

Using Bacteria as an Effective Model to Teach Evolution in An Introductory Organismal Biology Class

Cheryl Murphy, Amanda Gnau, Jeannine Scott, Christy Mecey Smith, Nicole Van de Velde, and Emily Norton

Michigan State University-Lyman Briggs College, E 191Holmes Hall, East Lansing MI 48824 USA
(camurphy@msu.edu)

We developed an inquiry based laboratory that explored the evolution of different phenotypes of the bacteria, *Pseudomonas fluorescens*, under different environmental conditions. The main learning goal of the laboratory was to differentiate between two competing hypotheses – the first hypothesis, and most common misconception for students, is that the environment induces evolution versus the second hypothesis beneficial mutations allow for certain phenotypes to flourish. The laboratory ran for four weeks, and had specific objectives: 1) Formulate alternate hypotheses for how the environment and mutations interact to allow for adaptation. 2) Understand how population size and mutation rates interact. 3) Apply the scientific method and perform an experiment using *Pseudomonas florescens* to test your hypotheses. 4) Write a scientific report that describes the experiment and results and incorporates appropriate literature sources into the discussion. We performed a pre and post test to assess student understanding of evolutionary concepts and results showed increased understanding after completion of this laboratory stream.

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