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Summary

Living organisms evolve in a physical world. Mechanics, electricity and light shape the function of cellular features. In this course, we will use physics to describe the behavior and function of living systems. We will particularly focus on how cells generate, sense and respond to forces.

Content

- Numbers and estimates in biology
- Life at low Reynolds number
- Biopolymers
- Cytoskeleton
- Membrane mechanics
- Molecular motors
- Ion channels
- Bioelectricity
- Multicellularity and biological patterns

Keywords

- Physics
- Biology
- Back of the envelope calculations
- Mechanics
- Cells

Learning Outcomes

By the end of the course, the student must be able to:

- Quantify forces in biological systems
- Identify mechanically sensitive elements in a cell
- Integrate their engineer knowledge in biology

Assessment methods

Written exam

Supervision

- Office hours: Yes
- Assistants: Yes
- Forum: Yes
Resources

Bibliography

Physical Biology of the Cell (Rob Phillips, Jane Kondev, Julie Theriot)
Ressources en bibliothèque
• Physical Biology of the Cell / Phillips

Notes/Handbook
The instructors will provide class notes