# ELECTROSENSORS

## 1. Course title

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| **Electrochemical sensors in the field of pharmaceutical and biomedical analysis** | **ELECTROSENSORS**<br><br>**https://learning.educalliance.eu/course/view.php?id=108** |

## 2. Project leader

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| **First name / Family name** | **Marie Laurence ABASQ** |
| **University** | University of Rennes 1 |
| **Faculty / Department** | Faculty of Pharmacy |
| **Position** | Maître de Conférences |
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## 3. Project partners

| First name / Family name | University | Faculty / Department | Position | Email |
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| **Sándor/Kunsági-Máté** | University of Pécs | Faculty of Pharmacy/Institute of Organic and Medicinal Chemistry | associate professor | sandor.kunsagi-mate@aok.pte.hu |
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## 4. Pedagogical engineer :

Rozenn Joufflineau

University of Rennes 1

## 5. Course objectives

In this teaching unit, we wish to introduce to the students the main electrodes (selective electrodes, oxygen sensor, glucose biosensor…) and the principles of the electrochemical methods used in the field of pharmaceutical and biomedical analysis. We focus on the enzyme electrochemical biosensors, notably the glucose biosensor, and on the ion selective electrodes, e.g. calcium. These electrodes are used in the blood glucose and in the blood gas detections (*Rennes contribution*).

To get deeper insights into the basic processes of several biosensors, thermodynamics and kinetics of weak molecular interactions are discussed in detail. Examples of host-guest interactions of bioactive guest molecules with cavity-shaped hosts (cyclodextrins, calixarenes, cavitands, cucurbiturils) and their immobilization onto the glassy carbon or platinum electrode surfaces by electro-polymerization are presented (*Pécs contribution*).

## 6. More information

We offer self-study sessions with videos, additionnal documents and two synchronous online sessions in order that the students acquire good knowledges in electrochemical sensor uses. We also recorded practical videos of the concepts developed in the theoretical courses. Moreover, the students work on a bibliographic project in mixed teams of 2 or 4 students.

The validation of this teaching unit consists in the submission of a powerpoint with sound on the project (2 ECTS credits and an EDUC certificate are issued).

At the University of Rennes 1 (Faculty of Pharmacy), this teaching is offered to 4th year students (industry sector) https://pharma.univ-rennes1.fr/dfasp. This course is compulsory.

At the University of Pécs (Faculty of Pharmacy), this teaching is offered to 3rd to 5th years pharmacy students. This course is optional.

Schedule: the next session will take place in the second semester 2023

## 7. Expected benefits/ Perspectives

Students will acquire the general principles of the use of electrodes in pharmaceutical and biomedical analysis in an original format. They also learn to work online in teams with students from another site. This specialized teaching in the field of electrochemical biosensors, rarely offered to pharmacy students, has added value thanks to the collaboration of teachers who are experts in electrochemistry and have complementary skills.

As a prospect, this teaching unit could be offered to other pharmacy students in the EDUC alliance, and perhaps also to medical students.

Professors from other universities in the EDUC alliance are most welcome to participate by complementing the course with their expertise in this field.