Developmental Biology

Syllabus Number 5J267

Special Subjects
Elective 2 credit

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1. Course Description

This course introduce scientific knowledge widely through the development of organisms. The first lecture of this course will review “cell differentiation” and “body axis planning” including basic high school level biology. Latter lectures will review “embryology by epigenetic regulation“. In the latter series of lectures, we will invite some researchers from other institutes to give some talks on their investigations.

2. Course Objectives

An organism transforms itself from an egg to individual by regulating “ cell differentiation ”. This very strict mechanism is controlled by the time axis. In this series of lectures, the concept is based on classic embryology, and the gene expression control and the environmental factors that have developed in recent years. The goal of these lectures are "Being able to explain the initial process of generating of a stem cell”.

3. Grading Policy

Intermediate test(30%)
Comprehensive test(50%)
report(20%)

4. Textbook and Reference

5. Requirements(Assignments)

6. Note

7. Schedule

[1] Introduction: Animal Development and Darwin's Theory of Evolution
[2] Concept of cell differentiation - totipotency and pluripotency
[3] Formation and fertilization of gametes
[4] Cleavage and blastula/ blastocyst
[5] Formation of triploblastic to the organs 1: Determine the information of positions in the body
[6] Formation of triploblastic to the organs 2: Why is the heart on the left?
[7] Formation of triploblastic to the organs 3: Where did the snake's legs gone?
[8] Intermediate test
[9] Nervous system development
[10] Abnormality due to environment - malformations, endocrine disrupting substances
[11] Environmental factors and normal occurrence - Can the environment control the occurrence?
[12] Speed of development and ability to regenerate
[13] control embryo? - Can we regulate the life of embryos
[14] Special lecture
[15] Comprehensive test and feedback