

**DISCOVER THE MICROBES WITHIN!:
THE WOLBACHIA PROJECT**

Professional Development Workshop
at the
Marine Biological Laboratory
Woods Hole, Massachusetts

April 16-18, 2011

INFORMATION AND APPLICATION PACKET

Application Deadline: January 24, 2011

Completed applications should be sent to Program Coordinator:

Michele Bahr
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Project Website: <http://discover.mbl.edu>

Call for Applications to Discover the Microbes Within!

The Marine Biological Laboratory (MBL), with support from the Howard Hughes Medical Institute (HHMI), is offering a professional development workshop in science education for high school teachers, Grades 9-12 - Discover the Microbes Within! The *Wolbachia* Project.

Join scientists at one of the nation's prominent biology institutions in Cape Cod, Massachusetts for a three day workshop that integrates inquiry, discovery, and biology into classroom labs and lesson plans. This workshop is designed to empower high school biology teachers grades 9-12 with an understanding of contemporary research: what is being learned and how it is learned. The objectives are (i) to provide discovery-based, contemporary science content (ii) to supply year round technical assistance and intellectual support for participants through teacher-scientist partnerships, site-based partnerships between the MBL and school districts, and among local schools forming a geographic nexus and (iii) to immerse selected teacher participants in summer "envisionships" in a *Wolbachia* scientist's laboratory.

What is *Wolbachia*?

Wolbachia is a genus of bacteria that infects arthropods. The symptoms of infection vary between host species, but include a skewing of the sex ratio of offspring from infected organisms toward females. Although the extent of the infection of arthropods by *Wolbachia* is unknown, it has been found infecting a wide variety of organisms and in a wide range of geographic areas.

During the workshop, held on MBL's campus, participants will identify arthropod samples or bring samples from their local insect fauna. We will extract DNA and use molecular methods (PCR) to detect *Wolbachia* infections in the collected specimens.

We will use *Wolbachia* 16S rDNA gene sequences to conduct bioinformatic analyses and construct a phylogenetic tree of the bacteria. You will develop the labs in your classroom to become part of a national network of high school students contributing to a single research effort.

What will happen during the "Discover the Microbes Within" Program?

The goal of the project is to establish partnerships between scientists and teachers in ways that stimulate student creativity, analytical thinking, and performance in real-world research. The project calls on resident scientists from the Woods Hole community and visiting scientists to present background information and current research developments on topics related to symbiotic microbes in insects. Teachers will engage in hands-on activities to study the diverse ways that bacteria evolve and symbiotically interact with other forms of life in an environment that promises close interactions with leading research scientists and other teachers. The workshop paradigm is that students naturally want to learn science as it is practiced. This process will enhance their skills in inquiry, increase understanding of what a scientist does, and contribute to new scientific discoveries. Topics will cover Insect Collection, Insect Biodiversity, the Symbiotic Bacteria that live within insects, DNA extraction, Polymerase Chain Reaction, Gel Electrophoresis, and Bioinformatics.

Who can be a participant?

Any teacher who has interest, enthusiasm and a commitment to science education can participate in Discover the Microbes Within. We encourage teachers to apply who will network with their colleagues and help spread this project within their own schools and beyond. We welcome teachers in any stage of their careers, from new teachers to

experienced teachers to participate in this program. The instructors are willing to help teachers at all levels of ability. However, please be aware that the program is very science intensive and so a willingness to learn new terms, techniques and material in a fast pace is key. 24 selected participants will attend the workshop from April 16-18, 2011. Our requirement of you is your willingness to learn and implement the molecular survey of *Wolbachia* symbionts in your local insect fauna. **20 MA PDPs may be awarded for completion.**

Costs?

Lodging, meals, and cost for all materials will be covered; lodging and meals will be on the MBL campus. Participants are responsible for making and covering their own travel arrangements.

What opportunities are available to you and your students beyond the workshop?

1. Summer Research Envisionships:

Six-week long summer research experiences are available for selected high school students and teachers who conduct the Discover the Microbes Within! lab series in their classrooms. These paid summer research experiences are mentored by a *Wolbachia* or entomology research lab at an institution near your own location.

2. Travel:

The program will provide travel assistance for teachers willing to promote the lab series at state or national teacher meetings.

3. Free Loaner Equipment Program:

Classes can borrow a BioRad MyCycler (Thermal Cycler) from the MBL for the week that they will be running the labs at no charge. Please plan in advance to coordinate scheduling and shipping. Our objective is to integrate this cutting edge technology into your classroom. Students versed in PCR will appreciate high standards and be well-equipped to take on research and training opportunities in college or summer lab experiences.

4. DNA Sequencing Collaboration:

Teachers can coordinate a free sequencing collaboration with the MBL. In this effort, you will mail aliquots of either *Wolbachia* PCR products or DNA templates to the lab. The sequence will be sent back to you or uploaded on a website for retrieval so that you and your students can use them in the DNA Sequence Analysis Lab using NCBI and BLAST.

DEADLINE FOR APPLICATION SUBMISSIONS IS JANUARY 24, 2011.

APPLICANTS WILL BE NOTIFIED BY FEBRUARY 28, 2011.

