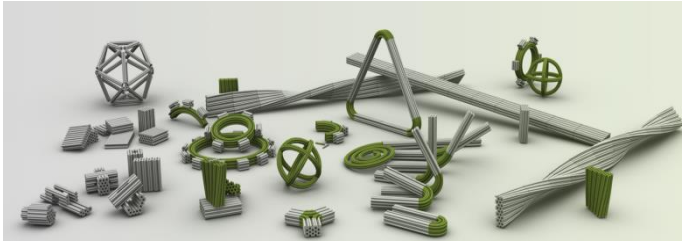


Continuous biosensing of biofluids with DNA origami-based fiber optic technology



Do you want to become part of a dynamic team at KU Leuven settled to unlock the potential of DNA nanotechnology-based continuous optical biosensing? Start now by joining us in the development of this disruptive technology with a multitude of health and pharmaceutical applications.

Project description. For the Biosensors group (www.biosensors.be) of the Department of Biosystems at KU Leuven we are looking for a PhD student to work in the field of bionanotechnology and more specifically on the development of novel DNA nanotechnology-based strategies for continuous fiber optic biosensing.

Healthcare is in demand of technologies for continuous sensing in order to guard the state of patients, based on real-time, precise, and reliable data. Sensors for monitoring patients' heart rate, muscle action, electrocardiography, temperature, blood pressure, and respiratory rate are well known. However, these sensors all rely on physical effects rather than on the underlying biomolecular processes. The ability to continuously observe biomolecular parameters such as peptides, proteins, small molecules, and nucleic acids has the potential to revolutionise health care for monitoring of disease status and treatment effect. Present-day methods and sensors for continuous monitoring are either non-specific, not sensitive enough or too slow. Therefore, novel generic biosensor technologies are needed for the continuous monitoring of biomarkers at nanomolar to picomolar concentrations, in order to observe disease status and treatment effect. This requires an interdisciplinary (molecular engineering, sensing technology, clinical applications) and intersectoral approach (academic, hospital, industry).

The CONSENSE project, funded under the Marie Skłodowska-Curie Action H2020-MSCA-ITN-2020, responds to this need by involving 9 different beneficiaries from 8 European countries and 7 partner organisations to provide an excellent interdisciplinary, intersectoral and international research and training platform in the context of continuous biosensing. Through this project, a new generation of 15 innovative, entrepreneurial and creative early-stage researchers (ESRs) will be trained with knowledge/skills to become the future academic or industrial leaders in this field.

For KU Leuven, as one of the partners in this EU project, we are looking for a PhD student who will be working on the development of innovative optical biosensors based on DNA nanotechnology for continuous monitoring in biofluids. More specifically, the PhD candidate will work on a molecular nanoswitch-based fiber-optic (FO)-SPR bioassays with a focus on: 1) control over the nanoarchitecture of the bioreceptors through 2D and 3D DNA origami structures, 2) integrated aptamer-based molecular nanoswitch concepts and 3) demonstrating proof-of-concept with good stability, specificity, sensitivity and repeatability for continuous monitoring in biological fluids (e.g., serum and blood).

To get more insight into our previous work on the in-house established FO-SPR technology, DNA origami and bioassay development, please visit our website: [Publications – MeBioS \(kuleuven.be\)](#)

Description of the organizational unit. The MeBioS division of the Biosystems Department at KU Leuven investigates the interaction between biological systems and physical processes. The focus of

the fundamental research in MeBioS is on the supradisciplinary field of bionanotechnology, i.e. the technology of biological systems at the nanometer scale. The Biosensors group within the division was founded in 2005 and is headed by prof. Jeroen Lammertyn. The group currently counts 6 postdocs, 23 PhD students and 3 lab technicians. Its fundamental research activities focus on the development of novel bio-molecular detection concepts and miniaturized analysis systems. The applications span a broad range of sectors including food (e.g. pathogen detection and allergenicity screening) and medical diagnostics (e.g. cancer, diabetes, infectious diseases and neurodegenerative diseases). The Biosensors group closely follows the emerging field of biosensing and is active in the following domains (1) bio-assay development (e.g. aptamers, biofunctionalized nanomaterials), (2) optical sensors (e.g. fiber optic SPR sensors) and (3) microfluidics (e.g. lab-on-a-chip technology).

Profile. A PhD candidate should fulfil the following requirements:

- You have a Master's degree *cum laude* in Bioscience Engineering, Biomedical Engineering, Biosciences or equivalent.
- You are, at the time of recruitment, in the first four years (full-time equivalent research experience) of your research career and have not been awarded a doctoral degree
- You have not, at the time of recruitment, resided or carried out your main activity (work, studies, etc.) in Belgium for more than 12 months in the 3 years immediately prior to the reference date
- Starting date is flexible, but you are available for starting before the 1st of September 2021
- You are highly motivated to do research in dynamic environment and as part of this unique EU training program
- You are familiar with general laboratory practices and have hands-on lab skills in at least some of the relevant fields (e.g. optical sensors, DNA nanotechnology, bioassay development)
- You are communicative, creative, eager to learn and able to work independently as well as part of the team
- You have a strong and proven knowledge of the English language, both talking and writing
- You are willing to travel
- You are proficient in Word, Excel, PowerPoint, Teams

Offer. You will be offered an unique opportunity to pursue research in a dynamic and international research team of young people and experienced researchers sharing the same passion for research and development. In addition, you will interact on a regular basis with your colleague PhDs in the framework of the CONSENSE project (www.consense-itn.eu). As a PhD candidate you will be enrolled in the Arenberg Doctoral School at the KU Leuven.

Information and application. More information can be obtained from Prof. Jeroen Lammertyn (jeroen.lammertyn@kuleuven.be) and/or Dr. Dragana Spasic (dragana.spasic@kuleuven.be)

If you are interested in this PhD position and would like to apply, please go to [Vacatures \(kuleuven.be\)](http://Vacatures(kuleuven.be))

Your application can be addressed to prof. Jeroen Lammertyn. Applications must include all of the following: (i) a personal motivation letter, (ii) a *Curriculum Vitae* including the names and contact details of at least two references, and (iii) lists of courses and grades of your BSc and MSc degrees, as originals and as transcripts.

Only complete applications will be considered. Screening of applicants will start as soon as applications are received and will continue until the position has been filled.

Selections will be made regardless of gender, nationality, religion, ethnicity and cultural background.