



**Howard Hughes Medical Institute
Summer Teachers' Workshop**
Biology in the Genomic Age

July 8-20, 2007

**Amherst College
Department of Biology
Amherst, Massachusetts**



This two-week, residential workshop provides high school science teachers from the New England area with an opportunity to gain new insights into biological explorations in the modern-day, genomics era. The workshop is designed for both new and experienced teachers who are dedicated to innovative instruction in biology. The workshop will combine seminars by Amherst College faculty with small-group discussions and lab investigations of current studies in biology. Participants will gain hands-on experience with lab exercises in DNA science, some of which can be directly integrated into science classes at their home institutions. In addition, teachers will have the opportunity to design, gather data and present the results of a short research project that includes DNA sequence analysis. Participants will also be exposed to ways in which scientists analyze the large amounts of information generated by the human genome project and the sequencing of hundreds of other genomes.

Eligibility:

The workshop is limited to 20 participants. Applicants must be employed as full-time science teachers in a high school and plan to teach full-time during the 2007-2008 academic year.

Each participant will receive:

- A stipend of \$1000 and an additional \$500 to purchase materials and supplies for science classes at his/her home institution
- A Laboratory Binder that contains detailed descriptions of each lab exercise
- A Certificate of Completion, to use in acquiring professional development credits
- Full room and board and free parking on the scenic Amherst College campus
- Free use of Amherst College libraries and athletic facilities
- An open weekend to explore area cultural, historical and recreational landmarks

Accommodations:

Participants will be housed together in a comfortable student dorm on the Amherst College campus. Bathrooms are “down the hall” and are shared by 4-6 people. All meals are provided in Valentine Dining Hall.

Travel:

Participants must cover the cost of their own transportation to and from Amherst College.

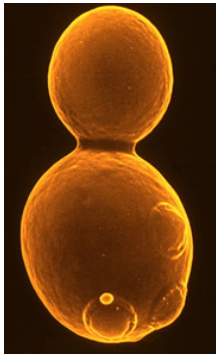
Workshop activities:

The workshop will be held in the McGuire Life Sciences Building, which was completed in 1996 and contains state-of-the-art research and teaching [facilities](#).

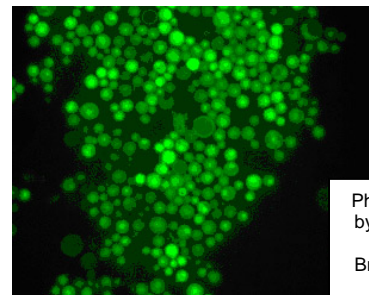
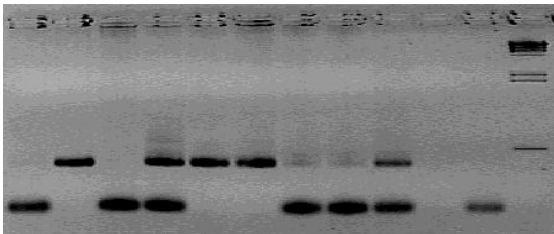


Laboratories:

The laboratory exercises will be focused on DNA science. They will include:



- Experiments in classical genetics using a variety of model organisms
- DNA isolation from strawberries, bacteria and human cheek cells
- Restriction digestion and agarose gel electrophoresis of DNA
- Bacterial transformation with the gene that encodes green fluorescent protein
- Polymerase chain reaction (PCR) analysis of human genetic polymorphisms



Photograph taken by Kronstad Lab, University of British Columbia.

Computational biology:

Computer-based labs will be held in the Webster Technology Classroom, a short walk from the Life Sciences Building. Participants will receive instruction in database searches and general approaches in bioinformatics. Teachers will also have access to PCs in a separate computer lab in the Life Sciences Building.

Independent project:

Participants will work in groups to complete an independent research project, which will include PCR and DNA sequencing analyses. Research topics for the 2007 summer program will be “Bacteria in the Environment”, “Human Genetic Variation in Melanin Production” and “Genetic Polymorphisms Associated with Lactose Intolerance in Humans.”



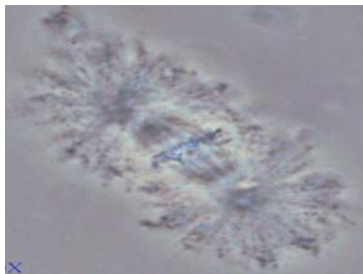
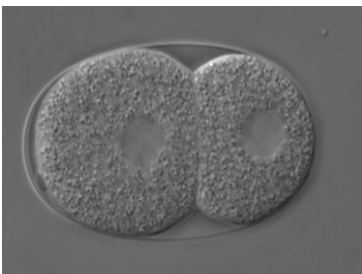
*Summer
2005
participants
at work
on their
independent
research
projects.*



“The mere fact that we COULD perform a mini-research project of real content value in such a short period of time was nearly miraculous to me!” (2005 participant)

Seminars:

Amherst College Biology faculty members and one or more guest speakers will present daily seminars. The seminars will focus on recent groundbreaking work in the specific research area of each speaker. The seminars will be on a wide range of topics and not limited to genomic biology. A listing of Amherst College Biology faculty and his/her area of interest can be obtained at <http://www.amherst.edu/~biology/faculty.html>.



Evening activities:

As this is a residential workshop, some after-dinner time on Mondays-Thursdays will be reserved for a variety of activities, such as the following: curriculum development (including discussions of classroom transfer of lab exercises, model-based pedagogical activities, viewing and discussion of DVD/video-based programs in genetics and genomics); laboratory exercises; and analyzing data and preparing final presentations for the independent projects.

Selection criteria include:

- A strong desire to improve one's teaching in DNA science
- A commitment to inquiry-based student learning
- The ability to work as part of a group
- A willingness to make a full-time commitment to the workshop, in order to meet the challenge of scientific inquiry in modern biology

To apply:

- Request an application from Marilyn Hebert at mjhebert@amherst.edu or 413-542-2097, or download and print out an application in pdf format at http://www.amherst.edu/~genomics/2007_Application.pdf
- Request a letter of recommendation from your Principal, Head of School or Department Chair
- Mail completed application and letter of recommendation to:
Marilyn Hebert
Department of Biology
Amherst College
Amherst, MA 01002-5000
- Application deadline is March 16, 2007
- Applicants will be notified of their acceptance by April 13, 2007

Program flyer:

Please post and share with colleagues.

http://www.amherst.edu/~genomics/2007_Flyer.pdf