

Price list

National Centre for Biotechnology Education

Microbiology

Bioreactor

The NCBE has developed an affordable and safe fermenter for use in schools and colleges. It is based on a 500 mL conical flask and incorporates the essential features of larger fermenters. It is autoclavable and has a novel sampling system to reduce the risk of accidental contamination. The bioreactor comes with a 36-page instruction manual.

Two booklets describing fermentation experiments are also available (see 'Publications').

Bioreactor SELF-ASSEMBLY..... £122.00

Replacement parts

Pre-bored silicone rubber bung £24.00
 Two micropore air filters £14.50
 Sampling pipette £14.50
 Silicone antifoam £7.00

Bubble counter

A battery-powered infra red counter is supplied with two glass fermentation locks, for monitoring simple fermentation experiments.

Bubble counter £50.00
 Spare fermentation lock £4.00

Microbial fuel cell

This cell can be used with yeast to generate a small electrical current. It comes with neoprene gaskets, electrode material, cation exchange membrane and an instruction booklet (but not the chemicals required — these are normal laboratory reagents). The microbial fuel cell is ideal for student investigations of respiration.

Microbial fuel cell £53.00

Replacement parts

Electrode material £7.00
 Cation exchange membrane, 50 x 50mm £11.50

Microbial slope cultures

- *Cellulomonas* sp.
- *Saccharomyces diastaticus*
- *Saccharomyces carlsbergensis*
- *Saccharomyces cerevisiae* STRAIN K5-5A
- *Janthinobacterium lividum*
- *Kluyveromyces lactis*
- *Leuconostoc mesenteroides*
- *Pichia anomala*
- *Escherichia coli* Lac +
- *Escherichia coli* Lac -
- *Escherichia coli* STRAIN HT-99
- *Escherichia coli* STRAIN J53-R

All slope cultures, each..... £10.00

Oyster mushroom starter culture

This is sufficient 'spawn' for at least 10 toilet rolls.

Oyster mushroom starter, 500g *£14.50

Bacterial transformation kit

This kit gives safe practical experience of one of the key techniques used in genetic modification. It provides an opportunity for students to understand and carry out basic microbiological techniques and provides a context for discussion of some of the ethical, social and safety issues associated with genetic modification. The kit contains sufficient materials for 16 students working in pairs.

Bacterial transformation kit £70.00

Replacement parts AS PROVIDED IN THE KIT

Slope culture of *Escherichia coli* K12 STRAIN DH5 α 18..... £10.00
 p2k plasmid DNA £12.00
 Kanamycin/X-Gal/LB agar + LB agar tablets £16.00
 Transformer kit Student's guides OUT OF PRINT



Please note: This kit is not generally available outside the UK (please enquire for details).

Gel electrophoresis

The NCBE's award-winning gel electrophoresis system has proved popular throughout the world.

How does the modular system work?

There are two parts to the system. All the re-usable items (gel tanks, combs *etc.*) come in a BASE UNIT. The base unit contains *eight* sets of these.

All the consumable items (agarose, DNA, enzymes *etc.*) are provided in MODULES. The modules' contents vary, but they usually include sufficient materials for 16 students or working groups to carry out the practical work. Full details are given in the description of each module. Some of the modules are ideal for individual practical projects and all of the contents will keep, if stored correctly, for at least a year.

Power supply

The electrophoresis system can be powered either by *four* nine volt batteries or with a 36 volt mains transformer. One transformer is sufficient to power four gel tanks simultaneously (see below).

How do I decide what I need?

It's easy. Decide how many base units you need, according to your class and/or working group sizes. Remember that the base unit contains *eight* sets of hardware. Next, choose which module(s) you're interested in. Again, you'll need to order the correct number for your class size(s). That's it. The modules also act as 'refill packs', although you can also buy most items individually.

Electrophoresis base unit

This pack contains *eight* sets of the non-consumable items required for gel electrophoresis. The contents comprise: 8 NCBE gel tanks; 8 4-toothed combs; 8 6-toothed combs; 8 pairs of red and black wires with crocodile clips; 8 microsyringe dispensing units (without tips).

Electrophoresis base unit £55.00

Investigating plant evolution

Materials for 16 amplification reactions of chloroplast DNA by the polymerase chain reaction (PCR). This procedure can be carried out using thermostatically-controlled water baths or a thermal cycler. The amplification takes about 45 minutes after which the samples can be stored before electrophoresis.

Investigating plant evolution module £145.00

36 volt mains transformer

This is the safe, cost-effective, fast and environmentally-friendly alternative to batteries. With the connector provided, a single transformer can power *four* gel tanks. At 36 volts, the ideal voltage for the electrophoresis equipment, gels take about two hours to run. *Please note that a standard 3 pin mains lead is also required (similar to those used for many desktop computers).*

36 volt transformer £40.00

Protein power!

Materials for the analysis of 100 protein samples (food proteins). Contains: 100 1.5 mL microcentrifuge tubes; 6 g protein-grade agarose; 100 'yellow' tips; 8 1 mL syringes; silicone tubing; 8 sheets of carbon fibre electrode material; 50 mL 10x TB buffer, 50 mL Laemmli buffer and 200 mL colloidal Coomassie Blue stain for proteins. Also contains 8 copies of the 'Protein power!' student's guide plus a teacher's guide.

Protein power module £70.00

The lambda protocol

Materials for 2 'runs' of 'The lambda protocol' (restriction of lambda DNA), each with 8 students or working groups. Contains: 16 tubes *Bam*HI; 16 tubes *Eco*RI; 16 tubes *Hind*III; 16 tubes lambda DNA; 16 'control' tubes; 2 g electrophoresis-grade agarose; 300 microsyringe tips; 8 sheets of carbon fibre electrode material; 2 foam floaters; 50 mL 10x TBE buffer; 8 tubes of loading dye; and 50 mL 2x Azure A stain for DNA. Also contains 8 copies of 'The lambda protocol' student's guide plus a teacher's guide.

Lambda protocol module £105.00

Nature's dice

Materials for 2 'runs' of the 'Nature's dice' protocol (simulation of genetic screening), each with 24 students or working groups. Contains: 1 fixed-volume 25 µL micropipette; 25 µg 1 kb DNA 'ruler'; DNA samples; 48 tubes of restriction enzyme; 48 1.5 mL tubes; 2 g electrophoresis-grade agarose; 100 microsyringe tips; 8 sheets of carbon fibre electrode material; 50 mL 10x TBE buffer; 8 tubes of loading dye; 50 mL 2x Azure A stain for DNA and 8 copies of the student's guide and a teacher's guide.

Nature's dice module £115.00

Please see the NCBE web site for additional information about these modules.

Individual replacement parts

Room temperature stable DNA and restriction enzymes

Restriction enzymes and lambda DNA in colour-coded tubes containing either 10 µg of DNA or 10 units of a restriction enzyme dried with buffer and a blue dye. They should be stored dry at room temperature and are supplied with silica gel desiccant.

Lambda DNA	16 tubes	£20.00
<i>Bam</i> HI	16 tubes	£18.50
<i>Eco</i> RI	16 tubes	£18.50
<i>Hind</i> III	16 tubes	£18.50

Lambda DNA and enzymes pack

16 tubes of each restriction enzyme and lambda DNA, with 16 empty yellow tubes.

Lambda DNA and enzymes pack	£75.00
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Gel tanks and combs

Gel tanks WITHOUT COMBS	8	£20.00
4-toothed gel combs	8	£10.50
6-toothed gel combs	8	£10.50

Plasmids for 'Nature's dice'

Plasmid mixtures (3 tubes) as in kit	£36.00
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Materials for 'Protein power!'

Protein electrophoresis agarose	6g	£12.50
TB buffer + 10% SDS (10x)	50 mL	£11.00
Laemmli buffer	50 mL	£12.00
Colloidal coomassie blue	200mL	£10.50

Materials for chloroplast PCR

Primers (one tube of each) AS IN KIT	£12.00	
FTA® cards	4	£18.00
Purification reagent	6mL	£7.50
TE-1 buffer	6mL	£2.50
'Ready to go' PCR beads	17.....	£40.00

Other electrophoresis kit items

Microsyringes	8	£29.00
White tips FOR MICROSYPINGES	300	£13.00
Empty yellow tubes	16	£6.50
Carbon fibre electrode material	1 pack	£7.00
DNA electrophoresis agarose	2g	£9.00
TBE buffer FOR DNA ELECTROPHORESIS (10x) 50 mL	£9.00	
Azure A stain FOR NUCLEIC ACID (2x)	50 mL	£9.00
1 kb DNA ruler/ladder	25 µg	£15.00
Loading dye BROMOPHENOL BLUE	8 tubes	£9.00
Foam tube holders	3	£2.00

Fixed volume micropipettes

These pipettes are accurate, autoclavable and robust. They have a 'double action' like conventional micropipettes, so that the last drop of liquid can be expelled from the tip.

<i>Volac</i> Minipipet	5 µL	£16.00
<i>Volac</i> Minipipet	10 µL	£16.00
<i>Volac</i> Minipipet	20 µL	£16.00
<i>Volac</i> Minipipet	25 µL	£16.00
<i>Volac</i> Minipipet	50 µL	£16.00
<i>Volac</i> Minipipet	100 µL	£16.00

Micropipette tips

The white 10 µL tips are graduated at 2 and 10 µL; the yellow 100 µL tips are not graduated.


White 10 µL graduated tips	300	£13.00
Yellow 100 µL tips	100	£5.50

School microcentrifuge

This 12 volt microcentrifuge holds 8 standard (1.5 mL) microcentrifuge tubes, and will spin at up to 13,000 rpm (8,500 g). It has been designed especially for educational use and is supplied with 120 microcentrifuge tubes in assorted colours.

Please note that it requires a 6-12 volt (1 amp maximum) mains adapter, which is not supplied. However, suitable adaptors can be purchased cheaply from high street stores.

Microcentrifuge WITHOUT POWER SUPPLY	£80.00	
Microcentrifuge tubes, 1.5 mL	100	£6.50

 **Please note: Unfortunately this microcentrifuge is not available to schools outside the UK.**



Enzymes

These are superior-quality industrial grade enzymes in re-sealable plastic bottles. They will retain their stated activity for at least a year if they are refrigerated at 3–5 °C.

Liquid enzyme preparations

All supplied as 100 mL volumes.

Alpha-amylase	Termamyl®	£11.50
Amyloglucosidase	AMG	£11.50
Cellulase	Celluclast®	£11.50
Carbohydrase mix	Viscozyme®	£11.50
Lactase	Lactozym®	£14.00
Pectinase	Pectinex®	£14.00
Pectin esterase	Novoshape®	£14.00
Pectinase	Peelzym®	£14.00
Protease	Neutrase®	£11.50
Catalase	Catazyme®	£11.50
Chymosin	Maxiren®	*£14.00
Fungal 'rennin'	Fromase®	*£14.00
Invertase	Bioinvert®	£14.00

Immobilised glucose isomerase

Glucose isomerase Sweetzyme® ~50g £11.50

Detergent product enzymes

These enzymes are now all supplied as liquids, in 100 mL bottles.

Protease (low temp)	Savinase®	£11.50
Protease (high temp)	Alcalase®	£11.50
Amylase	Termamyl®	£11.50
Amylase	Stainzyme®	£11.50
Lipase	Lipex®	£11.50

Washing product enzymes pack

This pack contains 100 mL of each of these liquids: Savinase®, Alcalase®, Termamyl®, Stainzyme® and Lipex®.

Washing product enzymes pack £50.00

Fruit processing enzymes pack

This pack contains 100 mL of each of six enzymes used in processing fruit (AMG, Termamyl®, Celluclast®, Pectinex®, Novoshape® and Peelzym®). This pack also includes a copy of *In a jam and out of juice*, a 20-page, full-colour booklet of background information and ideas for practical investigations.

Fruit processing enzymes pack £70.00

Please note: The NCBE supplies these enzymes to schools and colleges only for educational use. Commercial users of enzymes or those requiring enzymes for research purposes should contact other suppliers or the enzyme manufacturers.

Cellulase activity pack

This pack has been devised to allow investigations of the action of cellulase. It contains 100 mL of Celluclast®, 50 mL of full range (1–13) pH indicator and 100 g of carboxymethylcellulose (CMC). Individual items are also available.

Cellulase activity pack £29.00*

Carboxymethylcellulose (CMC)

Sodium salt. Low viscosity 100g £15.50

Full range pH indicator

pH 1–13 range 50 mL £10.00*

* Because the pH indicator is flammable, orders containing this item will incur an additional £5 courier charge.

Publications

Practical fermentation — a guide for schools and colleges

Two 20-page booklets: a student's and a teacher's guide, describing 14 practical investigations of fermentation. The teacher's guide includes ideas for extension activities and specimen results. *Please note: These booklets are supplied only in a pack of five Student's guides and two Teacher's guides. Pack sponsored by the SGM.*

Practical fermentation pack *£19.00

Illuminating DNA

A 44-page full-colour illustrated guide to practical work with DNA, including a 10-page introduction to molecular genetics, safety guidelines, nine practical protocols plus ideas for further investigations.

Illuminating DNA *£8.00

In a jam and out of juice

A 20-page full-colour guide to practical work with pectinases and other enzymes that are used in the processing of fruit. Includes a 7-page introduction, safety guidelines and four practical protocols.

In a jam and out of juice *£6.00

Replacement students' guides

The lambda protocol	8	*£12.00
Nature's dice	8	*£12.00
Protein power!	8	*£12.00
Investigating plant evolution	8	*£12.00
Transformer kit	OUT OF PRINT	
NCBE-SAPS Photosynthesis kit	8	*£12.00
NCBE-SAPS Plant DNA kit	8	*£12.00

NCBE-SAPS Photosynthesis kit

This kit, which is based on the one formerly supplied by SAPS, allows students to investigate photosynthesis using algae immobilised in calcium alginate.

The kit contains: 8 full-colour Students' Guides; 1 Teacher's Guide; 15 syringe units; 75 bijou bottles; 6 light filters, each ~13 x 20 cm (red, green, blue and 3 different Neutral density filters); 4g sodium alginate; 3g enrichment medium; 10x hydrogencarbonate indicator (250 mL); one culture of *Scenedesmus quadricauda*.

NCBE-SAPS Photosynthesis kit..... £58.00

Replacement parts AS PROVIDED IN THE KIT

Hydrogencarbonate indicator, 250 mL (10x).....£11.50
Filters, 6 £12.50
Photosynthesis kit Student's guides 8 *£12.00

Evans blue stain

0.09% aqueous solution, 100 mL £11.50

DNA pendant kit

Extract a sample of DNA from your cheek cells and save it in an attractive unisex pendant. Supplied with 30 full-colour illustrated instruction cards and a photocopyable written guide. Sufficient materials are provided to make 30 pendants.

Please note: each extraction requires a small volume (~2 mL) of ethanol or methylated spirit, which is not provided, as we cannot send this flammable liquid in the post.

DNA pendant kit £62.00

Double helix badge

An attractive grey metal brooch/pin. 21 x 9 mm.

Double helix badge £5.00

Whey powder

The lactose in this is used as a substrate for lactase. When rehydrated, 50g makes 600 mL of whey.

Whey powder ~50g £9.00

How to place an order

Placing an order

You may place an order by telephone, post or fax. Our office is open from 09:00 until 17:00 (UK time) from Monday-Friday, excluding public holidays. **Please note that for legal reasons we cannot accept orders by eMail.**

Despatch

Orders are usually despatched within 48 hours of receipt from Monday-Friday. At busy times of the year there may be a short delay in processing your order. If the item you have ordered is out of stock, and is likely to be delayed for a week or more, we will let you know.

Value Added Tax (VAT)

The prices given on the NCBE price list and website do not include VAT. All goods, except those marked with an asterisk (which are zero rated), incur VAT at the UK standard rate. VAT will be added to the total price of the order unless you provide us with a valid VAT registration number.

Orders sent to countries outside the European Union do not incur VAT, but please note that you will be responsible for paying any applicable taxes or duties.

Postage

United Kingdom

Except for packages containing the pH indicator, packing and postage by First Class mail is free-of-charge within the UK only. *Packages sent within the UK that contain the pH indicator will incur an additional courier charge of £5.* For orders from outside the UK, an additional charge is made for postage and handling (see below).

Overseas

Small orders will be sent by air mail. A 10% charge will be made to cover postal costs within the European Union. Larger or heavier orders and orders to non-EU countries will be sent by a courier service, which will be charged at cost. Please ask for an estimate of the shipping charge when you place your order.

Handling charge on non-UK orders

Due to the additional costs involved, we will add a £9 handling charge to all non-UK orders.

Cancelling an order or returning goods

Occasionally you may wish to return goods to us, or to cancel an order.

Under the United Kingdom's *Consumer protection (Distance Selling) Regulations (2000)*, you have the right to cancel the contract for the purchase of most* items within a period of seven working days, beginning with the day after the day on which the item was delivered to you.

The Regulations require you to send a notice of cancellation in writing: this can be done by post, fax or eMail. The Regulations also require that the goods must be returned to us in good condition, such that they may be re-sold.

Please note that you will be responsible for the costs of returning the goods to us unless we delivered the item to you in error or the item is faulty.

When we receive notice of your cancellation of the order, we will refund the relevant part of the purchase price for that item.

* We regret that we cannot accept the return of perishable items such as microbial cultures, enzymes, plasmids or PCR primers.

Payment

Educational institutions

Official orders with an order number from a school, college or education authority are preferred. All orders will be invoiced.

Payments should be made to the 'University of Reading' in GBP (Pounds Sterling) by cheque or direct bank transfer. Details of our bank account will be included on the invoice we send you.

Credit or debit card payments

We can usually accept credit or debit card payments for orders over £10 (cards with 16 digits only). Please ensure that you include the following details with any credit or debit card orders:

- The cardholder's name and address
- The card number (16 digits)
- The start date and expiry date of the card
- The three-digit security code from the back of the payment card

Please also provide a telephone number so that we may contact you should this prove necessary.

Our contact details

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