



# Engaging Science

## Bringing Creativity to the Undergraduate Classroom



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Bringing the Creativity of  
Scientists to the  
Undergraduate Classroom

# HHMI Professors

- All highly regarded scientists (40)
- Research grade funding (\$1M)
- Research grade innovation
- Applied to education
- Find people and projects at
  - [www.hhmi.org](http://www.hhmi.org)

# HHMI Professor Activities

- Education Group (like research group)
- Course and curriculum development
- Faculty development
- Research courses

# The Next Step



[www.hhmi.org](http://www.hhmi.org)



Together  
we can do more.

# First Project: Freshmen

- Intro courses turn bright students away
- Often the most talented are lost (AP4,5)
- Inquiry based instruction is exactly what is needed



# National Genome Experiment

- Based on work of several HHMI Professors
- Freshman course
- Delivered at multiple colleges/universities



# Bacteriophage



# First Semester: Students

- Isolate phage from soil samples
  - Diversity sufficient to ensure each isolate is unique and new
  - Students get to name their new life form
- Purify and analyze the phage DNA
- Prepare for sequencing

# Second Semester: Students

- We sequence during the break
- Receive raw sequence data
- Prepare finished genomes
- Annotate genomes
- Share data and analyze collective results

# Overall

- Microbiology: freshmen isolate new life forms.
- Molecular biology: freshmen manipulate DNA
- Bioinformatics: freshmen analyze a genome, discover brand new genes
- Data sharing: students and faculty work together, sharing results and answering authentic research questions



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# NUMBER COUNT!

## Integration of Mathematics and Statistics into Biology Education