

## **Module: Biodrugs, Bioinformatics, Development**

**Module coordinator: Stephanie Germon**

### **Module outline :**

This module will be the focus of vaccines or biotherapeutics such as therapeutic antibodies and their use as therapeutic tools to fight infectious diseases. The different processes of development from the bench to the final product (molecular modeling, drug design using bioinformatic tools, clinical studies, patents) will be taught.

### **Topics**

#### **Vaccines :**

- History of the vaccination

- Presentation of the different types of vaccines (live attenuated, inactivated, subunits, DNA etc)

- Viral vectors (lentivirus, AAV, poxvirus, adenovirus)

- Introduction to adjuvants used in vaccination (alum, emulsions, liposomes etc)

#### **Innovative therapies :**

- Therapeutic antibodies : introduction, optimisation (from bench to the benchside), other formats of antibodies (ScFv, diabody), camel antibodies

- Phage therapy

#### **Bioinformatics tools :**

- Bioinformatic tools for drug development

#### **Development :**

- Preclinical and clinical studies (animal models, methodology), Registration procedures for vaccines and monoclonal antibodies, Pharmacovigilance, Patents

### **Learning : 5 ECTS**

- Lectures: 50h

- Tutorials: 10h

- Independent work: 65h

### **Assessment**

- 50% Test

- 25% Review of a research paper

- 25% Resolution of practical exercises