Minutes from Round table discussion „Future Research Collaboration“

Galerie Kladno – May 28, 2014, 10:00 – 12:30 AM

Participants: Bastl Zdeněk, Bouilloux Jordan, Brůža Petr, Fidler Vlastimil, Hübner Jakub, Chen Yu, Jančárek Alexandr, Jarošíková Taťána, Kapusta Peter, Kučera Pavel, Kuncová Gabriela, Lange Norbert, Lipoldová Marie, Macháň Radek, Mihóková Eva, Mortet J., Müller Matthias, Nevrkla Michal, Pánek Dalibor, Parkman Tomáš, Petrák Václav, Pospíšilová Marie, Rose-Petruck Christoph, Tamáš Martin, Tatíček Milan, Turňová Jana, Vajda Stefan, Vondrová Šárka, Vrbová Miroslava, Vrba Pavel, Zakharov Sergey, Zakharov Vasily

Round table discussion was organized as a closing session of the BOX Workshop 2. The goal was to get suggestions of participants for continuation of the research activated in the frame of BOX project.

Prof. M. Vrbová opened the session and asked the participants coming from the most distant parts of the world to contribute first.

Dr. R. Macháň presented the opportunities of fluorescence lifetime correlation spectroscopy (FLCS). As this relatively novel technique was installed at FBME, it opens up several possibilities for research projects of both master and doctoral students. Master projects are straightforward but to sustain a PhD project, collaboration with biologically oriented group would be needed, e. g., Prof. Čeřovský group from the Institute of Organic Chemistry and Biochemistry ASCR. The FBME team capability lies in the instrumental side of the technique; however, for future development of this topic at FBME, a recruitment of a young biologist or biochemist would be beneficial to say the least as such a person would be able to explore the application possibilities in biomedicine. This opinion was supported by Assoc. Prof. V. Fidler.

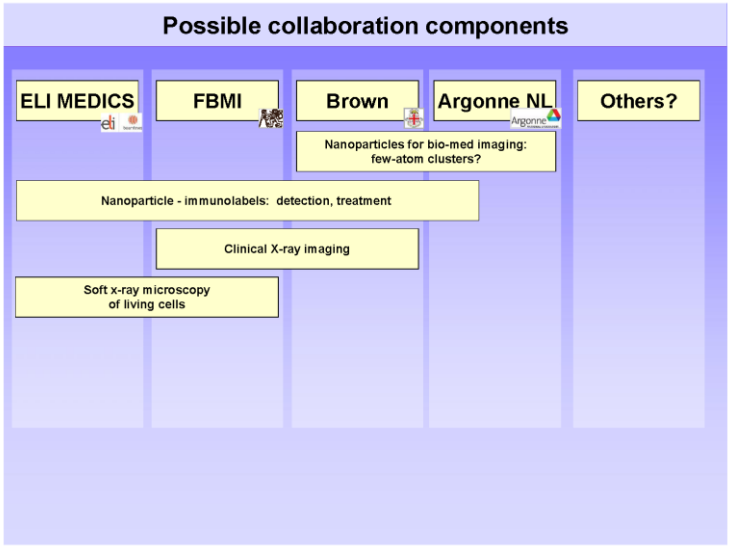
Fluorescence correlation spectroscopy of peptide-membrane interactions suggested as a topic for a PhD student. Membrane permeation can be studied by FLCS at FBME; fluorescence cross-correlation spectroscopy in either in collaboration with Heyrovsky Institute or at FBME if after an upgrade of the current instrument.

Dr. S. Vajda gave a presentation on the research activities of his Nanophotonics research group at Argonne National Laboratory. He summarized the key results obtained with optimized atomic Ag clusters for catalytic and electrocatalytic action in batteries. Dr. Vajda suggested joint doctoral projects between FBME and ANL that would be based on combining biomolecules with clusters. The future research will be focused on the study of cluster interactions with biomolecules.

Prof. C. Rose-Petruck summarized the collaboration of his research group with FBME group. The work consisted of validation of mathematical model for a novel diagnostic imaging technique and recently, there was an effort to introduce this method to clinical practice by modifying current medical equipment. He sees this as one opportunity for future collaboration. Prof. Rose-Petruck further strongly recommended that FBME representatives would explore possible collaboration with Extreme Light Infrastructure project (ELI) which he himself is involved in, as well as P. Brůža from the

FBME group. Several fields for potential collaboration between ELI and FBME were proposed such as SXR microscopy of living cells, radiation damage studies, and particle therapy.

Following scheme of potential cooperation among institutions was suggested. The cooperation of FBME with ELI Medics was stressed in the field of water window interaction with living cells.



Both Prof. Rose-Petruck and Assoc. Prof. Fidler mentioned European program HORIZON 2020. This program should be also followed by FBME representatives.

Doc. Lipoldová added more details about HORIZON 2020

Prof. N. Lange somewhat questioned the advantages of using soft X-rays for cell imaging and what structural information SXR microscopy might yield. A short debate on this topic followed.

Dr. Yu Chen presented the capabilities and research activities of Photophysics group at University of Strathclyde. One of them is oriented on nano-materials such as nanoclusters and nanoparticles and their possible use for cancer diagnosis and treatment. Dr. Yu Chen also gave a brief overview of the Horizon 2020 program. University of Strathclyde and CTU FBME have currently running student exchange program, both sides would gladly continue.

She suggested cooperation between her laboratory with laboratory prof. Vajda on the field “Clusters – x-ray imaging”. The main interest is fluorescence microscopy, nanoprobes for cancers, functionalization of gold nanoparticles, nanoparticle – cell interactions, and treatment of cancer via heat involved by particles.

Dr. V. Mortet and V. Petrák gave an overview of the current activities and future prospects of the group of Prof. M. Nesladek at FBME. The main aim is to design a nano-diamond-based chemical sensor with color-switching as the detection mechanism.

Dr. E. Mihóková from the Institute of Physics ASCR gave a presentation explaining the usefulness and importance of collaboration between IOP and FBME in the research of novel scintillating materials. An application for a joint project concerning novel multiple quantum well scintillators should be submitted, and a topic for a doctoral thesis should be announced.

Prof. P. Kučera (assisted by Prof. N. Lange) presented a not-so-optimistic analysis of the actual research concepts at FBME. He stressed out the necessity to formulate a powerful strategy for research development at FBME and its Department of Natural Sciences and regretted the hesitation of participants to initiate experiments using living systems. He further encouraged to orient the future research in the domain of Photobiology-Photomedicine with respect to promising topics in theoretical studies (modeling of light-tissue interaction and light propagation, photo-acoustic imaging, prediction of phototherapy), experiments (2-photon PD and PDT, X-ray-induced PDT) and technology (new contrast agents, high sensitivity detection). Prof. Rose-Petruck followed with a comment about the lack of “critical research mass” at FBME Kladno and small initiative of the faculty representatives toward research collaborations.

S. Zakharov, based on his broad experience in collaboration with industry he advised to university laboratories, to respect that a company needs marketable product . COST project. Horizon 2020 – calls for nanotechnology (viruses)

M. Lipoldová: Cooperation with FBMI is not fully developed. Bachelor students are not allowed to participate in biological research in the Institute of Molecular Biology. Future cooperation in the frame of master program and PhD program is presumed.

June 15, 2014

Minutes were composed by M.Vrbova, D.Pánek, M. Pospisilova and G. Kuncova