



### Bayesian Methods for Biomedical Research (BAYES)

From 16<sup>th</sup> to 18<sup>th</sup> June 2025 (3 days)

**Location:** Isped, Carreire campus  
University of Bordeaux

#### Training fees :

**Individual participation:** €360

**Institutional participation:** €900

#### Coordinator:

- Boris HEJBLUM

### Objectives

- › Understand and assess a Bayesian modelling strategy, and discuss its underlying assumptions
- › Rigorously describe expert knowledge by a quantitative prior distribution
- › Perform a Bayesian regression using R, applied to meta-analysis
- › Put into perspective the results from a Bayesian analysis described in a scientific article

### Program

- › This course provides an introduction to Bayesian tools, with an emphasis on biostatistical applications, in order to familiarize students with such methods and their practical applications.
- › We will cover the following topics:
  - Bayesian modeling (prior, posterior, likelihood, Bayes theorem);
  - Bayesian estimation (Credibility Intervals, Maximum a Posteriori, Bayes factor);
  - Bayesian applications to meta-analyses;
  - Practical Bayesian Analysis with R and JAGS softwares;
  - Critical reading of medical publications. All concepts will be illustrated with real-life examples from the medical literature.

### Requirements

To be able to follow this course, participants need both:

- › Some knowledge in statistics (most notably some familiarity with usual probability distributions, probability density functions, confidence intervals and Maximum Likelihood Estimation)
- › A practical knowledge of R programming (especially functional programming, for loops and "if" statements, vector allocation, linear regression).