

Comments and Study Questions for Campbell, Ch. 47

General Biology 2
Spring 2008

General Comments: There is a lot of detail in this chapter that we need not be concerned with; it is very interesting from a comparative viewpoint (comparing development in different species with different types of eggs and fertilization). On the other hand, there are many very important terms that will be useful in our course in also in your other endeavors (e.g., MCAT, professional school). In the guide below, I have tried to restrict the questions and terms to what will be most useful to you now and in the future.

Terms (sorry there are a lot of these but all are important): preformation vs. epigenesis (define, compare and contrast); cell differentiation & morphogenesis (define, compare and contrast); deuterostome; fertilization: acrosome, polyspermy, zona pellucida; general embryology: cleavage, morula, blastocoel, blastula, blastomere, animal vs. vegetal pole in amphibians, gastrula, archenteron, germ layers, blastopore, mesenchyme cells in embryos, coelom, notochord, neural tube, somites; mammalian development: blastocyst, trophoblast, inner cell mass, epiblast, hypoblast; embryonic membranes: chorion, allantois, yolk sac, amnion,; cell adhesion molecules, fate mapping, totipotency, organizers

Questions and suggestions for reading:

Comment: Note that many of the ideas covered in the previous assignment on the genetics of development will re-emerge in this section. Try to use these new references to cement and depend your understanding of the mechanisms that control development.

1. Reflect on the profound differences between the idea of preformation and epigenesis - there are echoes of this notion in the debate in our society in regards to abortion and right to life. One camp clearly believes that human life begins with conception and the other believes that human life is more gradually attained. Think about the relationship between science (based on philosophical materialism) and religion (typically based on vitalism). For your own benefit, try to understand all sides of this argument (we can talk about it in review sessions or office hours but you will not be tested on it).
2. Read the section on fertilization with care? What is polyspermy and how is it prevented or reduced in mammals? What is the role of the acrosomal vesicle? From which parent is the centrosome inherited? Where does it come from and what is its role in a cell (last semester)?
3. Read pp 992 to the end of the chapter with two goals in mind: terms and some appreciation for the intricacies of development. We will cover the relevant parts in class (but not all of the terms).