

---

## Non-biased fluorescent dyes as markers of drugs for optical European Consortium in cellulo and in vivo imaging

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 2023 – 2024

Welcome to the final Newsletter of NoBiasFluors project

### Goals of the project:

**Research** – Current fluorescent markers suitable for *in vivo* imaging are typically large molecules with either a positive or negative charge, which can alter the properties of the drugs they label. Our project, involving four academic and two industrial interdisciplinary teams from four European countries (Germany, Italy, Romania, and Ukraine) and the United States, aimed to develop non-biased red and near-infrared fluorescent dyes for *in vivo* imaging that do not interfere with the properties of labeled drugs. The NoBiasFluors dyes were tested with representative, well-known drugs to monitor and analyze their distribution *in vitro* and *in vivo*.

**Training** – Our consortium provided training in various aspects of the chemistry and biochemistry of fluorescent dyes to over 50 early-stage and experienced researchers.

### Representative activities / important events during the reporting period:

#### **Consortium Meetings**

In addition to regular online meetings involving two or more project partners, *NoBiasFluors* organized a series of in-person seminars throughout 2023 and 2024 at the Friedrich-Alexander University (FAU) facilities in Germany. These gatherings provided valuable opportunities to discuss scientific progress, address administrative and technical matters, and coordinate upcoming training activities.

To foster collaboration and strengthen interpersonal connections, each seminar included at least one non-scientific activity aimed at familiarizing participants with the local culture, history, and traditions. These informal events played a key role in encouraging social interaction and building a friendly, cohesive consortium atmosphere.

Among the memorable highlights was the engaging excursion titled "**The City and the Bier**", led by Ms. Barkei on 20.09.23, which offered a lively and informative tour through the historic center of Erlangen. Another notable moment was a scenic group walk through Erlangen after the scientific part of the meeting on 25.09.2024 that concluded with a traditional dinner at a local *Keller* restaurant, providing a relaxed setting for continued discussion and camaraderie.



Excursion through the center of Erlangen on 20.09.2023: (from left to right) Prof. Dr. I. Fritsky (IDCABN, Ukraine), C. England (FAU, Germany), A. Albrecht (FAU, Germany), Dr. A. Rotaru (ICMPP, Romania), Prof. Dr. A. Mokhir (FAU, Germany), A. Arkhypov (FAU, Germany).



A walk of NoBiasFluors team in Erlangen and a dinner after the seminar on 25.09.2024

A major milestone in the *NoBiasFluors* project was the comprehensive consortium meeting held from February 19 to 21, 2024, where the project's progress was thoroughly reviewed and discussed. Participants included representatives from *NoBiasFluors* partner teams, as well as



the University of California (UC) team led by Prof. Raskatov. In addition, two distinguished guest researchers from FAU—Dr. Eugeniy Kataev and Prof. Dr. Ingrid Span—were invited to contribute their expertise. Dr. Kataev brought valuable insight into the development of fluorescent probes targeting nucleosides and nucleotides, while Prof. Span offered her specialized knowledge in the structural analysis of proteins and their interactions with small molecules. Their participation enriched the scientific discussions and helped explore new directions for future research collaborations.

The project reached its conclusion with a final meeting on December 2, 2024, which not only served to summarize achievements and outcomes but also looked ahead to potential translational opportunities. In addition to the consortium members, two external colleagues from the University Hospital—Prof. Dr. M. Herrmann and Dr. C. Schauer (Section M3)—were invited to take part. Their involvement was aimed at initiating new collaborations focused on the medicinal applications of the fluorescent probes developed by *NoBiasFluors*, laying the foundation for future clinical and translational research efforts.



Prof. Mokhir outlines achievements of FAU within NoBiasFluors project during the meeting on 02.12.2024.

Apart from the meetings and seminars organized by NoBiasFluors, members of the consortium participated in 16 national and international conferences. For example, teams of Lectinotest (Ukraine) and FAU (Germany) presented their studies during SFRR-E Istanbul meeting, June 5-7, 2024 „From Molecules to Tissues: Redox Biology in Action“.



## Training of researchers

Early stage as well as experienced researchers were thoroughly trained in theoretical and practical sessions and by doing NoBiasFluors-related research. We are especially proud that many participants have obtained higher qualifications (MSc, PhD degrees) with help of the training provided by NoBiasFluors. Examples include:

1. Insa Klemt (FAU), who has successfully defended her PhD thesis on **Fe(II)-clathrochelate drugs** in 2023 at FAU.



After successful PhD defence of Dr. Insa Klemt in December 2023. From left to right: Prof. I. Span, Dr. Insa Klemt, Prof. N. Jux, Prof. A. Mokhir.

2. Dr. Agnesa Syniugina (IDCABN), who has successfully defended her PhD thesis on **Intraionic dyes as probes for fluorescence visualization of cells and potential reagents for photodynamic therapy** in 2023 at the Institute of Molecular Biology and Genetics NAS of Ukraine, in Kyiv. Dissertation includes data obtained during the secondment to FAU in the framework of the project NoBiasFluors.

3. Daria Aristova (IDCABN), who has successfully defended her PhD thesis on **Cyanine-based fluorescent probes for biomolecule detection and cell imaging** in 2023 at the

Instituto Gulbenkian de Ciencia, in Oeiras, Lisbon, Portugal. Dissertation includes data obtained during the secondments to FAU in the framework of the project NoBiasFluors.

4. Natalia Roshko, who successfully defended her MSc thesis in 2024 in Kyiv Shevchenko University, Kyiv, Ukraine. The thesis is based on the data obtained during the secondments to FAU in the framework of the project NoBiasFluors.

## **Publications**

Research activities within NoBiasFluors led to 22 peer-reviewed scientific publications (as of 19.04.2025). One more publication is in preparation.

The key results, including **identification of a non-biased red-fluorescent dye for labelling aminoferrocene based prodrugs and drugs**, were published in the following paper:

Svitlana Chernii, Roman Selin, Galyna Bila, Rostyslav Bilyy, Marlies Körber, Andriy Mokhir, Chemistry, Eur. J. 2024, 30(48), e202401107: <http://dx.doi.org/10.1002/chem.202401107>.