CER Technology Fellowship Program –2008

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Project Title: An Interactive Map of Developmental Biology

Audience: The Interactive MapTool for Developmental Biology will be a useful resource for students taking the Developmental Biology course. It may also be useful for the graduate Developmental Biology course for review of basic concepts, and there may be sections of interest to General Biology students.

Pedagogical Issue: Students in Developmental Biology currently learn the course material through lectures with faculty using a chalkboard and an associated textbook as a guide. To give students greater access to lecture materials and to enhance the textbook material, additional resources should be made available to the students 24/7. Animations are a component which could be developed to enhance student understanding of developmental biology concepts.

Solution: To give students access to Developmental Biology course enhancements 24/7 the Interactive MapTool developed by the Center for Educational Resources will be utilized. The use of the MapTool will allow the instructors to organize ancillary course materials as they see fit and provide a repository for the course learning aids. These aids may be postings of PowerPoint slides, images and videos organized by discrete sections or topics within Developmental Biology. The tool may also be used by students to submit a final assignment on some aspect of Developmental Biology utilizing web and textbook resources.

Technologies Used: Animation, Courseware (WebCT), Digital Audio, Digital Video, Graphic Design, HTML/Web Design, Macromedia Flash

Project Abstract: Developmental biology explores the complex processes by which a group of identical cells proliferate and differentiate to give rise to an organism. This involves different patterning events on multiple axes at several time points. In this course, students learn the details of different patterning processes separately; to understand developmental biology, they must be able to visualize how these processes affect the embryo and coordinate with the rest of development. We propose to provide students with a holistic representation of developmental processes, in a way not attainable using traditional lecture methods.

We will use Adobe Flash to create interactive animations of developmental processes, providing clear visualizations and descriptions of the physical events covered in lecture—which are often difficult to portray clearly in static images. For instance, developing embryos have multiple cell layers with different properties. Using Flash, students will be able to toggle each layer in the animation and observe the effects of the patterning events. Using the CER's Interactive Map tool, graphics, text notes, links to papers, and videos will be compiled to create easily-navigated online documentation which students can access through the Hopkins website.

Rather than learning information linearly, students will be able to consult the interactive tool to understand how the lecture material integrates with the rest of the course, and access supplemental illustrations and resources not presentable in lecture format. This documentation will structure the course content and allow the professor to designate additional material and online assignments. Therefore this tool will provide a valuable backbone with which students can organize their knowledge of development.