

Biomolecular diagnostic and DNA technologies

 **ECTS**
3 crédits**Etablissement(s)**
UFR Chimie,
UFR des
Sciences
fondamentales
et biomédicales**Volume horaire**
18h**Période de
l'année**
Semestre 3

En bref

- **Langue(s) d'enseignement:** English
- **Forme d'enseignement :** Cours magistral
- **Ouvert aux étudiants en échange:** Non

Présentation

DESCRIPTION

This class will address the topic of biomolecular diagnostic and DNA Technologies. This course will first describe the physico-chemical basis of gold standards bioanalytical techniques (immunoassays; nucleic acids assays; enzyme-based assays) and different strategies for signal amplification in association with highly sensitive analytical methods will be presented. In particular, a focus will be made on nucleic acids that are targets of choice for molecular diagnostics but also building blocks in numerous nanobiotechnologies.

The course will include the following sequences:

- General concepts and definitions of biomolecular diagnostics
- General strategies for signal amplification
- Gold standard techniques + case studies (ELISA, PCR, Western blot, sequencing)
- Isothermal methods for nucleic acid detection (RPA, RCA, LAMP NEAR, HCR...)
- Measurement formats (plates, lateral flow, droplets, microfluidics) and reading modes (fluorescence, colorimetry, electrochemical, other...)
- Digital measurements and high throughput methods (microarrays, sequencing, ...).
- CRISPR-based technologies (DETECTR or SHERLOCK as case study)
- Molecular computation for classification (context and history, logic gates, neuromorphic computation)
- DNA nanostructure (junctions, origami, DNA bricks). Therapeutic applications (drug delivery, theranostics, virus deactivation)

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- Enzymatic biosensors and electrochemistry of redox enzymes.
- Case studies

HEURES D'ENSEIGNEMENT

Biomolecular diagnostic and DNA technologies

Cours Magistral

18h

PRÉ-REQUIS OBLIGATOIRES

Notions in structure of biomolecules

En bref

CONTACTS

Responsable pédagogique

Francois Mavre

✉ francois.mavre@u-paris.fr

LIEU(X)

➤ Campus Saint Germain des Prés

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