



## Wydział Biotechnologii UR zaprasza na cykl wykładów

W dniach 23-25 kwietnia 2018 r. w Uniwersytecie Rzeszowskim na Wydziale Biotechnologii odbędzie się cykl wykładów dotyczących problematyki syntezy nanomateriałów i ich zastosowań biomedycznych. Serię wykładów wygłoszą Pan Profesor Vadim Kessler oraz Pani Profesor Gulaim Seisenbaeva z Wydziału Nauk Molekularnych, Szwedzkiego Uniwersytetu Rolniczego (SLU) w Uppsali.

Bardzo proszę o kierowanie zgłoszeń elektronicznych na adres [rpazik@ur.edu.pl](mailto:rpazik@ur.edu.pl) do 22 kwietnia 2018 roku. Ilość miejsc ograniczona.

Poniżej znajduje się szczegółowy plan wykładów oraz informacja dotycząca prelegentów

### **Plan of lectures in Rzeszow Professor Vadim Kessler and Professor Gulaim Seisenbaeva**

#### **Monday 23/4 building A0, wing B2, room 167, start at 13:00**

Molecular Mechanisms in the Chemistry of Nanomaterials 2x45 min Lecture

**Abstract.** General principles behind nucleation and growth of solid phases from solutions and from the gas phase will be considered. Regulation of size, shape, crystallinity of metal, metal chalcogenides and metal oxides nanoparticles will be discussed. Opportunities for control of aggregation and chemical behavior will be considered.

Synthesis and application of hybrid nanomaterials, Part 1, 45 min, lecture

Abstract. Hybrid nanomaterials as adsorbents for water cleaning and hydrometallurgy and as biocatalysts will be discussed. Choice and coupling of inorganic and organic constituents, additional functions (magnetic, luminescent) will be analyzed.

#### **Tuesday 24/4 building A0, wing B2, room 167, start at 13:00**

Synthesis and application of hybrid nanomaterials, Part 2, 45 min, lecture



Abstract. Hybrid materials based on biopolymers, in the first hand, nano cellulose as matrix will be presented. Focus will be set on anti-inflammatory patches and transdermal drug delivery application perspectives.

Biocompatibility and nano toxicity 45 min Lecture

Abstract. A discussion of reactivity and interaction mechanisms of nanoparticles with living cells will be presented. Comparison between the effects of natural and engineered nanoparticles made. The examples will be taken from the classes most important for biomedical applications: carbon nanotubes, silica and metal oxides, carbonates and silicates, quantum dots, gold and silver.

Nanomaterials for bio-imaging 45 min, lecture

Abstract. Approaches to imaging in biological systems will be presented. Optical and electron microscopy and NMR imaging as techniques will be discussed. Nanomaterials role as perspective contrast agents will be analyzed.

**Wednesday 25/5 building A0, wing B2, room 179, start at 13:00**

Nanomaterials as drug delivery vehicles 45 min, lecture

Abstract. Application of active and passive release approaches, photodynamic and magnetocaloric therapy approaches using inorganic nanoparticles will be the major topic. Challenges and perspectives in treatment of cancer and inflammation.

Approaches to biocompatible nanomaterials 45 min, workshop

Participants will on Monday divided into smaller groups that will be given a task to look at a family of nanoparticles with potential for biomedical application. An overview of synthesis, properties and applications to be presented in 5 min + 5 min discussion. Possible target materials can be iron oxide, aluminium oxide, titanium oxide, calcium carbonate. Participants can be given 2-3 papers to start their work with.

Informacje o wykładowcach:

**Prof. Vadim Kessler**



Vadim G. Kessler graduated with honours from the Moscow State University (MSU) in 1987 and obtained there his Ph.D. degree in inorganic chemistry in 1990. He was appointed an Assistant Professor at the Department of Inorganic Chemistry MSU. He has made his postdoc on a half-time basis as an Associate Researcher at the X-ray Crystallography Center of the Russian Academy of Sciences in 1990-1991.

He has then spent his first sabbatical year (1992/93) as an associate Researcher of CNRS at the University of Nice with Prof. L.G.Hubert-Pfalzgraf and became an Associate Professor at MSU in 1995. The second sabbatical year, 1995/96, he worked as visiting scientist at the University of Stockholm and moved finally to Sweden appointed an Associate Professor at the Department of Chemistry SLU in Uppsala in 1997.

He received there his Habilitation Degree in 2000 and was promoted to Full Professor at the same University in 2004. He received in 2003 the International Donald Ulrich Award Science in 2006. Currently he is a Head of the Department of Molecular Sciences at SLU.

His up-to-date H index is 32 and he was cited more than 3400 times.

Research interests are broad and cover following area:

- Developing molecular precursor chemistry for the synthesis of nanomaterials.
- Investigation of molecular mechanisms behind the formation and reactivity of nanomaterials.
- X-ray methods for molecular structure determination
- Developing nanotechnology for biomedical and agricultural applications.

## **Prof. Gulaim Seisenbaeva**

Gulaim A. Seisenbaeva received her PhD degree in inorganic chemistry in 1989 from the Moscow State University. She worked in the industries after graduation and was appointed a Senior Researcher at the Moscow State Academy of Fine Chemical Technology in 1993. She made her postdoc work at Stockholm University in 1996. Since 2000 she is Senior Researcher at SLU in Uppsala, where she obtained her Habilitation degree in Materials Chemistry in 2004. Her major research focus is on precursor-directed synthesis and characterization of porous nanomaterials.

Her up-to-date H index is 26 and she was cited more than 2000 times.



## Research interests:

- Synthesis and structure elucidation of molecular precursors
- Precursor directed synthesis of porous materials
- Tailoring functional hybrid adsorbents for water remediation and hydrometallurgy
- Application of porous oxides as alkali ion battery materials

Professor Vadim Kessler together with Professor Gulaim Seisenbaeva will share duties and give short course in bionanotechnology with focus on biocompatible nanomaterials surface chemistry of nanomaterials, bio-imaging, drug delivery issues as well as hybrid materials with emphasize on nano-adsorbents for biomedical applications. The course will start at Monday 23<sup>rd</sup> of April and will last up to Wednesday 25<sup>th</sup> of April.

