

MCB 231 Assignment 2
Due Friday April 27, 2007 by 10 am (earlier is fine!)

In lecture, Mike Levine said that if he “were a young developmental biologist, he work on visualizing extracellular morphogens”. For this assignment, you will take his advice.

Assignment #2

(1) Review what we know about how extracellular morphogen gradients are shaped, citing evidence from the literature to support your statements. A suggested pathway to focus on is the Dpp (BMP) pathway in flies, although you are welcome to use examples from other pathways (Hh, FGF, Wnt) to support your statements. Novel ideas about how gradients might be shaped are welcome, but briefly state how you might investigate them if there is no supporting evidence in the literature. Your answer should include a brief description of the methods currently used to detect morphogen gradients.

(2) Using this knowledge and your own creative ideas, design a novel method to visualize a morphogen gradient in live embryos (vertebrate or invertebrate, your choice). You can have fun here, but your creativity should be based in reality. For example, if you need an antibody for your technique, you can assume that one can be made, but it would be unrealistic to propose using genetic strategies in elephants. Please include controls (and expected results) that you would use to indicate that your method was accurate.