing Threshold Assessment
Anna Jodko-Władzińska, Michał Władziński, Tilmann Sander, Tadeusz Pałko
- 12:30 – 12:45 **OP052** Digital Measurement Modules for Non-Invasive Monitoring of Physiological Parameters Under Extreme Conditions
Ewelina Sobotnicka, Jan Mocha, Grzegorz J. Nowak, Grzegorz Badura, Aleksander Sobotnicki, Łukasz Dziuda
- 12:45 – 13:00 **OP053** Analytical Equations for Accurate Sensitivity Factors in Near-Infrared Spectroscopy
Aleh Sudakou, Stanislaw Wojtkiewicz, Roman Maniewski, Adam Liebert
- 13:00 – 13:15 **OP054** The Advancing Brain Tumor Diagnosis: Vibrational Spectroscopy for Differentiation and Classification of Gliomas
Marlena Gąsior-Głogowska, Anastasija Krzemińska, Bogdan Czapiga, Marta Kopaczyńska

Tuesday, June 17, 2025

Oral Session OS08

Biomedical Signal Processing: Brain and Physiological Function Analysis

Chairs: Gunta Krūmiņa (Latvia), Agnieszka Uryga (Poland)

OP055–OP058

Lecture Hall A

- 15:30 – 15:45 **OP055** Event-Related Potentials as Markers of Image Depth Perception
Mehrdad Naderi, Albina Abdullayeva, Gunta Krumina, Reinis Alksnis, Tatjana Pladere
- 15:45 – 16:00 **OP056** Analysis of the Website Accessibility Influence on the Cognitive Workload of Users With Visual Impairments
Piotr Zając, Aleksandra Królak
- 16:00 – 16:15 **OP057** Hemodynamic Group Activations From a Multi-Modal Setup Combining OPM-MEG and fNIRS
Pichaya Tappayuthpijarn, Urban Marhl, Piotr Sawosz, Vojko Jazbinšek, Adam Liebert, Tilmann Sander, Stanislaw Wojtkiewicz
- 16:15 – 16:30 **OP058** Relationship Between Entropy of Heart Rate Variability and Cerebral Autoregulation in Healthy Volunteers
Agnieszka Uryga, Teodor Buchner, Magdalena Kasprowicz

Special Symposium SE07a

IFMBE, Students and Recent Graduates Working Group: How Can We Bring Innovation to Socially Impactful Research Through the Effective Use of Emerging Technologies?

Chairs: Martha Zequera (Colombia), Piotr Ladyzynski (Poland), Anna Stecka (Poland)

OP059–OP062

Lecture Hall B

- 15:30 – 15:45 **OP059** Intelligent System for Monitoring Sedentary Behaviour to Support Elderly Care
Santiago Lynett, Santiago Mesa, Wilder Castellanos, Martha Zequera Díaz, Pilar Castellanos
- 15:45 – 16:00 **OP060** Hybrid Respiratory System Model as a Foundation for Modular Physiological Simulation Framework
Zofia Knapińska, Krzysztof Zieliński
- 16:00 – 16:15 **OP061** Bridging Innovation and Society: ANEEB Perspective on Emerging Technologies
Andreia Martins, Diogo Andrade
- 16:15 – 16:30 **OP062** Time-Domain Near-Infrared Spectroscopy: Advancing Brain Oxygenation Monitoring
Aleh Sudakou, Adam Liebert

Tuesday, June 17, 2025**Special Symposium SE08**

Meet the Editor

Chairs: Zahra Moussavi (UK), Adam Liebert (Poland)

KL04, KL05

Lecture Hall C

15:30 – 16:00 **KL04** **Keynote Lecture:** TBA
Zahra Moussavi

16:00 – 16:39 **KL05** **Keynote Lecture:** TBA
Adam Liebert

Oral Session OS09

Modeling Physiological Systems in Health and Disease

Chairs: Leszek Pstraś (Poland)

OP063–OP066

Lecture Hall A

16:45 – 17:00 **OP063** Linear vs. Nonlinear Diffusion According to Linear Nonequilibrium
Thermodynamics
Jacek Waniewski

17:00 – 17:15 **OP064** Indirect Application of Machine Learning to Estimate Parameters of Cancer
Growth and Response to Treatment in Individual Patients
Jarosław Smieja, Krzysztof Łakomiec, Artur Wycisłok, Andrzej Swierniak,
Krzysztof Fajarewicz

17:15 – 17:30 **OP065** Prognostic Value of Early Interictal Epileptiform EEG Patterns in Ischemic Stroke:
A Predictive Model for Functional Outcomes
Katerina Iskra, Edoardo Ricci, Andrea Bonini, Giovanni Furlanis, Michele Malesani,
Paola Caruso, Marcello Naccarato, Paolo Manganotti, Agostino Accardo, Miloš
Ajčević

17:30 – 17:45 **OP066** Effect of Huntington's Disease on Electrical and Mechanical Properties of Red
Blood Cells in a Mouse Model
Liliana Ponkratova, E Du, Hongyuan Xu, Jianning Wei

Tuesday, June 17, 2025**Special Symposium SE07b**

IFMBE, Students and Recent Graduates Working Group: How Can We Bring Innovation to Socially Impactful Research Through the Effective Use of Emerging Technologies?

Chairs: Martha Zequera (Colombia), Piotr Ladyzynski (Poland), Anna Stecka (Poland)

OP067–OP070

Lecture Hall B

- 16:45 – 17:00 **OP067** Development of an Innovative Methodological Model for the Integration of Emerging Technologies in the Development of Medical Devices with Social Impact
Leslie Yessenia Cieza Huane
- 17:00 – 17:15 **OP068** A Robotic System Integrating the Semmes-Weinstein Monofilament (SWM10g) for Automated Plantar Sensory Evaluation: Novel Approach for Early DPN Detection
César Augusto Moreno Baracaldo, Martha Zequera Díaz
- 17:15 – 17:30 **OP069** AI-Based Tool to Support Clinical Decisions Using Predictive Factors Derived from Tumor-Infiltrating Lymphocyte Quantification in Breast Cancer
Shrief Abdelazeez, Alessio Fiorin, Carlos Lopez, Laia Adalid, Marylene Lejeune, Anna Korzynska
- 17:30 – 17:45 **OP070** Deep Learning-Based Classification of Thermograms from Plantar Region
Santiago Humberto Ramirez Martinez and Martha Zequera

Oral Session OS10

Assistive Technologies and Rehabilitation Engineering

Chairs: Lenka Lhotska (Czech Republic)

OP071–OP074

Lecture Hall C

- 16:45 – 17:00 **OP071** Vision and Vibration-Based Feedback System to Support Situational Awareness of Uniformed Services Officers
Mateusz Urban, Ignacy Stencel, Mateusz Sudejko, Szymon Cygan
- 17:00 – 17:15 **OP072** Enhancing Cognitive and Motor Skills through Personalized Digital Games
Petr Novak, Lenka Lhotska
- 17:15 – 17:30 **OP073** Detection of Limb Movement Related Events from EEG Signals Using ARMA Models
Bartłomiej Sztyler, Paweł Strumiłło
- 17:30 – 17:45 **OP074** TBA

Wednesday, June 18, 2025**Plenary Lecture 4****Lecture Hall A**

09:00 – 09:50 **PL4** High-Resolution Magnetoencephalography: A New Window to Human Brain Function?

Prof. Lauri Parkkonen, PhD, Aalto University School of Science (Finland)

Oral Session OS11

Artificial Intelligence in Healthcare: Diverse Applications

Chairs: Paulo de Carvalho (Portugal)

OP075–OP080

Lecture Hall A

- 10:00 – 10:15 **OP075** Neurosymbolic AI Approach for Dry and Wet AMD Classification Using OCT Images
Aleksandar Miladinović, Alessandro Biscontin, Miloš Ajčević, Agostino Accardo, Dario Marangoni, Daniele Tognetto, Leandro Infrerra
- 10:15 – 10:30 **OP076** Estimation of Body Ratios from Low-Resolution, Dual-Energy X-ray Images Using Convolutional Neural Networks
Kamil Janczyk, Jacek Rumiński, Tomasz Neumann, Aleksandra Szymczyk, Piotr Wiśniewski
- 10:30 – 10:45 **OP077** Genetic Algorithm for Predicting Primary Imatinib Resistance in Locally Advanced or Metastatic Gastrointestinal Stromal Tumors
Martina Sassi, Jacopo Vitale, Maria Elisabetta Pagnano, Laura Risi Ambrogioni, Margherita A.G. Matarrese, Bruno Vincenzi, Leandro Pecchia
- 10:45 – 11:00 **OP078** Can Machine Learning Models Help Identify Infected Wounds Requiring Antibiotic Treatment?
Piotr Foltynski, Piotr Ladyzynski, Karolina Kruszewska, Arkadiusz Krakowiecki, Bożena Czarkowska-Paczek
- 11:00 – 11:15 **OP079** Deep Multiple Instance Learning for Automated Tumor Positivity Score Prediction in Non-Small Cell Lung Cancer
Krzysztof Pysz, Artur Bartczak, Jarosław Kwiecień, Piotr Krajewski, Witold Dyrka
- 11:15 – 11:30 **OP080** Artificial Intelligence Models for Age and Sex Estimation from Electrocardiograms,
Daniel Albornoz, Cristian Sposato, Gustavo Meschino, Santiago Manzollillo, Virginia Ballarin

Wednesday, June 18, 2025**Special Symposium SE09**

IFMBE, Industry Committee – From Lab to Market: Bridging the Gap in Biomedical Innovation

Chairs: Piotr Ładyżyński (Poland), Jari Hyttinen (Finland), Martha Zequera Diaz (Colombia)

KL6, OP081–OP084

Lecture Hall B

- 10:00 – 10:30 **KL6** **Keynote Lecture:** A Journey of +25 Years in the Ecosystem of Spin-off Creation: A Perspective of the Academic Innovators of ETRO.RDI
Johan Stiens
- 10:30 – 10:45 **OP081** Bioimpedance Method for Monitoring Chronic Wounds
Jari Viik, Atte Kekonen, Magdalena Antoszezewska
- 10:45 – 11:00 **OP082** From an Idea to the Product – Brain Optics Quantitative Near Infrared Spectroscopy Device
Stanislaw Wojtkiewicz, Mateusz Zbik, Adam Linkowski, Michal Waskiewicz, Dominik Domanski, Hamid Dehghani and Piotr Sawosz
- 11:00 – 11:15 **OP083** From Identification of Unmet Clinical Need to Commercialization - Story of Sensing Injection Needle
Jari Hyttinen
- 11:15 – 11:30 **OP084** Towards Commercialization of an Optical Guidance System for Neurosurgery
Karin Wårdell, Johan Richter

Wednesday, June 18, 2025**Special Symposium SE10**

Young Polish Society for Biomedical Engineering Meeting

Chairs: Marek Darowski and The Main Board of the Polish Society for Biomedical Engineering (Poland)

OP085–OP091

Lecture Hall C

- 10:00 – 10:12 **OP085** Development of a Neural Network-Based Method for Analyzing Muscle Interactions in Biomechanics and Medical Fields
Julia Wilk, Cezary Rzymkowski
- 10:12 – 10:24 **OP086** Analysis of the Influence of the Basal Geometry of the Auxetic Layer in the Intervertebral Disc Endoprosthesis on the Distribution of Stress and Strain in the Lumbar Spine Structures
Martyna Myszograj, Piotr Posadzy
- 10:24 – 10:36 **OP087** Multifunctional Chitosan-Based Hydrogels Enriched with Biologically Active Substances
Weronika Gura, Szymon Salagierski, Michał Dziadek, Katarzyna Cholewa-Kowalska
- 10:36 – 11:48 **OP088** The Influence of Simulated Microgravity on Cells Cultured on Polymeric Scaffolds and Microspheres
Barbara Szaflarska, Kamila Walczak, Agata Kołodziejczyk, Elżbieta Pamuła
- 10:48 – 11:00 **OP089** Unsupervised Segmentation of Defective Skulls in Volumetric Data by Using Deep Networks Dedicated to Modality Transfer
Kamil Kwarciak
- 11:00 – 11:12 **OP090** Multifunctional Alginate-Based Capsules for Theranostic Applications
Malwina Furgala, Patrycja Domalik-Pyzik
- 11:12 – 11:24 **OP091** Computer Methods to Support Diagnosis and Therapy of Scoliosis Using Spinal Radiograms and Clinical Data
Anna Berent

Wednesday, June 18, 2025**Special Symposium SCC**

IFMBE Scientific Challenge Competition – Segmentation Challenge: Wounds and Markers in Focus

Chairs: Paulo de Carvalho (Portugal), Piotr Foltynski (Poland), Jorge Henriques (Portugal), Piotr Ladyzynski (Poland)

OP092–OP097

Lecture Hall A

- 11:45 – 12:00 **OP092** Advanced Multi-Class Wound Segmentation Using EfficientNet Unet. A Comprehensive Approach to Automated Wound Assessment
Athanasios Kallipolitis, Melina Tziomaka, Argyrios Zafeiriou, Ilias Maglogiannis
- 12:00 – 12:15 **OP093** Automated Segmentation of Wound and Scale Markers Areas Using a U-Net-Based Neural Network
Zuzanna Błaszowska, Karolina Dzwonkowska, Piotr Stefański, Piotr M. Szczypiński
- 12:15 – 12:30 **OP094** Towards Efficient Wound Management: An Automatic Deep Learning Model for Accurate Wound Image Segmentation
Aleksandar Miladinović, Alessandro Biscontin, Andrea Bonini, Francesco Bassi, Simone Kresevic, Alessandra Raffini, Katerina Iskra, Agostino Accardo, Miloš Ajčević
- 12:30 – 12:45 **OP095** Dual-Attention U-Net++ with Class-Specific Ensembles and Bayesian Hyperparameter Optimization for Precise Wound and Scale Marker Segmentation
Daniel Cieślak, Miriam Reca, Olena Onyshchenko, Jacek Rumiński
- 12:45 – 13:00 **OP096** Wound Area Detection with nnU-Net v2 Architecture
Franciszek Kubala, Piotr Matusiewicz, Dominik Mika, Dominik Zawlocki, Zbysław Tabor
- 13:00 – 13:15 **OP097** Segmentation Challenge: Wounds and Markers in Focus
Piotr Potrzebowski, Arkadiusz Karbowski, Kamil Sterniuk, Aleksandra Krajna, Zuzanna Cemka, Krystian Opala, Jacek Rumiński

Wednesday, June 18, 2025**Special Symposium SE11**

Biosensing Devices

Chairs: Chia Ming Yang (ROC Taiwan) and Dorota G. Pijanowska (Poland)

IP03, OP098–OP102

Lecture Hall B

- 11:45 – 12:00 **IP03** Introduction
Dorota G. Pijanowska
- 12:00 – 12:15 **OP098** Silicon Technology Based Sensor Interfacing Circuit Development for Urolithiasis Prevention
Wen-Yaw Danny Chung, Roozbeh F. Ramezani, Meo Vincent Caya, Angelito Silverio, Yen-Wei Liu, Chia-Ming Yang, Vincent F. Tsai
- 12:15 – 12:30 **OP099** Novel DNA-Based Bioreceptor for Label-Free Lactoferrin Detection
Agnieszka Paziewska-Nowak, Marcin Urbanowicz, Dorota Pijanowska
- 12:30 – 12:45 **OP100** Selective Capture of Extracellular Vesicles by Peptide- Functionalized Hollow Fiber Membranes
Loredana De Bartolo, Simona Salerno, Antonella Piscioneri, Sabrina Morelli, Alessandro Gori, Elena Provasi, Paola Gagni, Lucio Barile, Marina Cretich, Marcella Chiari
- 12:45 – 13:00 **OP101** A Controllable and Multifunctional Semiconductor Chip for Neuron Cells for Separation, Culture and Potential Sensing
Chia-Ming Yang, Leung Sze Tsui, Ping-Han Hsieh, Yu-Fan Xue
- 13:00 – 13:15 **OP102** Development of a Biosensing Flow Cytometry-Based Assay for Predicting Drug Resistance in Leukemia Cells
Aleksandra Kaczorowska, Wojciech Kałas, Przemysław Sareło, Marlena Gąsior-Głogowska, Ewa Ziolo, Marta Sobas, Halina Podbielska, Marta Kopaczyńska

Wednesday, June 18, 2025**Special Symposium SE12**

Information Content Analysis in Cardiovascular and Respiratory Systems

Chair: Gerard Cybulski (Poland)

OP103–OP108

Lecture Hall C

- 11:45 – 12:00 **OP103** Magnetocardiography Adds Information to Electrocardiographic Recordings
Kazimierz Pęczalski, Judyta Sobiech, Mateusz Broczkowski, Natalia Jurek, Tadeusz Pałko, Teodor Buchner
- 12:00 – 12:15 **OP104** Information Content of the Electrocardiogram
Sebastian Wildowicz, Tomasz Gradowski, Igor Olczak, Izabela Ghafour, Aleksandra Bedełek, Maciej Standerski, Teodor Buchner
- 12:15 – 12:30 **OP105** Application of Impedance Cardiography for Differentiating Control Group from subjects with Presyncopal Symptoms During the LBNP Test
Katarzyna Tessmer, Grzegorz Graff, Gerard Cybulski
- 12:30 – 12:45 **OP106** The Effect of Data Filtering Methods on Heart Rate Asymmetry Measures
Rafał Pawłowski, Katarzyna Buszko
- 12:45 – 13:00 **OP107** Comparison of Three Methods of Identification the Characteristic Points in Impedance Cardiography Signal
Milena Chołuj, Bartosz Smigielski, Edward Koźluk, Ewa Michalak, Gerard Cybulski
- 13:00 – 13:15 **OP108** Simulations of Pulmonary Secretion Removal by the Closed Suctioning System in Two Subjects Ventilated by One Ventilator and the Ventil
Krzysztof Zieliński, Zofia Knapińska

Oral Session OS12

Biomedical Signal Processing: Cardiovascular, Muscular and Cognitive Signals

Chairs: Stanisław Wojtkiewicz (Poland)

OP109–OP112

Lecture Hall A

- 14:30 – 14:45 **OP109** Cross Evaluation of Diffuse Correlation Spectroscopy and Intravoxel Incoherent Motion MRI in Measuring Tissue Blood Flow
Neda Mogharari, Kamil Lipinski, Stanisław Wojtkiewicz, Adam Liebert, Michał Kacprzak
- 14:45 – 15:00 **OP110** QRS Detection Based on the Matching Pursuit Algorithm
Mohammed Owahidur Rahman, Piotr Augustyniak, Elżbieta Olejarczyk
- 15:00 – 15:15 **OP111** Estimation of Cognitive Flow Level During Gait with Metrorhythmic Stimulation Using Physiological Data and Machine Learning
Patrycja Romaniszyn-Kania, Anita Pollak, Aleksandra Tuszy, Damian Kania, Andrzej W. Mitas
- 15:15 – 15:30 **OP112** Evaluation of Factors-of-Interest in Muscle Phantoms Based on Ultrasonic Data
Vladislavs Agarkovs, Aleksandrs Sisojevs, Alexey Tatarinov, Tamara Laimiņa

Wednesday, June 18, 2025**Oral Session OS13**

ICT in Medicine and Health Technology Assessment

Chairs: TBA

OP113–OP116

Lecture Hall B

- 14:30 – 14:45 **OP113** Detection of Electronic Protected Health Information in DICOM Objects: Rule-Based Methods vs. LLMs
Dmytro Tkachenko, Milena Sobotka, Antoni Górecki, Jakub Kłopotek-Główczewski, Tomasz Neumann, Jacek Rumiński
- 14:45 – 15:00 **OP114** User Expectations on Wearable Medical Devices in Latvia
Nadezhda Semjonova, Roberts Malnieks, Alexei Katashev
- 15:00 – 15:15 **OP115** Relationship Between Accelerometer-Based Walking Activity and Subjective Health
Robert Róžański, Piotr Wiśniewski, Jacek Rumiński
- 15:15 – 15:30 **OP116** Subjective Evaluation of Phantoms in X-ray Breast Imaging Research: Insights from Bulgaria
Tsvetelina Teneva, Antonio Sarno, Nikolay Dukov, Vasileios Elefteriadis, Zhivko Bliznakov, Panagiotis Papadimitroulas, Kristina Bliznakova

Oral Session OS14

Neural Engineering and Neuroinformatics

Chairs: Leon Bobrowski (Poland)

OP117–OP120

Lecture Hall C

- 14:30 – 14:45 **OP117** Therapeutic Effects of Temporal Interference Stimulation on Post-Stroke Motor Function Recovery: An Animal Study
Chih-Wei Peng, Chun-Wei Wu, Yu-Ting Li
- 14:45 – 15:00 **OP118** Digital Cognitive Assessments and Smart Environments
Ankica Babic
- 15:00 – 15:15 **OP119** Creating Structures from Formal Neurons
Leon Bobrowski
- 15:15 – 15:30 **OP120** TBA

RAPID FIRE POSTER PRESENTATIONS

Tuesday, June 17, 2025**Rapid Fire Poster Presentations RF1**

Artificial Intelligence in Healthcare, Biomaterials,
Biomedical Sensors and Instrumentation

Chairs: Anna Stecka (Poland)

PP01–PP25

Lecture Hall A

- 14:30 – 14:32 **PP01** Control of Scanner Quality and Consistency for Deep Learning Models in Collaborative Digital Pathology
Shrief Abdelazeez, Lukasz Roszkowiak, Krzysztof Siemion, Antonina Pater, Alessio Fiorin, Carlos Lopez, Laia Adalid, Marylene Lejeune and Anna Korzynska
- 14:32 – 14:34 **PP02** Impact of Input Color Models on Breast Cancer Binary Classification Using CNNs
Jakub Jaworski, Lukasz Roszkowiak
- 14:34 – 14:36 **PP03** Artificial artifacts detection in raw EEG signal using Neural Networks
Kacper Filipek, Patryk Zych, Adam Patalas
- 14:36 – 14:38 **PP04** Color normalization in conventional Pap smear images
Antonina Pater, Lukasz Roszkowiak, Anna Korzynska
- 14:38 – 14:40 **PP05** Development of PES-PUR Scaffolds for Cartilage Tissue Engineering
Monika Wasyleczko, Cezary Wojciechowski, Judyta Dulnik, Wioleta Sikorska, Andrzej Chwojnowski
- 14:40 – 14:42 **PP06** Polymer-Modified PEO Coating: Corrosion Behavior and Cytotoxicity Assessment
Barbara Rynkus, Maciej Sowa, Ada Orłowska, Joanna Jaworska, Katarzyna Jelonek, Aneta Samotus, Janusz Szewczenko
- 14:42 – 14:44 **PP07** Development of a Method for Obtaining Blend Degradable Polysulfone/Cellulose Acetate Membranes
Cezary Wojciechowski, Monika Wasyleczko, Andrzej Chwojnowski
- 14:44 – 14:46 **PP08** Electrospun UV-crosslinked Polyvinylpyrrolidone Fibres Modified with Microspheres for Drug Delivery Systems
Aleksandra Bartkowiak, Adam Mirek, Marcin Grzeczkwicz and Dorota Lewińska
- 14:46 – 14:48 **PP09** Combination of Cold Helium Plasma with Fluoride Varnish to Improve Enamel Surface Protection
Sara Fathollah, Hossein Abbasi and Mohammad Sadegh Ahmad Akhouni
- 14:48 – 14:50 **PP10** Design and Experimental Research on a Self-Cleaning Endoscope Cover for the da Vinci Surgical Robot
Dominika Szuberla, Tadeusz Pałko, Wojciech Świąszkowski, Emilia Choińska, Krzysztof Pałko
- 14:50 – 14:52 **PP11** Electrospun PEDOT:PSS Nanofibers for Flexible Bioelectronics Applications
Izabela Lewandowska, Karolina Cysewska
- 14:52 – 14:54 **PP12** Study on Catalytic Activity of Lactate Oxidase Nanoflowers
Kamila Sadowska, Abdelkader Zebda
- 14:54 – 14:56 **PP13** A Novel dsDNA-Based Electrochemical Biosensor for 6 Mercaptopurine
Anna Sołdatowska, Marcin Urbanowicz, Kamila Sadowska, Dorota Pijanowska
- 14:56 – 14:58 **PP14** Surface-Functionalized Electrodes via Plasma Treatment for Enhanced Detection of *Pseudomonas* Quinolone Signals
Sunil Luhar, Kamila Sadowska

- 14:58 – 15:00 **PP15** Simultaneous Recordings of Vascular and Neuronal Responses Using 3d Printed Head Casts
Tilmann H. Sander, Urban Marhl, Pichaya Tappayuthpijarn, Piotr Sawosz, Paul Anders, Stanislaw Wojtkiewicz, Vojko Jazbinšek, Adam Liebert
- 15:00 – 15:02 **PP16** Continuous, Non-Invasive Intra-Abdominal Pressure Monitoring by Transient Radar Methodology
Salar Tayebi, Ashkan Zarghami, Ali Pourkazemi, Manu L. N. G. Malbrain, Johan Stiens
- 15:02 – 15:04 **PP17** Direct Printed Potentiometric Sensors for pH Monitoring in Body Fluids
Marcin Urbanowicz, Marek Dawgul, Agnieszka Paziewska-Nowak, Kornelia Bobrowska, Anna Sołdatowska, Dorota Pijanowska
- 15:04 – 15:06 **PP18** Radio Frequency Magnetic Field Detection for Magnetic Hyperthermia: Low-Cost, Lab-Friendly Hardware
Serhat Ilgaz Yöner, Alpay Özcan
- 15:06 – 15:08 **PP19** Advancing Sweat-Based Wearable Biosensors: Enzyme Stabilization and AI-Driven Correction for Long-Term Multi-Biomarker Monitoring
Abdelkader Zebda
- 15:08 – 15:10 **PP20** Leveraging Pulse Wave Signal Properties for Coronary Artery Calcification Screening in CKD Patients
Urszula Białończyk, Leszek Pstras, Małgorzata Debowska, Lu Dai, Abdul Qureshi, Torkel Brismar, Jonaz Ripsweden, Bengt Lindholm, Peter Stenvinkel, Jan Poleszczuk
- 15:10 – 15:12 **PP21** Attention U-Net for Retinal Blood Vessel Segmentation Using Various Color Space Models Channels
Patrycja Kwiek, Małgorzata Jakubowska
- 15:12 – 15:14 **PP22** Significance of Stable Feature Selection in Classifier Performance Assessment on High-Dimensional Genetic Data
Tomasz Łukaszuk, Jerzy Krawczuk
- 15:14 – 15:16 **PP23** Application of Artificial Intelligence in Psychiatric Neuroimaging: A Systematic Review
Ilona Karpiel, Ewelina Sobotnicka, Ana Starcevic
- 15:16 – 15:18 **PP24** The Method of Artificial Membranes Profile Image Construction for AI-Based Porosity Evaluation Tool
Jakub Zak, Antonina Pater, Monika Wasyleczko, Natalia Najuch, Andrzej Chwojnowski, Anna Korzynska
- 15:18 – 15:20 **PP25** Explainable Estimation of Blood Volume Pulse Signals from Video Sequences Using a Combination of Deep Learning Models and Signal Processing Methods
Milena Sobotka, Kamil Kopryk, Muhammad Usman, Jacek Rumiński

Tuesday, June 17, 2025

Rapid Fire Poster Presentations RF2

Medical Image Processing, Biomedical Signal Processing, Artificial Organs,
Modeling Physiological Systems, Biomeasurements

Chairs: Krzysztof Zieliński (Poland)

PP26–PP49

Lecture Hall B

- 14:30 – 14:32 **PP26** Deep Learning-Based Wound Segmentation Using a U-Net Architecture
Martinus Boom
- 14:32 – 14:34 **PP27** Unified Wound Detection and Segmentation Using YOLO: An Efficient Approach for Accurate Wound Measurement
Mahdi Bazargani, Mohammad Javad Heidari, Mehrdad Anvari-Fard, Hamid Soltanian-Zadeh
- 14:34 – 14:36 **PP28** Optimizing the Hemodynamic Response Function in EEG-fMRI Analysis of Focal Epilepsy: A Single-Case Report
Nikodem Hryniewicz, Rafał Rola, Ewa Piątkowska-Janko, Danuta Ryglewicz, Piotr Bogorodzki
- 14:36 – 14:38 **PP29** The Fractal Scale Variability Index for MRI Images Analysis
Ewelina Bebas, Marta Borowska, Jolanta Pauk
- 14:38 – 14:40 **PP30** Assessing Blood-Brain Barrier Impairments in Non-Enhancing Multiple Sclerosis Lesions with Perfusion MRI
Nikodem Hryniewicz, Piotr Bogorodzki, Stefan Gaździński, Ewa Piątkowska-Janko, Kamil Lipiński, Anna Karlińska, Paweł Grieb, Mikołaj Pawlak, Rafał Rola, Danuta Ryglewicz, Iwona Kurkowska-Jastrzębska
- 14:40 – 14:42 **PP31** Influence of the 3D Printing Infill, Pattern and CT kV on the Hounsfield Units for Biomedical Applications
Nikolay Dukov, Kristina Bliznakova, Yanka Baneva, Zhivko Bliznakov
- 14:42 – 14:44 **PP32** Morphological Analysis of Total Hemoglobin Concentration Pulse Waveform and Its Relationship with Age
Marta Hendler, Arkadiusz Ziółkowski, Tomasz Sozański, Magdalena Kasproicz
- 14:44 – 14:46 **PP33** Does Functional Brain Stimulation Change the Brain Tissue Scattering?
Kamil Lipiński, Neda Mogharari, Adam Liebert, Stanisław Wojtkiewicz
- 14:46 – 14:48 **PP34** Utilization of Instantaneous Frequency and Amplitude Obtained via EWT for Motor Imagery Classification
Patrik Zych, Kacper Filipek, Adam Patalas
- 14:48 – 14:50 **PP35** Nonlinear Analysis of ECG Signals in Arrhythmia Simulated by MPS450 Fluke and Measured with ADS1298 AFE
Elzbieta Raus-Jarzabek, Elzbieta Olejarczyk
- 14:50 – 14:52 **PP36** Influence of Liner Material Poisson's Ratio on Contact Pressure Distribution in Transtibial Prosthetic Sockets: A Finite Element Analysis Study
Agata Mrozek-Czajkowska
- 14:52 – 14:54 **PP37** Acid-Base Modelling in Peritoneal Dialysis
Mauro Pietribiasi, Joanna Stachowska-Pietka, Olof Heimbürger, Jacek Waniewski, Bengt Lindholm
- 14:54 – 14:56 **PP38** Modified Kinetics of Plasma Electrolytes During Hemodialysis After Changing Dialysate Bicarbonate Concentration

- Malgorzata Debowska, Monika Wieliczko, Mauro Pietribiasi, Urszula Bialonczyk, Jolanta Malyszko, John K. Leypoldt, Jacek Waniewski
- 14:56 – 14:58 **PP39** Patient-specific Pulse Wave Propagation Modeling for Improving Vasopressor Therapy in Severe Traumatic Brain Injury Patients
Kamil Wolos, Leszek Pstras, Urszula Bialonczyk, Malgorzata Debowska, Wojciech Dabrowski, Dorota Siwicka-Gieroba, Jan Poleszczuk
- 14:58 – 15:00 **PP40** Markov Model Simulation of Nicotine Addiction and the Effectiveness of Nicotine Replacement Therapy (NRT)
Joanna Chwał, Arkadiusz Banasik, Radosław Dzik, Ewaryst Tkacz
- 15:00 – 15:02 **PP41** Spontaneous Breathing and Mechanical Power Management: Toward Safer Ventilation Practices
Tomasz Urbankowski, Krzysztof Zieliński, Maciej Kozarski, Barbara Stankiewicz, Krzysztof Jakub Pałko, Raman Pasledni, Marek Darowski
- 15:02 – 15:04 **PP42** The Influence of the Ventilation Methods on Respiratory Variables – Model Studies
Raman Pasledni, Maciej Kozarski, Krzysztof Zieliński, Barbara Stankiewicz, Krzysztof Jakub Pałko, Tomasz Urbankowski, Marek Darowski
- 15:04 – 15:06 **PP43** Model-Based Investigation of the Effect of Multi-Site Arterial Occlusion by Cuffs on the Distribution of Blood Flow in the Arterial Tree
Kamil Wolos, Leszek Pstras, Malgorzata Debowska, Jan Poleszczuk
- 15:06 – 15:08 **PP44** Ornithine - a Marker for Metabolic Liver Disease
Elżbieta Remiszewska, Marcin Grzeczkowicz, Dorota G. Pijanowska
- 15:08 – 15:10 **PP45** Serum NMR-Based Lipidomics of Patients with Morbid Obesity
Beata Toczyłowska, Piotr Kalinowski, Elżbieta Ziemska, Paulina Duda, Michał Grąt
- 15:10 – 15:12 **PP46** Post-Exercise Heart Rate Recovery in Male Soccer Players Under 13 Years Old
Magdalena Mikielwicz, Jakub Sławomir Gąsior, Kacper Korzeniewski, Robert Makuch, Marcel Młyńczak
- 15:12 – 15:14 **PP47** Novel Approach to Ventilation Therapy of Neonates with Congenital Diaphragmatic Hernia
Barbara Stankiewicz, Krzysztof Jakub Pałko, Magdalena Mierzewska-Schmidt, Dariusz Madajczak, Marcin Michnikowski, Maciej Kozarski, Marek Darowski
- 15:14 – 15:16 **PP48** Portable NIRS Device for Real-Time Cerebral Oxygenation Monitoring in Aerospace Applications
Michał Kacprzak, Piotr Sawosz, Anna Gerega, Aleh Sudakou, Kamil Lipiński, Stanisław Wojtkiewicz, Krzysztof Kowalczyk, Łukasz Dziuda, Adam Liebert
- 15:16 – 15:18 **PP49** Seroma Prevention with Hypertonic Irrigation In Breast Reconstructions: A Double-Blind Trial – the SHIELD Trial
Marcin Ekman, Paulina Cichon, Kamil Drucis, Magdalena Graczyk, Piotr Woźniacki, Jarosław Kobiela

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 - object to data processing based on specific circumstances when the Organizer processes data on the basis of a legitimate interest,
 - to receive personal data from the Organizer in a structured, commonly used, machine-readable format. The Participant may transfer this data to another data controller or request that the Organizer transfer it directly to another data controller, provided that such a transfer is technically feasible. The right to data portability applies only to data processed based on received consent.
- To exercise the above rights, Participants should contact the Organizer using the methods outlined above.
- The Organizer assures participants that the Organizer makes every effort to implement physical, technical, and organizational measures to protect personal data against accidental or intentional destruction, accidental loss, alteration, unauthorized disclosure, use, or access.

During the registration for the NBC 2025 & PCBBE 2025 each Participant consented to the processing of her/his personal data for the purpose of organizing the 20th Nordic-Baltic Conference on Biomedical Engineering and the 24th Polish Conference on Biocybernetics and Biomedical Engineering (NBC 2025 & PCBBE 2025).

During the registration for the NBC 2025 & PCBBE 2025, in accordance with art. 81.1 of the Act of 4 February 1994 on copyright and related rights, each Participant consented to the publication of her/his image captured during the conferences: 20th Nordic-Baltic Conference on Biomedical Engineering and 24th Polish Conference on Biocybernetics and Biomedical Engineering (NBC 2025 and PCBBE 2025). Each registrant also confirmed that she / he got acquainted with the information clause, which can be found at:

<https://nbc2025.ibib.waw.pl/index.php/information-clause/>.

The above consent concerns the indefinite and non-commercial use of the Participant's image by the Nalecz Institute of Biocybernetics and Biomedical Engineering of the Polish Academy of Sciences, ul. Ks. Trojdena 4, 02-109 Warsaw, Poland, in digital and paper form in the following fields of use: the Institute's website, the Photographer's website and printed and published photos in the Institute's promotional materials.

Participants' personal data will be used to support their experience throughout the conference website, to manage access to their accounts, and for other purposes described in the privacy policy which can be found at: <https://nbc2025.ibib.waw.pl/index.php/privacy-policy/>.