BIOL4207 - Advanced Embryology & Developmental Biology - Fall term, 2020

Do you ever wonder how you turned out so perfect? Or how a single cell zygote, formed as a result of fertilization, develops into a functioning body? If you were an alpine newt, it would look something like this:
https://aeon.co/videos/watch-a-single-cell-become-a-complete-organism-in-six-pulsing-minutes-of-timelapse











These are centuries old questions, the answers to which have been both the traditional source of the majority of our knowledge on the processes that determine organismal anatomy (including humans), and also continue to be invaluable in more immediate fields, such as assisted reproduction technology, and stem cell biology, as well as wider questions of human health and disease.

The success of these disciplines has been based around simple animal models, whose developmental processes are readily accessible, and which are for the most part faithfully recapitulated in higher order organisms. For example, the events of fertilization can be observed using Sea Urchin; early cell cleavages can be readily observed in real-time using Xenopus, and their development can be compared with that of the Zebrafish to look at amphibian versus fish differences. Organogenesis is readily accessible and manipulated in developing chick embryos; and the humble flatworm, the Planarian, can be used to examine the remarkable processes of regeneration that occur in many lower order organisms and for which there remains a significant research interest from a human health perspective.

Delivering the course online:
During this year's course we will use a combination of online workshops, recorded demonstrations, and interactive online tutorials to examine all of these processes. We will discuss some of the historical data that forms the foundation of the discipline, and also some of the newest findings that continue to push our understanding of these most fundamental phenomena.

For videos of some of the past experiments we have run in the lab, check out our YouTube page:
https://www.youtube.com/channel/UCUr4C88pxBKIwVTOZrXRnOg?view_as=subscriber

Prerequisites: BIOL3201 - Cell Biology, or BIOL3202 – Principles of Developmental Biology, or permission of the Department.

Text: No assigned textbook. Readings assigned from journal articles.

Time: Labs/Workshops – Mondays from 11:35 – 3:25pm; Tutorials - Fridays, 1:35PM-2:25pm

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