

Curriculum Vitae Prof. dr. Karolien De Wael

Short CV

Prof. dr. Karolien De Wael is heading [A-Sense Lab](#) (Antwerp Electrochemical and Analytical Sciences Lab) at the University of Antwerp. The A-Sense Lab team counts 20+ experienced postdoc researchers, Ph.D. students and lab technicians and belongs to the Department of Bioscience Engineering of the Faculty of Sciences. A-Sense Lab links to the University's **Centre of Excellence NANOlabor** and the **Industrial Research Fund (IOF) consortium Enviromics** with prof. dr. Karolien De Wael as co-promotor.



Prof. dr. Karolien De Wael obtained her Ph.D. in Chemistry at Ghent University (UGent) funded by the national science foundation (FWO) in 2005. Following an FWO postdoctoral fellowship on “bio-electrochemistry of proteins” at Ghent University, she started as tenure track research professor (analytical chemistry) at the University of Antwerp (UAntwerpen) in 2011. In 2020, she was appointed as **full professor (gewoon hoogleraar)**. In 2021, she was appointed as **Distinguished Visiting Professor** at Universităţii de Medicină și Farmacie „Iuliu Hațieganu” Cluj University in Romania.

From 2017, she is member of the Research Board (BOF-onderzoeksraad) at the University of Antwerp. K. De Wael is also a member of the FWO Chemistry panel since 2019. From 2014 to 2019, she was member of the Young Academy (Belgium).

Since September 2021, K. De Wael is **chair of the Bioscience Engineering Department** (UAntwerpen).

The lab is collaborating with several worldwide leading labs in the field of electrochemistry and analytical chemistry. With over 3600 citations and an H-index 39 (google scholar), prof. Karolien De Wael published over 200 international articles in well reputed journals. In the past 5 years, she received **funding (national and EU) over €14M**. K. De Wael has been promotor of 22 successfully defended PhD's over the past 10 years. The lab has ample experience with patents, including 11 applications of which four were granted.

Spokesperson of A-Sense Lab

The strategic vision of A-Sense Lab aims at a **portfolio of innovative fundamental sensor concepts and technologies** that can be applied in different markets/sectors embracing the idea of responsible research and innovation. Research activities within A-Sense Lab investigate **game-changing strategies for the electrochemical detection of key targets** for industry and society – ranging from pollutants to health biomarkers – to provide affordable and rapid, robust solutions for reliable decision-making processes. **Future end users of the sensing devices are always involved** in the projects performed at A-Sense Lab.

Indeed, today the demand for ultra-sensitive and selective (on-site/in process) detection systems resounds from the health, food and environmental sector. These systems must be able to detect and quantify target molecules, important in point-of-care testing and for assessing the level of contamination in food, industrial and environmental samples. (Photo)Electrochemistry is an inviting approach for monitoring the presence and concentration of pollutants as these devices are fast, portable and extremely sensitive and selective towards (non)electro-active species.

A-Sense Lab **pioneered** singlet oxygen-based photoelectrochemical sensing, offering more precise, sensitive and affordable **diagnostics**, applicable in lab, screening and point-of-care settings to positively impact human society and quality of life. Since the technology developed during this project can be used to detect any nucleic acid sequence, it has the potential to be applied in various fields, e.g. detecting cancer biomarkers, infectious diseases and antimicrobial resistance markers.

Prof. dr. K. De Wael is currently **chair of the Bioscience Engineering Department**, where her managerial skills steer the department towards growth in performance while maintaining a strong educational profile, and operational and interpersonal well-being, based on the **principles of deep democracy**. She successfully guided the department through the transition phase of integrating a new master in the organisational structure of the department.

Five main publications

- 1) **Biosensors and Bioelectronics**, 195 (2022) 113652 (IF=12.545)
Singlet oxygen-based photoelectrochemical detection of DNA.
S. Thiruvottriyur Shanmugam, S. Trashin, **K. De Wael***
- 2) **Biosensors and Bioelectronics**, 197 (2022) 113764 (IF=12.545)
Wearable wristband-based electrochemical sensor for the detection of phenylalanine in biofluids.
M. Parrilla, A. Vanhooydonck, R. Watts, **K. De Wael***
- 3) **Advanced Functional Materials**, 31 (2021) 2107042 (IF=19.924)
Wearable self-powered electrochemical devices for continuous health management.
M. Parrilla, **K. De Wael***
- 4) **Sensors and Actuators B: Chemical**, 248 (2021) 130 659 (IF=9.221)
Enhanced electrochemical detection of illicit drugs in oral fluid by the use of surfactant-mediated solution.
M. Parrilla, F. Joosten, **K. De Wael***
- 5) **Journal of the American Chemical Society**, 142 (2020) 19622 (IF=16.383)
Do aptamers always bind? The need for a multifaceted analytical approach when demonstrating binding affinity between aptamer and low molecular weight compounds.
F. Bottari, E. Daems, A.M. de Vries, P. Van Wielendaele, S. Trashin, R. Blust, F. Sobott, A. Madder, J.C. Martins, **K. De Wael***

Other scientific output and impact

Coordination of the EU RIA BorderSens project (nr. 833787), ERANET-RUSPLUS plasmon electrolight project and an interuniversity BOF project SOCan

Organizer of BES2022 in Antwerp, the SMOBE meetings in Antwerp and three Nature Communications papers in the field of bio-electrochemistry

A-Sense Lab is a [fully equipped lab](#) and a [complete list of projects](#) can be accessed via our website.