

Course title: Stem Cells and Development
JM 206 (Aug) 3:0 Credits course

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Stem cells and Development

1. Content of the course (see below)
2. starting date : 17.8.2010
3. Ending date : 09.12.2010
4. timing : 11:00am to 1:00 pm
5. Days of the week: Tuesday, Thursday
6. Venue : JNC Seminar room III

Stem cells and Development:

This introductory course to stem cells and developmental biology has no prerequisite. It will substantially cover the material in two very good texts, Developmental Biology, Eighth Edition by Scott F. Gilbert and Principles of Development by Lewis Wolpert. In addition material from several reviews and research papers on various aspects of stem cells will be referred to. The aim is to take the student from classical experiments that began the mechanistic understanding of embryology to our current view of how animals develop- The latter understanding coming with the continued application of genetics and cell- and molecular- biology techniques. We will also discuss the use of stem cells in addressing questions in developmental biology and the promise of stem cells for regenerative medicine, biotechnology and the pharmaceutical industry. The topics that will be covered are:

1. History of- and introduction to- experimental embryology, genetics and evolution.
2. Genetics and development
3. Development and the regulation of gene expression, epigenetic, mechanisms, micro RNAs and development
4. Mechanisms of short- and long- range signaling.
5. Early embryonic development.
6. Appendage development and roles of Hox genes in animals.
7. The early development of the vascular, immune and nervous systems
8. Differentiation of the vascular, immune and nervous system.
9. Sex determination, the germline, stem- cells.
10. Embryonic Stem Cells
11. Adult and Fetal Stem Cells
12. Tissue Engineering and Clinical Applications
13. Regenerative Medicine

Kindly order two copies each of the following books for the course on “Stem Cells and Development” that I will teach in the August 2010 semester.

Principles of Development

Third Edition

Lewis Wolpert, Jim Smith, Tom Jessell, Peter Lawrence, Elizabeth
Robertson, and Elliot Meyerowitz

576 pages | 650 figures, colour and halftone illustrations | 268x204mm

978-0-19-927536-6 | Paperback | 03 August 2006

Developmental Biology, Ninth Edition

Scott F. Gilbert

April 12, 2010

711 pages, 699 illustrations