Faculty of Eng. & Natural Sci.

BIO407-202101

Multicellular Organization

Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
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Course Content

The mechanisms that underlie development of multicellular organisms from C. elegans to humans will be examined. Cellular differentiation and its genetic and molecular control; fertilization, cleavage and morphogenesis of plants and animals; cell motility; polarity and positional information; developmental basis of evolution.

Objectives

Refer to the course content.

Recommend or Required Reading

Readings

Scott F. Gilbert Developmental Biology, Sinauer Associates, Inc.

Assessment Methods and Criteria

	Percentage(%)	Number of assessment methods
Midterm	60	2
Exam		0
Term-Paper	40	1

Course Outline

Week Subject
1 The Anatomical Tradition
2 Life Cycles and the Evolution of Developmental Patterns
Principles of Experimental Embryology
3 Genetic Core of Development
4 Cell-cell Communication
5 Fertilization
6 Early Development in Selected Invertebrates
7 The Genetics of Axis Specification in Drosophila
8 Amphibians and Fish / Birds and Mammals
9 The Emergence of the Ectoderm
10 Neural Crest Cells and Axonal Specificity
11 Paraxial and Intermediate Mesoderm
12 Lateral Plate Mesoderm and the Endoderm
13 Sex Determination
14 Postembryonic Development

Learning Outcomes

Understand the main principles of gene and genomes in unicellular and multicellular organisms
A better understanding the main methods to study nucleic acids and proteins in gene regulation
Evolution of prokaryotic and eukaryotic organisms
Have knowledge on the basic principles of cell division, apoptosis, cell differentiation
Master the basic knowledge about the genetic principles involved in the design and maintenance of an organism