

Biochemistry

2016-2017 Resource Guide



Cat. #108 \$79

Principles of Gel Filtration Chromatography



For 10 Lab Groups. Introduce gel filtration separation and show how dyes of different colors separate on the basis of their size and shape. Columns may be rinsed and reused.

Kit includes: instructions, sample mixture, chromatography columns, dry matrix, elution buffer, transfer pipets, microtest tubes.

All you need: beakers, 25 ml beaker or test tube, ring stands with clamps, distilled water.

Storage: Room Temperature.



Cat. #113 \$79

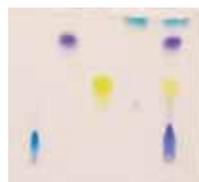
Principles of Thin Layer Chromatography

For 8 Separations. This experiment introduces chromatographic theory and methods of thin layer chromatography. A mixture of dyes are separated on a cellulose-based TLC plate using two different solvent systems.

Kit includes: instructions, samples, reagents and solvents, cellulose thin layer plate, small transfer pipets.

All you need: 250 ml beakers, metric rulers, pipet pump, 5 or 10 ml pipets, distilled water.

Storage: Refrigerator.



A detailed list of components and requirements, as well as experiment protocols are available on our website:

www.edvotek.com

Cat. #204 \$105

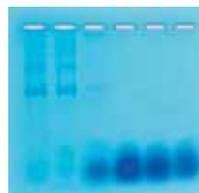
Separation of RNA and DNA by Gel Filtration Chromatography

For 5 Separations and 5 Gels. Gel filtration chromatography separates molecules on the basis of size and shape. This experiment provides a LyphoSample™ mixture of RNA and DNA that is separated on a gel exclusion column. The purified fractions of DNA and RNA are analyzed spectrally at A_{260} and/or by agarose gel electrophoresis.

Kit includes: instructions, DNA/RNA LyphoSample™, dry matrix, elution buffer, chromatography columns, agarose, gel loading solution, buffer, InstaStain® Blue & FlashBlue™ stain.

All you need: electrophoresis apparatus, power supply, ring stands with clamps, automatic micropipet with tips, microwave or hot plate, pipet pumps or bulbs, 5 or 10 ml pipets, balance, lab glassware, weigh boats, white light visualization system, distilled water.

Storage: Room Temperature.



Cat. #243 \$99

Ion Exchange Chromatography

For 6 Separations. Most molecules have a net charge within a pH range of 2 to 10. When the pH is altered, the net charge on molecules can change drastically. In this experiment, a mixture of two chemicals is absorbed onto a solid support ion-exchange column and separated during elution under conditions that influence their net charge.

Kit includes: instructions, ion exchanger (dry matrix), chemical mixture, potassium acetate buffer, chromatography columns.

All you need: spectrophotometer & cuvettes, ring stands and clamps, test tubes, lab glassware, distilled water, pipet pumps, 5 ml pipets.

Storage: Room Temperature.



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Cat. #277 \$105

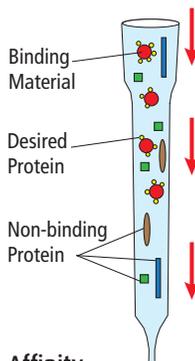
Affinity Chromatography

For 10 Lab Groups. In this experiment, students will prepare a seed extract from Jack Bean Meal, fractionate the extract using affinity chromatography, and elute the bound glucose binding protein. The presence of biological activity is determined by an immunoblot enzyme assay.

Kit includes: instructions, affinity gel, jack bean meal, various solutions and buffers, membranes, petri plates, columns with tips, conical tubes and transfer pipets.

All you need: clinical centrifuge, vortex or shaking platform, micropipet and tips, ring stands and clamps, lab glassware, pipets & pumps, microtest tubes, forceps, water.

Storage: Some Components Require Refrigerator Storage.



Affinity Chromatography

Cat. #255 \$85

Purification & Size Determination of Green & Blue Fluorescent Proteins

For 6 Lab Groups. When bacteria are used to make medically useful proteins by transformation, the protein of interest must be separated from all of the other cellular proteins. In this experiment, the unique fluorescent properties of Green Fluorescent Protein (GFP) and Blue Fluorescent Protein (BFP) will be used as an assay during their purification from the extract of genetically modified strain of *E. coli*. The column fractions containing GFP or BFP will be identified by fluorescence and then purified. As an optional activity, purified protein fractions can be separated by SDS polyacrylamide gel electrophoresis (SDS-PAGE) to estimate the purity and size of the GFP and BFP proteins.



Kit includes: instructions, columns, dry matrix, GFP and BFP extracts, buffer, protein gel reagents for optional activity.

All you need: waterbath, long wave UV lamp, ring stand & clamps, automatic micropipet, vertical gel electrophoresis apparatus, power supply, polyacrylamide gels (12%).

Storage: Some Components Require Freezer Storage.

Cat. #590 \$179

Edvotek® Variable Micropipet

Easy to use, sturdy, highly accurate and uses standard micropipet tips! 5 - 50 µl Micropipet. More sizes are available on our website.



Cat. #282 \$95

Principles of Enzyme Catalysis

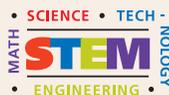
For 10 Lab Groups. This easy and safe experiment allows students to learn about enzyme catalysis, the nature of enzyme action and protein structure-function relationships. Students will perform an enzyme assay and determine the rate of the enzymatic reaction.



Kit includes: instructions, catalase solution, hydrogen peroxide, phosphate buffer, assay reagent, acidification solution, color enhancer & developer.

All you need: visible wavelength spectrophotometer, timer, 1, 5, and 10 ml pipets, pipet pumps or bulbs, test tubes & tube racks, beakers, linear graph paper, ice, lab markers, distilled water.

Storage: Some Components Require Freezer and Refrigerator Storage.



Cat. #904 \$99

Biochemical Analysis of Plant Enzymes

For 10 Lab Groups. This experiment will demonstrate general enzyme principles using specific plant enzymes which have important functions in biotechnology. Students will perform tissue prints of seeds to examine what happens during malting. An additional activity allows students to quantify the activity of the enzyme amylase.



Kit includes: instructions, 3 types of barley seeds, iodine solution/stain, reaction buffer, starch, amylase enzyme powder, 1 ml pipets, starch indicator paper, petri plates, graph paper template.

All you need: single edge razor blades, 2 waterbaths, spectrophotometer, automatic micropipet with tips, test tubes, microscope or magnifying lens, hot plate, cutting board, forceps, test tube racks, pipet pumps, lab glassware, 1N HCl, distilled water, ice.

Storage: Some Components Require Freezer Storage.

Cat. #566 \$870

UNICO® S1000 Educational Spectrophotometer

Features a wavelength range of 400-1000 nm, 20 nm bandpass, analog interface, digital display, transmittance and absorbance modes and a sample compartment that accepts round tube or square cuvettes (with included cuvette adapter).

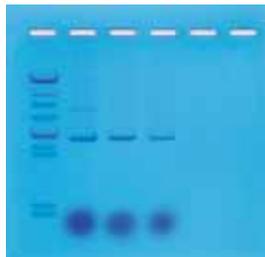


Cat. #202 \$99

Mini-Prep Isolation of Plasmid DNA

For up to 40 plasmid isolations and 5 gels.

Small-scale rapid isolation of plasmid DNA is a routine procedure used for screening and analysis of recombinant plasmid DNAs in cloning and sub-cloning experiments. In this experiment, students will isolate plasmid DNA without the use of toxic chemicals such as phenol or chloroform.



Kit includes: instructions, Plasmid LyphoCells™, various solutions and buffers, agarose powder, FlashBlue™ Stain.

All you need: electrophoresis apparatus and power supply, waterbath, balance, microcentrifuge, microwave or hot plate, automatic pipet with tips, visualization (white light), misc. labware, 95-100% isopropanol, distilled or deionized water, ice.

Storage: Room Temperature

Cat. #203 \$99

Isolation of *E. coli* Chromosomal DNA

For up to 20 DNA isolations and 5 gels. Isolation of high molecular weight chromosomal DNA is the first step in molecular cloning since it is the source of genes in cells. This experiment provides DNA Extraction LyphoCells™ and reagents for isolating chromosomal DNA from *E. coli*. After spooling from solution, the DNA can be dissolved and be quantified and analyzed spectrally by agarose gel electrophoresis as an optional lab extension activity.



Kit includes: instructions, Chromosomal LyphoCells™, various solutions and buffers, agarose powder, FlashBlue™ stain.

All you need: waterbath, pipet pumps or bulbs, lab glassware, distilled or deionized water, 95-100% isopropanol.

For optional electrophoresis: electrophoresis apparatus, power supply, automatic micropipet with tips, balance, microwave or hot plate, misc. labware, white light visualization system, and photodocumentation system (optional).

Storage: Room Temperature

Cat. #5063 \$799

Dual Electrophoresis LabStation™

Supports up to 16 Students!

Includes:

- 2 M12 Electrophoresis Apparatus (7 x 14 cm Tray)
- 1 DuoSource™ 150 (75/150 V for 1 or 2 units)
- 2 Cat. #590 Variable Micropipets (5 - 50 µl)



Cat. #302 \$175

Purification of the Restriction Enzyme *EcoRI*

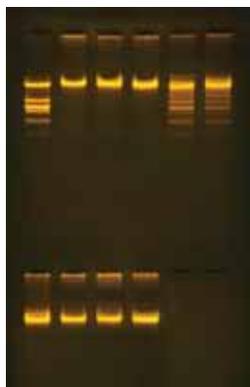
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MATH
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For 5 Purifications. In this experiment, students purify the restriction enzyme, *EcoRI*! This procedure utilizes an ion exchange chromatography step for *EcoRI*. Column fractions are assayed for the enzyme using Lambda DNA and digestion products are identified by agarose gel electrophoresis. Fractions that contain *EcoRI* are identified and pooled. The total and specific activities are calculated. Recommended for college level courses.

Kit includes: instructions, ion exchange matrix, chromatography columns, *E. coli* RY-13 cell extract, equilibration & elution buffer, Lambda DNA, Lambda/*EcoRI* Marker, KCl, glycerol, dilution & reaction buffers, gel loading solution, agarose, electrophoresis buffer, InstaStain® Ethidium Bromide.

All you need: horizontal gel electrophoresis apparatus, power supply, UV visualization system, waterbath, microcentrifuge, microwave or hot plate, UV spectrophotometer & cuvettes (optional), automatic micropipet with tips, ring stands & clamps, 10 ml pipets, lab glassware, ice and ice buckets.

Storage: Some Components Require Freezer & Refrigerator Storage.



InstaStain®
 ETR

Cat. #303 \$165

Exploring Biotechnology with Green Fluorescent Protein (GFP)

For 6 experiments with 4 modules each.

Four experimental modules are combined into one experiment to provide a comprehensive biotechnology exploration focusing on the green fluorescent protein (GFP). Bacterial cells are transformed to express the green fluorescent protein (GFP). Then, the transformed cells are grown and the GFP is purified by column chromatography. Finally, the purity of the protein fractions are analyzed by SDS polyacrylamide gel electrophoresis.

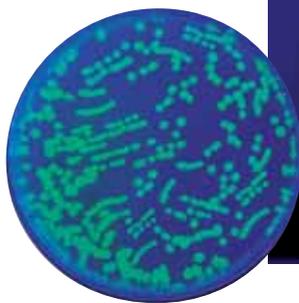
Kit includes: instructions, BactoBeads™, plasmid DNA for GFP, IPTG, ampicillin antibiotic, calcium chloride, ReadyPour™ luria broth agar, luria broth media for recovery, petri plates, pipets, calibrated transfer pipets, inoculating loops, microtest tubes with attached caps, toothpicks, dry matrix for columns, chromatography columns, green fluorescent protein extracts, elution buffer, protein molecular weight standards, protein denaturation solution, glycerol solution, Tris-Glycine-SDS buffer, Protein InstaStain®.

All you need: incubation oven, two waterbaths, microwave or hot plate, automatic micropipet and tips, pipet pumps or bulbs, ice, long wave UV light, ring stand and clamps, lab glassware, ice, vertical gel electrophoresis apparatus and power supply, 3 Polyacrylamide Gels (12%), plastic trays or large weigh boats for optional staining & destaining, glacial acetic acid, methanol.

Storage: Some Components Require Freezer Storage



InstaStain®
 Protein



Cat. #515 \$325

M36 HexaGel™ Electrophoresis Apparatus

Run up to 6 gels at one time!

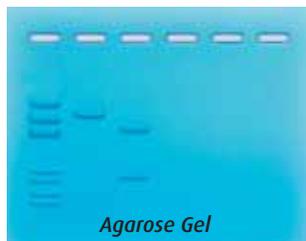
BEST
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Cat. #104 \$79

Size Determination of DNA Restriction Fragments

For 8 Gels. DNA sizing is an excellent tool used in many biotech applications, such as DNA mapping and forensic science. Students will separate DNAs on agarose gels and learn how to use a standard curve to determine the sizes of unknown fragments.



Kit includes: instructions, Ready-to-Load™ QuickStrip™ DNA samples, UltraSpec-Agarose™ powder, electrophoresis buffer, InstaStain® Blue and FlashBlue™ stain, calibrated pipet, and microtipped transfer pipets.

All you need: electrophoresis apparatus, power supply, automatic micropipet and tips, balance, microwave or hot plate, visualization system.

Storage: Room Temperature Stable. Storage of Ready-to-Load QuickStrip™ samples in the Refrigerator is Recommended.

ALSO Available - DNA Samples Only in Microtest Tubes

Cat. #104-C 24 Gels \$175

A detailed list of components and requirements, as well as experiment protocols are available on our website:

www.edvotek.com

Cat. #110 \$89

Molecular Weight Determination of Proteins (Agarose-based)



For 6 Lab Groups. Introduce a simple method to determine protein subunit molecular weights using horizontal electrophoresis. Because the protein standards and “unknowns” are prestained, the separation of proteins can be observed during electrophoresis. Included in the experiment is EDVOTEK®’s formulation of protein grade agarose, which provides an alternative to the use of polyacrylamide gels.



Kit includes: instructions, prestained LyphoProtein™ samples, practice gel loading solution, agarose, electrophoresis buffer, Protein InstaStain®.

All you need: horizontal electrophoresis apparatus, power supply, white light visualization system, automatic micropipet with tips, microwave or hot plate, waterbath, metric rulers, lab glassware, methanol, glacial acetic acid, distilled or deionized water.

Storage: Some Components Require Freezer Storage.

Cat. #5010 \$319

TetraSource™ 300 30/300V Power Supply

For 1 to 4 units. This mighty 750 mA power supply features an easy-to-use, fully programmable interface for setting voltage, current or timer control with each parameter displayed in real-time. 30-300 V.



Cat. #153 \$60

Determination of Protein Molecular Weight

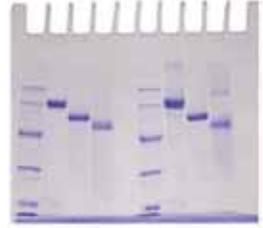


For 6 groups sharing 3 gels. Using prestained LyphoProteins™, sub-unit molecular weights are determined by analysis using denaturing SDS vertical polyacrylamide gel electrophoresis. Prestained Proteins with unknown molecular weights are assigned molecular weights based on the relative mobility of prestained standard protein markers.

Kit includes: instructions, denatured LyphoProtein™ samples, standard protein markers, practice gel loading solution, buffer, Protein InstaStain®.

All you need: 3 polyacrylamide gels (12%), vertical gel electrophoresis apparatus, power supply, hot plate or burner, white light visualization system, automatic micropipet with fine tips, microtest tube holder, lab glassware, methanol, glacial acetic acid, distilled or deionized water.

Storage: Some Components Require Freezer Storage.



Polyacrylamide Gel

ALSO Available - Protein Samples Only for 12 groups
Cat. #153-B \$89

Cat. #151 \$69

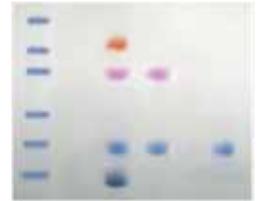
AIDS Kit III: Simulation of HIV Detection by Protein Electrophoresis

For 6 groups sharing 3 gels. The Human Immunodeficiency Virus (HIV) causes acquired immune deficiency syndrome (AIDS), a serious disease that suppresses a patient's immune system which leaves them susceptible to infections. In this experiment, students will use SDS-PAGE to simulate the identification of HIV proteins in simulated patient samples. The results of this test are used to diagnose an HIV infection.

Kit includes: instructions, denatured LyphoProtein™ samples, standard protein markers, practice gel loading solution, buffer, transfer pipets, Protein InstaStain®.

All you need: 3 polyacrylamide gels (12%), vertical gel electrophoresis apparatus, power supply, hot plate or burner, aluminum foil or foam waterbath float, white light visualization system, automatic micropipet with fine tips, microcentrifuge tube holder, lab glassware, methanol, glacial acetic acid, glass tray, plastic wrap, and distilled or deionized water.

Storage: Some Components Require Freezer Storage.



Precast Polyacrylamide Gels

Cat. #651 3 gels (12%) \$39
Cat. #652 6 gels (12%) \$74

NEW ONLINE RESOURCES!

Teaching biotechnology is easier and more exciting than ever!



[youtube.com/EdvotekInc](https://www.youtube.com/EdvotekInc)



[edvotek.com/Quick-Guides](https://www.edvotek.com/Quick-Guides)

Protein InstaStain™

Easy Staining & Destaining

Protein InstaStain® sheets stain gels faster than conventional methods. Protein InstaStain® gives high quality and uniform gel staining with excellent results for photography.

In small tray, place gel with 100 ml fixative solution. Gently float a card of Protein InstaStain® into the liquid, stain side down. Remove the card after 30 minutes.

Gently agitate on a rocking platform 1-3 hours or overnight. (Cover tray with plastic wrap to prevent evaporation). Protein bands will appear med. to dark against a light background.



Now provided in our protein kits at no additional cost!

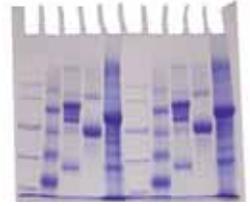


For 15 gels, 7.5 x10 cm
Cat. #2016 \$39

For 30 gels, 7.5 x10 cm
Cat. #2017 \$55

Cat. #150 \$60

Survey of Protein Diversity



For 6 groups sharing 3 gels. Learn about the diversity of proteins by studying the electrophoretic profiles of various sources. Your students will separate proteins from plant, animal serum, and milk proteins alongside a standard protein marker.

Kit includes: instructions, denatured LyphoProtein™ samples, standard protein markers, practice gel loading solution, buffer, Protein InstaStain®.

All you need: 3 polyacrylamide gels (12%), vertical gel electrophoresis apparatus, power supply, hot plate or burner, white light visualization system, automatic micropipet with fine tips, microtest tube holder, lab glassware, methanol, glacial acetic acid, distilled or deionized water.

Storage: Some Components Require Freezer Storage.

Cat. #253 \$69

Diversity of Fish Proteins



For 6 groups sharing 3 gels. Study the diversity of fish with these pre-stained, lyophilized proteins. Total protein from Perch, Walleye and Salmon have been extracted and pre-stained using an indicator dye. Each fish protein sample has a characteristic banding pattern when separated by denaturing SDS-polyacrylamide gel electrophoresis, which can be used to identify the specific species.

Kit includes: instructions, fish LyphoProtein™ samples, protein molecular weight standards, practice gel loading solution, buffer, Protein InstaStain®.

All you need: 3 polyacrylamide gels (12%), vertical gel electrophoresis apparatus, power supply, microcentrifuge, hot plate or burner, vortex, white light visualization system, automatic micropipet with fine tips, test tube holders, lab glassware, methanol, glacial acetic acid, distilled or deionized water.

Storage: Some Components Require Freezer Storage.

Cat. #5064 \$799

Dual Protein Electrophoresis LabStation™

Includes:

- 2 MV10 Protein Electrophoresis Apparatus
- 1 DuoSource™ 150 (75/150 V for 1 or 2 units)
- 4 Variable Micropipets (5 - 50 µl)

Supports up to 16 Students!



Cat. #304 \$99

Biofuel from Alcohol Fermentation



For 10 Lab Groups. Ethanol fermentation is a common biological process widely used in industry for its diverse applications (food, liquor and energy). In this kit, *Saccharomyces cerevisiae* is used to ferment sugar into ethanol. The conditions that are controlled are aeration and temperature. The pH for bacterial growth and ethanol production will be monitored using specific probes over a period of 5 hours.



Kit includes: instructions, yeast MicroBead, yeast growth medium, syringe, 15 ml centrifuge tubes, transfer pipets, loops.

All you need: air pump, heater, pH probe, temperature probe, ethanol sensor, fermentor vessel, autoclave, ice, shaker, ethanol, distilled or deionized water, centrifuge, colorimeter.

Storage: Some components require refrigerator storage.

Cat. #305 \$149

Fermentation and Bioprocessing of Green Fluorescent Protein

For 10 Lab Groups. This experiment is designed to introduce the basic concepts of fermentation and bioprocessing through the production of Green Fluorescent Protein (GFP) in a small-scale fermentor. At the end of the activity, students will observe and analyze results and will be able to purify GFP.



Kit includes: instructions, BactoBeads™ with supercoiled pFluoroGreen, Luria broth growth media, plastic lab material.

All you need: air pump, heater, pH probe, temperature probe, fermentor vessel, autoclave, ice, shaker, ethanol, distilled or deionized water, centrifuge, colorimeter, balance.

Storage: Some components require freezer storage.

EDVO-TECH Service

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Mon. - Fri. 8am-5:30pm EST

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- Approx. Purchase Date

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Cat. #954 \$99

Toxicity Detection of Pollutants in Freshwater

For 5 Lab Groups. This experiment has been adapted from a freshwater quality test which uses *Daphnia magna* to determine toxicity levels of freshwater. A simulated "toxicant" is provided to simulate environmental pollution in freshwater lakes, rivers and streams. Hydrolysis of a fluorescent substrate by *Daphnia* is used to determine the level of toxicants. Results are observed by using long wave ultraviolet light. Calculations for lethal concentration are determined.



Kit includes: instructions, fluorescent detection substrate, simulated toxicant concentrate, toxicity reduction reagent, 1 molded exposure chamber (Note: 5 required), wide bore transfer pipets, calibrated plastic pipets.

All you need: *Daphnia magna*, 4 additional molded exposure chambers (Cat. #965X), long wave UV light, white light visualization system, microscope or hand magnifier, large glass vessel, beakers, UV protective goggles, spring water, test tubes, 5 ml pipets and pumps.

Storage: Some Components Require Freezer Storage.

Cat. #965 \$39

Molded Exposure Chambers - 5 pack



A detailed list of components and requirements, as well as experiment protocols are available on our website:

www.edvotek.com

Cat. #956 \$95

Bioremediation by Oil Eating Bacteria

For 10 Lab Groups. Oil spills cause devastation to the environment killing sea life, birds, and coastal plants. Spraying areas of contamination with oil-eating microbes accelerates the degradation of the oil. This process is known as bioremediation. In this open-ended experiment, students will grow a mixture of oil-eating bacteria and observe their effectiveness at degrading a variety of oils.

BEST SELLER

Kit includes: instructions, oil-eating bacteria, growth medium, pipets.

All you need: shaking incubation oven (optional) or stir plate and stir bars, growth flasks, vegetable oil (or other food oils), distilled water, pipet pumps.

Storage: Room Temperature.



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