

Warsaw Doctoral School in Natural and Biomedical Sciences and the Institute of Organic Chemistry PAS cordially invites you to **Advanced Lecture Series**:

Fluorescent dyes and probes for biological applications

given by

Dr. Andrii Klymchenko

(Laboratory of Biophotonics and Pharmacology, University of Strasbourg, France)

Dr. Andrii Klymchenko was born in Kherson, Ukraine, in 1976. He started research with chemistry and photophysics of new fluorescent dyes, which was a subject of my Ph.D. degree from Kyiv National University in 2003. Then, he worked at the University of Strasbourg in a group of Yves Mely, where he combined the synthesis of new dyes with their bioimaging applications. In 2005, he moved to the Catholic University of Leuven, a group of Steven de Feyter to extend his expertise towards supramolecular chemistry and nanotechnology. He joined CNRS in 2006, received CNRS Bronze Medal in 2010, and was promoted to Director of Research in 2014. He was a recipient of the ERC consolidator grant BrightSens to work on fluorescent nanoparticles for ultrasensitive detection of cancer markers. He co-authored >140 publications.

Agenda: Fluorescent environment-sensitive probes are specially designed dyes that change their fluorescence intensity (fluorogenic) or color (e.g. solvatochromic) in response to changes in their microenvironment polarity, viscosity, and molecular order. The studies of the last decade, including those of our group, have shown that these molecules become universal tools in fluorescence sensing and imaging. In fact, any biomolecular interaction or change in biomolecular organization results in modification of the local microenvironment, which can be directly monitored by these types of probes. Overall, solvatochromic and fluorogenic probes enable background-free bioimaging in wash-free conditions as well as quantitative analysis when combined with advanced microscopy, such as fluorescence lifetime (FLIM) and ratiometric imaging. Our current developments in fluorescent environment-sensitive probes are directed to address the following challenges: (i) improving optical properties, especially brightness, photostability, and far-red to near-infrared operating range; (ii) minimizing non-specific interactions of the probes in biological media; (iii) their adaptation for advanced microscopies, notably for superresolution and in vivo imaging.

LECTURE SERIES: November 16, 2023 (Thursday) – conference room IOC PAS, Warsaw, Kasprzaka 44/52

10:00 – 10:45 Lecture 1: Fluorescent dyes and probes: concepts of molecular design

11:00 – 11:45 Lecture 2: Smart fluorescent probes based on environment-sensitive dyes for biological applications

13:00 – 13:45 Lecture 3: Fluorescent Turn-ON probes based on dye dimers: when two is much better than one

14:00 – 14:45 Lecture 4: Ultrabright fluorescent nanoparticles for biosensing and bioimaging

OPEN LECTURE: *Organic dyes and nanoparticles as smart and bright probes for biological applications*

November 17, 2023 (Friday) – 10 a.m. – aula IOC/ICP PAS, Warsaw, Kasprzaka 44/52

Registration at aleksandra.butkiewicz@icho.edu.pl

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