



Dear Colleagues and Friends,

this year, as hoped, we met in person in Rytyro, to celebrate something very special - the 30<sup>th</sup> birthday of our conference and 25 years of the Polish Society for Biomaterials. The conference was dedicated to the memory of Professor Jan Chłopek - Chairmen of the Annual 'Biomaterials in Medicine and Veterinary Medicine' meetings, who passed away in November 2020. We lost our conference Mentor but definitely not the spirit! We cherished his memory throughout the whole conference!

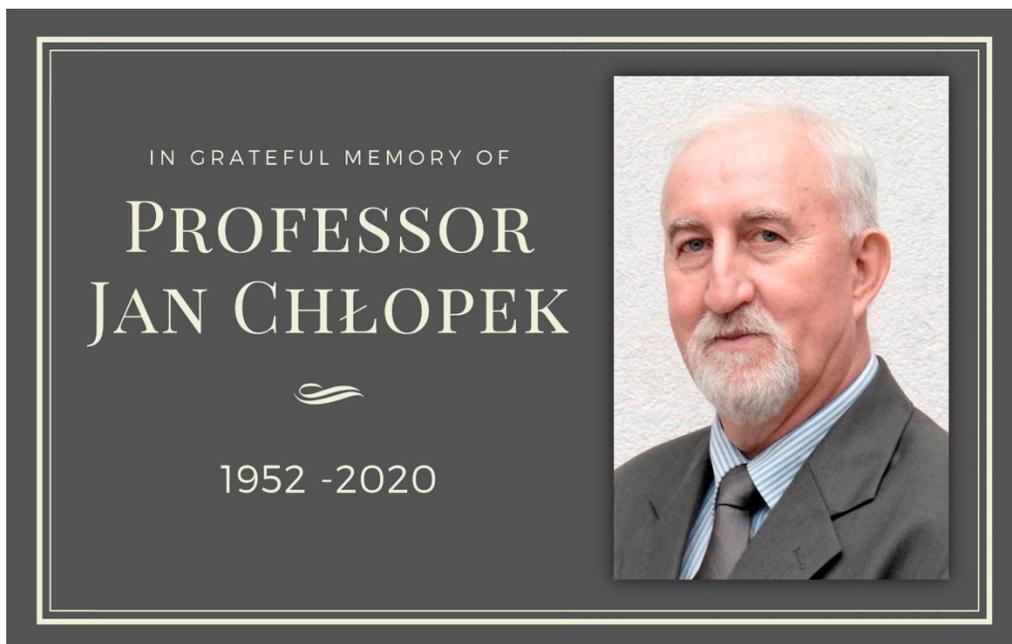
We had 3 outstanding Plenary Lecturers – Prof. C. James Kirkpatrick, Prof. Lucie Bacakova, and Prof. Dorota Bociąga, 1 Keynote Lecturer (sponsored by Polbionica) – Prof. Michał Wszola, accompanied by 31 oral and 78 poster presentations. That was a lot of first-class biomaterials-related science! Moreover, there were a lot of scientific discussions going on during both regular sessions and evening social events. Traditionally, under the auspices of the Young Scientist Forum of the ESB, we organized the Best Poster Competition and held a Rapid Fire Session. Congrats to Konrad Kwiecień for winning the prize and special thanks to Sygnis Bio Technologies and CELLINK companies for award sponsorship.

Finally, the celebrations and social events. We hope that you all enjoyed the regional dinner at cottage bar "Nad potokiem" (or "Chata u Stacha"), live-music Gala Dinner on Friday, and the trip to Krynica observation tower and sensory gardens in Muszyna on Saturday morning. We have seen quite a few of you enjoying the very early morning swim and still checking in for the first lecture – well done!

The photo gallery is available here: <http://www.biomat.agh.edu.pl/gallery>.

It has been a pleasure to organize this anniversary conference for you and then it was truly amazing to enjoy the event alongside such wonderful participants!

Thank you!  
Organizing Committee





## POLISH SOCIETY FOR BIOMATERIALS

AGH University of Science and Technology  
Faculty of Materials Science and Ceramics  
Department of Biomaterials and Composites  
Al. A. Mickiewicza 30  
30-059 Kraków

## ORGANIZING COMMITTEE

Elżbieta Pamuła - Chair of the Organizing Committee, President of the Polish Society for Biomaterials  
Barbara Szaraniec - Secretary  
Katarzyna Trała - Secretary of the Engineering of Biomaterials Journal  
Patrycja Domalik-Pyzik – YSF representative, Website administrator  
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## General Information

The **Conferences on Biomaterials in Medicine and Veterinary Medicine** are held every year and address both fundamentals and clinical applications of carbon, metals, polymers, ceramics and composite biomaterials. Their aim is to present the latest results of scientific research as well as to exchange ideas, knowledge and experience of scientists, researchers and clinicians in the field of biomaterials.

The topics to be covered during the Conference include, but are not limited to:

- Smart biomaterials
- Surface modification and functionalization
- Advanced manufacturing
- Antimicrobial surfaces and materials
- Biointerfaces
- Bioimaging and biosensing
- Tissue engineering / Regenerative medicine
- Drug and gene delivery
- Cell encapsulation and delivery
- Stem cells
- Cancer therapy
- Bone and cartilage
- Neural regeneration
- Cardiovascular applications
- Biomechanics and micromechanics
- Clinical trials
- Translation and commercialization



## ABSTRACTS

All participants intend to contribute oral and/or poster presentations were requested to prepare one-page abstract in English, which was published in conference materials (non-reviewed special edition of the "Engineering of Biomaterials,, Journal ). Each author might submit maximum two abstracts (one for oral and one for poster or two for poster presentations). Abstract submission was only possible during registration via our online system. Only abstracts from individuals who have paid the registration fee were published.

We have accepted total number of 61 abstracts.

## FULL PAPERS

We invited all participants to send full papers for publication in a regular issue of the "Engineering of Biomaterials" Journal (peer-reviewed, included in Index Copernicus Journals Master List, with the Polish Ministry of Science and Higher Education scoring – 20 points).

## ORAL AND POSTER PRESENTATIONS

We had 3 plenary lectures, 1 keynote lecture, 31 oral presentations , 78 poster presentations and 8 rapid fire presentations within the Best Poster Competition.



Plenary Lectures were given by:

- **Prof. C. James Kirkpatrick**  
University Medical Center, Johannes Gutenberg University,  
Mainz, Germany  
*„Biomaterials in Regenerative Medicine: View of the Past & Vision for the Future”*
- **Prof. Lucie Bacakova**  
Institute of Physiology of the Czech Academy of Sciences, Czech Republic  
*„Factors Governing the Differentiation of Stem Cells in Tissue Engineering”*
- **Prof. Dorota Bociaga**  
Lodz University of Technology  
*„3D Bioprinting - Dedicated Biomaterials and Devices”*
- **Keynote Lecture sponsored by Polbionica**  
**Prof. Michał Wszola**  
*„Cure for Type 1 Diabetes with Biotechnology –How Far We Are from Clinical Application?”*



## Prof. C James Kirkpatrick

Plenary Lecture: **Biomaterials in Regenerative Medicine : View of the Past & Vision for the Future**

*Emeritus Professor & Former Chair of Pathology, University Medical Center, Johannes Gutenberg University, Mainz, Germany*

*Distinguished Professor, University Medical Center, Johann Wolfgang Goethe University of Frankfurt, Germany*

*Distinguished Visiting Fellow, St. John's College, Cambridge University, UK*



**C. James Kirkpatrick** has a triple doctorate in science and medicine (MD, PhD, DSc) from the Queen's University of Belfast and from 1993 to 2015 was Professor and Chairman of Pathology at the Johannes Gutenberg University (JGU) in Mainz, Germany, where he is now Emeritus Professor. Previous academic appointments were at the University of Ulm, University of Manchester and the University of Technology (RWTH) in Aachen.

His principal research interests are in biomaterials in tissue engineering and regenerative medicine, with special focus on vascularization and nanomedicine. The methodological focus has been on developing human co-culture systems in 3D to study cellular crosstalk in regeneration. His research has led to more than 550 publications in peer-reviewed journals [ $> 27,000$  citations, h-index 86 (Google Scholar)]. Prof. Kirkpatrick has given more than 525 invited presentations to scientific

meetings worldwide. He has supervised 124 completed doctorate theses (MD/PhD/DDS) at two universities (Aachen, Mainz). James Kirkpatrick is a former President of both the German Society for Biomaterials (2001-2005) and the European Society for Biomaterials (2002-2007). In 2008 he was given the George Winter Award from the ESB and in 2010 the Chapman Medal from the Institute of Materials, Minerals & Mining, London. In addition, he is a Distinguished Professor at the Goethe University of Frankfurt, and has Honorary and Visiting Professorships in China, Singapore, and Sweden. He is currently Armourers & Brasiers' Distinguished Visiting Fellow to St. John's College, Cambridge.

## Prof. Lucie Bacakova

Plenary Lecture: **Factors Governing the Differentiation of Stem Cells in Tissue Engineering**

*Institute of Physiology*

*Czech Academy of Sciences*

*Czech Republic*



**Lucie Bacakova**, graduated from the Faculty of General Medicine, Charles University, Prague, Czechoslovakia in 1984. She completed her Ph.D. in 1992 from the Czechoslovak Academy of Sciences in the field of physiology and pathophysiology of humans and animals. Her research fellowships abroad included a stay at the University of Washington, Dept. of Vascular Biology and Pathology, Seattle, USA (Prof. Stephen M. Schwartz, 1996), where she studied the blood vessel damage during atherosclerosis and hypertension, and a stay at the University of Pennsylvania, Dept. of Mechanical Engineering, Philadelphia, USA (Prof. Dennis E. Discher, 2000-2001), where she studied the role of the substrate stiffness in the cell adhesion and growth. In 2013, she became an Associate Professor at the 2nd Medical Faculty, Charles University (field: Medical Physiology and Pathophysiology). Since 2005, she has been the Head of the Department of Biomaterials and Tissue Engineering, Institute of Physiology of the Czech Academy of Sciences.

She specializes in studies on the adhesion, growth, phenotypic maturation, potential immune activation and potential damage of differentiated and stem cells on biomaterials developed for vascular, bone and skin tissue engineering. These studies are conducted mainly *in vitro* under conventional static conditions as well as in dynamic bioreactors, and promising cell-material constructs are tested on laboratory animals. She has published more than 250 papers in reputed journals (5672 citations without self-citations, h-index 42).



## Prof. Dorota Bociaga

Plenary Lecture: 3D Bioprinting - Dedicated Biomaterials and Devices

*Division of Biomedical Engineering and Functional Materials*

*Institute of Materials Science and Engineering*

*Lodz University of Technology, Poland*



**Dorota Bociaga** is researcher at Lodz University of Technology and oversees the Laboratory of 3DBioprinting and Biomaterials Research (<https://iim.p.lodz.pl/en-EN/laboratorium-biodruku>). She specializes in biomedical engineering and bioprinting. In this area she is an author of articles, co-author of patents and implementations ([https://www.researchgate.net/profile/Dorota\\_Bociaga](https://www.researchgate.net/profile/Dorota_Bociaga)). In her scientific work she uses the experience gained at Bioprinting Lab at Pennsylvania State University (USA, 2019-2020), laboratories of Nanometrics Incorporated, California (USA, 2012), Join Research Centre, Institute for Health and Consumer Protection, Ispra (Italy, 2005, 2006), Eastman Dental Institute, London (GB, 2004), L'Ecole Catholique d'Arts et Métiers – ECAM, Lyon (France, 2003).

She conducts R&D projects and implements their effects since 2003 (the first in the 5th FP of the EU). Between 2008 and 2012 she was a Dean's Plenipotentiary of international projects affairs. So far, she has completed over 20 projects, which were mainly related to the development of thin coatings and biomaterials for the needs of regenerative medicine. Some of them ended with the implementation of the technology and medical devices. In recent years, she has been involved in research related to 3D bioprinting, both in terms of the development of materials dedicated to use as bioink, as well as devices for direct and indirect bioprinting. Currently she conducts the strategic research projects in the field of bioprinting for an urology need. The experience she supports also by knowledge in the field of technology commercialization reached at Stanford University (2012, California, USA) and Polish – American postgraduate studies (2010, University of Lodz and University of Texas at Austin)