



Putting It Into Action: Visualizations

Subject Number: 7.06

Instructors: Frank Solomon & Adam Martin

DLS: Mary Ellen Wiltout

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Subject Name: Cell Biology

Overview

Students need to understand laboratory procedures and the logic and analysis that inform research, so they can fully understand scientific research papers as well as generate and present similarly constructed arguments. Video animations help effect deeper understanding of the experiential and procedural components of biological research.

Educational Challenges

Problem: How do we get students in 7.06 (Cell Biology) to understand and apply experimental techniques and experimental design in a lecture-based course, when they have not had the experience in a lab?

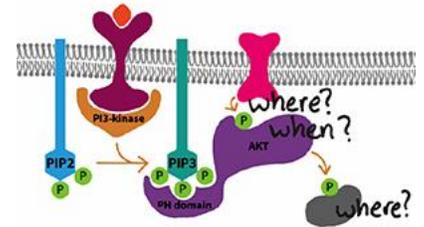
Solution: With Professors Solomon and Martin, Drs. Wiltout and Thornton created short video animations designed specifically for 7.06, based on relevant research papers. Hosted on MITx, each video included follow-up questions to gauge comprehension and promote active learning. In addition, students could submit 'mud slips' detailing the muddiest (i.e. most confusing) area of any course material. Instructors used popular mud slips as springboards for follow-up clarification in class as well as supplied answers to all mud slip questions on the discussion board. Results:

- High level of student engagement and approval: 100% of students used the videos and questions, even though they were optional.
- Student feedback: "The videos and discussion questions help a lot: [with] improved understanding and... the ability to think about experimental design, controls, and how results can be interpreted."
- Professors observed increased engagement in scientific thinking in the students as a result of these videos.

Key Take-Aways

Videos provide a media-rich window into scientific procedures and processes. They "impacted... how students look at a biological problems. [Students] were thinking like cell biologists." - Professor Adam Martin.

If you are interested in using the concepts from this case study in your teaching, please contact [MITx Residential](#) to speak with a consultant.



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MITx Biology resources:
web.mit.edu/mitxbio/

Education Express article:
bit.ly/1NncdFb

MITx Biology team receives award:
bit.ly/1k0EbOo