



XXII Polish Conference on Biocybernetics and Biomedical Engineering



COMMITTEE OF BIOCYBERNETICS
AND BIOMEDICAL ENGINEERING



Final Program

Conference schedule

May 18 – 21, 2021

	May 18, Tuesday	May 19, Wednesday		May 20, Thursday		May 21, Friday	
		Track 1	Track 2	Track 1	Track 2	Track 1	Track 2
09:00 - 10:00		Opening Ceremony Plenary Lecture 1 - Prof. Frąckowiak (Track 1)		Plenary Lecture 3 - Prof. Legallais (Track 1)		Plenary Lecture 5 - Prof. Marraro (Track 1)	
10:00 - 11:00	Preconference workshop: "Good practice in research"	S1. Biomedical imaging	S2. Bioinformatics	S6. Bio-micro, nano technologies	S7. Artificial Organs	S10. Biomaterials I	S11. Biomechanics and biorobotics
11:00 - 11:30		Coffee Break		Coffee Break		Coffee Break	
11:30 - 12:30		Team Leaders Session 1 (Track 1)		Team Leaders Session 2 (Track 1)		Team Leaders Session 3 (Track 1)	
12:30 - 13:30		Lunch Break Sygnis Bio Technologies - video		Lunch Break		Lunch Break Sygnis Bio Technologies - video	
13:30 - 14:30		S3. Biomedical signal processing I	SS1. Dlaczego Polska nie produkuje respiratorów?	SS3. IBBE PAS 45 anniversary (Track 1)		S12. Biomaterials II	S13. Biosensors and bioinstrumentation
14:30 - 15:30		Plenary Lecture 2 - Prof. Miklavčič (Track 1)		Plenary Lecture 4 - Prof. Pijanowska (Track 1)		Plenary Lecture 6 - Prof. Schoening (Track 1)	
15:30 - 16:00		Coffee Break		Coffee Break		Coffee Break	
16:00 - 17:30		SS2. Clinical Engineering	Poster Session I (15:45 - 17:30)	SS4. Prof. Roman Maniewski Anniversary	Poster Session II (15:45 - 17:30)	SS5. Shared Ventilation	Poster Session III (15:45 - 17:30)
17:30-18:30	S4. Biomedical signal processing II	S5. Modeling of biological systems	S8. Neural and rehabilitation engineering	S9. Molecular, cell and Tissue engineering	S14. E-health and telemedicine	SS6. PTIB Awards	
18:30						Closing Ceremony	

Plenary lectures

PL1: Prof. Richard Frąckowiak, [Non-invasive exploration of the human brain in health and disease](#)

PL2: Prof. Damijan Miklavčič, [Electroporation in biomedicine](#)

PL3: Prof. Cécile Legallais, [Building an external \(bio\)artificial liver : multi-scale and biomechanical considerations](#)

PL4: Prof. Dorota G Pijanowska, [Challenges in biosensing technologies](#)

PL5: Prof. Giuseppe A Marraro, [Respiratory support strategy of severe failure caused by sars-cov-2 infection](#)

PL6: Prof. Michael Schöning, [25 years with capacitive field-effect biosensors – a short review and current trends](#)

18 May, Preconference Workshop „Good practice in research”

Chairman: P. Ładyżyński

10:00 – 10:45 Prof. Jörg Vienken, *Designing medical devices: current concepts and their disqualification by fake news*

10:45 – 12:15 Prof. Adam Liebert, *How to write a good scientific article?*

14:00 – 15:30 Prof. Marek Wroński, *Naruszenia dobrych praktyk badawczych w biomedycynie*

11:30 – 12:30. Team Leaders Session 1 – May 19, 2021

Chairman: A.Liebert

1. Elżbieta Pamuła *"Multifunctional biomaterials for tissue engineering and drug delivery"*.
2. Paweł Sajkiewicz *"Biodegradable polymers as scaffolds and drug delivery systems for tissue engineering"*.
3. Ludomira Granicka *"Nanomembranes and nanobiosystems for therapeutic purposes"*.
4. Katarzyna Arkusz *"Biomechanics and nanobiomaterials at the University of Zielona Gora"*.
5. Celina Pezowicz *"Tissue Biomechanics"*.
6. Marta Kopaczyńska *"Changes of biomechanical properties of cancer cells induced by cytostatic agents"*.
7. Marek Gzik *"From the Biomechanics of the 20th to the Biomechanics of the 21st century"*.
8. Jolanta Pauk *"Trends, research and technologies in the area of biomedical engineering"*.
9. Zbigniew Paszenda / Marcin Kaczmarek *"Scientific potential and R&D experience of the Department of Biomaterials and Medical Devices Engineering"*.
10. Ewa Piętka *"Multimodal techniques in diagnostics, therapy and rehabilitation"*.

11:30 – 12:30. Team Leaders Session 2 – May 20, 2021

Chairman: A.Liebert

1. Andrzej Czyżewski *"Applications of multimedia technology in medicine"*.
2. Robert Iskander *"New concepts in corneal imaging - when noise is not noise"*.
3. Anna Korzyńska *"Artificial intelligence and deep learning in pathology"*.
4. Tomasz Markiewicz *"Medical image analysis: selected topics"*.
5. Jerzy Litniewski *"Quantitative ultrasound. Application in cancer diagnostics and therapy"*.
6. Zbysław Tabor *"Statistics and machine learning for radiotherapy"*.
7. Gerard Cybulski *"Biosignals detection and event prediction"*.
8. Piotr Augustyniak *"Assisted living aspects of physiological signal processing"*.
9. Adam Liebert/Piotr Sawosz *"Biomedical optics for assessment of tissue perfusion and oxygenation"*.

11:30 – 12:30. Team Leaders Session 3 – May 21, 2021

Chairman: A.Liebert

1. Andrzej Skalski *"Mixed Reality and Image Registration in medicine - IPAL AGH experiences"*.
2. Jacek Rumiński *"Ambient Intelligence in Healthcare"*.
3. Jacek Waniewski/Jan Poleszczuk *"Mathematical modeling of physiological processes"*.
4. Małgorzata Kotulska *"Amyloids - harmful or desirable proteins?"*.
5. Tomasz Lipniacki *"Dissecting innate immune responses at single cell level"*.
6. Krzysztof Fujarewicz *"Department of System Biology and Engineering at Silesian University of Technology"*.
7. Piotr Ładyżyński *"Biomedical systems supporting the diagnosis and treatment of diabetes and its complications"*.
8. Paweł Strumiłło *"Computer analysis of images of different modalities in medicine"*.
9. Józef Korbicz *"Computer-aided medical diagnosis"*.
10. Andrzej Swinarew *"Application of advanced methods of molecular analysis in medical diagnostics"*.

10:00 - 11:00	S1. Biomedical imaging Chairmen: A.Korzyńska, I.Buzalewicz
	<p>O1.1 Guy Perkins, Samuel J. E. Lucas and Hamid Dehghani. <i>Subject Specific Atlas Based Frequency Domain Diffuse Optical Tomography</i></p> <p>O1.2 Dawid Borycki, Egidijus Auksorius, Sławomir Tomczewski, Kamil Liżewski, Piotr Węgrzyn and Maciej Wojtkowski. <i>Spatiotemporal optical coherence (STOC) manipulation for structural and blood flow imaging of the human retina in vivo</i></p> <p>O1.3 Stanisław Wojtkiewicz, Karolina Bejm and Adam Liebert. <i>Homodyne detection of brain-origin signals in near infrared spectroscopy</i></p> <p>O1.4 Jakub Zak, Krzysztof Siemion, Lukasz Roszkowiak and Anna Korzyńska. <i>Fourier Transform Layer for fast foreground segmentation in samples images of tissue biopsies</i></p>

10:00 - 11:00	S2. Bioinformatics Chairmen: A.Dardzińska, A.Horzyk
	<p>O2.1 Agata Wilk, Krzysztof Łakomicz, Krzysztof Psiuk-Maksymowicz and Krzysztof Fajarewicz. <i>Individualized mathematical models for Covid-19 pandemic in European countries</i></p> <p>O2.2 Katarzyna Hubicka and Małgorzata Kotulska. <i>Choosing representative subsets of amyloid proteins dataset</i></p> <p>O2.3 Marek Kochańczyk, Frederic Grabowski, Maciej Czerkies, Zbigniew Korwek, Wiktor Prus and Tomasz Lipniacki. <i>Antagonism between viral infection and innate immunity at the single-cell level</i></p> <p>O2.4 Leon Bobrowski and Tomasz Łukaszyk. <i>Functionally similar groups of features (genes) in a complex layer of formal neurons</i></p>

13:30 - 14:30	S3. Biomedical signal processing I Chairmen: G.Cybulski, A.Uryga
	<p>O3.1 Tomasz Hawro, Ewelina Turczak, Reinhard König and Cezary Sielużycki. <i>ML classification of auditory evoked responses for task-related hemispheric lateralization</i></p> <p>O3.2 Anna M Stecka, Marcin Michnikowski, Elżbieta M Grabczak, Monika Zielińska-Krawczyk, Rafał Krenke and Tomasz Gólczewski. <i>Cough: is this seemingly unfavorable phenomenon profitable during thoracentesis?</i></p> <p>O3.3 Agnieszka Uryga, Marek Czosnyka and Magdalena Kasprówska. <i>The utility of using non-invasive arterial blood pressure to estimate the time constant of cerebral arterial bed</i></p> <p>O3.4 Jacek Jurkojć, Piotr Wodarski, Robert Michnik, Wojciech Marszałek, Kajetan J. Słomka and Marek Gzik. <i>The use of FFT and STFT analysis in assessment of ability to maintain balance in sensory conflict conditions as a complementary element for time domain analyses</i></p>

SS1. Dlaczego Polska nie produkuje respiratorów?
Moderatorzy sesji: Prof. Marek Gzik, Prof. Adam Liebert
Paneliści: prof. Jarosław Fedorowski , prezes Federacji Szpitali Polskich, kardiolog, prof. Tomasz Topoliński , rektor Uniwersytetu Technologiczno-Przyrodniczego im. Jana i Jędrzeja Śniadeckich w Bydgoszczy w kadencji 2016–2020, pomysłodawca polskiego respiratora, dr inż. Krzysztof Zieliński , Instytut Biocybernetyki i Inżynierii Biomedycznej im. prof. Macieja Nałęczyna PAN, kierownik zespołu wdrażającego polskie urządzenie Ventil, które może pozwolić na wentylację dwóch pacjentów z użyciem jednego respiratora.
Michał Janasik , wiceprezes Centrum Łukasiewicz ds. Finansów i Komerccjalizacji

16:00 - 17:30	SS2. Inżynieria kliniczna w Polsce – jak przeskoczyć lukę pokoleniową Chairman: Prof. E. Zalewska
	<p>SS2.1 Ewa Zalewska „Inżynieria kliniczna – filar nowoczesnej ochrony zdrowia”</p> <p>SS2.2 Tadeusz Pałko, Kazimierz Pęczalski „Zawód inżyniera medycznego – regulacje prawne”</p> <p>SS2.3 Zbigniew Paszenda, Marek Gzik, Witold Walke “Inżynier medyczny - realia i perspektywy”</p> <p>SS2.4 Piotr Augustyniak „Inżynieria kliniczna w planowaniu kariery absolwenta i programowaniu toku studiów”</p>

Poster Session I (15:45 - 17:30)

17:30 - 18:30	S4. Biomedical signal processing II Chairmen: P.Augustyniak, M.Kowal
	<p>O4.1 Zalewska Ewa. <i>Differentiation between single fiber potential (SFP) from one muscle fiber and SFP contaminated by other fibers</i></p> <p>O4.2 Aleksandra Królak and Edyta Pilecka. <i>Analysis and comparison of heart rate variability signals derived from PPG and ECG sensors</i></p> <p>O4.3 Nikodem Hryniewicz, Marcin Sińczuk, Rafał Rola, Ewa Piątkowska-Janko, Danuta Ryglewicz and Piotr Bogorodzki. <i>Manual and automatic epilepsy events selection in EEG-fMRI studies</i></p> <p>O4.4 Katarzyna Minta-Bielecka and Jolanta Pauk. <i>Gait patterns classification in hemiplegia patients based on biclustering algorithm</i></p>

17:30 - 18:30	S5. Modeling of biological systems Chairmen: K.Fajarewicz, M.Dębowska
	<p>O5.1 Emilia Kozłowska and Andrzej Świński. <i>The stochastic mathematical model predicts angio-therapy could delay the emergence of metastases in lung cancer</i></p> <p>O5.2 Jarosław Smieja, Krzysztof Psiuk-Maksymowicz and Andrzej Świński. <i>A framework for modeling and efficacy evaluation of treatment of cancer with metastasis</i></p> <p>O5.3 Mauro Pietribiasi, Jacek Waniewski and John Leypoldt. <i>Modelling bicarbonate and CO2 dialysance in the haemodialyzer</i></p> <p>O5.4 Leszek Pstraś and Jacek Waniewski. <i>Contribution of albumin and globulins to plasma oncotic pressure</i></p>

10:00 - 11:00	S6. Bio-micro, nano technologies Chairmen: M.Kopaczynska, L.Granicka O6.1 Katarzyna Reczyńska, Magdalena Bialik, Natalia Nowosińska and Elżbieta Pamuła. <i>Solid lipid nanoparticles loaded with antibacterial peptides as versatile drug delivery systems for the treatment of bacterial infections</i> O6.2 Katarzyna Arkusz, Marta Nycz, Ewa Paradowska and Dorota G. Pijanowska. <i>Corrosive and antibacterial properties of titanium nanotubes surface-modified thermally and with silver nanoparticles</i> O6.3 Maxime Fages-Lartaud, Joanna Doscokz, Magdalena Przybyło, Maciej Łukawski and Marek Langner. <i>Development of the effective iron delivery vehicle</i> O6.4 Krzysztof Makuch, Jolanta Zegarlińska, Aleksander Czogalla, Tomasz Borowik, Magdalena Przybyło and Marek Langner. <i>Liposomal carrier as a phospholipid depot for tear film lipid layer supplementation in patients with evaporative Dry Eye Syndrome</i>	S7. Artificial Organs Chairmen: A.Jung, J.Poleszczuk O7.1 Maria Rocchi, Libera Fresiello, Bart Meyns, Steven Jacobs, Anna Stecka, Maciej Kozarski and Krzysztof Zielinski. <i>An In Vitro System To Study Suction Events In Ventricular Assist Devices In Different Pathophysiological Conditions</i> O7.2 Jacek Waniewski, Joanna Stachowska-Pietka and Roman Cherniha. <i>Hydration and swelling of non-perfused tissue: spatially distributed mathematical model for nonlinear poroelasticity</i> O7.3 Anna Ciechanowska, Piotr Foltyński, Ilona Marcelina Góra, Stanisława Sabalińska and Piotr Ładyżyński. <i>Design and optimization of the system controlling glucose concentration in a model of the artificial blood vessel</i> O7.4 John Leypoldt, Joerg Kurz, Jorge Echeverri, Markus Storr, Mauro Pietribiasi and Kai Harenski. <i>Modeling acid-base balance for in-series extracorporeal carbon dioxide removal and continuous venovenous hemofiltration devices</i>
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13:30 - 14:30	SS3. IBBE PAS 45 anniversary Chairman: A.Liebert SS3.1 Piotr Ładyżyński. <i>45-years of the Institute of Biocybernetics and Biomedical Engineering Polish Academy of Sciences</i> SS3.2 Kamila Sadowska. <i>Implantable biofuel cells for self-powered biosensors</i> SS3.3 Piotr Sawosz. <i>Cerebral oxygenation – clinical aspects</i> SS3.4 Jan Poleszczuk. <i>Computational oncology: how close are we to performing in silico clinical trials?</i>	
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16:00 - 17:30	SS4. Prof. Roman Maniewski Anniversary Chairman: A.Liebert	Poster Session II (15:45 - 17:30)
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17:30 - 18:30	S8. Neural and rehabilitation engineering Chairmen: P.Strumiłło, T.Bem O8.1 Jolanta Zuzda, Jakub Kacpura, Jakub Dziura, Piotr Borkowski and Robert Latosiiewicz. <i>An innovative approach for a hip disorders rehabilitation</i> O8.2 Piotr Wodarski, Jacek Jurkojć and Marek Gzik. <i>Wavelet Decomposition in Analysis of Impact of Virtual Reality Head Mounted Display Systems on Postural Stability</i> O8.3 Kacper Ogórek, Paweł Poryżala and Paweł Strumiłło. <i>EEG Based Image Reconstruction Using Transformers</i> O8.4 Katarzyna Koter and Witold Szulc. <i>Examination of pneumatic bellows for the rehabilitation of the human jaw</i>	S9. Molecular, cell and Tissue engineering Chairmen: M.Kotulska, K.Pluta O9.1 Małgorzata Krok-Borkowicz, Bartosz Mielan and Elżbieta Pamuła. <i>Dynamic vs. static cell culture PLGA microspheres for “bottom-up” tissue engineering</i> O9.2 Ilona Marcelina Góra, Anna Ciechanowska and Piotr Ładyżyński. <i>Activation of NLRP3 Inflammasome in Type 2 Diabetes</i> O9.3 Małgorzata Kotulska, Michał Burdukiewicz, Witold Dyrka, Marlena Gąsior-Głogowska, Katarzyna Hubicka, Monika Szczyk, Natalia Szulc and Jakub Wojciechowski. <i>Identification of amyloid proteins and their interactions – bioinformatics versus experiment</i> O9.4 Natalia Szulc, Marelena Gąsior-Głogowska, Jakub W. Wojciechowski, Monika Szczyk, Andrzej M. Żak, Michał Burdukiewicz and Małgorzata Kotulska. <i>The effect of deuterium oxide on the aggregation process of CsgA fragments</i>
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10:00 - 11:00	S10. Biomaterials I Chairmen: B.Major, A.Sionkowska
	<p>O10.1 Aleksandra Jędrzejewska. <i>Corrosion properties of double-walled TiO2 nanotubes measured in 0.9% NaCl - preliminary results</i></p> <p>O10.2 Marcin Elgalal, Piotr Komorowski and Bogdan Walkowiak. <i>Custom implants for the reconstruction of complex cranial and maxillofacial bone tissue defects</i></p> <p>O10.3 Justyna Gargaś, Justyna Janowska, Karolina Ziąbska, Małgorzata Ziemka-Nałęcz and Joanna Sypecka. <i>An in vitro model of perinatal asphyxia: the influence of different biomaterials on proliferation and morphology of oligodendrocytes and astrocytes</i></p> <p>O10.4 Beata Niemczyk-Soczyńska and Paweł Sajkiewicz. <i>Thermosensitive hydrogel/short electrospun fibers as a smart scaffold for tissue engineering</i></p>

10:00 - 11:00	S11. Biomechanics and biorobotics Chairmen: J.Pauk, M.Gzik
	<p>O11.1 Kamila Wiśniewska, Aleksandra Jędrzejewska, Monika Ratajczak and Tomasz Klekiel. <i>Analysis of the mechanical properties of impact absorbing structures used in military helmets</i></p> <p>O11.2 Joanna Rymek and Adam Ciszewicz. <i>Analyzing the sensitivity of a procedure for obtaining a spherical contact pair to model the hip joint</i></p> <p>O11.3 Marek Gzik, Wojciech Wolański, Kamil Jozsko, Bożena Gzik-Zroska, Michał Burckacki and Sławomir Suchoń. <i>Multivariate analysis the blast injury of soldiers</i></p> <p>O11.4 Monika Palmerska, Tomasz Klekiel and Agnieszka Mackiewicz. <i>Characteristics of nerve roots mechanical properties exposed to uniaxial stretching tests</i></p>

13:30 - 14:30	S12. Biomaterials II Chairmen: J.Vienken, J.Sypecka
	<p>O12.1 Konrad Kwiecień, Katarzyna Reczyńska, Katarzyna Bąk, Daria Niewolik, Katarzyna Jaszcz and Elżbieta Pamuła. <i>Manufacturing of poly(ester-anhydride) microparticles as drug delivery systems for pulmonary administration</i></p> <p>O12.2 Aleksandra Jastrzębska, Marta Kamińska and Bogdan Walkowiak. <i>Assessment of changes in biological and antimicrobial properties of double-doped TiO2 coatings produced by anodic oxidation</i></p> <p>O12.3 Angelika Zaszczynska and Paweł Sajkiewicz. <i>Designing of Three-Dimensional Piezoelectric Scaffolds for Neural Tissue Engineering</i></p> <p>O12.4 Roman Major, Adam Byrski, Maciej Gawlikowski, Katarzyna Kasperkiewicz, Marcin Dyrer, Juergen M. Lackner and Boguslaw Major. <i>The demands for designing the patient-specific, anti-microbial bioactive finger implants for durable functional reconstruction after amputation</i></p>

13:30 - 14:30	S13. Biosensors and Bioinstrumentation Chairmen: K.Sadowska, F. Vahidpour
	<p>O13.1 Rene Welden, Michael J. Schöning, Patrick H. Wagner and Torsten Wagner. <i>Light-addressable electrodes induce pH changes in microfluidic channels</i></p> <p>O13.2 Igor Buzalewicz, Łukasz Zadka, Anna Matczuk and Halina Podbielska. <i>Optical phenotyping and characterization of macro- and micro-scale biological objects</i></p> <p>O13.3 Dua Özsoylu, Tugba Isik, Mustafa M. Demir, Michael J. Schöning and Torsten Wagner. <i>A cell-based biosensor: "All-in-one" and "off-the-shelf" format for on-site monitoring of cell response</i></p> <p>O13.4 Agnieszka Paziewska-Nowak, Marcin Urbanowicz, Anna Sołdatowska, Kamila Sadowska and Dorota Genowefa Pijanowska. <i>A multimodal, optical and electrochemical, approach towards detection of endogenous immunomodulators</i></p>

16:00 - 17:30	SS5. Shared Ventilation Chairman: M.Darowski
	<p>SS5.1 Giuseppe Marraro. <i>Flow diverters for lung ventilation in clinical practice: state of the art and future perspectives</i></p> <p>SS5.2 Peter Khan. <i>Split Ventilation – Lessons from the COVID-19 Pandemic</i></p> <p>SS5.3 Shriya Srinivasan et. al. <i>iSAVE Ventilator Multiplexing System</i></p> <p>SS5.4 Krzysztof Zieliński. <i>Ventil - the system for independent lungs ventilation in splitted ventilation</i></p>

Poster Session III (15:45 - 17:30)	
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17:30 - 18:30	S14 E-health and telemedicine Chairmen: J.Rumiński, P.Foltyński
	<p>O14.1 Piotr Foltyński and Piotr Ladyziński. <i>An internet service system for automatic wound area measurement: preliminary tests</i></p> <p>O14.2 Jan Poleszczuk, Niklas Krupka and Benjamin Misselwitz. <i>Microsimulation-based optimization of colorectal cancer screening strategies</i></p> <p>O14.3 Mariusz Kaczmarek, Adam Bujnowski, Kamil Osiński, Tomasz Neumann and Jacek Rumiński. <i>eBathtub and eChair sensor subsystems supporting the elders</i></p> <p>O14.4 Jakub Niemczuk, Dawid Michałowski, Bartosz Pośpiech and Marek Langner. <i>Novel Bluetooth Low Energy wireless endoscopic capsule for gastrointestinal diagnostics</i></p>

17:30 - 18:30	SS6. PTIB Awards Chairman: M.Darowski
	<p>SS6.1 Aleksandra Maria Osowska-Kurczab. <i>Differentiation of the Renal Cancer Types Based on the Analysis of CT Images</i></p> <p>SS6.2 Wiktoria Wojnarowska. <i>Analysis of PEEK applications in knee endoprosthesis modeling</i></p> <p>SS6.3 Paweł Czekala. <i>Construction of a voice communication device in production conditions for deaf people</i></p> <p>SS6.4 Krzysztof Andrzej Gromada. <i>Construction and research of pulse pump with magneto-hydraulic levitation applied to artificial heart</i></p> <p>SS6.5 Agnieszka Dubiel. <i>Attempt to develop a technology for the production of personalized polylactide plates for bone anastomosis reinforced with glass fiber</i></p>

- P1.1 Ilona Karpieł and Klaudia Duch. *BOLD-fMRI study of auditory cortex in young women*
- P1.2 Paweł Bzowski, Daniela Schwedka-Nowak and Damian Borys. *Analysing of breast deformations in different patient positions using FEM*
- P1.3 Marcin Skobel, Marek Kowal and Józef Korbicz. *Cell nuclei detection in breast cancer cytology images with U-Net neural network*
- P1.4 Damian Wanta, Mateusz Midura, Przemysław Wróblewski, Grzegorz Domański, Jacek Kryszyn and Waldemar T. Smolik. *Capacitively coupled electrical tomography for anatomical and functional imaging of thorax*
- P1.5 Anna Pawłowska, Norbert Żolek, Katarzyna Dobruch-Sobczak, Ziemowit Klimonda, Hanna Piotrkowska-Wróblewska and Jerzy Litniewski. *The outcome of breast chemotherapy based on Gray Relational Coefficient of ultrasound images*
- P1.6 Lukasz Fura, Norbert Zolek and Tamara Kujawska. *Numerical simulations of the ultrasonic tissue ablation process*
- P1.7 Dominika Gabor, Rafał Doniec, Szymon Sześciński, Natalia Piaseczna, Konrad Duraj and Ewaryst Tkacz. *Automatic Assessment of Benton Visual Retention Test Results*
- P1.8 Krzysztof Psiuk-Maksymowicz, Martyna Szczyrba and Damian Borys. *Automatic detection of intracranial aneurysms on MRA data sets*
- P1.9 Kamil Kawoń, Zuzanna Setkowicz, Agnieszka Dróżdż, Krzysztof Janeczko and Joanna Chwiej. *Biochemical anomalies of nervous tissue resulting from mechanical brain injury can be characterized using the techniques of vibrational microspectroscopy*
- P1.10 Mateusz Midura, Damian Wanta, Przemysław Wróblewski, Jacek Kryszyn and Waldemar Smolik. *Web Application with Semiautomatic Algorithm for Renal Blood Flow Estimation in Dynamic Scintigraphy*
- P1.11 Lukasz Roszkowiak, Jakub Zak, Krzysztof Siemion, Antonina Pater and Anna Korzyńska. *Split point assessment for HRnet dual model*
- P1.12 Marta Borowska. *Multiscale entropy in the analysis of enveloped uterine EMG signals*
- P1.13 Karolina Bejm, Stanisław Wojtkiewicz, Żanna Pastuszek and Adam Liebert. *Decrease of hemodynamic responses to visual stimulation in the human brain under hypoxia*
- P1.14 Aleksandra Jung. *Influence of compartment model structure simplification on radiation dose calculation for C-14 urea breath test*
- P1.15 Katarzyna Hajdowska, Damian Borys and Andrzej Świerniak. *Spatial 3D simulations of tumour progression model using evolutionary game theory*
- P1.16 Jolanta Zuzda, Jakub Kacpura, Jakub Dziura, Manuel Sillero Quintana and Robert Latosiewicz. *The Influence of Hip Conditioning Program with Rotational Movements on Thermal Response of Lower Limbs*
- P1.17 Agnieszka Mackiewicz, Tomasz Klekiel, Jagoda Kurowiak, Tomasz Piasecki and Romuald Będziński. *Mechanical properties of New Zealand White Rabbit urethra tissue under urinal fluid flow*
- P1.18 Mikołaj Schabowski and Adam Ciszewicz. *Analyzing the geometry of the articular surfaces of the bones in the radioulnar and the radiohumeral joint*
- P1.19 Anna Kasperczuk and Agnieszka Dardzińska. *Decision support system for IBD*
- P1.20 Marlena Gąsior-Głogowska, Natalia Szulc, Oliwia Polańska, Monika Szczyk and Witold Dyrka. *Aggregation determination of bacterial amyloid signaling motifs using ATR-FTIR spectroscopy*
- P1.21 Jakub W. Wojciechowski and Małgorzata Kotulska. *Statistical potential and energy maps in prediction of amyloids*
- P1.22 Katarzyna Orzechowska and Tymon Rubel. *An SVM-based peptide identification algorithm integrated into a database search engine*
- P1.23 Michał Burdukiewicz, Katarzyna Sidorczyk, Przemysław Gagat, Filip Pietluch, Jakub Kała, Dominik Rafacz, Mateusz Bąkała, Jadwiga Słowik, Rafał Kolenda, Stefan Rödiger and Paweł Mackiewicz. *Negative data set sampling as the source of bias in prediction of antimicrobial peptides*

Chairmen: A.Kaczorowska, A.Wencel, M.Antosiak-Iwańska

- P2.1 Agnieszka Kolodziejczyk, Paulina Sokolowska, Aleksandra Zimon, Magdalena Grala, Marcin Rosowski, Małgorzata Siatkowska, Piotr Komorowski and Bogdan Walkowiak. *Atomic force spectroscopy as a nanoscopic tool for assessing nanomaterials toxic effects in vitro*
- P2.2 Farnoosh Vahidpour, Torsten Wagner and Michael Josef Schöning. *A combined chemical/biosensor for simultaneous online monitoring and sterility assurance in aseptic food packaging*
- P2.3 Marcin Urbanowicz, Bartłomiej Lemieszek, Kamila Sadowska, Anna Soldatowska, Agnieszka Paziewska-Nowak, Marek Dawgul and Dorota Pijanowska. *A new low-range biosensor for glutamate based on hyperbranched linkers*
- P2.4 Małgorzata Siatkowska, Paulina Sokolowska, Kamila Białkowska, Aleksandra Zimon, Magdalena Grala, Marcin Rosowski, Kinga Kądzioła-Długotęcka, Piotr Komorowski, Krzysztof Makowski, Daniel Reda and Bogdan Walkowiak. *Impact of micron-sized diamond particles on barrier cells of the human small intestine*
- P2.5 Anna Grzeczkwicz, Agata Lipko and Ludomira Granicka. *Nanothin Polyelectrolyte Membranes for Biomedical Purposes*
- P2.6 Magdalena Walkowiak-Przybyło, Marta Walczyńska, Marta Kamińska, Małgorzata Siatkowska, Piotr Komorowski and Bogdan Walkowiak. *Quantitative real-time polymerase chain reaction (qRT-PCR) technique as a useful tool for the assessment of cancer risk caused by medical implants*
- P2.7 Krzysztof Pietryga, Angelika Kielbasa and Elżbieta Pamula. *Indirect 3D-printing of viscous hydrogel in poly(vinyl alcohol) molds as a method to obtain tissue engineering scaffolds*
- P2.8 Anna Miklewska, Eleonora Kruglenko, Ryszard Tymkiewicz, Marcin Krajewski and Barbara Gambin. *Magnetic ferrofluids and ferrogel as sample materials for hyperthermia study*
- P2.9 Julia Lisoń, Anna Taratuta, Marcin Basiaga, Magdalena Antonowicz and Zbigniew Paszenda. *Various approaches to modify Ti13Nb13Zr alloy surfaces for improving biocompatibility*
- P2.10 Natalia Janik-Olchawa, Agnieszka Drózd, Damian Ryszawy, Maciej Pudełek, Karolina Planeta, Zuzanna Setkovicz, Maciej Śniegocki, Andrzej Żądło, Beata Ostachowicz and Joanna Chwiej. *Assessment of the toxicity and possible therapeutic effects of iron oxide nanoparticles in in vitro cellular models*
- P2.12 Mateusz Kopec, Adam Brodecki and Zbigniew L. Kowalewski. *Microstructural analysis of fractured orthopedic implants*
- P2.13 Ved Prakash Dubey, Mateusz Kopec and Zbigniew L. Kowalewski. *Insight of magnesium matrix nanocomposites for biomedical applications- a synthetic review*
- P2.14 Marta Kamińska, Magdalena Walkowiak-Przybyło, Marta Walczyńska, Piotr Komorowski and Bogdan Walkowiak. *Effect of surface structuring of metallic materials on their thrombocompatibility*
- P2.15 Małgorzata Debowska, Mauro Pietribiasi, Jan Poleszczuk, Wojciech Zaluska, Wojciech Dabrowski and Alicja Wojcik-Zaluska. *Bioimpedance measurements in estimation of fluid removal during hemodialysis*
- P2.16 Joanna Stachowska-Pietka, Beata Naumnik, Ewa Suchowierska, Jacek Waniewski and Bengt Lindholm. *Mathematic modeling of automated peritoneal dialysis: Effect of schedules with variable temporal patterns of administration of dialysis fluid with different glucose concentration*
- P2.17 Barbara Stankiewicz, Krzysztof J. Palko and Marek Darowski. *Lung function impairment in CDH – from fetus diagnostics to young child examination*
- P2.18 Grzegorz Żurek, Mateusz Gąbka, Paulina Dalek, Magdalena Przybyło and Marek Langner. *The method for the approximation of AUC curve for supplements of endogenous biologically active substances*
- P2.19 Daria Hemmerling, Magdalena Wójcik-Pędziwiatr and Łukasz Paluch. *The classification system for Parkinson's disease based on EMD using voice signals*
- P2.20 Marzena Rugeł, Justyna Kutorasińska, Agnieszka Drózd, Zuzanna Setkovicz and Joanna Chwiej. *The use of FTIR microspectroscopy for the investigation of molecular changes in the hippocampal formation after repetitive electrical stimulation*
- P2.21 Bogdan Walkowiak, Magdalena Walkowiak-Przybyło and Piotr Komorowski. *Can molecular biology and photoelectron spectroscopy methods be used to identify nanotechnology products?*
- P2.22 Karolina Planeta, Zuzanna Setkovicz-Janecko, Damian Ryszawy, Natalia Janik-Olchawa, Agnieszka Drózd and Joanna Chwiej. *Biomolecular topography of glioblastoma multiforme developed in the rat brain – a FTIR study*
- P2.23 Katarzyna Kramek-Romanowska, Agata Dorosz, Anna Stecka and Piotr Okrzeja. *Numerical simulations of air flow and particle deposition in the model human airways during independent lung ventilation*

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- P3.1 Monika Drabik, Anna Grzczkowicz, Paweł Baçal, Angelika Kwiatkowska, Magdalena Antosiak-Iwańska, Beata Kazmierczak, Ewa Godlewska and Ludomira Granicka. *Composite Membrane Scaffolds with Incorporated Metallic Nanoparticles for Supporting Fibroblastic Cell Growth*
- P3.2 Karolina Orzeł, Tomasz Gajowik and Magdalena Zielińska. *Customizable transepithelial/endothelial electrical resistance device with integrated multi-microelectrodes for the measurement of cellular barrier integrity*
- P3.3 Denise Molinnus, Kevin A. Janus, Aleksander Drinic, Heiko Iken, Nadja Kröger, Max Zinser, Ralf Smeets, Marius Köpf, Alexander Kopp and Michael J. Schöning. *Flexible electrochemical biosensor fabricated from Bombyx mori silk*
- P3.4 Melanie Jablonski, Jasmina Nork, Denise Molinnus, Likas Muschallik, Johannes Bongaerts, Torsten Wagner, Michael Keusgen, Petra Siegert and Michael J. Schöning. *Biosensoric acetoin detection in alcoholic beverages and fermentation broths*
- P3.5 Yasamin Ziai, Chiara Rinoldi, Paweł Nakielski, Tomasz Kowalewski and Filippo Pierini. *Bioinspired glucose sensor based on a smart nanoarchitecture hydrogel composite*
- P3.6 Anna Sołdatowska, Marcin Urbanowicz, Agnieszka Paziewska-Nowak, Kamila Sadowska and Dorota Pijanowska. *Bioplatfrom development for DNA-azathioprine interaction studies*
- P3.7 Adam Mirek, Paulina Korycka, Katarzyna Kramek-Romanowska, Marcin Grzczkowicz and Dorota Lewinska. *How to create the electrospun polymeric mats of desired structure for biomedical applications?*
- P3.8 Aleh Sudakou, Anna Gerega, Helene Isler, Piotr Sawosz, Daniel Ostojic, Martin Wolf and Adam Liebert. *Hemoglobin spectra affect estimation of concentration and oxygen saturation: blood-lipid phantom study*
- P3.9 Antonina Pater, Łukasz Roszkowiak, Krzysztof Siemion and Anna Korzyńska. *Estimation of the fraction of area covered by cells and cell clusters in WSI patches*
- P3.10 Krzysztof Siemion, Anna Korzyńska, Łukasz Roszkowiak, Jakub Żak, Antonina Pater and Joanna Reszeć-Giełażyn. *Application of image analysis methods to evaluate histopathological slides in the study of prognostic factors of inflammatory spindle cell lesions*
- P3.11 Marcin Sińczuk, Jacek Rogala, Nikodem Hryniewicz, Ewa Piotrowska-Janko and Piotr Bogorodzki. *Feasibility analysis of suppressed water peak in single voxel 1-H MRS thermometry*
- P3.12 Elham Fazliazar, Piotr Sawosz, Aleh Sudakou and Adam Liebert. *Validation of a method to improve depth sensitivity of diffuse reflectance measurements to absorption changes in an optically turbid medium*
- P3.13 Kamil Wołos and Jan Poleszczuk. *Pulse wave propagation modeling for non-invasive assessment of heart function*
- P3.14 Piotr Okrzeja, Krzysztof Zieliński, Marcin Michnikowski and Marek Darowski. *Independent Lungs Ventilation impact on the cardiovascular system – a computer simulations*
- P3.15 Julia Grajek, Iñaki Schniewind, Claudia Peitzsch and Jan Poleszczuk. *Cellular plasticity upon proton irradiation*
- P3.16 Raman Pasledni and Krzysztof Zielinski. *Hybrid cardiovascular simulator - an application for the mechanical assistance by an intra-aortic balloon pump*
- P3.17 Małgorzata Jakubowska, Monika Wiśniewska, Agnieszka Wencel, Dorota Genowefa Pijanowska and Krzysztof Dariusz Pluta. *Evaluation of Polysulfone Capillary Membranes Used for Hepatic Cells Culturing in Dynamic Conditions*
- P3.18 Monika Wiśniewska, Małgorzata Jakubowska, Agnieszka Wencel, Dorota Pijanowska and Krzysztof Pluta. *Construction of Hollow Fiber Bioreactors for Hepatic Cell Culture*
- P3.19 Joyce Pinto, Małgorzata Debowska and Jacek Waniewski. *Mathematical modelling of phosphate kinetics, its peculiarity and adequacy indices for patients on maintenance hemodialysis*
- P3.20 Akanksha Jaiswar, Maria Grześ, Magdalena Oroń and Dawid Walerych. *Functional transcriptomics analysis of driver's oncogenes molecular programs in human neoplasia*
- P3.21 Saeed Samaei, Neda Mogharari, Dawid Borycki, Adam Liebert and Michał Kacprzak. *Non-invasive brain perfusion and oxygenation assessment with combined use of time-domain diffuse correlation spectroscopy and time-domain near-infrared spectroscopy*
- P3.22 Neda Mogharari, Saeed Samaei, Stanisław Wojtkiewicz, Adam Liebert and Michał Kacprzak. *Hybrid diffuse optical system for the tissue perfusion and oxygenation assessment*
- P3.23 Dominika Szuberla, Włodzimierz Łukasik, Elżbieta Magdalena Grabczak, Krzysztof Jakub Pałko and Tadeusz Pałko. *Two methods for recording and classifying cough signals*