

# 21-st Polish Conference on Biocybernetics and Biomedical Engineering

## Scientific Program

### Conference opening ceremony

Room, date, time: bldg. A2 aud. 115, Wed. Sep. 25, 8:45 – 9:00

### Plenary Lecture WePL1

***Personalised medical treatments enabled by image-based biomechanical models***

**Prof. Jos Vander Sloten, Catholic University Leuven, Leuven-Heverlee, Belgium**

Room, date, time: bldg. A2 aud. 115, Wed. Sep. 25, 9:00 – 10:00

Chairperson: Prof. Roman Maniewski

### Coffee break

Room, date, time: bldg. A2 hall, Wed. Sep. 25, 10:00 – 10:30

| Session WeRS1                                                                                                                                                                                                                                                                                                                      | Biomechanics and artificial organs I          | Session WeRS2                                                                                                                                                                                                                                                                     | Biosensors, biomeasurements and biosignals monitoring I  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Room, date, time                                                                                                                                                                                                                                                                                                                   | bldg. A2 aud. 115, Wed. Sep. 25, 10:30 –11:30 | Room, date, time                                                                                                                                                                                                                                                                  | bldg. A2 aud. 315, Wed. Sep. 25, 10:30 –11:30            |
| Chairpersons:                                                                                                                                                                                                                                                                                                                      | Marek Gzik, Sylwia Łagan                      | Chairpersons:                                                                                                                                                                                                                                                                     | Marek Darowski, Michał Doligalski                        |
| <ul style="list-style-type: none"> <li>Aneta Liber-Kneć and Sylwia Łagan<br/><i>Experimental and constitutive approaches for a study of mechanical properties of animal tendons</i></li> </ul>                                                                                                                                     |                                               | <ul style="list-style-type: none"> <li>Radosław Mędrala and Piotr Augustyniak<br/><i>Taking Videoplethysmographic Measurements at Alternative Parts of the Body – Pilot Study</i></li> </ul>                                                                                      |                                                          |
| <ul style="list-style-type: none"> <li>Monika Ratajczak, Tomasz Klekiel, Grzegorz Sławiński and Romuald Będziński<br/><i>Investigation of helmet-head interaction in the aspect of craniocerebral tissue protection</i></li> </ul>                                                                                                 |                                               | <ul style="list-style-type: none"> <li>Krzysztof Pałko, Tomasz Gólczewski, Maciej Kozarski, Barbara Stankiewicz and Marek Darowski<br/><i>A new method and device for differentiating elastic and resistive properties of the respiratory system</i></li> </ul>                   |                                                          |
| <ul style="list-style-type: none"> <li>Jakub Gałuszka and Adam Ciszewicz<br/><i>A workspace analysis for a planar model of a tibiofemoral joint - a preliminary study</i></li> </ul>                                                                                                                                               |                                               | <ul style="list-style-type: none"> <li>Aleksandra Królak and Julia Biskupiak<br/><i>Analysis of Aaped heart rate sensor performance under the influence of various external factors and user characteristics</i></li> </ul>                                                       |                                                          |
| <ul style="list-style-type: none"> <li>Andrzej Bieniek, Piotr Wodarski, Miłosz Chrzan, Robert Michnik and Marek Gzik<br/><i>Algorithm for estimating angular accelerations in joints in the initial phase of symmetrical lifting of object from the ground</i></li> </ul>                                                          |                                               | <ul style="list-style-type: none"> <li>Elena Iomdina, Olga Kiseleva, Daniel Khoziev, Anna Kiseleva, Petr Luzhnov and Dmitry Shamaev<br/><i>Research of ocular hemodynamics by optical coherence tomography and transpalpebral rheophthalmography methods</i></li> </ul>           |                                                          |
| Session WeRS3                                                                                                                                                                                                                                                                                                                      | Biomechanics and artificial organs II         | Session WeRS4                                                                                                                                                                                                                                                                     | Biosensors, biomeasurements and biosignals monitoring II |
| Room, date, time                                                                                                                                                                                                                                                                                                                   | bldg. A2 aud. 115, Wed. Sep. 25, 11:35 –12:45 | Room, date, time                                                                                                                                                                                                                                                                  | bldg. A2 aud. 315, Wed. Sep. 25, 11:35 –12:35            |
| Chairpersons:                                                                                                                                                                                                                                                                                                                      | Marta Kopaczyńska, Aneta Liber-Kneć           | Chairpersons:                                                                                                                                                                                                                                                                     | Adam Liebert, Aleksandra Królak                          |
| <ul style="list-style-type: none"> <li>Aleksandra Kaczorowska, Weronika Lamperska, Marta Sobas, Tomasz Wróbel, Jan Masajada, Sławomir Drobczyński, Halina Podbielska, Edyta Wysokińska, Wojciech Kałas and Marta Kopaczyńska<br/><i>Diagnostics of chemoresistance in acute myeloid leukemia using optical tweezers</i></li> </ul> |                                               | <ul style="list-style-type: none"> <li>Michał Kania, Roman Maniewski, Rajmund Zaczek, Małgorzata Kobylecka, Leszek Królicki and Grzegorz Opolski<br/><i>Diagnostic value of high-resolution body surface potential mapping in assessment of ischemic heart disease</i></li> </ul> |                                                          |
| <ul style="list-style-type: none"> <li>Monika Palmerska and Tomasz Klekiel<br/><i>Measurement of dynamic properties of animal liver to identify the material model</i></li> </ul>                                                                                                                                                  |                                               | <ul style="list-style-type: none"> <li>Piotr Foltyński and Piotr Ładyżyński<br/><i>Improvements in Digital Planimetry Applied for Wound Area Measurement</i></li> </ul>                                                                                                           |                                                          |
| <ul style="list-style-type: none"> <li>Sylwia Łagan and Aneta Liber-Kneć<br/><i>Mechanical properties of porcine aorta – influence of orientation of specimens taken</i></li> </ul>                                                                                                                                                |                                               | <ul style="list-style-type: none"> <li>Marcin Michnikowski<br/><i>A new device for the measurement of intra-oral pressure in neonates</i></li> </ul>                                                                                                                              |                                                          |
| <ul style="list-style-type: none"> <li>Patryk Zradziński, Jolanta Karpowicz and Krzysztof Gryz<br/><i>Modelling the Influence of the Electromagnetic Field on a User of a Bone Conduction Hearing Medical Implant</i></li> </ul>                                                                                                   |                                               | <ul style="list-style-type: none"> <li>Karolina Bejm, Stanisław Wojtkiewicz, Piotr Sawosz, Maciej Perdziak, Żanna Pastuszek and Adam Liebert<br/><i>Cerebral hemodynamic response to visual stimulus at various frequencies measured by near infrared spectroscopy</i></li> </ul> |                                                          |
| <ul style="list-style-type: none"> <li>Lechosław F. Ciupik, Agnieszka Kierzkowska<br/><i>Biomedical innovation in the spondyloimplantology, the need of examination; when the development needs research?</i></li> </ul>                                                                                                           |                                               |                                                                                                                                                                                                                                                                                   |                                                          |

### Lunch

Room, date, time: bldg. A10 hall, Wed. Sep. 25, 12:45 – 13:45

**Plenary Lecture WePL2**  
**Near-infrared spectroscopy and fluorescence imaging of tissue in vivo**  
**Dr. Dirk Grosenick, Physikalisch-Technische Bundesanstalt, Berlin, Germany**  
Room, date, time: bldg. A2 aud. 115, Wed. Sep. 25, 13:45 – 14:45  
Chairperson: Prof. Halina Podbielska

**Session WeRS5      Cybernetics, bio-mimetics and modeling of biological systems**

Room, date, time: bldg. A2 aud. 115, Wed. Sep. 25, 14:45 –15:45  
Chairpersons: Jarosław Śmiejka, Barbara Stankiewicz

- Krzysztof Zieliński, Krystyna Górczyńska, Maciej Kozarski, Piotr Okrzeja, Marek Darowski and Gianfranco Ferrari  
*A novel real-time computer model of the coronary system including a physiological feedback between the left ventricular muscles and coronary perfusion*
- Andrzej Świerniak, Jarosław Śmiejka, Marzena Mura and Piotr Bajger  
*Modeling and optimization of radio-chemotherapy*
- Barbara Stankiewicz, Krzysztof Pałko, Marek Darowski, Maciej Kozarski and Krystyna Górczyńska  
*Challenges with conventional ventilation of infants with inhomogeneous lungs*
- Katarzyna Kramek-Romanowska, Anna Stecka, Krzysztof Zieliński, Agata Dorosz and Piotr Okrzeja  
*Effect of lung compliance variation on the gas distribution in the model respiratory tract with double-lumen endotracheal tube*

**Session WeRS6      Biomedical image processing and analysis I**

Room, date, time: bldg. A2 aud. 315, Wed. Sep. 25, 14:45 –15:45  
Chairpersons: Anna Korzyńska, Adam Piórkowski

- Włodzimierz Klonowski, Bożena Kuraszkiewicz, Anna M. Kamińska and Anna Kostera-Pruszczyk  
*Novel digital pathology method for computer-aided analysis of histopathological images obtained from dystrophic muscle biopsies*
- Łukasz Jeleń  
*Texture Description for Classification of Fine Needle Aspirates*
- Marta Borowska, Ewelina Bębas, Marcin Hładuński, Małgorzata Mojsak and Edward Oczeretko  
*Fractal dimension analysis of PET-MRI liver images for various ROI's sizes*
- Katarzyna Wójcik, Łukasz Roszkowiak and Anna Korzyńska  
*Computer program for generation and evaluation of texture in synthetic histological images*

**Coffee break**

Room, date, time: bldg. A2 hall, Wed. Sep. 25, 15:45 – 16:00

**Session WeRS7      Molecular, cellular and tissue engineering**

Room, date, time: bldg. A2 aud. 115, Wed. Sep. 25, 16:00 –16:45  
Chairpersons: Krzysztof Fajarewicz

- Magdalena Skonieczna, Dorota Hudy, Patryk Bil, Małgorzata Adamiec, Marta Stachowska and Krzysztof Biernacki  
*Role of let-7 family miRNAs in migration of colorectal cancer HCT 116 and Caco-2 cells after stimulation by the adipokine vaspin. Time-lapse live-cell microscopic observations*
- Przemysław Sareło, Marta Kopaczyńska, Magdalena Zaręba, Agata Białońska, Łukasz Uram, Małgorzata Walczak, David Aebischer and Stanisław Wołowicz  
*Structural characteristics of the mixed-generation PAMAM G3-G0 megamer as a drug delivery system and its antitumor activity*
- Monika Drabik, Anna Grzeczkwicz, Paweł Bącal and Ludomira Granicka  
*Composite membranes with gold nanoparticles for fibroblastic cells immobilization*

**Session WeRS8      Applications of deep learning in biomedicine**

Room, date, time: bldg. A2 aud. 315, Wed. Sep. 25, 16:00 –17:00  
Chairpersons: Leon Bobrowski, Krzysztof Patan

- Anna Korzyńska, Jakub Zak, Krzysztof Siemion, Łukasz Roszkowiak and Dorota Pijanowska  
*CNN support to diagnostics in Sjogren's Syndrome*
- Bartosz Miselis, Thomas Fevens, Adam Krzyżak, Marek Kowal and Roman Monczak  
*Deep Neural Networks for Breast Cancer Diagnosis: Fine Needle Biopsy Scenario*
- Krzysztof Patan and Grzegorz Rutkowski  
*Detection of epileptic seizures via deep long short-term memory*
- Łukasz Roszkowiak, Jakub Zak, Krzysztof Siemion, Joanna Kinasiewicz and Anna Korzyńska  
*Fibroblast segmentation in microscopic brightfield images with convolutional neural network*

**Plenary Lecture ThPL1**  
**Polymer properties to comply with requirements for medical devices**  
**Prof. Jorg Vienken, Technical University Mittelhessen, Giessen, Germany**  
Room, date, time: bldg. A2 aud. 115, Thu. Sep. 26, 9:00 – 10:00  
Chairperson: Prof. Józef Korbicz

**Coffee break**  
Room, date, time: bldg. A2 hall, Thu. Sep. 26, 10:00 – 10:30

**Session ThRS1      Biomaterials and nanotechnology**

Room, date, time: bldg. A2 aud. 115, Thu. Sep. 26, 10:30 – 11:30  
Chairpersons: Dorota Pijanowska, Uwe Steinhoff

- Peter Schier, Craig Barton, Simo Spassov, Christer Johansson, Daniel Baumgarten, Olga Kazakova, Paul Southern, Quentin Pankhurst, Marco Coisson, Cordula Grüttner, Alex Price, Roman Rüttinger, Frank Wiekhorst, James Wells and Uwe Steinhoff  
*European research on magnetic nanoparticles for biomedical applications: standardisation aspects*
- Katarzyna Kramek-Romanowska, Marcin Grzeczakowicz, Paulina Korycka and Dorota Lewińska  
*A factorial design for assessment of the effect of selected process variables on the impulse electrostatic droplet formation*
- Przemysław Wróblewski, Damian Wanta, Grzegorz Domański, Jacek Kryszyn, Piotr Bogorodzki and Waldemar Smolik  
*Lock-in measurements of SPIONs' magnetic susceptibility*
- Maciej Duda, Magdalena Wawrzyńska, Honorata Kraśkiewicz, Iain O'Connor, Łukasz Wasyluk, Dariusz Biały, Gerard Wall, Halina Podbielska and Marta Kopaczynska  
*Cardiovascular surfaces biofunctionalized with VEGFR2-binding antibody fragment exhibit enhanced endothelialization in vitro and in vivo*

**Session ThRS2      Biomedical image processing and analysis II**

Room, date, time: bldg. A2 aud. 315, Thu. Sep. 26, 10:30 – 11:30  
Chairpersons: Włodzimierz Klonowski, Paweł Strumiłło

- Bartosz Kopczyński, Paweł Strumiłło, Marcin Just and Ewa Niebudek-Bogusz  
*An acoustic based method for automatic segmentation of vocal folds edges in laryngoscopic high speed image sequences*
- Dorota Kamińska, Tomasz Sapiński, Grzegorz Zwoliński, Sławomir Wiak and Magdalena Kucharczyk-Pośpiech  
*Virtual reality as a tool for ophthalmic examination*
- Rafał Obuchowicz, Andrzej Urbanik and Adam Piórkowski  
*Novel technique of T1- and T2-weighted magnetic resonance images superposition for growth plate analysis in adolescent wrists*
- Jan Juszczyk, Marta Biesok, Agata Wijata, Jacek Andrzejewski, Paweł Bożek, Michał Smoliński and Paweł Badura  
*Automated Size-Specific Dose Estimate Determination Method Based on DICOM Image Data*

**Session ThRS3      Bioinformatics and computational biology I**

Room, date, time: bldg. A2 aud. 115, Thu. Sep. 26, 11:35 – 12:35  
Chairpersons: Jacek Waniewski, Krzysztof Psiuk-Maksymowicz

- Agata Wilk, Marta Gawin, Katarzyna Frątczak, Piotr Widłak and Krzysztof Fajarewicz  
*On stability of feature selection based on MALDI mass spectrometry imaging data and simulated biopsy*
- Krzysztof Psiuk-Maksymowicz, Roman Jaksik, Aleksander Placzek, Aleksandra Gruca, Sebastian Student, Damian Borys, Dariusz Mrozek, Krzysztof Fajarewicz and Andrzej Swierniak  
*BioTest - Remote platform for hypothesis testing and analysis of biomedical data*
- Szymon Pyka, Michał Marczyk, Christos Hatzis and Joanna Polańska  
*Using single-cell RNA sequencing to capture pharmacodynamics in combination therapy of Triple Negative Breast Cancer*
- Wiktor Jedrzejczak  
*Does increased attention affect inner ear function?*

**Session ThRS4      Biomedical signal processing**

Room, date, time: bldg. A2 aud. 315, Thu. Sep. 26, 11:35 – 12:35  
Chairpersons: Piotr Augustyniak, Michał Kania

- Szymon Sieciński, Paweł Kostka, Natalia Piaseczna and Marta Wadas  
*Comparison of Indices Derived From Poincaré Maps on Electrocardiograms and Seismocardiograms*
- Paweł Marcełi Senator, Beata Toczyłowska, Elżbieta Ziemińska and Jerzy W. Łazarewicz  
*Comparison of two animal models of autism using <sup>13</sup>C NMR spectroscopy of rat urine hydrophilic compounds*
- Ewa Zalewska and Małgorzata Gawel  
*Simulation study on single muscle fiber potentials (SFP) contaminated by distant fibers*
- Elżbieta Olejarczyk  
*Comparison of transcranial magnetic stimulation protocols in depression and schizophrenia*

**Lunch**  
Room, date, time: bldg. A10 hall, Thu. Sep. 26, 12:45 – 13:45

| Session<br>ThSS5                                                                                                                                                             | The role of<br>medical/clinical<br>engineers in the<br>health care – part 1           | Poster session<br>ThPS6                                                                                                                                                                                                                                                    | Biomedical engineering - part 1                                                     | Session<br>ThSS7                                                                                                                                     | PSBE (PTIB)<br>competition winners –<br>award nomination<br>(part1)                             |
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| Room,<br>date,<br>time<br>Chairpersons:                                                                                                                                      | bldg. A2 aud. 115,<br>Thu. Sep. 26,<br>13:45 –14:45<br>Tadeusz Pałko,<br>Ewa Zalewska | Room,<br>date,<br>time<br>Chairpersons:                                                                                                                                                                                                                                    | bldg. A2 hall,<br>Thu. Sep. 26,<br>13:45 –14:45<br>Paweł Badura,<br>Piotr Foltyński | Room,<br>date,<br>time<br>Chairpersons:                                                                                                              | bldg. A2 aud. 315,<br>Thu. Sep. 26,<br>13:45 –14:45<br>Marek Darowski,<br>Krzysztof Jakub Pałko |
| <ul style="list-style-type: none"> <li>Ewa Zalewska<br/><i>Position of clinical engineer in the health care – legislation and practice in different countries</i></li> </ul> |                                                                                       | <ul style="list-style-type: none"> <li>Katarzyna Kramek-Romanowska, Agata Dorosz, Anna Stecka and Piotr Okrzeja <i>Computational fluid dynamics in the upper human airways during independent lung ventilation – selected aspects</i></li> </ul>                           |                                                                                     | <ul style="list-style-type: none"> <li>Magdalena Żukowska, <i>Szybkie wytwarzanie i wirtualne prototypowanie pomocy przedoperacyjnych</i></li> </ul> |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Hanna Goszczyńska, Beata Toczyłowska, Piotr Ładyżyński, Ewa Piątkowska-Janko and Piotr Foltyński, <i>MR diffusion imaging in peripheral nerve diagnostics - preliminary studies</i></li> </ul>                                      |                                                                                     |                                                                                                                                                      |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Sebastian Podgórski, Marcin Skobel, Marek Kowal, Andrzej Obuchowicz and Józef Korbicz, <i>Analysis of texture features extracted from virtual slides of cytological samples</i></li> </ul>                                          |                                                                                     |                                                                                                                                                      |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Ewa Łukowska, Monika Wasyleczko and Andrzej Chwojnowski, <i>A composite membrane for smart dressings and skin substitutes</i></li> </ul>                                                                                            |                                                                                     | <ul style="list-style-type: none"> <li>Michał Pielka <i>Metody odwzorowania ruchu dla radiowego interfejsu środowiska wirtualnego</i></li> </ul>     |                                                                                                 |
| <ul style="list-style-type: none"> <li>Tadeusz Pałko<br/><i>The status of medical engineering in Poland</i></li> </ul>                                                       |                                                                                       | <ul style="list-style-type: none"> <li>Małgorzata Ciężkowska, Anna Samluk, Agnieszka Wencel, Joanna Motyl, Dorota Genowefa Pijanowska and Krzysztof Dariusz Pluta, <i>C3A cell line with restored urea cycle as a promising source of cells for BAL devices</i></li> </ul> |                                                                                     |                                                                                                                                                      |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Katarzyna Kramek-Romanowska, Anna Stecka, Krzysztof Zieliński, Agata Dorosz and Piotr Okrzeja, <i>Influence of double-lumen endotracheal tube on the air flow in the model respiratory tract</i></li> </ul>                         |                                                                                     |                                                                                                                                                      |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Kamil Kiliszek, Marek Kowal, Marcin Skobel, Andrzej Obuchowicz and Józef Korbicz, <i>Analysis of cytological specimens using the distribution function of morphological features</i></li> </ul>                                     |                                                                                     | <ul style="list-style-type: none"> <li>Ewa Dzierzkowska <i>Fibrous polymer membrane as drug delivery system</i></li> </ul>                           |                                                                                                 |
|                                                                                                                                                                              |                                                                                       | <ul style="list-style-type: none"> <li>Hanna Goszczyńska, Bożenna Kuraszkiewicz and Maria Piotrkiewicz, <i>Computer simulations of recurrent inhibition</i></li> </ul>                                                                                                     |                                                                                     |                                                                                                                                                      |                                                                                                 |

#### Coffee break

Room, date, time: bldg. A2 hall, Thu. Sep. 26, 14:45 – 15:00

| Session<br>ThSS5                                                                                                                                                                   | The role of<br>medical/clinical<br>engineers in the<br>health care – part 2           | Poster session<br>ThPS6                                                                                                                                                                                                                                                    | Biomedical engineering – part 2                                                    | Session<br>ThSS7                                                                                                                              | PSBE (PTIB)<br>competition winners –<br>award nomination<br>(part2)                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Room,<br>date,<br>time<br>Chairpersons:                                                                                                                                            | bldg. A2 aud. 115,<br>Thu. Sep. 26,<br>15:00 –16:00<br>Tadeusz Pałko,<br>Ewa Zalewska | Room,<br>date,<br>time<br>Chairpersons:                                                                                                                                                                                                                                    | bldg. A2 hall,<br>Thu. Sep. 26,<br>15:00 –16:00<br>Artur Gramacki,<br>Łukasz Jeleń | Room,<br>date,<br>time<br>Chairpersons:                                                                                                       | bldg. A2 aud. 315,<br>Thu. Sep. 26,<br>15:00 –15:30<br>Marek Darowski,<br>Krzysztof Jakub Pałko |
| <ul style="list-style-type: none"> <li>Kazimierz Pęczalski<br/><i>Issues related to present status of medical engineers in clinical practice</i></li> </ul>                        |                                                                                       | <ul style="list-style-type: none"> <li>Katarzyna Kramek-Romanowska, Agata Dorosz, Anna Stecka and Piotr Okrzeja <i>Computational fluid dynamics in the upper human airways during independent lung ventilation – selected aspects</i></li> </ul>                           |                                                                                    | <ul style="list-style-type: none"> <li>Katarzyna Charuza, <i>Modifications of WPI-based hydrogels for bone tissue regeneration</i></li> </ul> |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Hanna Goszczyńska, Beata Toczyłowska, Piotr Ładyżyński, Ewa Piątkowska-Janko and Piotr Foltyński, <i>MR diffusion imaging in peripheral nerve diagnostics - preliminary studies</i></li> </ul>                                      |                                                                                    |                                                                                                                                               |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Sebastian Podgórski, Marcin Skobel, Marek Kowal, Andrzej Obuchowicz and Józef Korbicz, <i>Analysis of texture features extracted from virtual slides of cytological samples</i></li> </ul>                                          |                                                                                    | <ul style="list-style-type: none"> <li>Karolina Paszkowska, <i>Production and investigation of bioactive peptide coatings</i></li> </ul>      |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Ewa Łukowska, Monika Wasyleczko and Andrzej Chwojnowski, <i>A composite membrane for smart dressings and skin substitutes</i></li> </ul>                                                                                            |                                                                                    |                                                                                                                                               |                                                                                                 |
| <ul style="list-style-type: none"> <li>Kazimierz Pęczalski, Tadeusz Pałko<br/><i>How hospital medical engineer can decrease costs of medical equipment exploitation</i></li> </ul> |                                                                                       | <ul style="list-style-type: none"> <li>Małgorzata Ciężkowska, Anna Samluk, Agnieszka Wencel, Joanna Motyl, Dorota Genowefa Pijanowska and Krzysztof Dariusz Pluta, <i>C3A cell line with restored urea cycle as a promising source of cells for BAL devices</i></li> </ul> |                                                                                    |                                                                                                                                               |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Katarzyna Kramek-Romanowska, Anna Stecka, Krzysztof Zieliński, Agata Dorosz and Piotr Okrzeja, <i>Influence of double-lumen endotracheal tube on the air flow in the model respiratory tract</i></li> </ul>                         |                                                                                    |                                                                                                                                               |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Kamil Kiliszek, Marek Kowal, Marcin Skobel, Andrzej Obuchowicz and Józef Korbicz, <i>Analysis of cytological specimens using the distribution function of morphological features</i></li> </ul>                                     |                                                                                    |                                                                                                                                               |                                                                                                 |
|                                                                                                                                                                                    |                                                                                       | <ul style="list-style-type: none"> <li>Hanna Goszczyńska, Bożenna Kuraszkiewicz and Maria Piotrkiewicz, <i>Computer simulations of recurrent inhibition</i></li> </ul>                                                                                                     |                                                                                    |                                                                                                                                               |                                                                                                 |

#### Gala Dinner

Room, date, time: bldg. Palmiarnia, Thu. Sep. 26, 19:00

**Plenary Lecture FrPL1**  
**Multimodal measurement systems for health and behavior analysis in living environment**  
**Prof. Piotr Augustyniak, AGH University of Science and Technology, Kraków, Poland**  
Room, date, time: bldg. A2 aud. 115, Fri. Sep. 27, 9:00 – 10:00  
Chairperson: Prof. Andrzej Świerniak

**Coffee break**  
Room, date, time: bldg. A2 hall, Fri. Sep. 27, 10:00 – 10:15

| <b>Session FrRS1</b>                                                                                                                                                                                                                                                   | <b>Health informatics, e-health and telemedicine</b> | <b>Session FrRS2</b>                                                                                                                                                                                                 | <b>Bioinformatics and computational biology II</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Room, date, time                                                                                                                                                                                                                                                       | bldg. A2 aud. 115, Fri. Sep. 27, 10:15 –11:15        | Room, date, time                                                                                                                                                                                                     | bldg. A2 aud. 315, Fri. Sep. 27, 10:15 –11:15      |
| Chairpersons:                                                                                                                                                                                                                                                          | Krzysztof Horoba, Emil Michta                        | Chairpersons:                                                                                                                                                                                                        | Andrzej Obuchowicz, Kazimierz Pęczalski            |
| <ul style="list-style-type: none"> <li>• Michał Maćkowski, Piotr Brzoza, Katarzyna Rojewska and Dominik Spinczyk<br/><i>Assessing the influence of the teaching method on cognitive aspects in the process of mathematical education among blind people</i></li> </ul> |                                                      | <ul style="list-style-type: none"> <li>• Leon Bobrowski<br/><i>Local aggregation of large multidimensional datasets for precision medicine</i></li> </ul>                                                            |                                                    |
| <ul style="list-style-type: none"> <li>• Łukasz Sobolewski, Wiesław Miczulski, Sławomir Pilc, Joanna Wróbel and Jakub Szulc<br/><i>A concept of a system monitoring the parameters of the dialysis apparatus</i></li> </ul>                                            |                                                      | <ul style="list-style-type: none"> <li>• Artur Gramacki, Krystian Dziędzioła, Jarosław Gramacki<br/><i>Detection of epileptic seizures in EEG signals using deep learning techniques</i></li> </ul>                  |                                                    |
| <ul style="list-style-type: none"> <li>• Adam Matonia, Krzysztof Horoba, Tomasz Kupka, Janusz Wróbel and Michał Jezewski<br/><i>Smart monitor for detection of silent atrial fibrillation – selected software design issues</i></li> </ul>                             |                                                      | <ul style="list-style-type: none"> <li>• Paweł Pendzialek and Joanna Polańska<br/><i>Can unsupervised clustering of the mass spectrometry imaging data serve as a nearly lossless compression method?</i></li> </ul> |                                                    |
| <ul style="list-style-type: none"> <li>• Emil Michta, Wiesław Miczulski and Łukasz Sobolewski<br/><i>Regional Teleradiology System</i></li> </ul>                                                                                                                      |                                                      | <ul style="list-style-type: none"> <li>• Ouali Mohammed Assam, Ladjal Mohamed and Djerioui Mohamed<br/><i>A New BBO-Type-1 Fuzzy logic scheme for ECG signal Modelling</i></li> </ul>                                |                                                    |

| <b>Session FrRS3</b>                                                                                                                                                                                                                              | <b>Biosensors, biomeasurements and biosignals monitoring III</b> | <b>Session FrRS4</b>                                                                                                                                                                                                                            | <b>Bioinformatics and computational biology III</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Room, date, time                                                                                                                                                                                                                                  | bldg. A2 aud. 115, Fri. Sep. 27, 11:20 –12:05                    | Room, date, time                                                                                                                                                                                                                                | bldg. A2 aud. 315, Fri. Sep. 27, 11:20 –12:20       |
| Chairpersons:                                                                                                                                                                                                                                     | Piotr Ładyżyński, Janusz Wróbel                                  | Chairpersons:                                                                                                                                                                                                                                   | Jolanta Polańska, Joanna Stachowska-Piętka          |
| <ul style="list-style-type: none"> <li>• Sylwia Włodarczak, Marek Ochowiak, Michał Doligalski, Anna Kasperkowiak and Andżelika Krupińska<br/><i>Phytotherapy in nebulization</i></li> </ul>                                                       |                                                                  | <ul style="list-style-type: none"> <li>• Marcin Skobel, Marek Kowal and Józef Korbicz<br/><i>Breast cancer computer-aided diagnosis system using k-NN algorithm based on Hausdorff distance</i></li> </ul>                                      |                                                     |
| <ul style="list-style-type: none"> <li>• Janusz Wróbel, Adam Matonia, Krzysztof Horoba, Janusz Jezewski, Tomasz Kupka and Robert Czabanski<br/><i>Some hardware aspects of an unobtrusive monitoring of silent atrial fibrillation</i></li> </ul> |                                                                  | <ul style="list-style-type: none"> <li>• Joanna Stachowska-Piętka and Jacek Waniewski<br/><i>Importance of interstitium and a daytime exchange for the treatment efficiency in patients undergoing automated peritoneal dialysis</i></li> </ul> |                                                     |
| <ul style="list-style-type: none"> <li>• Marek Ochowiak, Michał Doligalski, Anna Kasperkowiak, Magdalena Matuszak and Małgorzata Markowska<br/><i>Analysis of droplet mean diameter for thermostated pneumatic medical nebulizer</i></li> </ul>   |                                                                  | <ul style="list-style-type: none"> <li>• Artur Gramacki, Marek Kowal, Anna Pławiak-Mowna and Małgorzata Mazurkiewicz<br/><i>Statistical analysis of the morphometric parameters of human cell nuclei</i></li> </ul>                             |                                                     |
|                                                                                                                                                                                                                                                   |                                                                  | <ul style="list-style-type: none"> <li>• Norbert Nowicki, Marek Kowal and Andrzej Obuchowicz<br/><i>Discriminant analysis of morphologic features of cell nuclei for breast cancer diagnosis based on fine needle biopsy smears</i></li> </ul>  |                                                     |

**Conference closing ceremony**  
Room, date, time, bldg. A2 aud. 115, Wed. Fri. 27, 12:30 – 12:45

**Lunch**  
Room, date, time: bldg. A10 hall, Fri. Sep. 27, 12:45 – 13:45