Teaching Goals: To provide students with an overview of the processes involved in normal and abnormal animal development at the tissue, cellular and molecular levels focusing on terms and concepts, experimental approaches and the evolution of ideas and directions in developmental biology.

10/7/04 Lecturer: Jan Ryerse, Ph.D.
The Early Stages of Embryonic Development
- Fertilization and species specificity
- Block to polyspermy
- Cloning
- Cleavage
- Implantation

10/8/04 Lecturer: Jan Ryerse, Ph.D.
Primary Embryonic Axis Formation
- Gastrulation in amphibians and mammals
- The primary embryonic organizer
- The Nieuwkoop center and the molecular biology of the organizer
- Primary embryonic axis formation in humans
- Neurulation – the process, the molecular biology and what happens when it goes wrong

10/11/04 Lecturer: Jan Ryerse, Ph.D.
Organogenesis
- Development of the eye
- pax6 and eye development
- hedgehog and cyclopia
- Development of the limb
- The apical ectodermal ridge, the progress zone and the zone of polarizing activity

10/12/04 Lecturer: Jan Ryerse, Ph.D.
Pattern Formation
• The gradient, polar co-ordinate and boundary models
• Embryonic development in Drosophila
• The F2 screen
• Identification of developmental mutants in Drosophila


10/13/04 Lecturer: Jan Ryerse, Ph.D.
Developmental Genetics of Pattern Formation in Drosophila
• Maternal effect and zygotic genes
• General principles of gene expression in embryonic development
• Primary embryonic axis specification in Drosophila
• bicoid as a model morphogen


10/14/04 Lecturer: Jan Ryerse, Ph.D.
Segment Formation and Patterning in Secondary Embryonic Fields
• Development of segments and segment polarity genes
• The homeotic selector genes and determination of segment phenotype
• Molecular genetics of leg and wing development in Drosophila


10/15/04
Study Day

10/18/04
EXAM 9:00 am to Noon, location TBA

Students will be provided with a detailed handout of the lecture material on the first day of lectures. Background reference material can be found in Developmental Biology, 6th edition by Scott Gilbert and in Principles of Development by Lewis Wolpert both of which are on reserve in the Medical School library. There is a copy of Gilbert in the reading room in the BBS office on the second floor of the Medical School and JR has an extra copy of Wolpert.