Problem set 6

1. Define gastrulation. What is the major structure formed during this process?

2. What do the three germ layers differentiate into?

3. Define neurulation and describe its process. Draw a midline cross section of the structures (with proper labels) formed at the end of the neurulation process. Please label the dorsal and ventral sides.

4. What are the roles of noggin, chordin, and BMP-4 in neural induction?

5. Describe in detail the Spemann-Mangold experiment. How did these results argue for and help formulate the concept of neural induction?

6. What molecular biology blotting techniques were discussed in class?

7. If you need spatial resolution of expression levels (i.e. where a given gene is transcribed), which technique would you use. Explain.

8. One of the genes discussed in class, Sevenless, encodes a Receptor Tyrosine Kinase, a component of one of the major signaling complexes that transduce membrane receptor events to the nucleus. Draw the signaling pathway initiated by the activation of the Sevenless receptor.

9. What is the role of Notch and Delta signalling in determining neuronal fate?