

*The Arthur  
Vining Davis  
Foundations*



Biological  
Discovery  
in Woods Hole

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

Professional Development Workshop at Bridgewater State University,  
Bridgewater, Massachusetts  
March 31- April 2 and April 8-9, 2017

### **INFORMATION AND APPLICATION PACKET**

The application deadline is March 3<sup>rd</sup>, 2017. All applicants, even those planning to take the course for credit, should send completed applications via email to Program Coordinator Hege Lizarralde at [hlizarralde@mbl.edu](mailto:hlizarralde@mbl.edu).

Mailing address:

Marine Biological Laboratory  
7 MBL Street, Woods Hole, Massachusetts 02543

This workshop may be taken for graduate credit. Please contact Dr. Jenna Mendell at [Jennifer.Mendell@bridgew.edu](mailto:Jennifer.Mendell@bridgew.edu) for more information and instructions on how to register.

Teachers must attend both weekends in order to earn Professional Development Points.

If you have any questions, please contact program coordinator Hege Lizarralde at [hlizarralde@mbl.edu](mailto:hlizarralde@mbl.edu).

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

## Call for Applications to Discover the Microbes Within!

The Marine Biological Laboratory (MBL) and Bridgewater State University (BSU), with support from the Arthur Vining Davis Foundations, is offering a professional development workshop in science education over two weekends as part of The *Wolbachia* Project for pre-service and practicing high school teachers.

Join scientific experts in the study of symbiosis – the infection of insects by the *Wolbachia* bacterium. The project is constructed to serve as a vehicle for introducing in-service and pre-service high school teachers to a wide range of issues in the biological sciences. This includes the concepts and approaches used by scientists to address real world questions. We will discuss different fields of biology ranging from ecosystem studies and taxonomy to cell and molecular biology and bioinformatics, which can all contribute to a meaningful scientific investigation.

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 MBL, BSU and school districts, and among local schools forming a geographic nexus.

In-service teachers who successfully complete all requirements of the workshop will be awarded 30 Professional Development Points. Additionally, this workshop can be taken for 3 graduate or undergraduate credits.

**Friday sessions** are from 4 – 7 pm, and are required for students and teachers taking the course for credit. The Friday sessions are optional for teachers taking the course for PDPs. Saturday and Sunday sessions are 8:30 am – 3:30 pm..

### What is *Wolbachia*?

*Wolbachia* is a genus of bacteria that infect 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 [Bridgewater State University's campus](#) (BSU), participants will identify arthropod samples or bring samples from their local insect fauna. We will use molecular methods to detect *Wolbachia* infections in the collected specimens. We will review sequencing procedures and conduct bioinformatics analyses. Using *Wolbachia* 16S rDNA sequences, we will construct a phylogenetic tree of the bacteria. Sequencing of positive insect DNAs will be completed at MBL and made available to participants after the workshop.

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?**

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 (PCR), Gel Electrophoresis, and bioinformatics.

## **Who can be a participant?**

Half of our annual workshop attendees will be students from nearby institutions with teaching training programs. BSU College of Education and Allied Studies and the BSU Biology Department will select these participants from its pool of enrolled students interested in teaching high school science. The remaining attendees will be practicing teachers seeking to improve their comfort levels in teaching "Discovery Science". They will partner with the pre-service teachers in a mentoring role.

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. 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 at a fast pace is key. Selected applicants will attend the workshop over two weekends in March/April, 2017. Our requirement of you is your willingness to learn and implement the molecular survey of *Wolbachia* symbionts in your local insect fauna.

## **Costs?**

All education materials will be covered. In-service teachers taking the course for graduate-credit will receive a \$600 discount on tuition and fees.

For more information, contact program coordinator Hege Lizarralde (email: hlizarralde@mbl.edu). ***Deadline for application submissions is March 3<sup>rd</sup>, 2017.***

**DISCOVER THE MICROBES WITHIN!**

**Teacher workshop on real-world research in symbiosis, microbes and evolution**

**APPLICATION**

Applications should be returned by March 3<sup>rd</sup>, 2017 to Program Coordinator Hege Lizarralde, Marine Biological Laboratory, 7 MBL Street, Woods Hole, Massachusetts 02543. Email: [hlizarralde@mbi.edu](mailto:hlizarralde@mbi.edu).

Name \_\_\_\_\_

School \_\_\_\_\_

School address \_\_\_\_\_

\_\_\_\_\_

Phone \_\_\_\_\_

Home address (optional) \_\_\_\_\_

Phone \_\_\_\_\_ Email address \_\_\_\_\_

Current grades taught \_\_\_\_\_ Years teaching \_\_\_\_\_

Subject(s) \_\_\_\_\_

Total number of students in your class(es) \_\_\_\_\_

Please respond to the following questions.

1. Please tell us briefly why you're interested in the workshop.

*The following questions are for in-service teachers only.*

2. To what extent are these research activities typical or representative of the overall school program?

3. Please describe school resources (computer labs, molecular biology equipment, supply budget) that could enable your school to be successful in this project.

4. How would you describe the status of your school's science curricula (i.e., nonexistent, newly revised, needs revision) and how do you participate in statewide and national efforts to reform science education?