

MSCA-RISE - Marie Skłodowska-Curie Research and
Innovation Staff Exchange (RISE)

FAU - CNR - ICMPP - IDCABN - Lectinotest - UC



Germany - Italy - Romania - Ukraine - United States

01.01.20 – 31.12.24

NoBiasFluors Newsletter 2020 - 2023

Welcome to our first NoBiasFluors Newsletter.

Goal of the project:

Current fluorescent markers suitable for in vivo imaging are large entities with positive or negative charge that could change drug properties. Our project involving four academic and two industrial interdisciplinary teams from four European countries (Germany, Italy, Romania and Ukraine) and United States aims to develop non-biased red and near infrared fluorescent dyes for in vivo imaging that do not affect the properties of labelled drugs. Developed dyes will be tested using representative known drugs for monitoring and analysis of their distribution in vitro and in vivo.

Activities during the reporting period from 2020 until 2023:

The COVID19 pandemic as well as war in Ukraine have curtailed person to person meetings and exchanges of co-workers. Despite these difficulties some visits could be realized that contributed to the overall positive development of the project: for example, the visit of FAU researchers Ms. Insa Klemt and Ms. Marlies Rippl to the group of Prof. Raskatov at Santa Cruz, USA from 30.08.2022 until 30.09.2022. Insa and Marlies have investigated the impact of two clathrochelates (PP and PSpH) on the oligomerization of amyloid β 42 peptide by photo-induced cross-linking of unmodified proteins (PICUP) and subsequent SDS PAGE and silver staining. The fibrillation properties of amyloid β 42 in presence of the clathrochelates were investigated using a TAMRA-labelled amyloid β 42 derivative in a self-quenching aggregation assay. Lastly, the toxicity of amyloid β 42 towards SH-SY5Y in the presence/absence of the clathrochelates was investigated by MTT assay and the uptake of the TAMRA-labeled amyloid β 42 in the presence/absence of the clathrochelates was quantified by flow cytometry.

During the stay, the FAU researchers have also gotten the opportunity to visit a conference of the chemistry & biochemistry department of the University of California Santa Cruz, where all working

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groups and professors presented their research and networking activities took place, which was very beneficial.



Left: Synthesis of peptides. *Middle:* The group of Prof. Raskatov in September 2022. *Right:* free time activity of Ms. Insa Klemt and Ms. Marlies Rippl in USA

We had a very interesting kick-off meeting on 31.01.2020, an excellent midterm-meeting on 21.09.2022 and a productive consortium seminar on 09.03.2023, where all groups of the consortium discussed project progress, dissemination plan, communication activities, administrative issues, a strategy for reducing effects of COVID and the war in Ukraine as well as presented their exciting scientific results. The latter led to a number of peer-reviewed publications (see the list below).

PUBLICATIONS

1. Rostyslav Bilyy, Galyna Bila, Oleg Vishchur, Volodymyr Vovk, Martin Herrmann, *Nanomaterials*, 2020, 1273, doi:10.3390/nano10071273.
 2. Claudia Riccardi, Domenica Capasso, Angela Coppola, Chiara Platella, Daniela Montesarchio, Sonia Di Gaetano, Giovanni N. Roviello, Domenica Musumeci, *Pharmaceuticals*, 2020, 284, doi: 10.3390/ph13100284.
 3. Monica-Cornelia Sardaru, Oana Carp, Elena-Laura Ursu, Anda-Mihaela Craciun, Corneliu Cojocar, Mihaela Sillion, Vladyslava Kovalska, Ionel Mangalagiu, Ramona Danac, Alexandru Rotaru, *Molecules*, 2020, 4397, doi:10.3390/molecules25194397.
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4. Mulliri S, Laaksonen A, Spanu P, Farris R, Farci M, Mingoia F, Roviello GN, Mocci F, *Int. J. Mol. Sci.*, 2021, doi:10.3390/ijms22116028.

5. Valentina Roviello, Domenica Musumeci, Andriy Mokhir, Giovanni N. Roviello, *Curr. Med. Chem.*, 2021, doi:10.2174/0929867328666210201152326.

6. Monica-Cornelia Sardaru, Irina Rosca, Simona Morariu, Elena-Laura Ursu, Razvan Ghiarasim, Alexandru Rotaru, *Int. J. Mol. Sci.*, 2021, doi: 10.3390/ijms22179179.

7. Andrii Rabets; Galyna Bila; Roman Grytsko; Markian Samborskyy; Yuriy Rebets; Sandor G. Vari; Quentin Pagneux; Alexandre Barras; Rabah Boukherroub; Sabine Szunerits; Rostyslav Bilyy, *Archivum Immunologiae et Therapiae Experimentalis*, 2021, doi:10.1007/s00005-021-00607-8.

8. Daria Aristova; Viktoriia Kosach; Svitlana Chernii; Yuriy Slominsky; A. O. Balanda; Valeriy Filonenko; Sergiy M. Yarmoluk; Alexandru Rotaru; Hülya Gizem Özkan; Andriy Mokhir; Vladyslava B. Kovalska, *Methods and Applications in Fluorescence*, 2021, doi:10.1088/2050-6120/ac10ad.

9. Daria Aristova; Roman Selin; Hannah Sophie Heil; Viktoriia Kosach; Yuriy Slominsky; Sergiy Yarmoluk; Vasyl Pekhnyo; Vladyslava Kovalska; Ricardo Henriques; Andriy Mokhir; Svitlana Chernii, *ACS Omega*, 2022, doi:10.1021/acsomega.2c05231.

10. Bila, G., Rabets, A., Bilyy, R. Nano- and Microparticles and Their Role in Inflammation and Immune Response: Focus on Neutrophil Extracellular Traps. In: Stoika, R.S. (eds) *Biomedical Nanomaterials*. Springer, Cham. 2022, doi:10.1007/978-3-030-76235-3_6.

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COMMUNICATIONS

We are committed to sharing new knowledge where ever possible, and protecting knowledge in a manner that is appropriate and necessary to advance the opportunities in developing new dyes for labelling of drugs.

We have initiated two major actions this reporting period to improve the visibility of the consortium and the broader mission of our work.

The first of these is to update and to improve the quality of our webpage: https://www.chemistry.nat.fau.eu/research/euprojects/#collapse_5.

We have also created a Twitter feed and will use this as another means to increase visibility of our brand and our outputs: @NoBiasFluors.
