

MIEDZYNARODOWE CENTRUM BIOCYBERNETYKI

INSTYTUT BIOCYBERNETYKI I INŻYNIERII BIOMEDYCZNEJ im. Macieja Nałęcza POLSKIEJ AKADEMII NAUK

INTERNATIONAL CENTRE OF BIOCYBERNETICS

at the NAŁĘCZ INSTITUTE OF BIOCYBERNETICS AND BIOMEDICAL ENGINEERING POLISH ACADEMY OF SCIENCES

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157th ICB SEMINAR

NANOPARTICLES AND NANOTECHNOLOGY FOR BIOMEDICAL ENGINEERING, BIOTECHNOLOGY AND MEDICINE

A symposium to address new ways of biomedical research

Location: Nalecz Institute of Biocybernetics & Biomedical Engineering

Polish Academy of Sciences PAS

4 Trojdena Street

02-109 WARSAW / POLAND

Date: October 15-17, 2017

Chairmen: Assoc Prof. Ludomira H. Granicka, Warsaw, Poland

Prof. Wojciech Piątkiewicz, Warsaw, Poland Prof.Dr. Jörg Vienken, Usingen, Germany

PROGRAM OF THE SEMINAR

SUNDAY, 15 October 2017

Arrival of Participants

MONDAY, 16 October 2017

08:30 - 09:15 Registration at IBBE PAS Premises

OPENING OF THE SEMINAR 09:15 – 09:30

WELCOME ADDRESS by Piotr Ładyżyński (Poland)

Director of the International Centre of Biocybernetics

Session I NANOPARTICLES & NANOFIBERS & SURFACE MODIFICATIONS OF POLYMERS FOR MEDICAL APPLICATIONS I

Chairmen: Assoc. Prof. L. Granicka, Warsaw

Prof. W. Piatkiewicz, Warsaw

09:30 - 10:00 Prof. Dr. Mathias Ulbricht (University of Duisburg-Essen, Duisburg,

Germany)

"Advanced polymer-based membranes with tailored barrier and surface

properties"

10:00 - 10:05	Discussion
10:05 - 10:35	Prof. Aharon Gedanken (Bar-Ilan – University, Ramat Gan, Israel) "Making the hospital a safer place by sonochemical coating of all textiles and medical devices by antibactericidal nanoparticles"
10:35 - 10:40	Discussion
10:40 - 11:10	Prof. Dr. Jörg Vienken (Usingen, Germany) "Biomaterials and blood compatibility: Synergies and controversies"
11:10 - 11:15	Discussion
11:15 - 11:45	COFFEE BREAK (30 min.)
11:45 - 12:15	Prof. Witold Łojkowski (Institute of High Pressure Physics PAS, Warsaw, Poland) "Sonocoating of 3D printed scaffolds and nanofibers with nanohydroxyapattite for osteoinductivity of implants"
12:15 - 12:20	Discussion
12:20 - 12:50	Assoc. Prof. Tomasz Ciach (Faculty of Chemical and Process Engineering Warsaw University of Technology, Poland) "Surface modification for medical devices and implants"
12:50 - 13:00	Discussion
13:00 - 14:15	LUNCH BREAK (75 min.)
Session II	NANOSYSTEMS FOR PROCESS REGULATION
(Chairmen: Prof. Dr. J. Vienken, Germany Prof. A. Chwojnowski, Poland
14:15 - 14:45	Assoc. Prof. Ludwika Lipińska (Institute of Electronic Materials Technology (ITME), Warsaw, Poland) "Biomedical applications of graphene: Cancer therapy and tissue engineering"
14:45 - 14:50	Discussion
14:50 - 15:20	Dr. Nizamieva Augul Alfredovna (MIPT Dolgoprudny, Russia) "Conduction pathways in rat cardiac cell culture"
15:20 - 15:25	Discussion
15:25 - 15:55	Prof. Tomasz R. Sosnowski (Faculty of Chemical and Process Engineering, Warsaw University of Technology, Poland) "Dynamic interfacial characteristics of the lung surfactant contaminated by nanostructured particles"
15:55 - 16:00	Discussion

16:00 - 16:30 MSc. Eng Angelika Kwiatkowska (IBBE PAS, Warsaw, Poland)

"DDS for anti-tumour therapies"

16:30 - 16:35 Discussion

TUESDAY, 17 October 2017

Session III NANOPARTICLES & NANOFIBERS & SURFACE MODIFICATIONS OF POLYMERS FOR MEDICAL APPLICATIONS II

Chairmen: Prof. A. Gedanken, Israel

Prof. T. Sosnowski, Poland

Research, Dübendorf, Switzerland)

"Nanoparticles: characterization and surface modification"

09:30 - 09:35 Discussion

09:35 - 10:05 Dipl. Ing. Marc Müller (Leibniz University, Hannover, Germany)

"Electrospinning of nanofibers"

10:05 - 10:10 Discussion

10:10 - 10:40 Dr. Marta Bojarska (University of Duisburg-Essen, Duisburg, Germany)

"Functional modification of filtering materials"

10:40 - 10:45 Discussion

10:45 - 11:15 *COFFEE BREAK (30 min.)*

Session IV SELECTED DEVELOPMENTS FOR FEASIBLE NEEDS

Chairmen: Prof. Dr. T. Graule, Switzerland

Prof. M. Darowski, Poland

11:15 - 11:45 Prof. Dr. Andreas Lendlein (Institute for Biomaterial Research,

Helmholtz Centre, Geesthacht/Teltow, Germany)

"Nanoengineering multifunctional biomaterials"

11:45 - 11:50 Discussion

11:50 - 12:20 MSc Ewa Stanisławek (Institute for Sustainable Technologies, National

Research Institute, Radom, Poland)

"Antimicrobial activity of nanoparticles against biofouling of polymer

membranes"

12:20 - 12:25 **Discussion**

Dr Katarzyna Matusiak (Department of Medical Physics and 12:25 - 12:55 Biophysics, Faculty of Physics and Applied Computer Science AGH, Cracow, Poland) "Temporary and long-term changes occurring in selected rat organs after the exposure to iron oxides nanoparticles with different coatings" **Discussion** 12:55 - 13:00 13:00 - 14:00 LUNCH BREAK (60 min.) FROM INVENTION TO IMPLEMENTATION **Session V** Chairmen: Prof. W. Piatkiewicz, Poland Assoc. Prof. L. Granicka, Poland 14:00 - 14:30 **Prof. Aharon Gedanken** (Bar-Ilan University, Ramat Gan, Israel) "Novel methods (Microwave, radiation, sonochemistry and hydrothermal), reactions for the conversion of biomass to biofuel and fine chemicals" 14:30 - 14:35 Discussion 14:35 - 15:05 Prof. Andrzej Chwojnowski (IBBE PAS, Warsaw, Poland) "Application of 3D membranes for repair of articular cartilage defects" 15:05 - 15:10 Discussion 15:10 - 15:40 Assoc. Prof. Tomasz Ciach (Faculty of Chemical and Process Engineering Warsaw University of Technology) "Innovations: a long way from universities to the market" 15:40 - 15:45 Discussion 15:45 - 16:15 **Prof. Dr. Jörg Vienken** (Usingen, Germany) "The new European Medical Device Regulation (MDR): Stresses, challenges and assets" **Final Discussion** 16:15 - 16:25

Closing remarks by Prof. Dr. J. Vienken, Prof. W. Piątkiewicz and Assoc.

16:25 - 16:35

Prof. L. Granicka