

INSTRUCTION MANUAL

Electro-Eluter/Concentrator

ECU-040-20

ECU-040-50

ECU-040-25

ECU-040

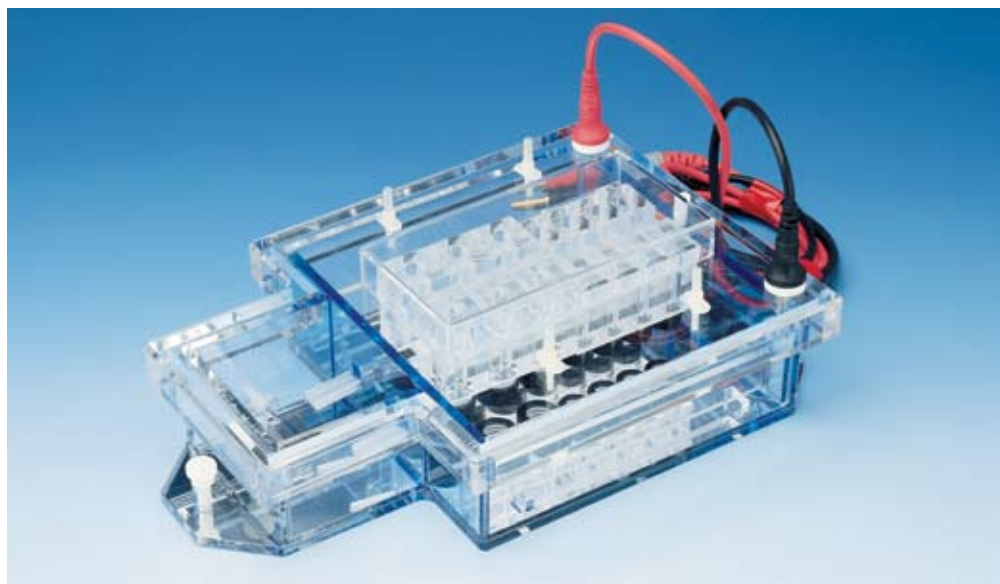


TABLE OF CONTENTS

	Page
Important User Information	3-4
Section 1 General Information	
1.1 Introduction	5
1.2 Specifications	5
1.3 Safety	6
Section 2 Description of parts	
2.1 Unpacking	7
2.2 Components and Assembly	7
Section 3 Instructions for Use	
3.1 Unit Preparation	8
3.2 Elution Block Set-up	8
3.3 Procedure for Protein Elution	8-10
3.4 Procedure for Elution of DNA	11
Section 4 Maintenance of Equipment	
4.1 Care and Handling	12
4.2 Maintenance	12
Section 5 Ordering Information	13

IMPORTANT USER INFORMATION

This Instruction Manual will explain how to use this product safely and effectively. Please read and carefully follow the instruction manual in its entirety.



The triangle/exclamation mark symbol alerts the user of the product to important operational, maintenance, and/or warranty requirements.



The triangle/lightning bolt symbol alerts the user of the product to potentially hazardous electrical exposure.



Failure to adhere to the instructions could result in personal and/or laboratory hazards, as well as invalidate any warranty. Always turn off the DC power source prior to disconnecting power cords from the product. Disconnect power cords from the power source first and then from the product. For maximum safety, always operate this system in an isolated, low traffic area, not accessible to unauthorized personnel. Never operate damaged or leaking equipment.

WARRANTY AND LIABILITY

This product was produced utilizing the highest practical standards of materials, workmanship, and design. C.B.S. Scientific warrants that the product has been tested and will meet or exceed published specifications. This warranty is valid only if the product has been operated and maintained according to the instructions provided.

C.B.S. Scientific warrants this product to be free from defects in materials and workmanship under normal service for one year from date of shipment. If the product proves defective during this period, C.B.S. Scientific will repair or replace it at our option, free of charge, if returned to us postage prepaid. This warranty does not cover: damage in transit, damage caused by carelessness, misuse or neglect, normal wear through frequent use, damage caused by solvent corrosion, damage caused by improper handling or user alteration, nor unsatisfactory performance as a result of conditions beyond our control. C.B.S. Scientific shall in no event be liable for incidental nor consequential damages, including without limitation, lost profits, loss of income, loss of business opportunities, loss of use and other related damages, however caused, nor any damage arising from the incorrect use of the product.

<p>FRANÇAIS INFORMATION IMPORTANTE À L'USAGE DES UTILISATEURS</p> <p>Le présent manuel d'utilisation explique la manière de se servir efficacement du produit en conditions de sécurité. Il est recommandé de soigneusement lire la totalité du manuel, avec ses consignes et ses instructions.</p> <p> Le triangle avec point d'exclamation est un symbole destiné à avertir l'utilisateur du produit de l'importance de certaines exigences relatives au fonctionnement, à l'entretien et/ou à la garantie.</p> <p> Le triangle avec flèche en zigzag est un symbole destiné à avertir l'utilisateur du produit de la possibilité d'exposition à des décharges avec danger de secousses électriques.</p> <p> Tout manquement à l'observation des consignes et des instructions peut exposer les personnes et les biens à des dommages corporels et/ou matériels et peut annuler toute garantie. Il faut toujours interrompre l'alimentation de courant continu avant de déconnecter les cordons d'alimentation du produit. Déconnecter d'abord les cordons d'alimentation branchés sur la source de tension (alimentation de secteur) puis ceux branchés sur le produit. Pour une sécurité maximum, il faut toujours faire fonctionner ce système dans un lieu isolé, peu fréquenté, où le personnel non autorisé n'a pas accès. Ne jamais faire fonctionner un matériel endommagé ou affecté par des fuites.</p> <p>GARANTIE ET RESPONSABILITÉ</p> <p>Le produit a été fabriqué conformément aux normes applicables les plus exigeantes en matière de matériaux, de main d'œuvre, de conception et d'ingénierie. C.B.S. Scientific garantit que le produit a subi des essais et que ses performances rempliront les conditions des spécifications publiées ou leur seront même supérieures. La présente garantie n'est valide que si le produit a fonctionné et a été entretenu conformément aux consignes et instructions fournies.</p> <p>C.B.S. Scientific garantit que le produit sera dépourvu de vices de matériaux et de main d'œuvre, en conditions de service normales, pendant un an à compter de la date d'expédition. Au cas où le produit s'avérerait défectueux pendant cette période de garantie, C.B.S. Scientific réparera ou remplacera le produit, à sa discrétion et gratuitement, si le produit lui est retourné port payé d'avance. La garantie ne couvre pas les dommages de transport; les dommages causés par l'imprudence, le manque de soins, l'abus ou la négligence; l'usure normale résultant d'une utilisation fréquente; les dommages causés par la corrosion des solvants; et les dommages causés par la manipulation inadéquate ou des changements apportés par l'utilisateur. La garantie ne couvre pas non plus les performances non satisfaisantes résultant de conditions hors du contrôle de C.B.S. Scientific. C.B.S. Scientific ne pourra en aucun cas être tenue responsable de dommages indirects, y compris, de manière non limitative, la perte de bénéfices, le manque à gagner, la perte d'occasions d'affaires, l'impossibilité d'usage ou tous autres dommages associés, quelle qu'en soit la cause, ni de dommages résultant de l'usage incorrect du produit.</p>	<p>ESPAÑOL INFORMACIÓN IMPORTANTE PARA EL USUARIO</p> <p>El presente instructivo explica la manera de usar este producto en forma segura y efectiva. Sírvase leerlo en su totalidad y seguir detenidamente las indicaciones que contiene.</p> <p> El símbolo del triángulo con exclamación llama la atención del usuario a requisitos importantes para el uso y mantenimiento del producto, así como para la validez de la garantía.</p> <p> El símbolo del triángulo con rayo llama la atención del usuario a la posibilidad de riesgos eléctricos.</p> <p> El incumplimiento de las instrucciones aquí señaladas podría dar lugar a riesgos a la persona, al laboratorio o a ambos y podría anular toda garantía. Siempre apague la fuente de corriente continua antes de desenchufar los cables eléctricos del producto. Primero desconecte los cables de la fuente de energía y después del producto. Para mayor seguridad, siempre use este sistema en un área aislada, de poco movimiento de personas e inaccesible a personal no autorizado. Jamás use equipo que presenta algún daño o fuga.</p> <p>GARANTÍA Y RESPONSABILIDAD</p> <p>Este producto fue fabricado de acuerdo con las normas más estrictas que sean factibles en cuanto a materiales, mano de obra y diseño. C.B.S. Scientific garantiza que se sometió el producto a pruebas y que cumplirá o excederá las especificaciones publicadas. Esta garantía será válida únicamente si se usa y se da servicio de mantenimiento al producto de acuerdo con las instrucciones señaladas.</p> <p>C.B.S. Scientific garantiza que este producto se encontrará libre de defectos de materiales y mano de obra por un período de servicio normal de un año a partir de la fecha de embarque. Si el producto resulta defectuoso durante este período, C.B.S. Scientific lo reparará o lo repondrá, a criterio de C.B.S. Scientific, libre de cargos, si se devuelve el producto a C.B.S. Scientific porte pagado. Esta garantía no cubre daños sufridos en tránsito, daños provocados por descuido, mal uso o negligencia, desgaste normal como consecuencia del uso excesivo, daños atribuibles a corrosión provocada por solventes, daños causados por el uso indebido o alteraciones realizadas por el usuario ni rendimiento insatisfactorio atribuible a circunstancias fuera del control de C.B.S. Scientific. C.B.S. Scientific en ningún caso asumirá responsabilidad por daños incidentales o subsequentes, incluyendo, en forma no limitativa, la pérdida de utilidades, de ingresos, de oportunidades comerciales o del uso del producto y otros daños afines, fuere cual fuere su origen, ni por daños derivados del uso incorrecto del producto.</p>
<p>DEUTSCH WICHTIGE INFORMATION FÜR DEN BENUTZER</p> <p>Diese Bedienungsanleitung beschreibt wie man dieses Produkt sicher und wirksam benutzt. Bitte lesen und befolgen Sie alle Anweisungen in dieser Anleitung.</p> <p> Das Dreieck mit Ausrufezeichen weist den Benutzer des Produktes darauf hin, daß wichtige Bedienungs-, Wartungs- und/oder Garantievorschriften zu beachten sind.</p> <p> Das Dreieck mit Zickzackblitz warnt den Benutzer des Produktes vor möglichen Gefahren durch elektrische Spannungen.</p> <p> Nichtbeachtung dieser Anweisungen kann zu persönlichen und/oder labortechnischen Schäden führen und gleichzeitig alle Garantien als nichtig erklären. Die DC Stromzufuhr muß immer, vor dem Entfernen der Steckdose und erst dann vom Produkt entfernt werden. Die Stromzufuhrkabel müssen zuerst von der Steckdose und erst dann vom Produkt entfernt werden. Um höchste Sicherheit zu gewährleisten sollte dieses System in einem abgesonderten und besonders ruhigen Bereich eingesetzt werden und vor Unbefugten sicher sein.</p> <p>GARANTIE UND HAFTUNG</p> <p>Dieses Produkt wurde unter Anwendung von Produkten mit höchster Qualität und aus Materialien mit bester Verarbeitung und modernstem Design hergestellt. C.B.S. Scientific garantiert, daß das Produkt getestet wurde und alle publizierten Spezifikationen übertrifft. Diese Garantie ist jedoch nur gültig, wenn das Produkt nach der beigefügten Bedienungsanleitung bedient und gewartet wurde.</p> <p>C.B.S. Scientific garantiert, daß dieses Produkt bei normaler Bedienung aus fehlerfreiem Material besteht und fehlerfrei in der Ausführung ist. Diese Garantie gilt für ein Jahr ab Lieferdatum. Sollte das Produkt in diesem Zeitraum fehlerhaft werden, bietet C.B.S. Scientific eine kostenlose Reparatur bzw. kostenlosen Ersatz, einschließlich freiem Rückporto. Diese Garantie schließt folgendes aus: Transportschaden, Schaden durch Nachlässigkeit, Mißbrauch oder Vernachlässigung, normale Abnutzung durch regelmäßigen Gebrauch, Schaden durch Säureangriff, Schaden durch falsche Handhabung, Veränderung des Produktes durch den Benutzer, oder unzureichende Leistungen die sich nicht im Verantwortungsbereich von C.B.S. Scientific befinden. C.B.S. Scientific kommt unter keinen Umständen für folgende Schäden auf: Sachschadensverlust, Einkommensverlust, Verlust von Geschäftsmöglichkeiten, Verlust der Anwendung und andere damit verbundene Schäden die auf irgend eine Art und Weise entstanden sind, oder Schäden die aus falscher Anwendung des Produktes entstanden sind.</p>	<p>ITALIANO INFORMAZIONI IMPORTANTI PER L'UTENTE</p> <p>Questo manuale spiega come utilizzare questo prodotto in maniera sicura ed efficiente. Si preghi di leggere e seguire con cautela le istruzioni di ogni parte di questo manuale.</p> <p> Il triangolo contenente il simbolo di un punto esclamativo avverte l'utente di importanti requisiti relativi al funzionamento, manutenzione e/o garanzia del prodotto.</p> <p> Il triangolo contenente il simbolo di un lampo avverte l'utente del prodotto della possibilità di pericoli dovuti a corrente elettrica.</p> <p> La mancata osservanza delle istruzioni può essere causa di pericolo alla propria persona ed al laboratorio, oltre a poter annullare la garanzia. Prima di distaccare il cordone d'alimentazione dal prodotto, spegnere sempre la sorgente di corrente continua. Distaccare i cordoni d'alimentazione prima dal lato della sorgente di tensione e poi dal lato del prodotto. Per maggior sicurezza, mettere sempre in funzione il prodotto in un'area isolata con poco traffico che non sia accessibile al personale non autorizzato. Non mettere mai in funzione un'apparecchiatura che sia danneggiata o abbia perdite.</p> <p>GARANZIA E RESPONSABILITÀ</p> <p>Questo prodotto è stato fabbricato seguendo gli standard più elevati per i materiali, la manodopera e la progettazione. La C.B.S. Scientific garantisce il prodotto è stato sottoposto a prova e raggiunge o supera i valori pubblicati per i dati tecnici. Questa garanzia è valida solo se il prodotto è messo in esercizio e soggetto a manutenzione secondo le istruzioni fornite.</p> <p>La C.B.S. Scientific garantisce che questo prodotto è libero di difetti di materiali e manodopera, in normali condizioni d'esercizio, per la durata di un anno dalla data di spedizione. Se, in questo periodo, il prodotto si dimostrerà difettoso, la C.B.S. Scientific, a suo giudizio, lo riparerà o sostituirà. Questa garanzia non copre danni in transit, danni causati da negligenza, uso improprio, trascuratezza, normale consumo derivante da uso frequente, o danni causati da solventi corrosivi, danni causati da maltrattamento o da modifiche apportate dall'utente e non copre prestazioni insoddisfacenti che siano il risultato di condizioni al di fuori del controllo del fabbricante. La C.B.S. Scientific non sarà in ogni caso responsabile per danni incidentali o consequenziali, incluso, senza limitazioni, perdite di profitto, perdita di entrate, perdita di opportunità d'affari e altri danni relativi, comunque causati, e per danni risultanti da uso incorrecto del prodotto.</p>

SECTION 1 General Information

1.1 Introduction

The Electro-Eluter/Concentrator is designed to elute and concentrate macromolecules simultaneously from acrylamide or agarose gels. Typical applications include recovery of proteins from SDS-acrylamide gels, and of restriction enzyme-treated DNA from agarose gels. The elution of proteins from gel strips has become a useful technique for preparing proteins for primary structure analysis because this procedure can be used after Coomassie staining to visualize the location of the protein bands in the gels.

Eluter/Concentrator blocks consist of a precision-machined sample recovery channel and two silicone-Teflon® washer/open-top cap assemblies for holding dialysis membranes securely in place.

The three-chamber Electro-Eluter is designed to allow buffer cycling. The buffer drain outlets on the side for the two electrode chambers allow overflow buffer to drop into the mixing chamber. The mixed buffer is then pumped back into the electrode chambers. This prevents build-up of a pH gradient, which can occur during long-term electrophoresis, interfering with the ionic migration of the protein or DNA sample. The buffer cycling system also eliminates the need to change buffer during electrophoresis.

1.2 Specifications

Constructions

Buffer chamber, lid	Acrylic, mirror
Electrodes	Platinum wire .012" diameter
Power cords	FR Urethane, rated 7500V, 200mA, 65° C
Blocks	Acrylic
Caps	Bakelite*
Washers	TFE/Silicone
Safety Certification	EN61010-1-1993 (IEC1010-1)

	ECU-040	ECU-040-25	ECU-040-20	ECU-040-50	ECB-102	ECB-105
Shipping weight	7lbs	8lbs	8lbs	8lbs	2lbs	2lbs
Overall Size (l)x(w)x(h) cm	30.8x20.3x12.7	30.8x20.3x12.7	30.8x20.3x12.7	30.8x20.3x12.7	1.9x5.7x2.54	5.7x5.7x2.54
Recommended buffer volume:	550	550	550	550	-	-
Loading chamber capacity	—	—	—	—	2.0ml	5.0ml
Migration channel volume	—	—	—	—	5.0ml	12.0ml
Sample recovery volume	—	—	—	—	200ul	500ul
Distance between electrodes	15cm	15cm	15cm	15cm	—	—
Voltage limit	250	250	250	250	—	—

1.3 Safety



Power to the Electro-Eluter/Concentrator unit is to be supplied by an external DC voltage power supply that must be ground isolated so that the DC voltage output floats with respect to ground. For any power supply used, the maximum specified operating parameters for the units are:

Maximum Limits

250 VDC voltage

25 watts power

50 mA current

60° C ambient temperature



Current to the unit, provided from the external power supply, must enter the unit through the lid assembly, providing a safety interlock to the user. Current to the unit is broken when the lid is removed. **Do not attempt to use the unit without the safety lid. Always turn the power supply off before removing the lid, or when working with the unit in any way. Follow safety precautions specified by the power supply manufacturer.**

Description of Parts

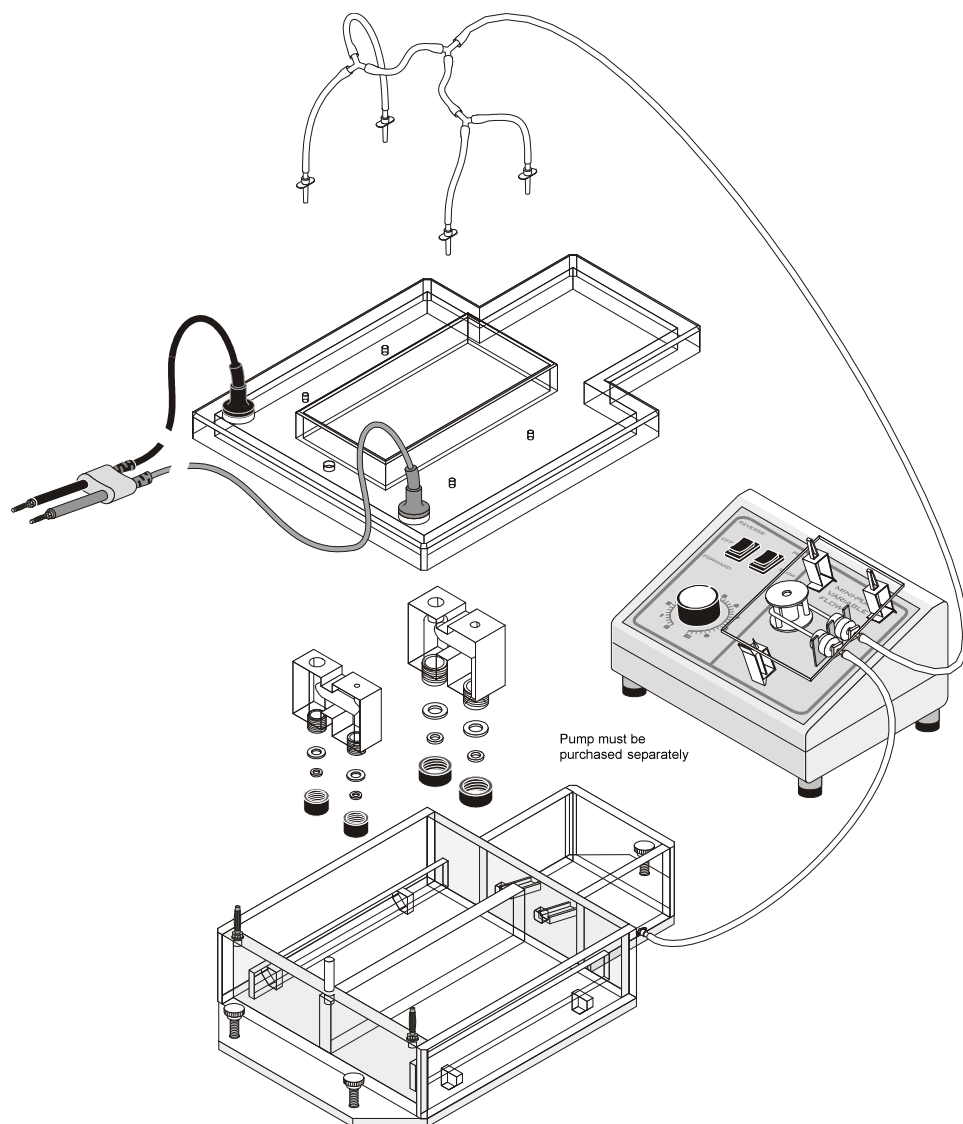
2.1 Unpacking

Please verify that your Electro-Eluter Concentrator comes complete with the following components:

- Buffer Chamber with leveling base, spirit level, platinum electrodes, and 2 safety/vapor covers
- Power leads
- 3 “Y” and 4 straight tubing connectors
- 4 Elution/Concentrator Chambers or “Blocks”. Each Block has 2 black open-top screw caps, 2 Teflon-Silicone flat washers.

Notes: We do not supply dialysis membrane. Use non-charged, well washed membrane such as Spectrapore. A small peristaltic pump must be used for buffer re-circulation.

Electro-Eluter Components



SECTION 3

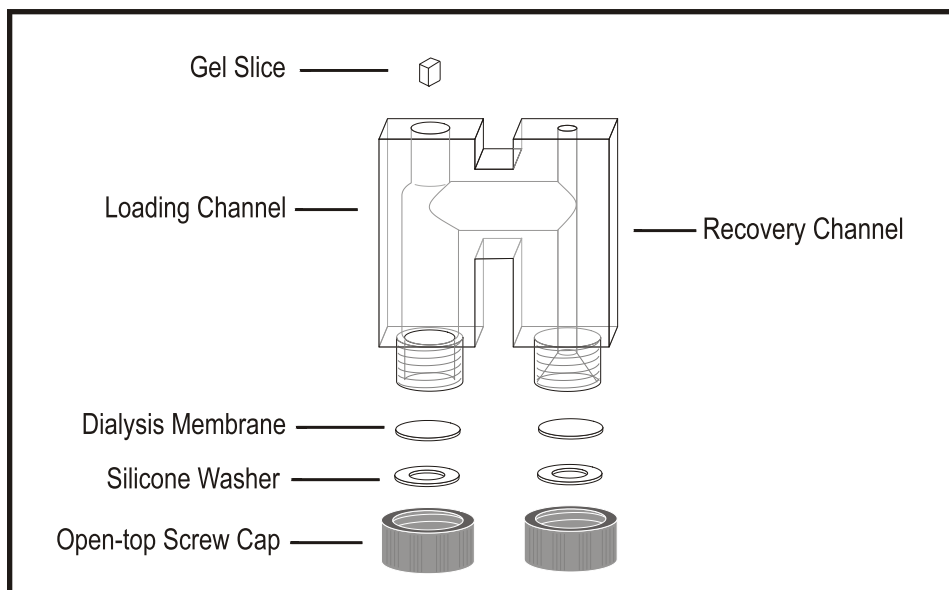
Instructions for Use

3.1 Unit Preparation

Place the Electro-Eluter Concentrator and the Elution blocks on a level work surface in an authorized work area.

3.2 Elution Block Set-Up

To assemble Block for electroelution, unscrew black caps and remove washers. Cut dialysis membrane into circles the same diameter as the Teflon/Silicone Washers. Place the membrane onto the slightly tan side of the washer inside the black cap (the Teflon will allow the membrane to slide instead of binding on the washer). Screw the black cap with the washer and membrane into place as shown in figure 1.

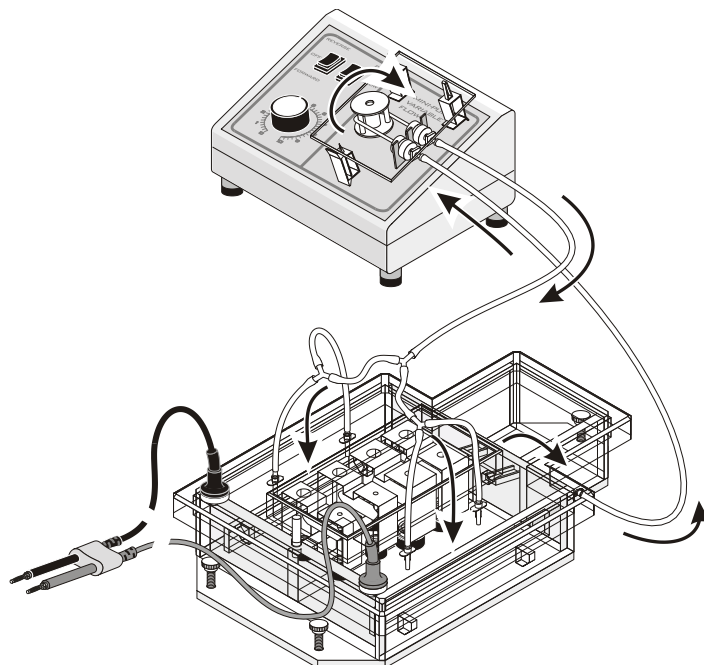


3.3 Procedure for Protein Elution

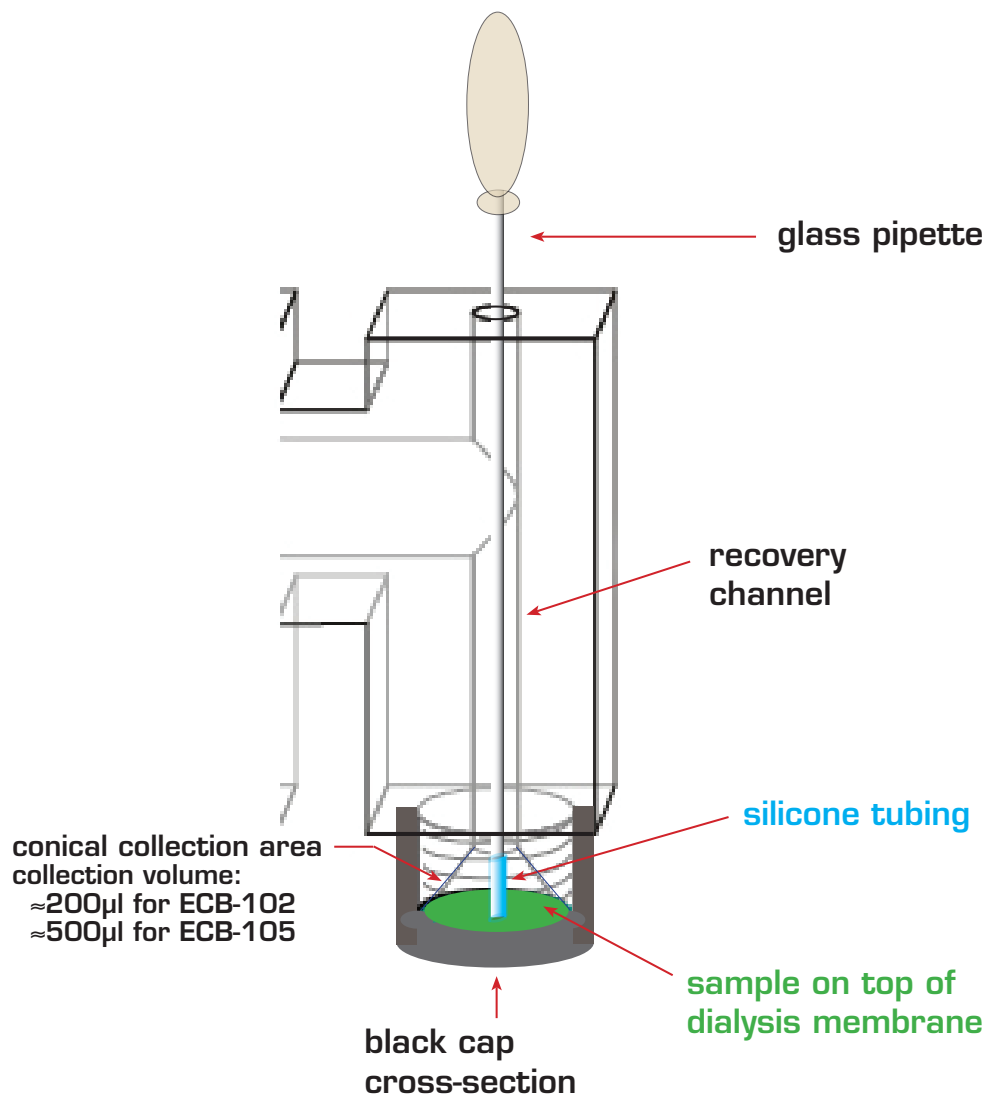
1. For electroelution of protein samples prior to sequencing, read carefully the Hunkapillar et. al. paper in Methods in Enzymology, Vol. 91, 1983, pgs. 227-236.
2. Equilibrate each block with 1% Ethanolamine to take away most of the non-specific binding sites for protein attachment. The Plexiglas walls of the blocks, if not treated, may decrease the yield from electroelution by non-specific absorption. Dilute the Ethanolamine in running buffer.
3. The gel slice should be equilibrated in running buffer, as per the Hunkapillar paper. On the large volume side of the Block, top load the gel slice onto the membrane. Fill the entire chamber with running buffer $\frac{3}{4}$ of the way up to the cross channel. Tap blocks with finger so that ALL THE AIR BUBBLES TRAPPED INSIDE ARE DISLODGED.
4. Insert loaded blocks into unit. Flush air trapped beneath each black cap with syringe and bent needle. Be careful not to puncture membrane.

5. **Buffer Cycling System Set-up.** This unit is designed to maximize yield by preventing any pH gradient from forming inside the block by constantly re-cycling buffer. Attach tubing to outlet on side of the third chamber to dual peristaltic pump. Split outlets from pump with “Y” connectors, followed by attachment to the tubing connectors mounted in the safety covers. The flow of recycled buffer drops out of anode and cathode buffer chambers into the mixing chamber, and is then returned via the pump system. The remixed buffer drops onto the small plastic strips, which protect the platinum wire. This prevents unwanted small air bubbles from re-entering the buffer.

Buffer Re-Circulation



6. Running conditions for
 - a) **Proteins prepared for Sequencing: Electrophoresis** is carried out as per Hunkapillar et. al.
 - b) **Elution of Protein from SDS-Acrylamide Gels, not to be Sequenced:** Buffer: 50mM Tris Acetate (pH 7.8), 1mM EDTA, Current: 60-70 Volts, Duration: 15-20 hours
7. At the end of electrophoresis remove the blocks carefully from the chamber. Pipette off and discard most of the running buffer in the loading and cross channels. Re-suspend the eluted sample on the node membrane, typically 100-200ul of buffer (500ul in the 5ml block). For initial runs save all of the buffer in the collection side above the conical chamber. If the elution is incomplete, protein sample may not have migrated all the way down the membrane. Therefore, check yield before discarding collection side buffer. **See diagram on page 10.**



3.4 Procedure for Elution of DNA

1. Please read through directions for elution of proteins. Follow instructions 3-5 of Section 3.1 using the buffer suggestions below.
 - a. Buffer: 5mM Tris-HoAc pH 7.5, 1mM EDTA, Current: 100-150 Volts @ 10mA, Duration: Minimum of 5 hours for large DNA (8-10 kbp); 1.5 hours for 300 bp.
 - b. Comparisons of recoveries after 5 hours to 18 hours are similar. Therefore, it does not hurt to run overnight when running large DNA fragments.
2. All electroelution preps are extensively Phenol extracted after run (2x, 1 hour) followed by chloroform ether extraction. This is to remove any contaminants including dissolved agarose. **Note:** Most people use a Brom-phenol-Blue Sucrose marker in with the piece of agarose to make sure current flow is unobstructed by bubbles. After loading sample into chamber, drop a little of this marker into the bottom of the loading chamber. Watch for movement of dye after power is turned on.
3. DNA recovered from our ECU units has been tested for a number of viable characteristics including kinase treatment, re-restriction, and ability to transform E. Coli and has been found to be more active than DNA recovered by conventional techniques. Also, the percent recoveries of DNA and the percent of specific E. Coli transformation by that DNA are much better than traditional methods, despite extensive Phenol extraction.

SECTION 4 Maintenance of Equipment

4.1 Care and Handling



The plastic components of the Electro-Eluter Concentrators are fabricated from acrylic. Electrodes and connectors are made from pure platinum, stainless steel, and chrome plated brass. As with any laboratory instrument, adequate care ensures consistent and reliable performance.

After each use, rinse buffer chamber with de-ionized water. Wipe dry with a soft cloth or paper towel, or allow to air dry. Whenever necessary, all components may be washed gently with water and a non-abrasive detergent, and rinsed and dried as above. *Never* use abrasive cleaners, glass cleaning sprays or scouring pads to clean the components, as these will damage the unit and components.

Additional precautions:

- Do not autoclave or dry-heat sterilize the apparatus or components.
- Do not expose the apparatus or components to phenol, acetone, benzene, halogenated hydrocarbon solvents or alcohols.
- Avoid prolonged exposure of the apparatus or components to UV light.
- Do NOT treat with diethylpyrocarbonate (DEPC)-treated water for extended periods at 37°C. A brief rinse with DEPC-water is sufficient after a thorough wash.

4.2 Maintenance



The following inspection and maintenance procedures will help maintain the safety and reliable performance of the Electro-Eluter Concentrator. Replacement parts can be ordered by calling 1-858-755-4959 or by contacting your local distributor.

- Banana plugs and power cords should be inspected regularly. If the banana plugs become loose or do not feel friction tight replace the plugs or power cords.
- Should power cord assemblies (connectors, wire or shrouds) show any signs of wear or damage (e.g. cracks, nicks, abrasions, or melted insulation), replace them immediately.
- The platinum wire is secured to the banana jack by compression between a stainless washer and the jack nut. The nut/washer interface should be tight and free of corrosion.

SECTION 6 Equipment and Accessories

<u>Cat. #</u>	<u>Item</u>
ECU-040-20	Electro-Eluter Concentrator. Includes four 2.0ml blocks
ECU-040-50	Electro-Eluter Concentrator. Includes four 5.0ml blocks
ECU-040-25	Electro-Eluter Concentrator. Includes two 2.0ml blocks and two 5.0ml blocks
ECU-040	Electro-Eluter Concentrator. Unit only
ECB-102	Additional 2.0ml Eluter/Concentrator block
ECB-105	Additional 5.0ml Eluter/Concentrator block
ECB-102-C	Additional 2.0ml Cap
ECB-105-C	Additional 5.0ml Cap
ECB-102-W	Additional 2.0ml Washer
ECB-105-W	Additional 5.0ml Washer

Power Supply

<u>Cat. #</u>	<u>Item</u>
EPS-200-II	High Current Mini Power Supply with timer, CE, CV or CC 5-200 Volts, 110V/50-60Hz, current range: 2000mA, 200 Watts
EPS-200-IV	High Current Mini Power Supply with timer, CE, CV or CC 5-200 Volts, 220V/50-60Hz, current range: 2000mA, 200 Watts
EPS-300-II	Mini Power Supply with timer, CE, CV or CC 10-300 Volts, 110V/50-60Hz, current range: 4-500mA, 90 Watts
EPS-300-IV	Mini Power Supply with timer, CE, CV or CC 10-300 Volts, 220V/50-60Hz, current range: 4-500mA, 90 Watts

Casting Pump

<u>Cat. #</u>	<u>Item</u>
MPP-100	Mini Casting/Recirculation Pump

NOTES

NOTES

CONTACT US



Telephone:
Local or International
858-755-4959
Toll Free: 858-755-0733



Fax: 858-755-0733



Check out our new and improved online ordering!

www.cbsscientific.com



E-mail address:
sales@cbssci.com



Mailing address:
C.B.S. Scientific Company
P.O. Box 856
Del Mar, CA 92014



Shipping address:
C.B.S. Scientific Company
10805 Vista Sorrento Pkwy
Suite 100
San Diego, CA 92121



Credit Card Options:
Visa/Mastercard
Discover/American Express