Table of Contents

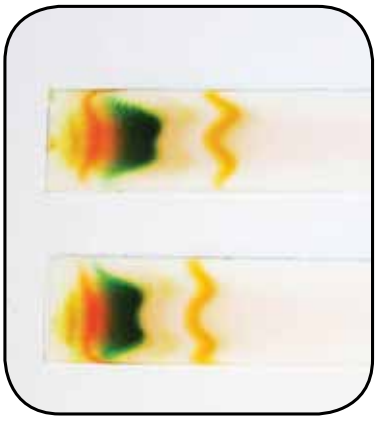
On the Cover

Cover painting of DNA by Dr. Robert T. Schimke, Professor Emeritus, Standford University, Department of Biological Sciences. Read more about the artist on the inside back cover.

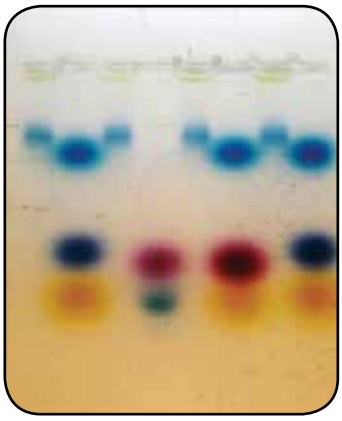
New Experiments from Modern Biology Inc.!

IND-29. Electrophoretic and Chromatographic Analysis of Photosynthetic Pigments from Blue-Green Algae $65.28

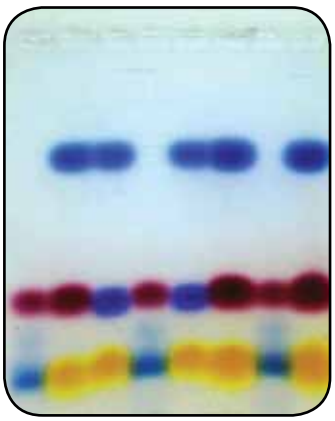
See Page 35 For More Information



Cyanobactera, also known as blue-green algae, obtain their energy by photosynthesis using sunlight as their energy source. These organisms have been considered to be the oldest and the most important bacteria on the earth. It is believed that they were responsible for the initial oxygenation of the earth's atmosphere through photosynthesis and it is also felt they were the precursors to the chloroplasts that are found in true algae and plants. In part A of this exercise, students prepare a water-soluble extract from blue green algae and show that it contains the single major protein Phycocyanin by electrophoresis as shown in the gel below. They also determine the charge of this protein by comparing its electrophoretic mobility to the mobilities of dyes with known charges. In part B, they prepare an alcohol extract and analyze the smaller alcohol soluble pigments by thin layer chromatography in order to identify the chlorophylls and major carotenoid pigments. The results of this two-part study give students practical hands-on experience with isolation of components from cells as well as electrophoresis and thin layer chromatography and introduces them to one of the most important organisms on the earth.



IND-30. Specific Binding of Dyes to DNA $19.99



Proteins that bind to DNA control the processes of gene regulation and DNA replication. The electrophoretic mobility band shift assay is a common technique used to study these proteins and to study specific protein-DNA interactions. In this exercise, students use this assay to identify dye molecules that bind to DNA and attempt to determine the mechanism by which these drugs interact with the DNA molecule.

Equipment Packages!

Order Now!

PIPETTOR PACKAGE $378.00

For the Value of $512.00

1 Pipettor Stand & 4 Pipettors of your choice

Mechanical Adjustable Volume Pipettor

Our mechanical adjustable pipettors offer accurate and precise sampling and dispensing of liquid volumes. The pipettors come in a variety of ranges to meet your needs. All pipettors have been quality tested according to ISO 8655/DIN 12650 and come with a one year warranty.

Features:

- Easy to calibrate and maintain
- Ejector collar and tip cone can be removed for easy cleaning and maintenance
- Digital display clearly reads volume setting
- Supplied with full documentation, warranties and certificates

CAT NO.	CAPACITY	PRICE
720080	2-20ul	~~$118~~
720020	5-50µl	~~$118~~
720070	20-200µl	~~$118~~
720060	100 - 1000µl	~~$118~~

Micropette™ Pipettor Stand

Linear Pipettor Stand, holds up to 6 pipettors.

Item No. 71000085

Reg. Price ~~$40.00~~

See Page 51 For More Information

A Laboratory Course in Innovative Biology (LC6)

This Program is a complete laboratory course for teaching general biology or introductory cell and molecular biology. This program, like all of our others, is designed for 16 students working in pairs. This course provides essentially all of the chemicals and instructions that are needed to teach fifteen 3-hour laboratory sessions or twenty-five 1-hour laboratory sessions. The course consists of a series of experiments that are presented in a comprehensive integrated laboratory manual. In the first two sections of the course, students study topics in protein biology and biochemistry such as protein structure, function, and isolation. Experiments on enzyme kinetics and cellular metabolism are then carried out. Students perform a project of their own design in the second section of the course. The projects focus on the characterization of plant peroxidases. A number of other optional student-designed experiments are outlined in the Instructor manual of the program and basic reagents are provided in order for the student to carry out their hypothesis driven projects. Experiments on the properties and structure of DNA are presented in the next section of the course. Here, students perform experiments that deal with genome organization, and specific gene function. Techniques include DNA electrophoresis, cell fractionation, DNA isolation, restriction nuclease mapping, and basic cloning procedures. In the final section of the course students study the genetics, biochemistry and molecular biology of hemoglobin.

Features

Suitability – General college-level biology, advanced high school biology or introductory cell and molecular biology for college sophomores and juniors.

Topics include evolution, protein biochemistry and enzyme action, photosynthesis and cell respiration, immunology, animal and plant physiology, anatomy and histology, cell biology, molecular biology and biotechnology, bacteriology, genetics, molecular genetics and genomics, and human genetic diseases.

Lab Schedule – Fifteen 3 hour lab sessions or twenty-five 1-hour lab sessions.

Cost - $52 per student per student per fifteen 3-hour laboratory sessions, excluding costs of manuals if the students work in pairs.

Student Designed Experiments - Ideas for over 50 optional student-designed experiments are outlined in the Instructor manual of the program and basic reagents are provided in order for the student to carry out their hypothesis driven projects.

Equipment Requirements include horizontal electrophoresis equipment, microliter dispensers, a microcentrifuge and water bath. A colorimeter is recommended but not absolutely necessary for parts of two experiments.

Description of the Laboratory Exercises

Proteins and Pigments

1. Electrophoretic and Chromatographic Analysis of Photosynthetic Pigments from Blue-Green Algae

Cyanobactera, also known as blue-green algae, obtain their energy by photosynthesis using sunlight as their energy source. These organisms have been considered to be the oldest and the most important bacteria on the earth. It is believed that they were responsible for the initial oxygenation of the earth's atmosphere through photosynthesis and it is also felt they were the precursors to the chloroplasts that are found in true algae and plants. There are two classes of photosynthetic pigments in Cyanobactera. The first class contains water-soluble proteins and the major protein is called Phycocyanin, which is blue. The other classes of photosynthetic pigments that include the carotinoids and chlorophylls are small molecular weight molecules and are insoluble in water but soluble in organic solvents such as alcohol. In this laboratory exercise, students isolate and characterize both groups of pigments. In part A of this exercise, students prepare a water-soluble extract from blue green algae and show that it contains the single major protein Phycocyanin by electrophoresis as shown in the gel. They also determine the charge of this protein by comparing its electrophoretic mobility to the mobilities of proteins and dyes with known charges. In part B, they prepare an alcohol extract and analyze the smaller alcohol soluble pigments by thin layer chromatography in order to identify the chlorophylls and major carotenoid pigments. The results of this two-part study give students practical hands-on experience with isolation of components from cells as well as electrophoresis and thin layer chromatography and introduces them to one of the most important organisms on the earth.

2. Specificity of Albumin Binding

The binding of an enzyme to its substrate is only one example of the many specific molecular interactions that occur in biological systems. An analogous binding process occurs with serum albumin, which binds certain small molecular weight compounds and serves as a carrier molecule for these compounds in blood. In this exercise, students use an electrophoretic assay to examine the binding of various dyes to cow albumin. The results of this graphic analysis show that the binding of dyes to albumin is saturable, specific, compatible, and dependent on the native structure of the protein.

Enzymes and Metabolism

3. Enzyme Action and Kinetics

This set of experiments was designed to give students a basic understanding of enzyme kinetics. In the first experiment in this series, students prepare an extract from wheat germ. They then determined the initial velocity of the reaction catalyzed by purified acid phosphatase and by the acid phosphatase activity present in the extract. From these data, they estimate the amount of the enzyme that is present in the wheat germ. In the second experiment, the student examines the effects of substrate concentration on the reaction velocity. The results enable them to determine the Vmax and Km of the enzyme catalyzed reaction.

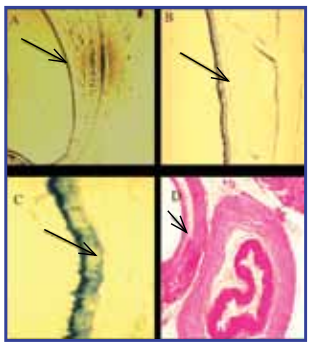
4. Effects of Temperature on Respiration

Respiration can be viewed as a series of enzyme catalyzed reactions in which carbohydrates, proteins, and fats are broken down to carbon dioxide and water with the release of energy. During the process, hydrogen is removed from the fuel molecules and oxygen is consumed. With this background information, students measure oxygen consumption and hydrogen liberation in germinating barley and corn at different temperatures. The program provides eight calibrated respirometers for measurement of oxygen consumption and the chemicals required to perform a graphic dye reduction assay.

Cell Biology and Molecular Evolution

5. A Rapid Immunological Method to Study Evolution

Each protein carries in its amino acid sequence information pertaining to its evolutionary history and origin, and provides clues to the evolutionary history of the organism in which it is found. Indeed, proteins existing today are in effect living fossils. This concept is illustrated in this exercise where students examine the abilities of antibodies against cow gamma globulin to react with gamma globulins in the sera of cow, goat, sheep, horse, and chicken. The results of the experiment will enable the student to answer the questions posed in the Student Guide provided with the exercise. Answers to these questions are given in the Instructor Guide. The method used for the experiment involves dotting small quantities of serum onto nitrocellulose and then incubating the nitrocellulose with an enzyme-linked antibody against cow gamma globulin. Following development of the nitrocellulose, purple dots appear with intensities that are proportional to the reactivity of the antibody.



6. Localizing Tubulin by Immunohistochemistry

Microtubules are hollow cylinders made up of polymers of the protein tubulin. Microtubules are major components of cilia and flagella, which are tail like projections that are covered by a plasma

membrane and extend outwards from the cell. Motile cilia are used for locomotion and food gathering by some protozoa and are found in the lining of the trachea, where their wave like motion propels mucus, dust and other foreign matter out of the lungs. In this exercise, students use the powerful technique of immunohistochemistry to localize tubulin in the esophagus and trachea. The provided tissue sections are exposed to a tubulin monoclonal antibody, which binds to the tubulin. The sections are then incubated with a secondary antibody, which binds to the first antibody. The second antibody is complexed with peroxidase, which catalyzes a color producing reaction. Following the addition of a non-toxic peroxidase substrate, the peroxidase converts the colorless substrate to a blue product, thus "staining" the area containing tubulin. As can be seen in the photographs in panels A-C at the right, the cilia that line the trachea are stained in a highly selective manner in keeping with the high concentrations of microtubules that make up these structures. In the course of these studies, students also become familiar with the four basic tissue types and the structure of tubular organs and identify representative examples of these features in tissue sections that they prepare.

Student Designed Experiments

7. Characterization of Peroxidase in Plants-Student Designed Projects

These experiments were designed to actively engage students in exciting biological research projects of their own design. The projects focus on peroxidases, which form a large family of related enzymes that are ubiquitous in plants. Plant peroxidase isoenzymes can be tissue specific, developmentally regulated and display variable tissue and, high salt and disease resistance defense reactions and this induction may be related to the abilities of peroxidases to strengthen the plant cell wall and to kill microorganisms. Students begin their projects with a hypothesis, which is a statement of an ideal that they will test in the laboratory. They then test their hypothesis by carrying out a series of experiments using the materials provided with the program and vegetables, intact plants or roots and stems. They first use the technique of tissue printing which enables them to localize the peroxidases in tissue sections. They then quantify peroxidase activity by using a DOT-blot assay and Spectrophotometric procedures. Students also carry out an electrophoresis analysis in order to characterize peroxidase isoenzymes in plant extracts that they prepare. In the final section of the program, students are given detailed instructions for organizing their data for presentation in a scientific paper. They are then instructed to write a paper that conforms to the style of a scientific publication using the detailed steps that are presented in the laboratory manuals.

DNA and the Cell Nucleus

8. Properties of DNA and Cell Fractionation and DNA isolation

A DNA molecule from a single human chromosome is about 4 cm long and the length of DNA in an individual is about 200 times the distance from the earth to the sun. Isolated DNA in a test tube is also a long, stiff molecule. When alcohol is added to a DNA solution, the DNA fibers precipitate and can be spooled onto a glass rod. This feature of DNA is illustrated in the first part of this lab period. In the second part, students isolate nuclei from calf thymus tissue. The DNA is then extracted from the nuclei by a simple procedure that uses a detergent and alcohol.

9. Anatomy and Evolution of the Genome

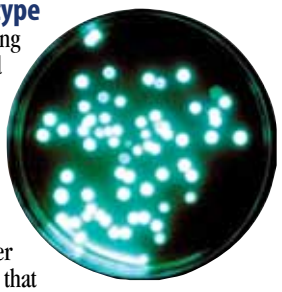
Common plasmids are simple DNA molecules, which contain a few genes and regulatory elements. Most viral genomes are more complex. For example, the genome of phage lambda contains approximately 50 genes. About 4,000 genes are present in the *E.coli* genome while there is approximately 1,000 times more DNA in the genome of a mammal. This progression in genome complexity is the topic of this exercise. Here, students compare the electrophoretic patterns of restriction digests of a plasmid, phage lambda DNA, and cow DNA from thymus and kidney.

10. Specific Binding of Dyes to DNA

Proteins that bind to DNA control the processes of gene regulation and DNA replication. The electrophoretic mobility band shift assay is a common technique used to study such specific protein-DNA interactions. In this exercise, students use this assay to identify dye molecules that bind to DNA and attempt to determine the mechanism by which these drugs interact with the DNA molecule.

Molecular Genetics Genetics and Biochemistry of Hemoglobin

11. DNA Cloning and Genotype to Phenotype

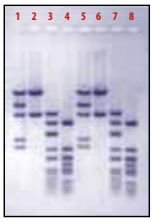


This exercise was designed to provide an exciting introduction to specific gene structure and function. The students are given four tubes that are labeled Plasmid A-D. which are identified in the instructor's guide. One plasmid (A) has a functional gene for the enzyme the ß-galactosidase while tube B contains an inactive form of this gene because it contains a segment of foreign DNA. The tube labeled C contains water while tube D contains the lux operon. Bacteria that carry this plasmid glow in the dark. In the first part of the exercise, students analyze restriction digests of the plasmids in order to determine which plasmid should have a functional ß-galactosidase gene. In the second part of the exercise, the plasmids are introduced into *E.coli* by transformation and the color of the resulting colonies (blue or white) is then used to assess the functional status of the ß-galactosidase gene. The bacteria are also viewed in the dark for glowing in order to see which plasmid contains the lux operon. By comparing the results they identify the plasmids and relate the genotypes of the plasmids to the phenotypes conferred by the plasmids in *E.coli.*

12. Sickle Cell Anemia

Many changes in the structure of hemoglobin have arisen by mutations. About one person in 100 carries a mutant hemoglobin gene, and these individuals have abnormal hemoglobin molecules in their blood. One of the most common abnormal hemoglobins is hemoglobin S, which causes sickle cell anemia. When the gene for hemoglobin S is inherited from both parents, all of the hemoglobin in the circulation is hemoglobin S and the individual suffers from severe anemia. An electrophoretic procedure is used to illustrate the various types of hemoglobin in the first part of this laboratory exercise. In the second part, Students use the technique of gel filtration chromatography to isolate hemoglobin and then to determine its size.

13. Analysis of a Mutant Hemoglobin Gene

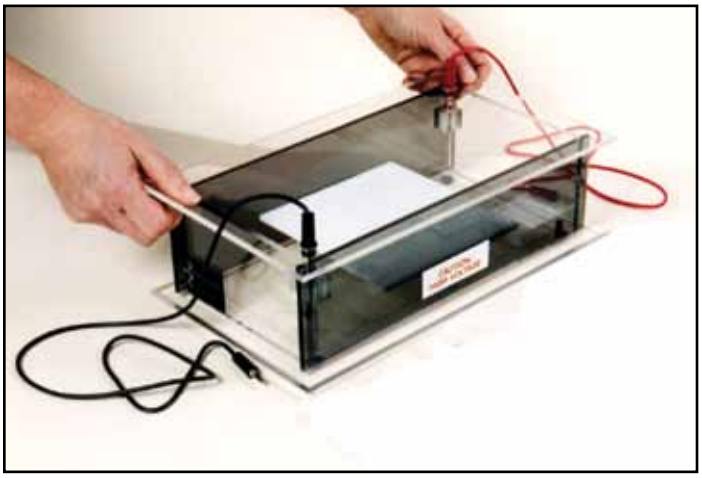


A mutation is a change in the nucleotide sequence of DNA, which leads to an inherited change in an organism. Restriction endonucleases provide valuable tools for characterizing mutations at the DNA level. This principle is illustrated in the exercise where students digest a normal and a mutant gene with EcoR1 and Hae III and then analyze the DNA fragments from each by electrophoresis as shown in the figure below. The gene is from rabbit and codes for the ß-globin chain-s of hemoglobin.

CATALOG #	DESCRIPTION	PRICE
LC6-C	The Chemical Package for 16 students working in pairs plus one student manual, one instructor manual and a CD containing PDF's. (The student manual may be reproduced for educational purposes).	$845
LC6SM	Sample Student Manual (164 pages) plus one instructor manual (44 pages)	$37
LC6-BK	8 Student Manuals	$148

Manual PDFs Included on CD

Electrophoresis Equipment in the Teaching Laboratory



The PROCELL - Four Electrophoresis Units in One

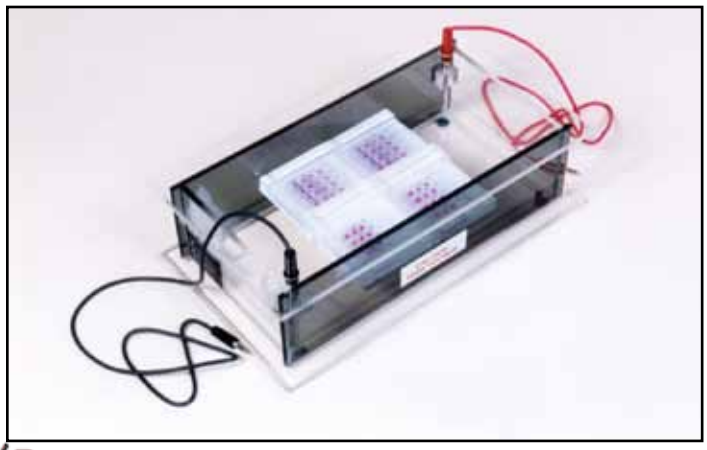
The PROCELL is a horizontal electrophoresis unit designed specifically for our teaching programs. Up to 16 students working in pairs can use the unit at the same time. Four agarose gels are made individually outside of the chamber using 4 casting trays and sample well forming combs. They are then placed on the chamber's white platform which enables students to follow the movement of colored samples during the electrophoretic run. Although the PROCELL was designed primarily to run four agarose gels for teaching purposes, the versatile unit can also be used to run polyacrylamide gels. The reader is referred to pages 49 of the catalog for these applications and for individual accessories for the PROCELL.

Features:

- Sturdy construction for years of student use
- Safety interlock lid with built-in power cords. The lid must be in place for the unit to operate.
- Platinum electrodes
- Acrylic chamber (30 x 15 x 9cm) with a buffer capacity of 2.5 liters
- Four precision gel trays with 10 glass slides, gel size 7.5 x 5cm
- Four sample well-forming combs (8 wells)
- Complete instructions

Find more electrophoresis equipment at **MODERNBIO.COM**

CAT NO.	DESCRIPTION	PRICE
PC	The PROCELL Electrophoresis Chamber	$317.16



MB-170 Power Supply

Designed to be used with large electrophoresis units like the PROCELL, this research-quality power supply has two voltage settings (85 and 170V). With up to 85 watts of power, the MB-170 is at least twice as powerful as other power sources in this price range. Additional features include On-Off indicator light, current output meter, recessed banana plug ports as an important safety feature, overload protection, quality UL-approved components, up to 500 MA and a one year warranty. When used with the PROCELL at the 170V-setting, electrophoresis of DNA or protein is complete in 45 minutes to 1 hour.

CAT NO.	DESCRIPTION	PRICE
MB-170	Power Supply	$199.99

The EXCELL - Two Electrophoresis Units in One

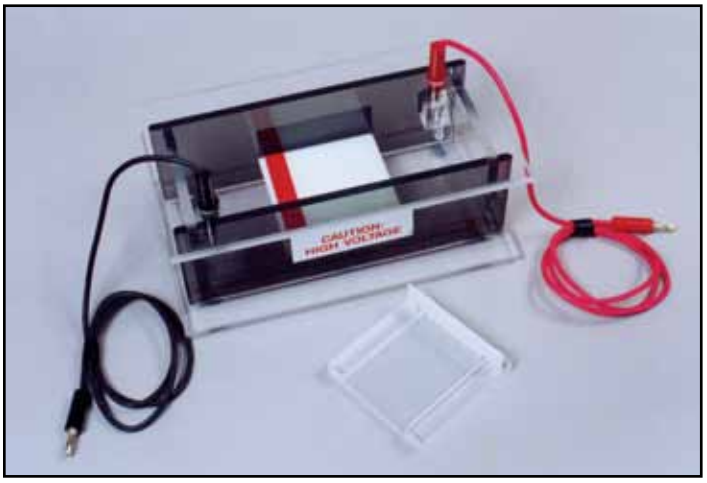
The EXCELL is a horizontal electrophoresis unit designed to be used by 8 students working in pairs. Two agarose gels are made outside the unit using two casting trays and combs.

Features:

- Sturdy construction with safety interlock lid
- Platinum electrodes
- Acrylic chamber (30 x 8 x 9cm) with a capacity of 1.1 liters
- Two precision gel trays with 4 glass slides, gel size 7.5 x 5cm
- Two sample well-forming combs (8 wells)
- Complete instructions

CAT NO.	DESCRIPTION	PRICE
EC	The EXCELL Electrophoresis Chamber	$209.02

Electrophoresis Equipment in the Teaching Laboratory



The BIOCELL

A high quality mini-electrophoresis unit at an affordable price

The BIOCELL is a horizontal electrophoresis unit designed specifically for our teaching programs. Four students working in pairs use the unit at the same time. The agarose gel is made outside of the chamber using the casting tray and sample well forming comb. The gel is then placed on the chamber's white platform which enables students to follow the movement of colored samples during the electrophoretic run.

Features:

- Sturdy construction for years of student use
- Safety interlock lid with built-in power cords . The lid must be in place for the unit to operate.
- Platinum electrodes
- Acrylic chamber 18 x 8 x 7cm with a buffer capacity of 400ml
- Precision gel tray with 2 glass slides, gel size 7.5 x 5cm
- Sample well-forming comb (8 wells)
- Complete Instructions

CAT NO.	DESCRIPTION	PRICE
BC	The BIOCELL Electrophoresis Chamber	$187.16

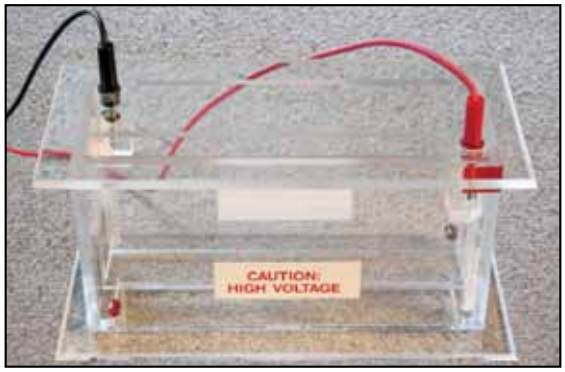
Electrophoresis Power Strip

The power strip permits up to four electrophoresis cells to be run by a single electrophoresis power supply such as the MB-170 described on page 48. Supplied with 18" length attached cables with banana plugs which connect to the power supply.

CAT NO.	DESCRIPTION	PRICE
EPS	Electrophoresis Power Strip	$89.99

Accessories for the Agarose Electrophoresis Units

CAT NO.	DESCRIPTION	PRICE
7-1	8-sample well-forming comb (7. x 2.5cm)	$7.49
7-2	Precision Casting Tray (7.5 x 7.5cm)	$23.04
7-3	Glass Slides (10 slides) (7.5 x 5cm)	$8.49
7-6	Stabilizing Bar	$10.18



Vertical Electrophoresis Unit

This easy to use vertical electrophoresis unit is designed to run one or two precast polyacrylamide gels simultaneously. The unit allows the use of most standard size precast gels (8x10cm). At 170 volts, electrophoresis is complete in about 40 minutes.

Features:

Sturdy construction for years of student use and a safety interlock lid with built-in power cords. *The lid must be in place for the unit to operate.* It also features platinum electrodes and an acrylic chamber (20.5 x 7.2 x 10.5 cm) with a buffer capacity of 1 liter.

Fine Tip micropipet tips are now available at MODERNBIO.COM.

CAT NO.	DESCRIPTION	PRICE
VEU	Vertical Electrophoresis Unit	$239.00

Electrophoresis Package for SDS Polyacrylamide Gels

The package contains Tris-Glycine-SDS electrophoresis buffer (makes 3 liters) and Coomassie Blue Gel Stain (makes 1 liter). The package provides sufficient materials for three of our polyacrylamide experiments. The gels must be ordered separately.

CAT NO.	DESCRIPTION	PRICE
EP-2P	Electrophoresis Package for SDS Polyacrylamide Gels	$27.73

Electrophoresis Equipment for the Entire Class

The Complete Teaching Laboratory (TCTL)

Utilizing todays most reliable and classroom appropriate equipment – The Complete Teaching Laboratory Package (Cat. No. TCTL) is by far our most economical package offering an incredible discount of over 45% from the list prices! The authors and creators of our experiments have hand selected the pieces of equipment that they feel are best suited for todays teaching laboratory. The TCTL will ensure that you can carryout all experiments offered from Modern Biology. With the purchase of a single catalog number - you can equip your lab with todays most modern, rugged and professional equipment available.

ITEM INCLUDED	CAT. NO	PAGE
(4) BioCell	BC	49
MB-170 Power Supply	MB-170	48
Power Strip	PS	49
Extra Casting Trays	7-2	49
(4) Extra Combs	7-1	49
(2) Extra Glass Slides (10)	7-3	49
Stabilizing Bar	7-6	49
(4) Auto Micropipettors	720080 (you pick sizes)	51
6 space Micropipetor Rack	MR	51
Case of 960 Tips in Racks	PT-200 (you pick sizes)	51
Adam 200g/0.01g balance	CQT 202	52
Labnet Vortex Mixer	VX-200	52
12 x 1.5/2ml tube		52
(2) Mini Microcentrafuge	SPMC	53
8 L Water Bath	HW-8L	54
Heated Stir Plate	H4000 HS	54
Labnet Mini Incubator	LMI	55
Labnet Mini Roller	LMR	55
(4) Infinity Microscopes	1008	56
Bag Sealer 8"	BS	58
100Bags (6 by 10")	Bag-6	58
(4) Cold Box	CB	58
(16) Stopwatches	MAST1110-16	58
(4) Mortar and Pestal	GMP	58
19L Dispensing Jug	DJ	58
PVC Lab Aprons	Apron	58
1.7ml Test Tube (500)	6-1	59
(8) Tube Racks	6-3-8	59
1ml Transfer Pipets (500)	6-5	59
3ml Transfer Pipets (250)	6-6	59
(500) Petri Dish	mk1004j3-500	59
(500) Inoculating Loops	MK1020-500	59
Parifilm 4 X 125' ROLL	PF	59
(4) Niltrale Gloves	LD1003	59
(16) Adult Safety Goggles	G10902-16	59
TCTLC *(includes all above items plus)*		
Spectrophomoter	WP-100D Plus	53
Spectrafuge 16M	16M	53
Thermocycler	TC05018	57
Orbi Blotter	BT30	57





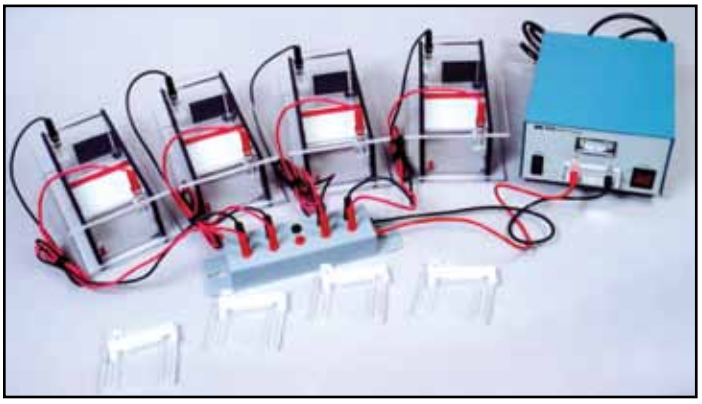







CAT NO.	PRICE
TCTL	$6,999.00
TCTLC	$11,499.00

Save over $5,000.00



Modern Biology has created this combination of equipment and chemicals for 16 students working in pairs to perform electrophoresis.

The Complete System Contains:

- Four Complete BIOCELLS
- MB-170 Power Supply
- Electrophoresis Power Strip
- Overview Program 3 *An Introduction to Electrophoresis* (See page 39)
- Complete Instructions

CAT NO.	DESCRIPTION	PRICE
SV-1	All for only	$947.99
SV-2	All items listed above *except* the MB-170.	$747.99

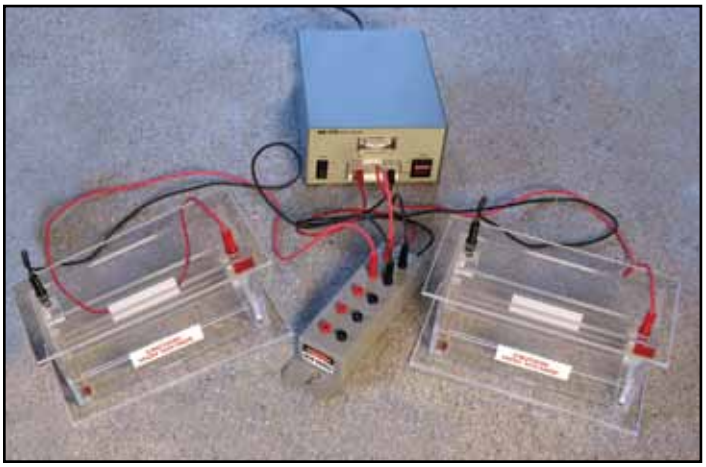
Polyacrylamide Gel Electrophoresis Equipment

Modern Biology has created this combination of equipment for 16 students working in pairs to perform polyacrylamide gel electrophoresis.

The Complete System Contains:

- Two Complete vertical electrophoresis units
- MB-170 Power Supply
- Electrophoresis Power Strip and Complete Instructions.

CAT NO.	DESCRIPTION	PRICE
SVP-1	All items shown below	$642.00
SVP-2	All items listed above except the MB-170.	$448.00



Accessories For Sample Handling

Variable Automatic Micropipets

These high-quality micropipets from the Labnet Discovery series are continuously adjustable and deliver precise volumes with ease. The micropipets use standard disposable tips and feature an easy-to-read digital display that indicates the selected volume. Each micropipet also has a tip ejector and comes with a calibration kit and instructions. Available in four sizes for ranges from 2 to 1000 µl.

CAT NO.	CAPACITY	PRICE
AM-20	2-20µl	$184.12
AM-100	10-100µl	$184.12
AM-200	20-200µl	$184.12
AM-1000	100-1000µl	$184.12

Buy any ***four*** AM series automatic micropipets and save over $97.00!
AM-Four • Please specify size(s) • $639.00

Economy Variable Micropipets

These lightweight yet durable pipettes are an excellent value. They are easy to maintain and are supplied with full documentation and a one-year warranty. The tip ejector, finger support and ergonomic design allow for efficient one-handed use.

CAT NO.	CAPACITY	PRICE
720080	2-20ul	$118
720020	5-50µl	$118
720070	20-200µl	$118
720060	100 - 1000µl	$118

Buy any ***four*** of your choice plus a rack for $378.00!
Save $134.00 - See page 2 for details!

Micropipet Tips

More sizes available at **MODERNBIO.COM**

Universal Tips

Volumes from 0.2 to 5000ul. Available in bulk packs, racked and racked-sterile. MicroPette Tips are made from high purity virgin polypropylene and are designed for use in a wide variety of pipetting applications. They are tested for compatibility with Eppendorf®, Gilson®/Rainin®, and Thermo Labsystems/Finnpipette® pipettes. All tips are supplied in racks.

CAT NO.	CAPACITY	#TIPS	PRICE
PT-200	10-200µl	96	$9.99
PT-200-5	10-200µl	960	$39.25
PT-1000	100-1000µl	70	$7.03
PT-1000-4	100-1000µl	840	$50.07
PT-1000-4S	100-1000µl	840 Sterile	$62.25
PT-200-5S	10-200µl	960 Sterile	$56.84

Micropipetors

These precision micropipetors combine the accuracy of an expensive research dispenser with the ease and economy of a disposable pipet. The devices will dispense 5, 10, 15, 20, and 25µl with an accuracy of ± 1%

CAT NO.	DESCRIPTION	PRICE
6-7-1	Two micropipetors and 50 micropipets	$15.29
6-7-1P	Pipets only	$7.65
6-7-4	Eight micropipetors and 200 micropipets	$37.05
6-7-4 P	200 micropipets	$27.53

Linear Pipette Stand

Carousel Pipette Stand

CAT NO.	DESCRIPTION	PRICE
71000085	Linear Pipettor Stand, holds up to 6 pipettors	$40.00
71000084	Carousel Pipettor Stand, holds up to 6 pipettors	$40.00

Balances and Mixers

KLE Series Economy Balances

These economical toploaders offer maximun efficiency at a minimal cost. These scales will weigh in grams and ounces. A removable stainless steel platform makes it easy to keep clean.

CAT NO.	CAPACITY GRADUATION	PRICE
WPS1	200g .01g	$132.18
WPS2	2000g 1g	$132.18

KHA Precision Balances

The WPS3 offers fast microprocessing speed and digital filtration. This balance comes with a RS232 port, leveling bubble and adjustable feet. It measures in grams and ounces.

CAT NO.	CAPACITY GRADUATION	PRICE
WPS3	200g .01g	$299.99

ADAM Equipment Compact Portable Balances

The Core series from Adam Equipment is the best choice for simple operation and economy. Each of these balances feature the following:

Features

- 9 weighing units
- Full range tare
- Zero Tracking
- Simple 4 button operation
- Backlit LCD display
- Stainless steel pan
- ShockProtect™ overload three-point protection
- Can be stacked for storage (120mm pan size only)
- Lock down mounting slot for Kensington™ type lock and cable
- Dual tare keys
- Lightweight and portable
- Modern low profile design
- Colour coded, sealed keypad
- Low cost and simple to use
- External calibration
- Battery power (6 x AA Batteries)
- Auto sleep / power down function to save battery life
- AC Adapter

For more sizes and options be sure to visit our website **MODERNBIO.COM**

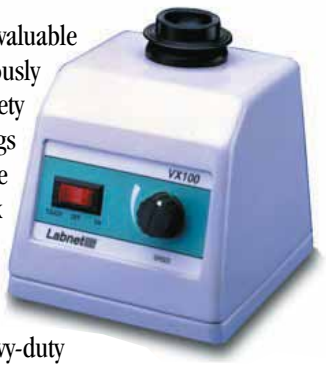
Specifications

CAT NO.	CAPACITY/READABILITY	PLATFORM/SIZE	PRICE
CQT 202	200g/0.01g	4.7Ø/120mm Ø	$219.67
CQT 2000	2000g/1g	5.7/145mm Ø	$91.16

Accessories

CAT NO.	DESCRIPTION	PRICE
No.308002042	Hard Carry Case with Lock	$75.00
No.700100046	Security Lock and Cable	$28.00
No.308232033	In-use Cover	$20.00
No.700100187	ASTM 2 - 100g calibration weight	$65.00
No.700100195	ASTM 3 - 200g calibration weight	$65.00
No.700100190	ASTM 2 - 1000g calibration weight	$125.00

Vortex Mixer



Labnet's VX-200 vortex mixer is a valuable addition to any laboratory. The continuously adjustable speed control meets a variety of applications. Lower speed settings allow for gentle mixing of samples while higher speeds can be used for vortex mixing and resuspending of pellets. The general-purpose cup attachment supplied with the VX-200 accepts a variety of different sized tubes. The heavy-duty construction of the unit ensures a long life and the rubber feet, keep the unit stable and prevent "walking"across the bench during operation.

CAT NO.	DESCRIPTION	PRICE
VX-200	Vortex Mixer	$199.00

Optional Heads and Accessories

CAT NO.	DESCRIPTION	PRICE
	24 x 1.5/2.0ml tubes, 24 x 0.5ml tubes, and 32 x 0.2ml tubes (or 4 PCR strips)	$33.00
	1 microplate or 64 x 0.2ml tubes or 8 PCR strips	$40.20
	8 x 15ml and 8 x 12/13mm diameter tubes	$40.20
	6 x 50ml tubes	$40.20
	12 x 1.5/2.0ml tubes, held horizontally	$40.20
	4 x 15ml tubes, held horizontally	$77.25
	2 x 50ml tubes, held horizontally	$77.25

Benchmark Vortex Mixer

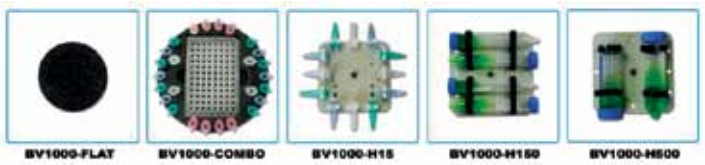
The new BenchMixer from Benchmark Scientific provides smooth instant vortexing with a wide array of adapters available to cater to almost every common size of tube. The unique counter-balance system creates maximum vortexing action, while minimizing noise and excessive vibration. This results in quieter, more efficient and longer lasting operation.

Additional features include: "no-walk" suction feet, cold room/incubator compatibility and spill-proof electronic controls.

CAT NO.	DESCRIPTION	PRICE
BV1000*	BenchMixer Vortex Mixer	$199.00

Accessories

CAT NO.	DESCRIPTION	PRICE
BV1000-FLAT	Optional 3 in. flat head attachment	$22.00
BV1000-COMBO	Optional combination head for one microplate and microtubes (38x1.5 & 28x0.5)	$44.00
BV1000-H15	Optional attachment, 12 x 1.5ml, horizontal	$82.80
BV1000-H150	Optional attachment for 4 x 15ml, horizontal	$82.80
BV1000-H500	Optional attachment for 2 x 50ml, horizontal	$82.80



Spectrophotometer, Centrifuges and Dry Baths

Spectrophotometer

WP-100D PLUS - This simple, practical laboratory instrument is precisely designed and ruggedly built. This spectrophotometer is easy to use and is ideal for student use in high schools, colleges, and in general laboratory settings. The Model WP-100Dplus is suitable for general analysis and experiments and features a large screen graphic LCD that gives you clear, quick, and accurate readings in Absorbance and Transmittance. The sample compartment is designed to accept both round optical glass, or square 10mm path length cuvettes. This classic spectrophotometer contains built-in secondary optical filters that reduce stray light and increase precision, giving more reliable results with basic training. The WP-100Dplus offers a USB port for data transfer and to interface with a windows-based computer. An optional software package is available that allows users to perform a wider range of analyses and documentation. The spectrophotometer comes with ½" (13mm)round tube holder, 10mm square cuvette adapter, box of twelve round optical glass cuvettes, dust cover, and user manual.

WP-110RS - The WP-110RS Model features a 10nm slit width and is designed to be used with ½" (13mm) round tubes or 10mm square cuvettes (an adaptor is supplied at no additional charge for 10mm square optical glass cuvettes). Similar to the WP-110RS Model, the WP-110RS is reliable and easy to use featuring automatic zeroing, one-touch blanking, and built-in automatic filters for easy operation.The large screen graphic LCD are easy to read and gives quick accurate readings in Absorbance, Transmittance, Factor, and Concentration. Each option can easily be selected with using the Mode button located on the control panel.High quality silicon photodiode detector and 1200 lines/mm grating assures high performance, while second order filters are built-in and automatically adjust as the wavelength is set. The WP-110RS offers a USB port to interface with windows-based computers. Optional software packages are also available for further processing and analyses of data collected.The spectrophotometer comes with twelve round optical glass cuvettes, a square cuvette adapter, dust cover, and user manual.

WP-120 - The WP-120 Model Spectrophotometer is a great value for precise and accurate readings. This model features a 5nm Bandwidth design while high quality silicon photodiode detector and 1200nm lines/nm grating assures optimal performance. The large screen graphic LCD are easy to read and gives quick accurate readings in Absorbance, Transmittance, Factor, and Concentration. Each option can easily be selected with using the Mode button located on the control panel. The WP-120 Model also offers automatic zeroing and blanking with the touch of a single button. Replacements bulbs are quick and easy to install and requires no tools or alignment. The large sample compartment on the WP-120 Model comes standard with a four position 10mm square cuvette holder. Additional accessories are also available for alternative options. The WP-120 Model features USB port for data transfer and can be integrated with a windows-based computer for further data processing and analyses. Optional software packages are available. This spectrophotometer comes standard with a four cell (four position) 10nm, square cuvette changer, set of two optical glass square cuvettes, dust cover, and user manual.

You can view all accessories and learn more about this equipment by visiting our website at **MODERNBIO.COM**

CAT NO.	DESCRIPTION	PRICE
WP-100D PLUS	Spectrophotometer	$638.00
WP-110RS	Spectrophotometer	$799.00
WP-120	Spectrophotometer	$899.00

Spectrafuge Mini Microcentrifuge

This personal Mini Centrifuge can be used to prepare serum, pellet cells and cell nuclei. The unit can even be employed for plasmid miniprep procedures using extended run times. The Spectrafuge Mini is supplied with a rotor and adapters to accommodate 1.5 ml, 0.5 ml and 0.4 ml tubes. This unit requires less than 6 inches of bench space and the maximum speed is and adaptors 6,000 rpm (2,000g).

CAT NO.	DESCRIPTION	PRICE
SPMC	Mini Centrifuge with rotor	$234.00

Spectrafuge 16M Microcentrifuge

The Spectrafuge 16 M is a high performance, brushless microcentrifuge which is priced below most brush models. The fixed angle rotor accommodates eighteen 1.5/2.0ml tubes. Operation of the centrifuge is controlled by a 1 to 30 minute timer (or hold) and speed selection is continuously variable to 14,000 rpm (16,000 x g). A locking mechanism prevents the lid of the centrifuge from being opened while the rotor is spinning. The unit weighs 10 lbs and is 8.25in x 8.9in x 7.6in.

CAT NO.	DESCRIPTION	PRICE
16M	Spectrafuge 16M	$1476.00

Digital Dry Bath

Dry Baths are useful for a variety of applications in molecular and cell biology. This bath features microprocessor control and digital setting/ display of temperature. This provides for precise, accurate control of temperature, which can be adjusted, from ambient to 150ºC with an accuracy of ±0.3ºC. Blocks for 0.5 and 1.5 ml tubes are available separately.

CAT NO.	DESCRIPTION	PRICE
LDB	Digital Dry Bath, dual block capacity	$383.00
LDBT1	Block, 24 x 2.0 ml tubes	$94.00
LDBT2	Block, 24 x 0.5 ml tubes	$94.00

Water Baths and Stir Plate

HW-2L

Top View of HW-2L

HW-4L

Electro-thermal Constant-temperature Water Bath

The Walter brand digital water bath is a great economic solution for general purpose use at both the high school and college level. Available in three sizes, 2L, 4L and 8L with a temperature range of 37 to 100°C.

These Water Baths each have the following features:

- Easy to read digital display
- Stainless steel inner reservoir
- All sizes include cover with removal open ring covers to allowing beaker & flasks to be used while limiting water evaporation
- Intelligent temperature controller w/PID program
- Safety features including over-temp protection

HW-8L

Specifications

	HW-2L	HW-4L	HW-8L
Item No.			
Capacity	2 Liter	4 Liter	8 Liter
Cover	1 opening	2 openings	4 openings
Voltage(v)	110V / 50Hz	110V / 50Hz	110V / 50Hz
Consuming power (w)	400	500	1000
Temperature Volatility (°C)	±0.5	±0.5	±0.5
Temperature variation (°C)	37-100	37-100	37-100
Temperature Sensitivity (°C)	≤±1	≤±1	≤±1
Indication error (°C)	≤±2.5	≤±2.5	≤±2.5
Interior dimensions(L×W×H)mm	168×168×110	325×168×110	325×325×110
Exterior dimensions(L×W×H)mm	340×235×190	490×235×190	495×370×190
Packaging dimension(mm)	370×290×235	530×300×240	530×435×260
Net weight (kg)	3.3	4.5	6
Gross weight (kg)	4.5	5.5	7.8

CAT NO.	DESCRIPTION	PRICE
HW-2L	2 Liter Water Bath	$224.00
HW-4L	4 Liter Water Bath	$266.00
HW-8L	8 Liter Water Bath	$319.00

SPECIAL VALUE

This hotplate/stirrer is perfect for making Agarose gels.

H4000-HS Benchmark Magnetic Hotplate/Stirrer

- Ceramic work surface, 7.5 x 7.5 in.
- Stir speed from 60 to 1500 rpm
- Temperature control up to 380°C
- Three models: heat-stir, heat only or stir only

Benchmark hotplates, stirrers and hotplate-stirrers feature an exceptionally durable, chemical resistant white ceramic work surface. Their space-efficient design (8 X 9 in. footprint), makes them ideal for use on crowded benchtops and inside of bio-hoods.

Advanced microprocessor controls with convenient turn knobs allow quick, precise adjustment and maintenance of speed and temperature. Safety indicator LED's on the front panel indicate when the heating and/or stirring functions have been activated. With a square 7.5 in work surface, all three models are compatible with a wide variety of popular sizes of borosilicate glass beakers, flasks, bottles and other vessels. The hotplate/magnetic stirrer model (H4000-HS) comes complete with a support rod for mounting thermometers and temperature probes.

- Temp. Range: 80 to 380°C
- Speed Range: 60 to 1500 rpm
- Platform Dimensions: 7.5 x 7.5 in./ 19 x 19 cm
- Operating Temp. Range +4 to +65°C
- Dimensions: (w x d x h) 8 x 9 x 4.5 in.; 20 x 23 x 11.5 cm
- Weight: 9 lbs (4kg)
- Electrical: 120 or 230V, 50-60Hz 500W
- Warranty: 2 Years

CAT NO.	DESCRIPTION	PRICE
H4000-HS*	Benchmark Hotplate & Stirrer	$299.00
H4000-S*	Benchmark Magnetic Stirrer	$199.00
H4000-H*	Benchmark Hotplate	$199.00

SPECIAL VALUE

Incubator and Shaker

Mini Incubator with Lab Roller Combination

A Few Uses of this Versatile Combination Package include:

- Bacterial Growth on Plates and in Solution
- Growth of Bacterial for Plasmid Minipreps
- Western Blots
- Southern Blots and DNA Hybridization
- Tube Shaking

SPECIAL VALUE

Labnet's Mini Incubator is compact (W x D x H) (11.2 x 11 x 13.2 in) and economically priced, yet offers features not typically found in a basic incubator. The housing is all metal, as is the door frame. A plexi-glass window in the door offers full visibility to the interior. One shelf is included, and can be adjusted to three different levels. A grommet hole in the top of the unit can hold a thermometer for accurate temperature setting.

The Mini LabRoller Rotator is designed for mixing samples in both a horizontal and vertical plane. The unit accepts a broad assortment of tube sizes. Safe for cold room or incubator use, this mixer is ideal for a wide range of applications in areas such as biochemistry, molecular biology, and cell biology. The LabRoller Rotator is supplied with three interchangeable rotisseries. The rotisseries hold (A) 36 x 1.5 / 2.0 ml tubes, (B) ten conical 15 ml or other tubes with a 15-17 mm diameter as well as twelve tubes with a 12-13 mm diameter and (C) six 50 ml conical tubes. The unit has an operating temperature range of ambient plus 4ºC to 65ºC and the speed is 24 rpm.

CAT NO.	DESCRIPTION	PRICE
INC	Mini incubator with Lab Roller Combo	$618.00
LMI	Labnet Mini Incubator	$399.00
LLR	Labnet Mini Lab Roller	$349.00

My Temp Mini Digital Incubator

- Digital temperature control
- Personal sized, 13 x 14.5" footprint (20L)
- Accepts bottles and flasks up to 2L
- Two models: Heat Only or Heat/Cool
- Optional mini shaker available for agitation of samples

With digital temperature control, the MyTemp incubators provide convenient "set and walk away" operation's, eliminating the need for external thermometers and repetitive "fine tuning" of an analog control knob. Simply choose the desired temperature and the incubator immediately begins to heat up (or cool down, -HC model only) while accurately monitoring the chamber temperature and conveniently displaying the temperature in real time on the large LED control panel.

Despite a modest footprint of 14.5 x 13", the MyTemp incubators feature large internal chambers, capable of storing flasks and bottles up to 2 liter. In addition, the incubators include two adjustable/ removable shelves for increased capacity. A mini nutating rocker (supplied with both flat and dimpled mats) is also available for agitation of samples during incubation.

- Temp. Range (H): Ambient +1°C to 60°C
- Temp. Range (HC): Ambient -15°C to 60°C*
- Temp. Accuracy: 0.5°C (at 37°C)
- Temp. Uniformity: +/- 1°C (at 37°C)
- Temp. Increment: 1°C
- Platform Dimensions: 9.5 x 11.5 in./ 23.5 x 29 cm
- Operating Temp. Range +4 to +65°C
- Dimensions: (w x d x h)
- Exterior: 13.2 x 14.5 x 18.7 in. / 33.5 x 37 x 47.5 cm
- Interior: 10.3 x 9.3 x 12.8 in. / 26 x 23.5 x 32.5 cm
- Capacity: 20L, (0.75 cu. ft.)
- Weight: 15 lbs / 6.5 kg
- Warranty: 2 Years
- Electrical: 100 to 240V, 50-60Hz
- Warranty: 2 Years
- * Minimum temperature is approx. 7°C in 22°C room temp.

SPECIAL VALUE 2013 SALE PRICE

LOWEST PRICE GUARANTEE! ~~$768.40~~ NOW 499.00!

CAT NO.	DESCRIPTION	PRICE
H2200-H*	MyTemp™ Mini Digital Incubator, Heat Only	$499.00
H2200-HC*	MyTemp™ Mini Digital Incubator, Heat and Cool	$599.00
H3D1020	Mini Nutating Mixer with flat cord, 8x6" platform with dimpled & flat mats, 115V	$344.00
H3D1020-E	Mini Nutating Mixer with flat cord, 8x6" platform with dimpled & flat mats, 230V	$369.00
H2200-SH	Extra shelf, 10.5 x 8 in.	$29.00

Microscopes

Olivia Series Microscope

Features a unique euro style base design and an ergonomic arm for convenient transport and a sturdy aluminum die-cast stand for durability. Excellent optics for biology studies and laboratory applications. Grades 11 through college level application. Limited lifetime warranty.

Features

- Arm and base are now made of one piece construction
- Choice of Monocular 45° Inclined head, Double 45° Dual View Head, 90° Video Dual-View Head, or Binocular head
- Quadruple nosepiece
- DIN Objectives 4X, 10X, 40XR, and 100XR (retractable) (oil immersion) are parfocaled and parcentered
- Built-in mechanical stage
- Substage 1.25 N.A. abbe condenser and iris diaphragm is standard for four objective models
- Coaxial focus with rack and pinion mechanisms and positive stops at both ends of the stage to prevent damage to delicate specimens or optics
- Built-in LED illumination system with on/off switch and three-wire grounded power cord
- Mechanical tube length: 160mm
- Objective conjugated distance: 195mm
- Comes complete with dust cover and instructions
- Shipping information: 20″ x 14″ x 20″ - 12lbs


Calibrated Pointer

CAT NO.	PRICE
OL-D-100	$399
OL-E-100	$428
OL-G-100	$ 449
OL-CXB-100	$549

1000 Series Infinity Microscopes

Designed to meet the demands in education and training environments, the new 1000 series with infinity optical system will deliver the best performance for a variety of applications. Limited lifetime warranty.

Features

- The rectangular shape and cast aluminum stand features minimum vibrations and provides a strong and stable operation
- Standard 10X wide-field eyepieces optimize viewing field for easy and comfortable operation
- Binocular or trinocular heads that are 30º inclined and 360º rotatable
- Trinocular head light distribution is 20/80
- Interpupillary adjustment from 50mm to 75mm
- Infinity optical system with semi-plan infinity DIN objectives
- Coaxial coarse and fine focusing
- Coarse movement stroke of 26mm with fine focus graduation of 2µm
- Quadruple reverse nosepiece gives easy access to the workspace & slide
- Built-in mechanical stage and large 145 x 140mm rectangular stage with Vernier scales that allows smooth cross travel motion of 76 x 52mm (right hand operation)
- 1.25 N.A Abbe condenser with position guide markings for their respective objectives.
- LED light system with light intensity control provides cool, bright and even illumination
- Comes complete with dust cover and instruction manual
- Shipping information: 22″ x 12″ x 15″-25lbs

CAT NO.	PRICE
1008	$649
1010	$799

Special Features

- Iris diaphragm protective cover (with 100x objective models)
- Built-in mechanical stage
- Large asperhical light condenser for extra bright light
- Swing open door on base for easy access to change light bulb
- Calibrated pointer with 10x Wide-Field Eyepiece to assist in measurements
- Rechargeable units available


OL-D-100


45° Dual View Head


OL-CXB-100

90° Video/Dual View Head

Look for other types and accessories at **MODERNBIO.COM**

QZG Series Zoom Stereo Microscopes

Features:

- Paired 10x Wide-Field eyepieces
- Binocular head inclined at 45° angle
- Working distance 85mm
- Interpupillary adjustment 55 to 75mm
- Dual diopter adjustments
- Remains in focus throughout zoom range
- Coated optics for crisp image and superior resolution
- Illumination and stand are great for examining opaque or translucent specimens
- Heavy-duty rack and pinion focusing with slip clutch and tension adjustment
- Includes 75mm frosted glass stage plate and black and white reversible stage plate for contrast
- Locked-on spring mounted stage clips
- Limited life-time warranty
- Comes complete with dust cover and instructions

Special Features

- Latest technology in LED lighting with long life and cool temperature
- Equipped with a light cluster of mini LED light panels for optical illumination
- Diagonally adjustable top light creating the desired amount of light on the stage plate
- Separate light intensity control for top and bottom illumination
- 3 way, built-in illumination system allows transmitted, incident, or dual lighting
- Even distribution of high intensity illumination
- Shipping Information for QZG-L: 18″ x 12″ x 9″ - 12lbs

CAT NO.	PRICE
QZG-L	$463.00
QZG-T	$499.00

Thermal Cycler and Orbital Blotter

Labnet's MultiGene Mini

Labnet's MultiGene Mini is a compact and lightweight thermal cycler, but do not let its small size fool you. This cycler is packed with features typically found only on larger thermal cyclers.

- Fast ramping - up to 5°C/second
- Intuitive graphical programming
- Lightweight and compact
- Interchangeable blocks - 24 x 0.2 ml and 18 x 0.5 ml
- Economical - half the price of a full size unit

Excellent accuracy and uniformity combine with fast ramping rates to provide quality results. An algorithm calculates sample temperature, based on volume, to control heating and cooling of the block. This means that samples reach programmed temperatures quickly, without any overshoot or lagging. Powerful Peltier units provide ramping rates as fast as 5°C/second.

Programming the MultiGene Mini is simple and intuitive. The control pad combines function keys, a key pad and arrow keys for easy navigation and entering of parameters. The large graphical display is easy to read. In addition to the standard parameters of time and temperature, the software also allows for successive time and temperature increments and decrements (for touchdown amplification and auto-extension), auto-restart after a power failure, end of cycling elongation steps and extended soaks at 4°C. One hundred programs, each with up to nine segments, can be stored in memory.

The MultiGene Mini is available with either a 24 x 0.2 ml tube block or 18 x 0.5 ml tube block. Blocks are easily interchanged.

Units come standard with an adjustable heated lid. The lid features a slip gear to provide proper compression to prevent sample evaporation without deforming the tubes.

PRODUCT SPECIFICATIONS

• Block capacity	24 x 0.2 mL or 18 x 0.5 mL tubes
• Temp. control range	4° to 99°
• Max. heat/cool rate	5°C per sec/ 4°C per sec
• Accuracy/uniformity	±0.3°C/±0.5°C at 55°C
• Heated lid temperature	105°C
• Max. number of cycles	99
• Gradient Temperature Range	30°C to 99°C
• Max. number segments	9
• Max. holding time/step	99 minutes 59 seconds
• Program Memory	up to 100 programs
• Dimensions (W x D x H)	21.8 x 28.5 x 17.8 cm
• Weight	7.1 lb/3.2 kg
• Electrical	230V~ or 120V~, 50/60 Hz

CAT NO.	DESCRIPTION	PRICE
TC020-24	MultiGene Mini Personal Thermal Cycler with 24 x 0.2 ml tube block, 120 volts	$2,473.00
TC050-18	MultiGene Mini Personal Thermal Cycler with 18 x 0.5 ml tube block, 120V	$2,473.00
TC96-AS-100	Aluminum sealing tape for 96 well plates, pack of 100 films	$95.80
TC96-CM-10	Compression mat, silicone, pack of 10	$53.60
TC96-ES-50	96 well plate, polypropylene, elevated skirt, pack of 50	$432.60
TC96-NS-50	96 well plate, polypropylene, no skirt, pack of 100	$576.80
TC96-TT	Thermal sealing tape for 96 well plates, pack of 100 films	$80.35
TCSC-02	Caps for 0.1 ml tube strips, 8 caps per strip, 125 strips	$272.95
TCST-02	0.2 ml tube strips, 8 tubes per strip, 125 strips	$803.40

ORBI Blotter

- Gentle orbital motion for gel applications
- Horizontally circular 19mm orbit for aeration & mixing
- Large 14 x 12" work surface
- Variable speed control from 3 to 70 rpm
- Incubator and cold room safe

The Orbi-Blotter™ features a gentle orbital motion with speed control down to as little as 3 rpm, making it the ideal orbital choice for low speed applications, such as blotting, washing, staining/destaining, etc. A large 14x12". work surface is included along with a non-slip rubber mat for holding trays, dishes, plates and other flat vessels.

An optional stacking platform can be purchased as an accessory, effectively doubling the usable work surface. The maintenance free, brushless motor is capable of loads up to 2kg and is safe for use in cold rooms and incubators.

CAT NO.	DESCRIPTION	PRICE
BT30*	OrbiBlotter. with flat mat platform	$699.00
BR2000-STACK	Optional stacking platform with flat mat, 14" x 12"	$97.20
BR2000-SP	Optional stacking extender set, adds 1.25" clearance to stavking platform	$28.00

Small Equipment and Labware

Bag Sealer

A convenient way to stain, destain and store electrophoretic gels is in sealed bags. In addition, both Western and Southern blots are readily processed in bags making a high quality bag sealer an important component of your teaching laboratory. This thermal impulse sealer with electronic time-temperature control will meet your needs for years to come. Compact in size, the unit produces an 8" seal.

CAT NO.	DESCRIPTION	PRICE
SE	Bag Sealer	$89.00

Plastic bags

These transparent plastic bags can be heat sealed with the above sealer at the opened end. Polyethylene transparent bags can be used for storing, shipping and freezing specimens. More sizes available at modernbio.com.

CAT NO.	BAG SIZE	PRICE/100 BAGS
Bag-4	4"X10"	$6.20
Bag-6	6"X10"	$8.72
Bag-8	8"X10"	$8.99

Cryo-Safe Cold Box

Convenient box prevents expensive enzymes and critical samples from warming. Handy unit consists of a molded polystyrene container with cover. Internal support holds twelve 1.5 ml microcentrifuge tubes. The space surrounding the tubes is filled with a sealed-in material that maintains the low temperature required for safe storage and transport. When the container is removed from a -20°C freezer, it will maintain a -15°C temperature for 1.5 hours, and will remain below 0°C for 4 hours.

CAT NO.	DESCRIPTION	PRICE
CB	Cold Box	$51.99

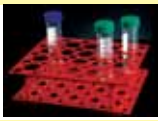
Alarm Stopwatches

These hand-held Alarm Stopwatches have a standard display for hours, minutes, seconds, month, date, and week. Also includes a stage time keeping function, 12/24 hour function and alarm function. Assorted blue or black color.

Dimensions: 4 x 55 x 18mm (26g)

CAT NO.	DESCRIPTION	PRICE
MAST1110	Alarm Stopwatch	$3.49
MAST1110-16	Pack of 16	$38.16

Centrifuge Tube Racks



These easy to assemble autoclavable orange tube racks will hold 20, 50ml tubes and 30, 15 ml tubes.

CAT NO.	DESCRIPTION	PRICE
MH 101	Centrifuge Tube Rack	$9.99

Test Tube Rack

Easy to assemble polypropylene test tube racks. Capacity holds 50 test tubes up to 18mm in diameter. Individual stability support for conical cubes

CAT NO.	DESCRIPTION	PRICE
MH 1018	Test Tube Rack	$13.45

Glass Mortar With Pestle

Made of heavy clear glass and ideal for preparation of tissue extracts from plants and animals. The unit is completely fire polished, has a 2 oz capacity and a 2 11/16 in diameter.

CAT NO.	DESCRIPTION	PRICE
GMP	Mortar and pestle	$14.25

Dispenser Jug With Spigot (19 Liters)

The dispenser allows convenient storage of large volumes of liquid such as electrophoresis buffer. Lies on its side with a spigot that overhangs the edge of a table or shelf. Jug features rounded corners, a sturdy handle, and a bottom grip for pouring.

CAT NO.	CAPACITY	PRICE
DJ 5	Gallon jug	$43.28

Heavy Duty Carboys With Spigots

These heavy-duty carboys are made of high-density polyethylene. Each carboy is equipped with a handle and spigot.

CAT NO.	CAPACITY	PRICE
CB5	5 liters	$99.99
CB10	10 liters	$142.18

Sterile Containers

These sterile containers molded from polypropylene are graduated in both ml and ounces. Each comes with a leak-resistant cap and a frosted area for labeling.

CAT NO.	CAPACITY	PRICE
WPSC1	120ml, Pack of 100	$29.99
WPSC2	60ml, Pack of 100	$26.49
WPSC3	30ml, Pack of 100	$18.99

PVC Lab Aprons

These black aprons are made from a chemically resistant, flexible and lightweight PVC material and have been reinforced at areas of strain. They are latex free and tie at the waist and neck.

CAT NO.	DESCRIPTION	PRICE
Apron30	24 x 30	$4.99
Apron36	27 x 36	$5.35
Apron42	27 x 42	$5.45
Apron46	36 x 46	$5.99

2 Stage Vacuum Pump

This two stage vacuum pump is CE approved and comes ready to operate. With an easy to carry design, it is smaller, lighter and more portable. This high performance, powerful pump provides free air displacement of 2.5CFM@50Hz and 3.0CFM@60Hz and runs steadily for a long period of time. Comes complete with initial supply of high vacuum pump oil.

SPECIFICATIONS:

- Voltage: 115V/60Hz • Ultimate Vacuum: 3 x 10-1Pa • Motor: 1/3HP • Intake Ports: ¼" • Oil Capacity: 250mL

CAT NO.	DESCRIPTION	PRICE
P30001	2 Stage Vacuum Pump	$299.99

Supplies and Expendables

Test Tubes and Racks

Micro-Test Tubes

These clear polypropylene tubes are ideal for small reactions and the 1.5 ml size is also a microcentrifuge tube.

CAT NO.	DESCRIPTION	PRICE
6-1	0.5 ml (per 500)	$17.12
6-2	1.5 ml (per 500)	$18.61

Micro-Tube Racks

The polyurethane foam racks will float in a water bath and hold 15 - 0.5 ml or 1.5 ml micro-test tubes.

CAT NO.	DESCRIPTION	PRICE
6-3-2	2 racks	$3.59
6-3-8	8 racks	$9.35

Large Micro-Tube Racks

The polypropylene racks will hold up to 80 - 1.5 ml micro-test tubes.

CAT NO.	DESCRIPTION	PRICE
6-4	1 rack	$9.16

Transfer Pipets

These polyethylene pipets are self- filling by using an attached bulb. They are convenient for liquid chores and the 1 ml size can even be used to load agarose gels.

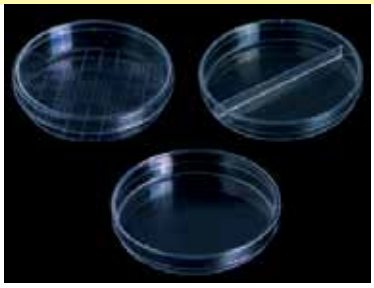
CAT NO.	DESCRIPTION	PRICE
6-5	1 ml (per 100)	$14.12
6-6	3 ml (per 500)	$27.16

Sterile Disposables for Bacterial Propagation

Disposable Petri Dishes

Made of polystyrene, these sterile petri dishes are available in standard sizes and configurations. Economical clear dishes packaged in sleeves of 10 or 20 depending on the type. Very sturdy and easily stackable. Vented petri dishes have high profile partitions to minimize spillage from one cell to another during filling. Four types to choose from.

CAT NO.	SIZE	TYPE	UOM	PRICE
MK1004J3-20	100 x 15mm	Mono Plate	20/PK	$5.12
MK1004J3-500	100 x 15mm	Mono Plate	500/CS	$81.82
MK1001-100	150 x 15mm	Mono Plate	100/CS	$69.22
MK1002C-500	100 x 20mm	Mono Plate w/Grid	500/CS	$111.73
MK1003-500	100 x 15mm	Bi-Plate	500/CS	$83.38



Culture Tubes

These individually wrapped polystyrene tubes hold 19 ml of media. The sterile screw-cap tubes can be used for small (5-10 ml) overnight suspension cultures of bacteria.

CAT NO.	DESCRIPTION	PRICE
5-2	25(16x150mm) tubes	$11.25

Sterile Transfer Pipets

The 3 ml individually wrapped pipets are self-filling by using an attached bulb. Ideal for transferring sterile media.

CAT NO.	DESCRIPTION	PRICE
5-4	100 pipets	$14.99

Disposable Sterile Inoculating Loops and Needles

Sterile disposable polypropylene high impact loops and needles are smooth and flexible to facilitate uniform and smooth streaking without damaging the gel surface. They come 10 units to a package. Order as a Case of 500 or as a package of 10.

CAT NO.	DESCRIPTION	PRICE
MK1020-10	Inoculating Loops 10UI, Blue-Sterile Disposable 10/Pkg	$0.53
MK1020-3T	Inoculating Loop, Blue 10UI-(EOG) Sterile 3000/Pkg	$142.16
MK1020-500	Inoculating Loops 10UI, Blue-Sterile Disposable 500/Pkg	$26.30
MK1021-3T	Inoculating Loop, White 1UI-(EOG) Sterile 3000/Pkg	$142.16
MK1021-500	Inoculating Loops 1UI, White-Sterile Disposable 500/Pkg	$26.30
MK1022-3T	Inoculating Needle, Red-(EOG) Sterile 3000/Pkg	$142.16
MK1022-500	Inoculating Needle (EOG) Red-Sterile Disposable 500/Pkg	$26.30

Sterile Disposable Screwcap Centrifuge /Culture Tubes

Molded from research grade copolymer to provide strength and clarity. Ideal for small bacterial cultures, tissue culture, virology, and other laboratory applications. Molded-in graduations and leak-proof caps.

CAT NO.	DESCRIPTION	PRICE
T-15	15ml tubes 25tubes/bag $5.99/bag	$6.23
T-50	50ml tubes 25tubes/bag $7.49/bag	$7.79

Parafilm M Laboratory Film

Parafilm is a flexible, moisture resistant self-sealing wrapping film for laboratory use. Parafilm is ideal for protecting and sealing cultures, tubes, beakers etc.

CAT NO.	DESCRIPTION	PRICE
PF	4" x 125' roll	$37.14

Reaction Plates

These 24-well polystyrene plates are ideal for biochemical reactions. Each well is numbered and holds about 3 ml.

CAT NO.	DESCRIPTION	PRICE
6-8-2	2 plates	$8.26
6-8-8	8 plates	$26.87

Nitrile Examination Gloves

Blue, lightly textured nitrile gloves contain no natural rubber proteins. FDA approved and CFIA approved for food handling. 100% Latex-free and provides excellent comfort for prolonged use. ISO 2859-1.

CAT NO.	DESCRIPTION	PRICE
Id1003	Nitrile Gloves Powdered Large- (Box of 100)	$11.99
Id1003m	Nitrile Gloves Powdered Medium - (Box of 100)	$11.99
Id1003s	Nitrile Gloves Powdered Small - (Box of 100)	$11.99
Id1003xl	Nitrile Gloves Powdered X-Large - (Box of 95)	$11.99
Id1004l	Nitrile Gloves Powder-Free Large- (Box of 100)	$12.99
Id1004m	Nitrile Gloves Powder-Free Medium - (Box of100)	$12.99
Id1004s	Nitrile Gloves Powder-Free Small - (Box of 100)	$12.99
Id1004xl	Nitrile Gloves Powder-Free X-Large - (Box of 95)	$12.99

Safety Goggles - Chemical Splash Resistant

These safety goggles have a soft flexible PVC frame that comfortably contours around your eyes with wide polycarbonate lens. Indirectly ventilated, these goggles are recommended to prevent chemical splash and ventilated for frontal impact resistance of particles. (Does not protect against UV radiation). Meets the American National Standards Institution (ANSI Z87.1). Individually packaged.

CAT NO.	DESCRIPTION	PRICE
G10902	Adult Safety Goggles	$3.87
G10902-16	Case of 16 Adult safety gloves	$51.12
G10903	Junior Safety Goggles	3.24
G10903-16	Case of 16 Jr Safety Gloves	$43.16

Individual Products and Kits for Teaching and Research

Modern Biology Inc. provides a range of individual products and kits for DNA and protein analysis that meet the stringent requirements of the research laboratory. The items indicated by the " ✔ " are shipped next-day air on ice. Please include all such reagents on the same order to avoid excess shipping costs.

Products for Protein Analysis

Native (nondenaturing) Agarose Gel Electrophoresis

Reagent Package-Native Protein Gels
Chemical package and instructions for extracting proteins from tissues and for separating proteins using native agarose gel electrophoresis. Contains all reagents needed to separate nondenatured proteins by electrophoresis on 35 small agarose gels. Includes protein extraction buffer (enough to make 500ml), electrophoresis buffer (Tris-Glycine pH 8.6; enough to make 7 liters), agarose (10 g), gel loading buffer (5 ml of a 2 X solution), Coomassie Blue gel stain (enough to make one liter) and a mixture of three colored dyes that can be used to monitor an electrophoretic run.
1-1 **$80.84**

Agarose
Protein electrophoresis grade
1-2-100 10 g **$18.25**
1-2-25 25 g **$42.50**

Electrophoresis Buffer
(Tris-Glycine, pH 8.6)
1-3 100 g -Makes 7 liters **$24.98**

Hemoglobin Electrophoresis Buffer
(Tris-Glycine, pH 9.2)-for separation of different hemoglobin types.
1-3-HB 100g-Makes 7 liters **$24.98**

Gel-Loading Buffer
(Glycerol-Bromophenol blue)
1-4 5 ml of a 2 X solution **$7.50**

Coomassie Blue R Gel Stain
1-5 10ml of a 100 X solution **$7.65**

Dye Mixture
A mixture of xylene cyanol, bromophenol blue and orange G that can be used to monitor the course of an electrophoretic run.
1-7 5ml of a 1 X solution **$13.75**

Protein Extraction Buffer
The buffer is used to prepare tissue proteins for native agarose gel electrophoresis.
1-8 5ml of a 100 X solution **$7.50**

✔ Electrophoresis Standard Proteins
A colorful mixture of rabbit hemoglobin, bovine serum albumin, and bromophenol blue that can be used for calibrating nondenaturing protein gels.
1-9 1ml (enough for 60-100 gel lanes) **$12.90**

LDH Substrate
Substrate for detection of lactate dehrdrogenase (LDH) isoenzymes in agarose gels.
1-10 Sufficient substrate for the staining of 10 agarose gels. **$58.86**

SDS (denaturing) Agarose Gels

Reagent Package-SDS Protein Gels
Complete chemical package for extracting proteins from tissues and for separating proteins using SDS agarose gels. Contains all reagents needed to separate denatured proteins by electrophoresis on 30 small agarose gels. Includes protein extraction buffer (enough to make 200ml), electrophoresis buffer (Tris-Acetate-SDS; enough to make 6 liters), gel buffer (enough to make 500 ml), agarose (25 g), loading buffer (5 ml of a 2 X solution), and Coomassie Blue gel stain (enough to make one liter). The reagent package is also supplied with instructions for protein extraction and for preparation, electrophoresis and staining of agarose gels.
2-1 **$135.91**

Agarose
SDS-protein electrophoresis grade. A unique blend that permits formation of high concentration (6-7%) gels.
2-2-25 25grams **$84.16**

Electrophoresis Buffer
(Tris-Acetate-SDS pH 8.3)
2-3 250 ml of a 25 X solution **$28.83**

Gel Buffer
(Tris-Borate-SDS pH 8.6)
2-4 50 ml of a 10 X solution **$11.47**

Gel-Loading Buffer
Contains Bromophenol Blue, Glycerol and SDS.
2-5 5 ml of a 2 X solution **$7.50**

Coomassie Blue R Gel Stain
2-6 10ml of a 100 X solution **$7.65**

Protein Extraction Buffer
The buffer is used to prepare tissue proteins for SDS gels.
2-6-1 20ml of a 10 X solution **$7.50**

Electrophoresis Standard Proteins
A pre-stained mixture of myoglobin, ovalbumin, bovine albumin monomer, bovine albumin dimer used for calibrating SDS-agarose or SDS-polyacrylamide gels.
✔ 2-7 1 ml (enough for 60-100 gel lanes) **$22.48**

✔ Antibody-Antigen Kits

The two kits described below contain antigen, antibody (as antiserum), agarose, petri dishes, Pasteur pipet sample well formers and buffer for double diffusion analysis.

Kit 1 Ovalbumin (Egg Albumin)-Anti-Ovalbumin
Complete with 1 ml of antiserum (made in rabbits), 1 ml of chicken ovalbumin (50 mg), 1 ml of chicken serum and instructions for Ouchterlony double diffusion analysis. With this kit, you can determine the amount of ovalbumin in an egg or compare the ovalbumin in eggs from different avian species.
2-8 **$62.89**

Kit 2 Cow Serum-Anti Cow Serum Albumin
Complete with 1 ml of cow serum, 1 ml of antiserum, 1 ml of chicken serum and instructions for Ouchterlony double diffusion analysis.
2-9 **$62.89**

Column Chromatography

Column Chromatography Kit
Contains all materials needed for 8 groups of students to separate hemoglobin from phenol red by gel filtration chromatography. Includes 8 columns, Sephadex G-100(7g), column buffer (enough to make 5 liters) column loading pipets, and enough phenol red and bovine hemoglobin for at least forty chromatographic runs.
B3-X **$86.82**

Chromatographic Columns
Each polypropylene column (8mm by 200mm; 9 ml bed volume) comes with a 20 ml reservoir, lower fitting, porous polyethylene bed support and cap (see pictures on page 8).
2-10-2 2 columns **$7.50**
2-10-8 8 columns **$23.16**

Sephadex G-100
A gel filtration chromatographic media typically used for separation of proteins that are between 5,000-100,000 daltons. The 7g hydrates to about 120 ml of column bed volume.
2-11 7grams **$56.57**

Products for DNA Analysis

Electrophoresis Chemicals

Reagent Package-DNA Gels

Contains all reagents needed to separate DNA restriction fragments by electrophoresis on 35 small agarose gels. Includes electrophoresis buffer (Tris-Acetate-EDTA; enough to make 10 liters), agarose (10 g), Loading buffer (5 ml of a 2 X solution), dye for rapid DNA staining and either methylene blue (5 ml of a 1000 X concentrate) or ethidium bromide (1 ml-5mg/ml) as gel stain. The reagent package is also supplied with an instruction sheet for preparation, electrophoresis and staining of gels.

3-1 with methylene blue **$70.18**
3-2 with ethidium bromide **$70.18**

Agarose

DNA electrophoresis grade

3-3-100 10 g **$18.25**
3-3-25 25 g **$42.50**

Electrophoresis Buffer

(Tris-Acetate-EDTA)

3-4 100 ml of a 100 X solution **$35.19**

Gel-Loading Buffer

(Bromophenol Blue-Glycerol)

3-5 5 ml of a 2 X solution **$8.00**

Methylene Blue

A stain for DNA in agarose gels.

3-6 5 ml of a 1000 X solution **$12.50**

Ethidium Bromide

A stain for DNA that requires UV-illumination for detection. Ethidium Bromide is a mutagen and probably a carcinogen. This chemical should be handled with extreme caution and should in our opinion not be used in an open teaching laboratory.

3-7 l ml of a 5 mg/ml solution **$8.16**

✔ Restriction Endonucleases

Each enzyme is supplied with its own enzyme reaction buffer concentrate (10 X concentration) which is provided in a separate tube. Enzymes are also supplied with an instruction sheet for restriction nuclease cutting of DNA. One unit is defined as the amount of enzyme required to completely digest 1µg of phage lambda DNA in 60 minutes.

EcoRI

3-8-1 1000 units **$22.48**
3-8-5 5000 units **$58.74**

BamHI

3-9-1 1000 units **$28.83**
3-9-5 5000 units **$74.90**

Hind III

3-9A-1 1000 units **$32.12**

✔ Electrophoresis Standards

Dye Mixture

A mixture of xylene cyanol, bromophenol blue and orange G that can be used to estimate the sizes of small DNA fragments on an agarose gel. The dyes are dissolved in gel-loading buffer and ready for electrophoresis.

3-10 5 ml of a 1 X solution **$ 13.75**

DNA Standard I

Lambda Hind III Digest-Phage Lambda DNA was digested with Hind III, yielding 8 fragments: 23130, 9416, 6557, 4361, 2322, 2028, 564, and 125 base pairs. The DNA is dissolved in gel-loading buffer and is ready for electrophoresis. The figure on the right (lane 1) shows these DNA standards.

3-11 100 µg (400µl)- enough for 30-40 gel lanes **$52.43**

DNA Standard II

Lambda EcoRI, Hind III Digest- Phage lambda DNA was digested with EcoRI and Hind III yielding 13 fragments: 21226, 5148, 4973, 4277, 3530, 2027, 1904, 1584, 1330, 983, 83l, 564, and 125 base pairs. The DNA is dissolved in gel-loading buffer and is ready for electrophoresis. The figure on the right (lane 2) shows these DNA standards.

3-12 100µg (400 µl)- enough for 30-40 gel lanes **$52.43**

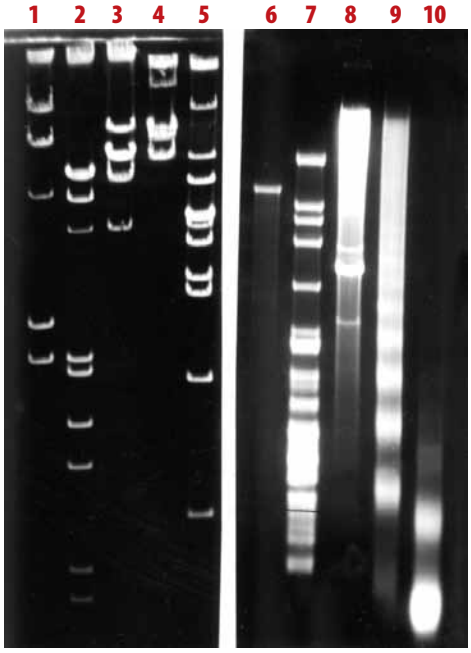
DNA Standard III

These DNA samples exhibit the nucleosome repeat of 200 base-pairs when electrophoresed on agarose gels (See page 21, experiment 306). Electrophoretic analysis of this DNA can be used to illustrate the structure of chromatin. The DNAs also provide economical standards for small DNA fragments. The DNAs were obtained by digestion of calf thymus nuclei with low (Nucleosome I), medium (Nucleosome II) and high (Nucleosome III) amounts of micrococcal nuclease. Two of the DNA samples are shown in the picture of the gel on the right (lanes 9, 10). The DNAs are dissolved in gel-loading buffer and are ready for electrophoresis.

3-13 Nucleosome I, II and III 600µl each **$52.43**

✔ DNA

DNA preparations are of the highest of purity and suitable for gene cloning experiments and as substrates for restriction endonucleases. DNAs are shipped as aqueous solutions on wet ice and are supplied with an instruction sheet for restriction nuclease digestion. The Figure below shows electrophoretic analysis of our DNAs after digestion by restriction endonucleases.



The indicated DNA digests were electrophoresed on 1.1% (left panel) or 1.5% (right panel) agarose gels.

Lane	DNA	Restriction Endonuclease
1	Lambda	Hind III
2	Lambda	EcoRI & Hind III
3	Lambda	EcoRI
4	Lambda	BamHI
5	Lambda	EcoRI & BamHI
6	Plasmid pUC18	EcoRI
7	Lambda	Hae III
8	Calf Thymus	EcoRI
9	Nucleosome I	———
10	Nucleosome II	———

Products for DNA Analysis Continued

Plasmid DNA - pUC18
This DNA can be used in gene cloning experiments and will transform *E.coli* to an ampicillin resistant phenotype. This plasmid contains single cloning sites for a number of restriction endonucleases including EcoRI, BamHII, and Hind III.

3-14-30 30 µg (100 µl) **$37.45**
3-14-120 120 µg (400 µl) **$63.86**

Phage Lambda DNA
An excellent DNA preparation to show the specificity of restriction endonucleases (see lanes 1-5 in the figure on the previous page)

3-15-60 60 µg (150 µl) **$27.02**
3-15-240 240 µg (600 µl) **$74.12**

Calf Thymus DNA
This DNA can be used to illustrate the G - C-rich satellite sequences in the cow genome (see lane 8 in the figure on the previous page.

3-16 5 mg (5 ml) **$37.45**

Colony Transformation

✔ *E.coli* Transformation Kit
Complete ready-to-use kit for transformation of *E.coli* with plasmid pUC18. The success of the transformation is monitored by growing the bacteria on an ampicillin-containing medium. Sufficient materials supplied for sixteen platings. Kit includes *E.coli*, pUC18, $CaCl_2$, nutrient broth, inoculating loops, pipets, tubes, petri dishes, and 400 ml of nutrient agar-ampicillin.

3-17 Transformation Kit **$71.91**

Kits for DNA Isolation

Plasmid DNA Isolation Kit
Kit contains all materials needed to isolate up to 30 ug of high quality plasmid DNA from 3 ml overnight cultures of E. coli. Plasmid DNA purification is simplified with Mini Spin Column technology that uses three quick steps: Bind, Wash, and Elute. The isolated DNA is suitable for a variety of applications including restriction nuclease digestions, ligation reactions and DNA sequencing. Sufficient materials are provided for 50 plasmid isolations.

3-18 Plasmid Isolation Kit **$63.50**

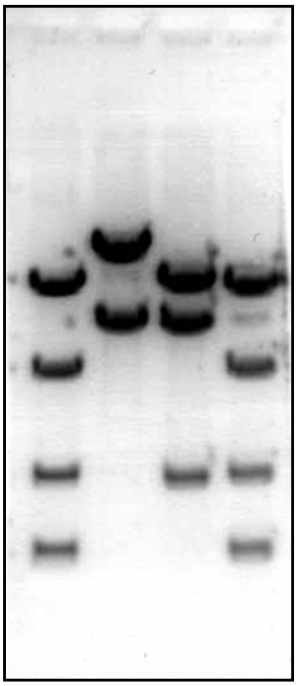
✔ Genomic DNA Isolation Kit
The reagents in this kit are used to isolate DNA from bacteria or eukaryotic tissues. The unique procedure yields high quality genomic DNA without the use of toxic organic solvents. The procedure has been successfully used to isolate DNAs from *E.coli*, corn seedlings, wheat germ, chicken erythrocytes, and calf thymus. In each case, the DNAs were undergraded and were excellent substrates for a variety of restriction endonucleases. Kit includes NB-buffer, SDS, ammonium acetate, Tris-EDTA buffer, an electrophoresis buffer containing ribonuclease and wheat germ so that you can test the procedure. Ethyl alcohol and a centrifuge that can be operated at a force of at least 5000 x g are needed but not provided.

3-19 Genomic DNA Isolation Kit **$71.91**

✔ Plasmid Restriction Fragment Set
An electrophoretic analysis of the four DNA samples provided with this set is shown on the agarose gel below. The ready-to-load DNA samples can be used as DNA size markers or in "DNA Fingerprinting" exercises designed by the instructor. Each of the four DNA samples contains sufficient material for 8 - 10 gel lanes and the fragments can readily be detected by methylene blue gel staining.

3-20 Restriction Fragment Set **$71.84**

Plasmid Restriction Fragment Set



Bacterial Strains

✔ *E.coli* - Contains no Plasmid
This culture is supplied with directions for propagation. The cells can be transformed to an ampicillin-resistant phenotype with plasmid pUC-18.

4-5 Cells **$ 10.48**

✔ *Ecoli*-pUC18 - Contains plasmid pUC18
The cells have been transformed with pUC18.

4-5-P Cells **$10.48**

Culture Media and Bacteria

The prepared bacterial media listed below are provided sterile and are ready to use.

Nutrient Broth
This rich media is commonly used for the maintenance and propagation of *E.coli*.

4-1 400 ml **$18.90**

Nutrient Broth + Ampicillin
Selects for the ampicillin-resistant phenotype.

4-2 400 ml **$18.90**

Nutrient Agar
Nutrient agar for isolation and propagation of *E.coli* colonies. To prepare plates, simply melt the agar in the bottle in a water bath, cool and pour into 20 petri dishes.

4-3 400 ml **$18.00**

Nutrient Agar + Ampicillin
Selects for the ampicillin-resistant phenotype.

4-4 400 ml **$18.90**

Nutrient Agar + Ampicillin + X gal
Selects for the ampicillin-resistant phenotype. Appropriate cells containing pUC18 (such as those under cat.# 4-5-P) grow as blue colonies on agar-ampicillin-X gal plates.

4-4-X 400ml **$33.12**

Replacement Nitrocelulose Packs
4 (5 x 7.5 MM) sheets of nitrocelouse paper with a pack of 16 sheets of blotting paper.

These packages are used in the following experiments:

IND-2	S2	58
IND-4	205	LC2
IND-17	801	LC5
IND-22	802	LC6

RNP **$13.03**

NEW!

Replacement Nylon Membrane Folder
These folders contain 1 (10mm x 20mm) sheet of Nylon Membrane and 4 (14 x 25mm) sheets of blotting paper. These folders are used in the following experiments:

IND-16	S6 (2 folders)
401	S9
402	LC-3
403	LC-4
S5	

NEW!

RNBF **$21.07**

Ordering Information and Policy

HOW TO ORDER

Three ways to order:
Phone: For Fast Service call Toll Free 1-800-733-6544

FAX: 1-765-523-3397

Mail to: MODERN BIOLOGY, INC.
3710 East 700 South
Lafayette, Indiana 47909

The order form in this catalog can be sent to us directly or can be used as a guide.

Please include the following on all written orders and have the information available when placing orders by phone.

- Purchase Order or Visa/Master Card number
- Desired delivery date
- Shipping address and billing address
- Product name, catalog number and quantity
- Special shipping instructions, if any

Please note that we only ship perishable items on Monday, Tuesday, and Wednesday to ensure they can be stored properly.

TERMS, CONDITIONS, AND SHIPPING

Whenever possible, we recommend that items be combined on a single order to minimize shipping costs. The chemical packages contain perishable materials and are shipped on ice, Next-Day-Air by UPS . **Please allow 7 to 10 days for an order to be processed. Frozen items are shipped on Monday, Tuesday, and Wednesdays only. We will prepay and add the shipping and handling to your invoice.** Prices are subject to change without notice. Our terms of payment are Net 30 days to all educational institutions. Note that UPS does not deliver to P. O. boxes. A service charge of $7.00 will be added to all orders under $25.00 except for orders of laboratory manuals. The products in this catalog are not to be used for diagnostic purposes.

DAMAGED OR MISSING MERCHANDISE AND RETURN POLICY

Please inspect the contents of your order immediately upon arrival. Notify us and the carrier as soon as possible if items are damaged. **Contact us within 10 days of shipment if merchandise is missing from your order.** We will then inform you of the proper procedure to obtain credit or replacement. Please contact us for authorization prior to returning goods. Your satisfaction is guaranteed.

ORDER FORM

MODERN BIOLOGY, INC.
3710 East 700 South
Lafayette, Indiana 47909

Telephone Orders:
Call Toll-Free 1-800-733-6544
or (765)-523-3338
FAX: 1-765-523-3397

Bill To _____

Department _____

Institution _____

Street _____

City _____ **State** _____ **ZIP** _____

Your Name _____

Purchase Order Number _____

Desired Shipping Date _____

Ship To _____
If different from Bill To address.

Department _____

Institution _____

Street _____

City _____ **State** _____ **ZIP** _____

Telephone _____

Today's Date _____

QUANTITY	CATALOG NO.	DESCRIPTION	UNIT PRICE	TOTAL

Some of the Equipment Available from MODERN BIOLOGY INC.

MY TEMP MINI DIGITAL INCUBATOR SEE PAGE 55

1000 SERIES INFINITY MICROSCOPE SEE PAGE 56

H4000-HS BENCHMARK MAGNETIC HOTPLATE/STIRRER SEE PAGE 54

OLIVIA SERIES MICROSCOPE OL-CXB-100 SEE PAGE 56

ADAM EQUIPMENT COMPACT PORTABLE BALANCES SEE PAGE 52

ALARM STOPWATCHES SEE PAGE 58

TOP VIEW OF HW-2L WATER BATH SEE PAGE 54

BENCHMARK VORTEX MIXER SEE PAGE 52

LABNET'S MULTIGENE MINI SEE PAGE 57

SAFETY GOGGLES - CHEMICAL SPLASH RESISTANT SEE PAGE 59

2 STAGE VACUUM PUMP SEE PAGE 58

ORBI BLOTTER SEE PAGE 57

LINEAR PIPETTE STAND SEE PAGE 51

DIGITAL DRY BATH SEE PAGE 53

About the Artist, Robert T. Schimke

In February of 1995 Robert Schimke's life changed dramatically and abruptly. While riding a bicycle in the bike lane on Sand Hill Road in Woodside, California, he was struck by a car from behind and became a quadriplegic. He has fought back from total unconsciousness and total paralysis to the point where, although confined to a powered wheelchair, he has recovered sufficient motor function to allow limited use of arms and legs. Four years ago he started to express his creative and innovative talents with various forms of art . . . it is his new passion.

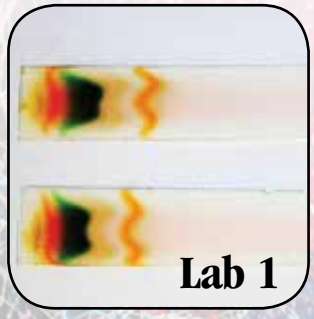
Schimke actually started painting in 1976 while on sabbatical in London, following the sudden death of his wife, Mary. Upon returning to California he continued to paint for the next year. His paintings in oils depict scenes from London and California.

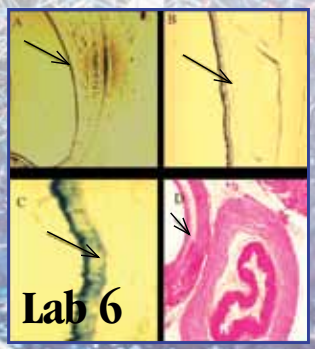
Schimke, Robert T. Professor Emeritus, Standford University, Department of Biological Sciences. Read about Schimke as a scientist at: *www.stanford.edu/group/schimke/scientist.html* and as an artist at: *www.stanford.edu/group/schimke/artist.html*

MODERN BIOLOGY
3700 East 700 South
Lafayette, IN 47909
Call Toll Free: 1-800-733-6544
FAX: 1-765-523-3397

NEW IN 2013 (See pages 4 & 5)

A Laboratory Course in Innovative Biology (LC6)





Lab 1. Electrophoretic and Chromatographic Analysis of Photosynthetic Pigments from Blue-Green Algae

Lab 2. Specificity of Albumin Binding

Lab 3. Enzyme Action and Kinetics

Lab 4. Effects of Temperature on Respiration

Lab 5. A Rapid Immunological Method to Study Evolution

Lab 6. Localizing Tubulin by Immunohistochemistry

Lab 7. Characterization of Peroxidase in Plants-Student Designed Projects

Lab 8. Properties of DNA and Cell Fractionation and DNA isolation

Lab 9. Anatomy and Evolution of the Genome

Lab 10. Specific Binding of Dyes to DNA

Lab 11. DNA Cloning and Genotype to Phenotype

Lab 12. Sickle Cell Anemia

Lab 13. Analysis of a Mutant Hemoglobin Gene

US POSTAGE PAID
PERMIT 399
LAFAYETTE, IN