

University of Massachusetts

Engaging Students: Lecture to Lab

Introductory Biology for Life Science Majors

- 2 Semester Sequence: 750-1000 students
- 2-3 Traditional Lecture Sections/semester
- 1-2 instructors/section

Redesign:

- ↑ Student engagement, attendance and success
- Online Preparation to support Active Learning

Course Redesign: Histology Laboratory Experience

Before:

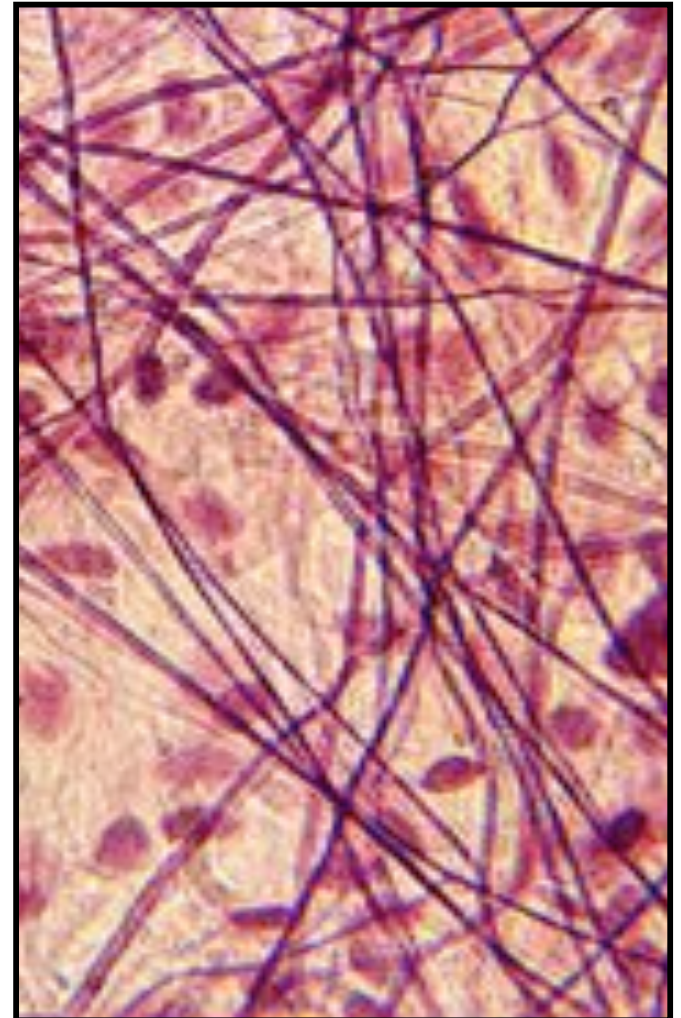
Traditional Histology Lab

Observe prepared slides

Assessment: Practical Exams

Low student engagement

Limited student interaction



Histology: Student Ownership

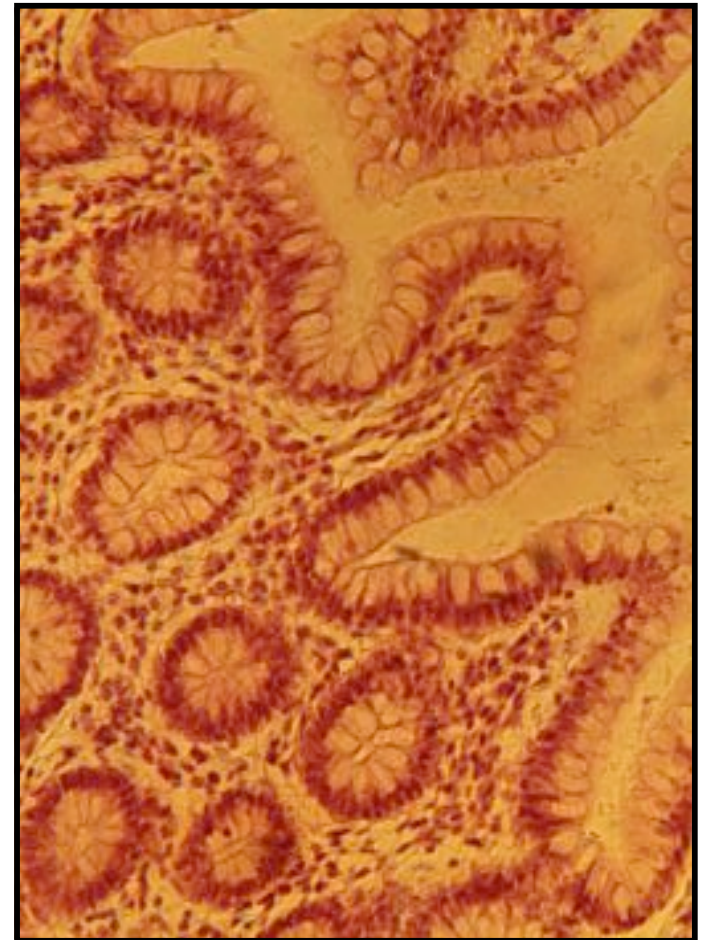
Redesign of Laboratory Component of Histology

Successful Outcomes:

- Increase student learning
- Improve imaging skills
- Increase interest / engagement
- Increase student ownership

Funding:

- UMASS Grant for Professional Development in Teaching



Histology: Student Ownership

After: Redesigned Histology Lab



Observe prepared slides

Assemble Image Galleries

- Capture image: Motic camera
- Post image to Web page

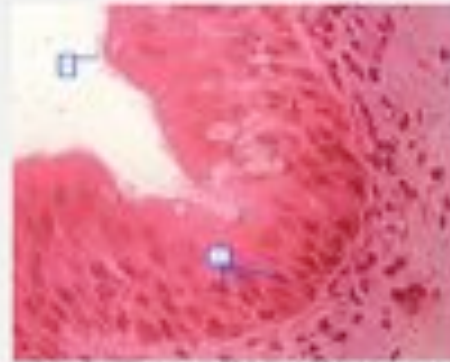
Assessment:

- Practical Exams
- Image Gallery postings
- Group Projects

Histology: Image Galleries

- Select
- Capture
- Label
- Post

Image galleries

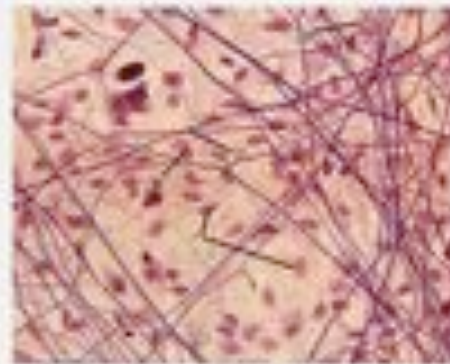


Epithelial Tissue

Here are images of vertebrate epithelial tissues.

There are 40 images in this gallery

Last updated: Sun, 03/09/2008 - 23:56



Connective Tissue

Here are images of vertebrate connective tissue.

There are 39 images in this gallery

Last updated: Wed, 03/12/2008 - 02:24



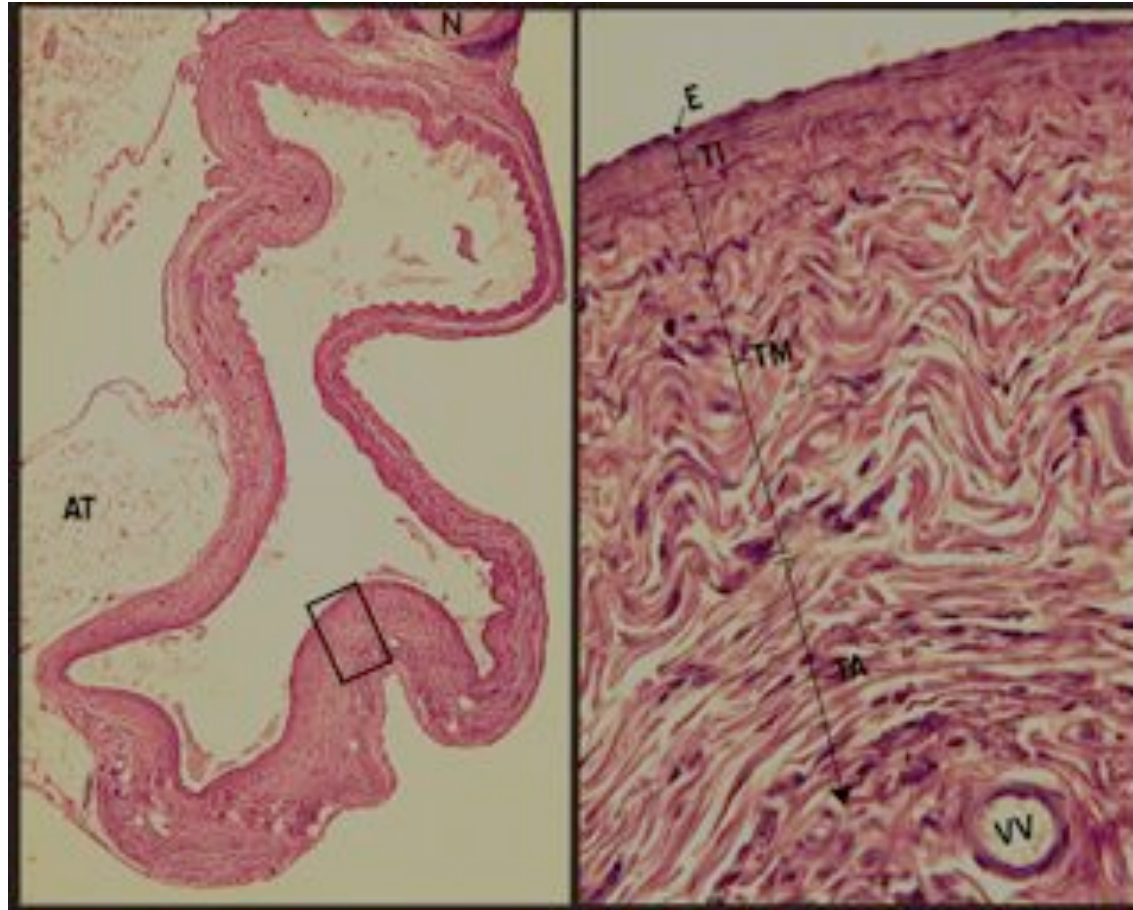
Muscle

Here are images of vertebrate muscle.

There are 13 images in this gallery

Last updated: Mon, 03/10/2008 - 22:10

Histology: Image Galleries



This micrograph was taken from slide #85, in box #16. This is an image of a large vein. Recognizable by its "collapsed" shape. A thin tunica intima (TI), a tunica media (TM), and a very large tunica adventitia (TA) all layer the wall of the vein. The venous endothelium (E) lines the inner wall. Peripheral to the vein is a bundle of nerves (N) along with large amounts of adipose tissue (AT). In the magnified image on the right, there is an identifiable vasa vasorum (VV). (Erik Schmitt – Thu, 03/27/2008 – 02:07)

Histology: Class Poster

Image Galleries: A New Way to Learn Histology
Biology 523 Histology
Regulski P., Hawkins E., Jechow M., Klump M., Lutz B., Wagner W., Stuhler A.

Abstract
Histology is the study of the cellular structure and function of human tissues and organs. It is a branch of anatomy that deals with the microscopic structure of tissues and organs. The study of histology is essential for understanding the normal function of tissues and organs and for identifying the changes that occur in disease. This poster describes the development of an interactive image gallery for histology, which allows students to explore the structure and function of various tissues and organs in a virtual environment. The gallery includes a variety of histological images, including light and electron micrographs, and is designed to be used in a classroom setting. The gallery is available online and can be accessed from a computer or a mobile device. The gallery is a valuable resource for students and faculty alike, and it provides a new way to learn histology.

Introduction
The study of histology is essential for understanding the normal function of tissues and organs and for identifying the changes that occur in disease. This poster describes the development of an interactive image gallery for histology, which allows students to explore the structure and function of various tissues and organs in a virtual environment. The gallery includes a variety of histological images, including light and electron micrographs, and is designed to be used in a classroom setting. The gallery is available online and can be accessed from a computer or a mobile device. The gallery is a valuable resource for students and faculty alike, and it provides a new way to learn histology.


Methods
The image gallery was developed using a variety of histological images, including light and electron micrographs. The images were organized into a grid and labeled with their respective tissue and organ. The gallery was designed to be user-friendly and easy to navigate. It includes a search function and a list of images that can be viewed in a larger format. The gallery is available online and can be accessed from a computer or a mobile device.

Results
The image gallery was used by a group of students in a histology class. The students found the gallery to be a valuable resource for learning about the structure and function of various tissues and organs. They were able to explore the images at their own pace and in a virtual environment. The gallery was also used by faculty members in their lectures and in their research. The gallery is a valuable resource for students and faculty alike, and it provides a new way to learn histology.

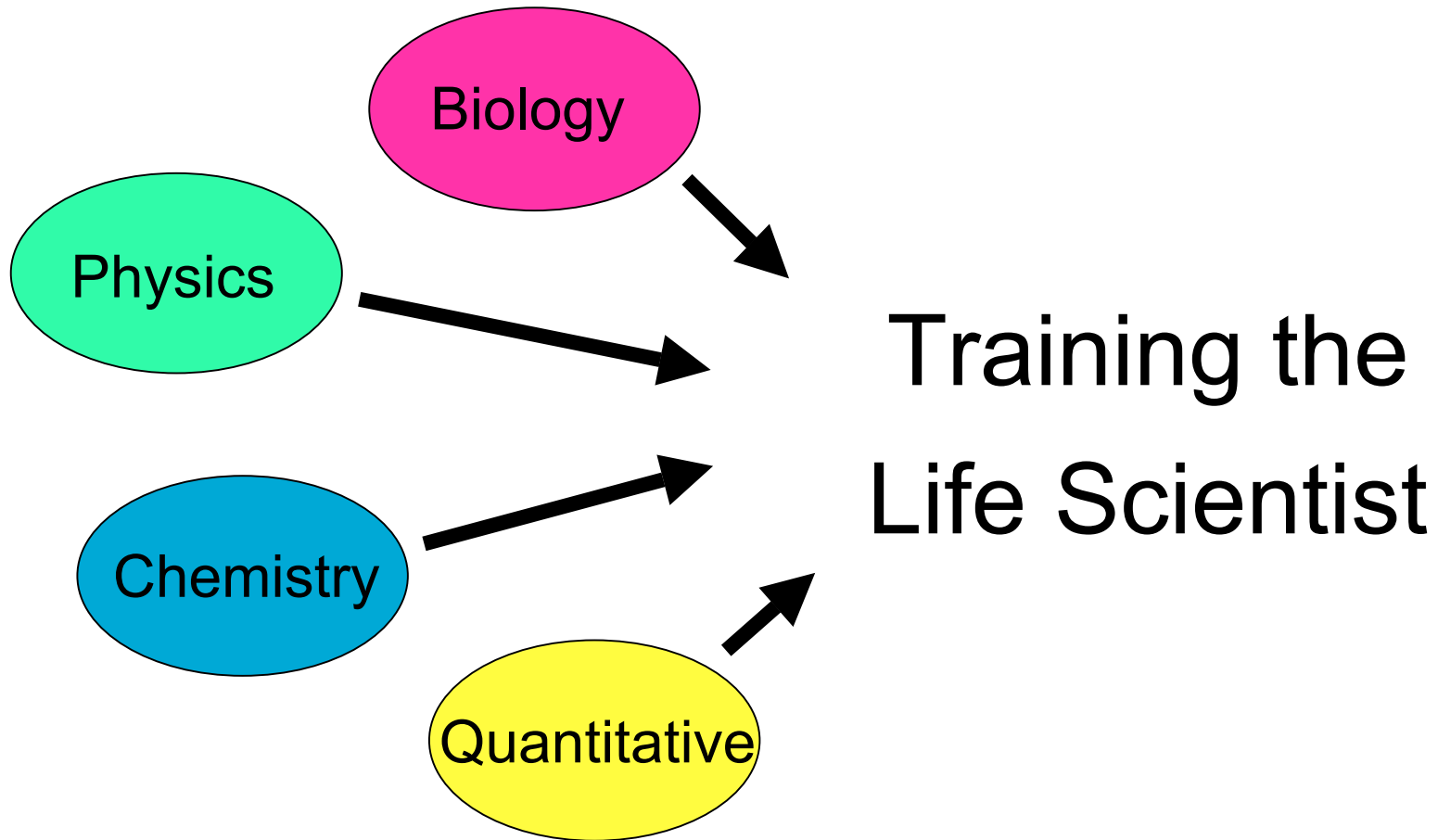
Conclusion
The image gallery is a valuable resource for students and faculty alike, and it provides a new way to learn histology. It is a user-friendly and easy-to-navigate tool that allows students to explore the structure and function of various tissues and organs in a virtual environment. The gallery is available online and can be accessed from a computer or a mobile device. The gallery is a valuable resource for students and faculty alike, and it provides a new way to learn histology.

References
1. [Reference 1]
2. [Reference 2]
3. [Reference 3]

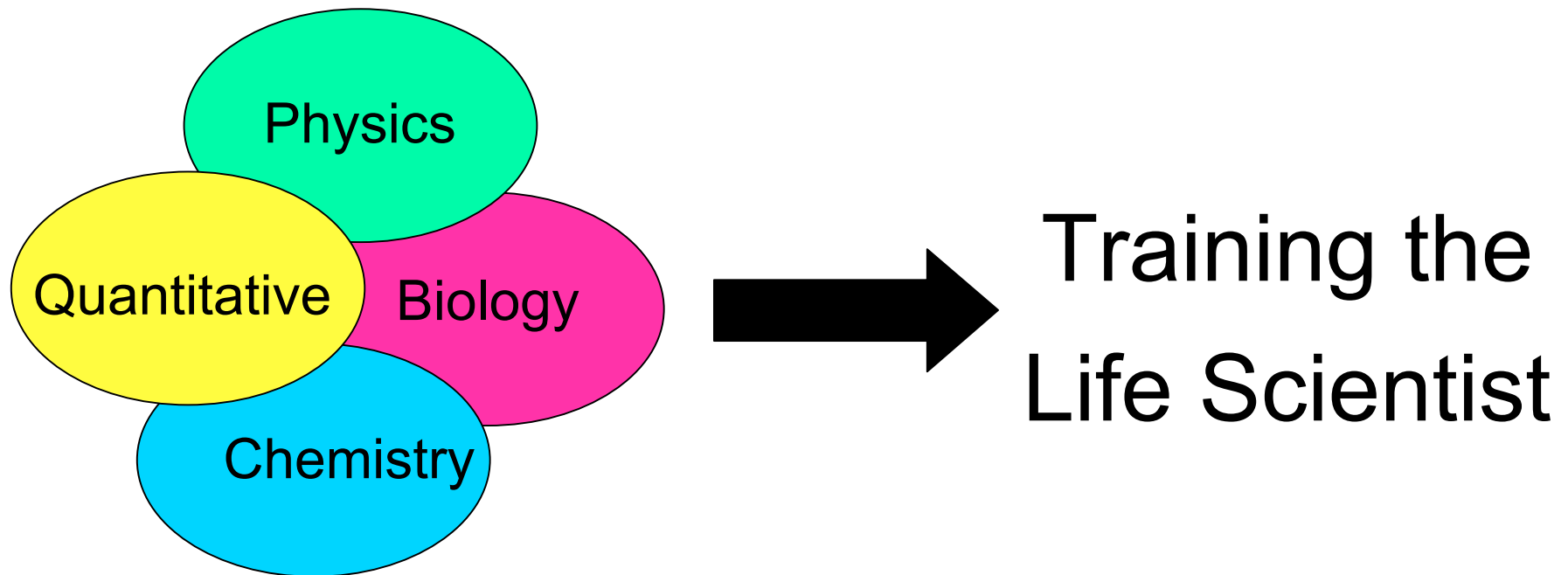
Keywords
Histology, Image Gallery, Virtual Environment, Interactive Learning, Biology 523 Histology



Course Redesign: Interdisciplinary Teaching



Course Redesign: An Interdisciplinary Approach



Training Life Science Majors: An Interdisciplinary Approach

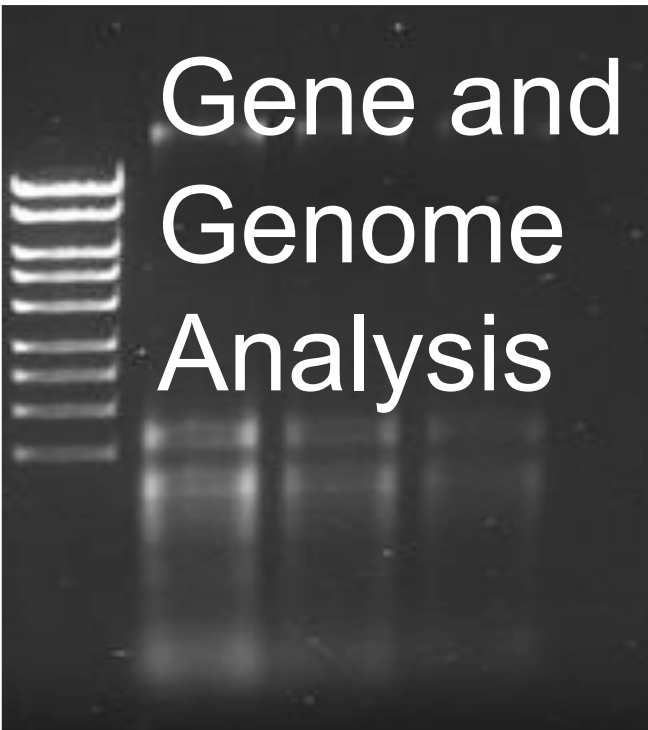
Bio2010 Challenge:

- prepare students for increasingly interdisciplinary nature of biological research.

Meet the challenge by strengthening:

- connections between biological & physical sciences.
- quantitative and computational skills.

Four Interdisciplinary Courses



Gene and
Genome
Analysis



Bioimaging



Quantitative
Systems Biology



Quantitative
Biology of the Cell

Interdisciplinary Lab Courses

Successful Outcomes:

- Increase student learning
- Develop skills of a scientist
- Develop positive attitude about practice of science

Assessment:

- CURE Survey- pretest and posttest surveys
- Midsemester Review
- Student course evaluations
- Instructor and TA interviews

Gene and Genome Analysis

CURE Survey Results

Skills: Reported large gains in:
(>4 on 5 pt scale;5=very large gain)

analyzing data
presenting results
computer modeling
being responsible for part of project
working in small groups
collecting data
maintaining a lab notebook

Attitudes toward Science

(1-5, 1=strongly agree)

	PreCourse	PostCourse
You can rely on scientific results to be true & correct.	2.94	3.18
Career Goals: Plan to pursue life science PhD	2/18	6/13

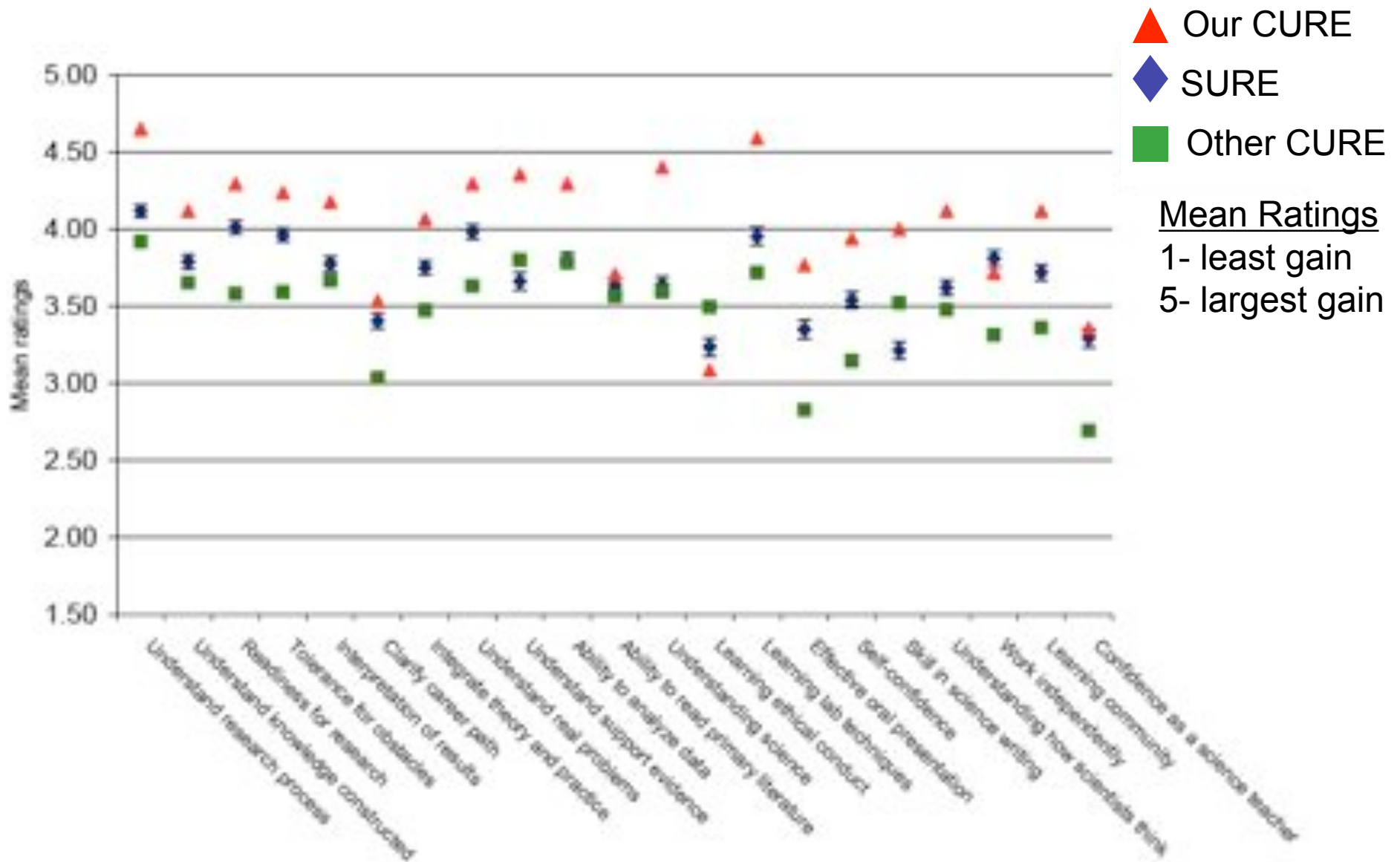
Student and Instructor Feedback: Very high satisfaction

“intensive hands on lab experience”

“encouraged to solve unexpected issues and problems”

“liked the independence..felt like we were doing real research”

Gene and Genome Analysis



Interdisciplinary Lab Courses



Interdisciplinary Teaching: Challenges

- Cross departments / colleges
- Departments assign teaching