Biochemistry and Molecular Biology   🔓 Free Access

An Enhanced 1D Electrophoresis Simulation with Pedagogical Tools

Tyler Bernhardt, Matthew Seyfarth, Robert M. Hanson, Rebecca Roberts, Paul A. Craig

Abstract

Electrophoresis is a fundamental tool for biochemistry and molecular biology research. Our team has updated a popular 1D electrophoresis simulation to give instructors a choice - they can use the built in protein mixtures or they can add their own protein mixtures and use the simulation to focus on particular learning goals and objectives in their classroom and laboratory courses. The simulation retains many of its original features: variable voltage and % acrylamide, built in molecular weight standards, animation of the pipetting process, and a built-in plot for estimating molecular weights. Features in the updated simulation include (a) an expansion from two to ten wells, (b) drag and drop options for loading proteins on the gel, (c) a choice of ten built-in protein sets and learning objectives designed for the BASIL curriculum (https://basilbiochem.github.io/basil/index.html), and (d) the option to introduce custom designed protein mixtures with associated learning objectives. The simulation, formerly a Java applet, was redeveloped using java2script/SwingJS and now runs both as an independent Java application and as a browser-based JavaScript app.

This is the full abstract presented at the Experimental Biology meeting and is only available in HTML format. There are no additional versions or additional content available for this abstract.

FASEB
Federation of American Societies
for Experimental Biology