University of Massachusetts Course Redesign: Introductory Biology

2 Semester Sequence:

Fall 1000 students

Spring 750 students

2-3 Lecture Sections/semester

250-475 students/section

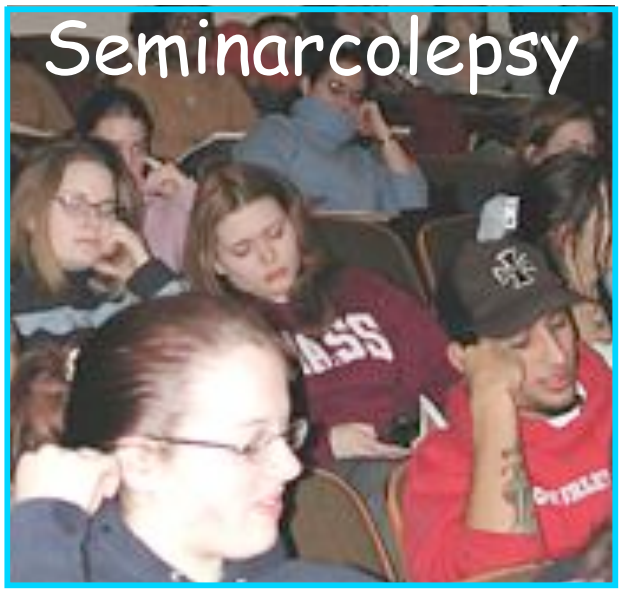
1-2 instructors/section

Associated Laboratory: 24 students/section

Introductory Biology: Starting Point

- Substantial enrollment increase

- Diverse Student Population
  - 9 majors
  - AP Bio ->8th Grade Health



- Straight lecture format

- Limited opportunities to practice skills

  Observe, describe, construct, apply, problem solve

Step 1. Active Learning

- Better meet Learning Goals for Majors
- Classroom communication system
- Brief lecture segments/Small group problem solving

Benefits of Active Learning

- Students practice critical skills
- Problem solving strategy is emphasized
- Provides feedback
- Relates content to real world issues
- Builds sense of community
- Increased interaction

- Content Coverage
- Preparation for in-class problems

- Active learning
- Student engagement
- Problem-solving skills

Step 2. Online Preparation Page

Online Class Preparation Page

- Objectives
- Reading assignment
- Related activities
- Online DUCK quiz

Assessment Plan

Successful Outcomes:

- Increase student learning
- Increase student engagement
- Strengthen problem-solving skills

Assessment:

- Share exam questions:control/redesign
- Score questions: Reasoning Index
- Student surveys, interviews
- Instructor interviews

Assessment Results

Assessment:

Shared exam questions: control/redesign

61% → 73%

Score questions: Reasoning Index

23% → 67% higher reasoning

Student surveys, interviews

engagement, enthusiasm

Instructor interviews

enthusiasm, interaction w/ students

Refining the Redesign

Weekly 5 Question Quiz each Friday

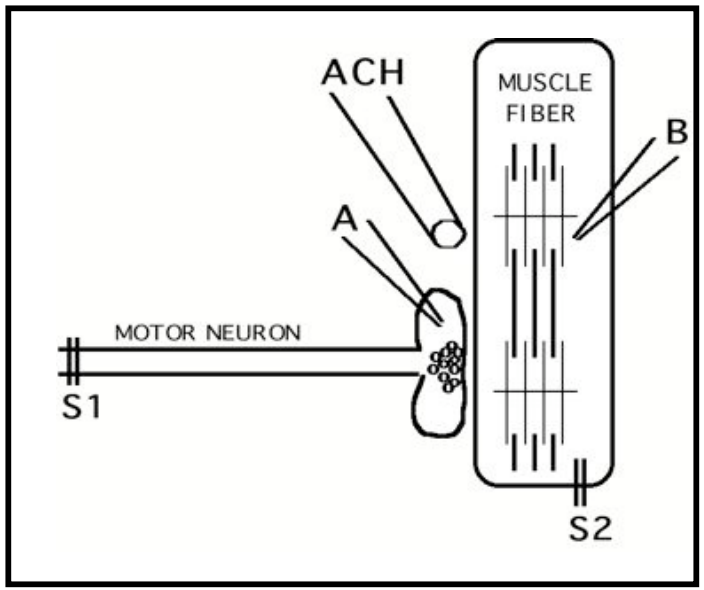
- Multiple Choice
- 10 minutes
- Mimics in-class and exam questions

Refining the Redesign

Platform-based questions

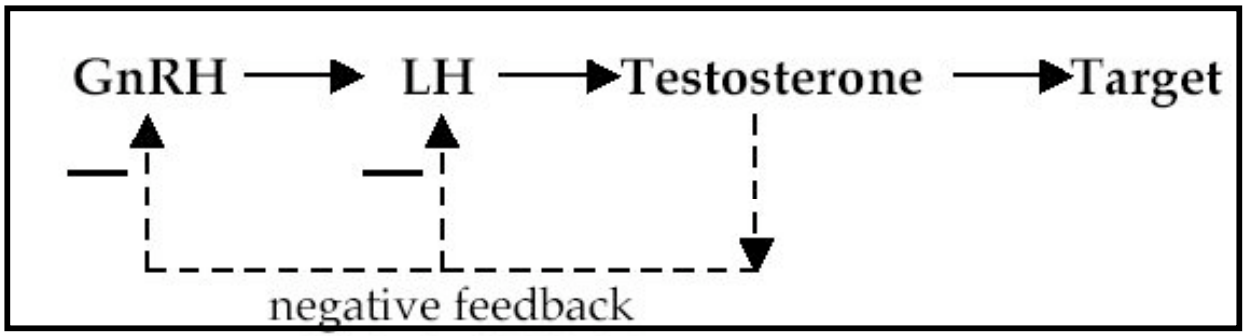
Synaptic Transmission

- Neuromuscular Junction

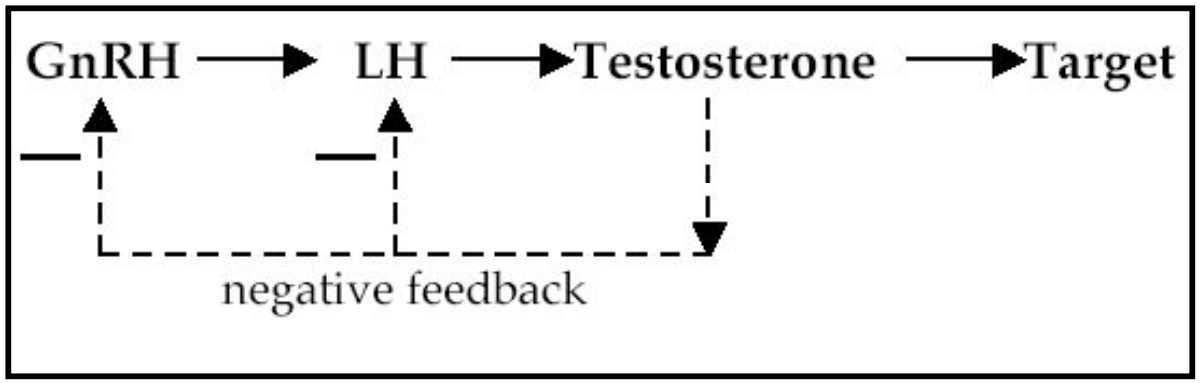


Cell Signaling:

- Pituitary Hormones



Refining the Redesign



When possible, probes are available for hormone receptor and mRNA.

1) Which probes would NOT be predicted to stain endocrine cells in the hypothalamus? ……
2) A probe for the testosterone receptor would label cells in each of the following structures EXCEPT ……
3) Messenger RNA (mRNA) for LH would be localized in endocrine cells of ……
4) Which of the following is TRUE about LH receptors? ……

The Outcome

In Redesign Format, Students:

PREPARE	Before class
PRACTICE	In class
PRACTICE	Reviewing Website
PRACTICE	Online Quiz
PRACTICE	In-class Quiz
SUCCESS!	Exam

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