

The Center for Development and Support for High School Biology Labs
presents
“Molecular Biology -- from Theory to Classroom Practice”

Prof. Michal Zion – Academic Head, Dr. Shoshy Herman – Academic Director, Dr. Pirchi Waxman – Deputy Academic Director, Dr. Mor Levi-Farber-Researcher

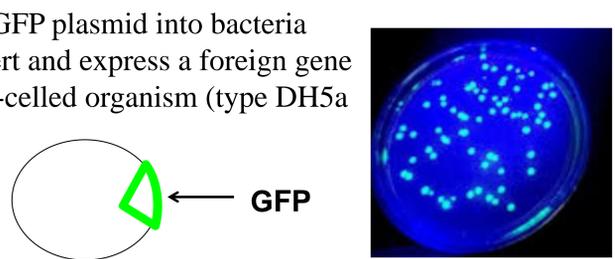
Goals of the Project
The project emphasizes future-oriented pedagogy. This entails teaching biology that meets several challenges: It has relevance for the students, involves collaboration, requires leadership, and encourages a global perspective.

This future-oriented pedagogy is reflected in the goals of the project:

- ❖ Including experiments from cutting-edge science in a school lab.
- ❖ Putting molecular biology theory into practice.
- ❖ Including students in citizen science, such as the Wolbachia project
- ❖ Collaboration between teachers and academic researchers.
- ❖ Collaboration between teachers and students in Israel and abroad.

1. Transformation of a GFP plasmid into bacteria

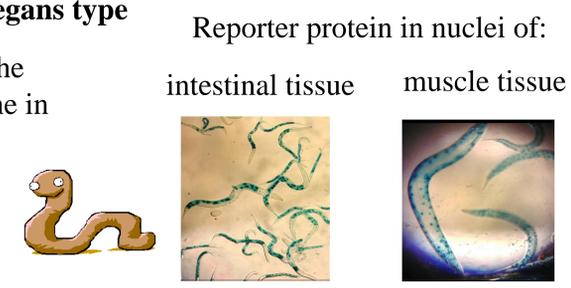
Transformation of a GFP plasmid into bacteria
An experiment to insert and express a foreign gene called GFP into a one-celled organism (type DH5a E. Coli bacteria)



2. Control of reporter gene expression in nematodes of the C. elegans type

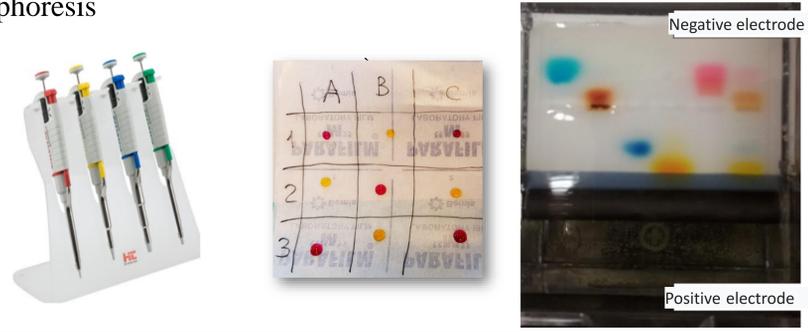
Reporter protein in nuclei of:
intestinal tissue muscle tissue

An experiment to identify the expression of a reporter gene in different tissues (muscle and intestinal) in transgenic nematodes



3. A kit for pipetation and loading of dyes in gel electrophoresis

Correct use of the micropipator is a necessary requirement for performing molecular biology experiments
Understanding the principles of running the DNA using gel electrophoresis



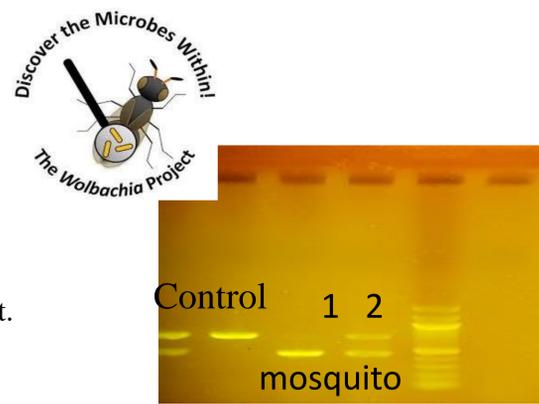
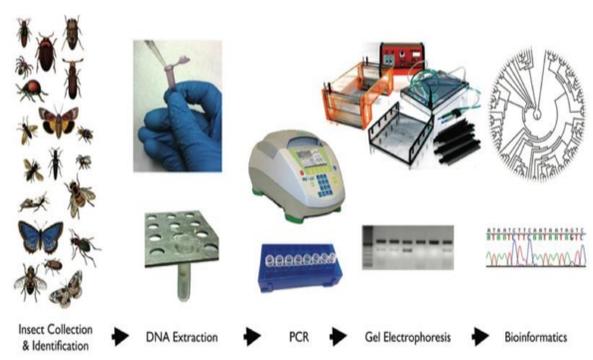
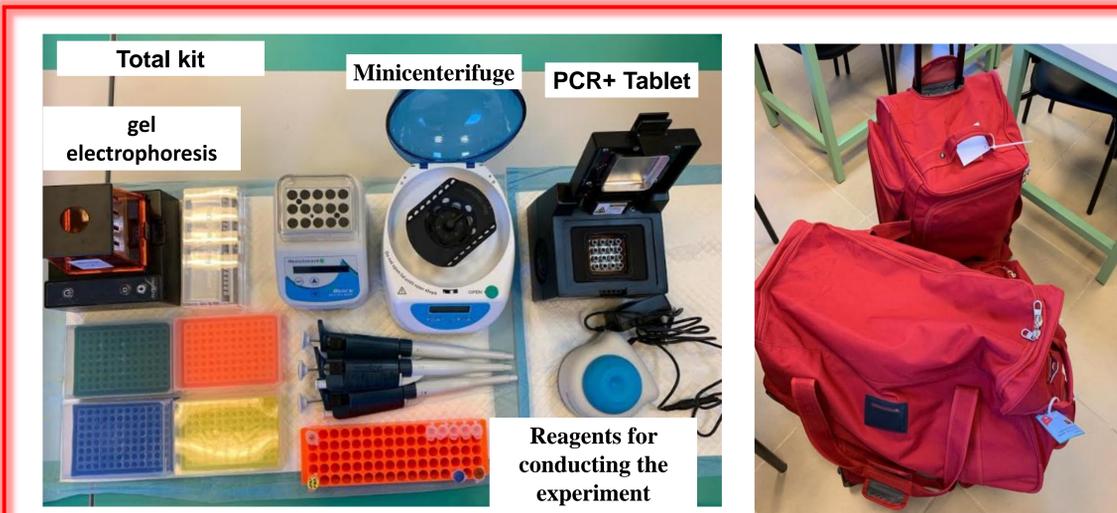
4. A kit for testing the resistance of plasmid to antibiotic material

DNA amplification in a plasmid containing a gene that is resistant to antibiotics (ampicillin) using the PCR-technique and running the DNA using gel electrophoresis



5. The Wolbachia Project

An international project in collaboration with Vanderbilt University
Insects collection by students and examination for the presence of Wolbachia bacteria in the insects.
DNA production from the insect and amplification the DNA genes by PCR,
One gene specific to the Wolbachia and the other specific to the insect.
Running the results in gel electrophoresis

**For the first time in Israel,
the Bar-Ilan Center lends out complete
equipment kits for molecular work in the labs.**