# Biomechanics and micro hydrodynamics

ECTS credits
1 credits

## In brief

**Course langage:** French

# Presentation

## Learning objectives

- Understand the complexity of the characteristics and functioning of living environments.
- Predict and analyze mechanical phenomena in the living world to bring new insights from mechanics to health issues.
- Know how to identify the key mechanisms and choose the right models according to the problem considered for living environments.
- Acquire and master certain modeling and characterization tools for living environments.

## Description of the programme

The objectives of the program will be conceptualized during an introductory talk that will present the pedagogical motivations. Some examples of articulation: biological system, functioning, pathology, modeling, diagnosis, and therapy will allow the medical and mechanical contexts to be linked. The medical context will be addressed by a clinician experienced in clinical research activities. The courses on characterization, modeling of biological tissues and fluids, and fluid-structure interactions will be taught by teacher-researchers specializing in the field. They will be declined after explaining their contribution in relation to the examples of articulation. Within the framework of a project, various scientific articles directly related to the courses will be proposed to the students in order to allow them to apprehend the scientific research. Finally, a practical work that will be a concrete application of the courses will be proposed.

## Generic central skills and knowledge targeted in the discipline

- Understand and simplify a complex biomechanical problem.
- Be able to propose appropriate solutions.
- Understand how to structure their work in a time.

- Be able to report on one's work both orally and in writing.

## How knowledge is tested

CC : QCM at the beginning of each course, writing of TP reports, bibliographic analysis, proctored exams, 100%

## Bibliography

1. Fung, Y. C. (1993). *Biomechanics: Mechanical Properties of Living Tissues, Second Edition* (2nd ed.). Springer.
2. Humphrey, J. D. (2002). *Cardiovascular Solid Mechanics: Cells, Tissues, and Organs* (2002nd ed.). Springer

## Teaching team

Cécile Baron (CNRS-IRPHE)

Olivier Boiron (ECM)

Carine Guivier-Curien (AMU)

Valérie Deplano (CNRS-IRPHE)

A practicing clinician

## Sustainable Development Goal



Access to health

| | | |
|---|---|---|
| **Total des heures** | | **24h** |
| CM | Master class | 15h |
| TD | Directed work | 6h |
| TP | Practical work | 3h |

# Useful info

## Name responsible for EU

**Lead Instructor**
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