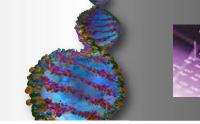
ElectroPrep[™] System



The Nest Group, Inc.

The NEW ElectroPrep[™] System from The Nest Group is a versatile sample preparation technology based on electro-dialysis.

The patented ElectroPrep[™] System can be used for electro-dialysis, electro-elution, electro-filtration, electro-fractionation or electro-concentration.

By running a sample sequentially into multiple molecular weight cut off (MWCO) chambers – in as little as three minutes – this ElectroPrep[™] System is ideal for the rapid purification of dye–labeled proteins from unbound dye, nucleic acids from gel slices, desalting carbohydrates or detergent removal from biomolecules. It provides speed and convenience, even at the very low currents (5 to10 mA) it uses.

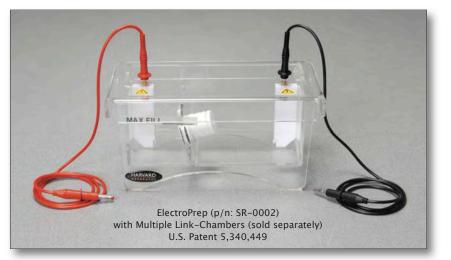
The redesigned, reusable sample chambers are

made of PTFE for high sample recovery, and provide large membrane surface areas for faster dialysis rates. The DIALYZER[™] volumes are from 50 µl to 1500 µl. They can be used individually or joined with a Union or with one or more Link Chambers. With different combinations of MWCO membranes, the ElectroPrep[™] System is ideal for:

- Electro-Dialysis Buffer Exchange or Detergent Removal.
- Selective Electro-Filtration, Concentration and Separation of Charged Bio-molecules.
- Rapid Removal of Dye From Dye-Labeled Proteins.
- Electro-MW Fractionation and Concentration of DNA or Proteins From Gel Slices.

After electro-dialysis, a momentary polarity reversal assures complete removal of concentrated molecules from the membrane surface.

Membranes from 100Da to 300KDa MWCO offer a wide range of choices for your special application.



Order#	Product				
ElectroPrep Sys	tem				
SR 0002	ElectroPrep Tank, includes Tank, with Safety Lid and High Voltage leads, pkg. of 1				
74-1197	ElectroPrep Connector, pkg. of 1				
74-1198	Power Supply, 110V 300 Volt, 500 mA, 90W, pkg. 1				
74-1199	Power Supply, 230V 300 Volt, 500 mA, 90W, pkg. 1				
Dialysis Chamb	ers (uses SC dia. membranes)				
SRD-00502D	50µl Chamber Volume, pkg. 2				
SRD-01002D	100µl Chamber Volume, pkg. 2				
SRD-02502D	250µl Chamber Volume, pkg. 2				
SRD-05002D	500µl Chamber Volume, pkg. 2				
SRD-10002D	1000µl Chamber Volume, pkg. 2				
SRD-15002D	1500µl Chamber Volume, pkg. 2				
Link Chambers	use SB dia. membranes for 1st Link & SA for 2nd Link:				
Link Chambers					
SRD-0502L	50µl Chamber Volume, pkg. 2				
SRD-01002L	100µl Chamber Volume, pkg. 2				
SRD-02502L	250µl Chamber Volume, pkg. 2				
SRD-05002L	500µl Chamber Volume, pkg. 2				
SRD-10002L	1000µl Chamber Volume, pkg. 2				
SRD-15002L	1500µl Chamber Volume, pkg. 2				
Unions					
SRU 50-1500.1	50µl-1500 Chamber Volumes, Volume 500µl Union, pkg. 1				

ElectroPrep[™] is a trademark of Harvard Apparatus

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sample preparation

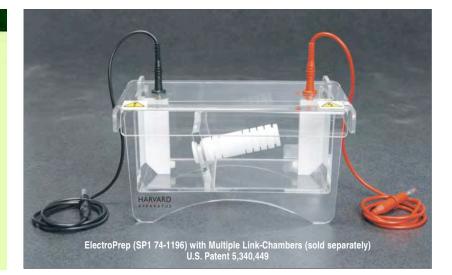
ElectroPrep[™] System

advantages 🔹 🔳

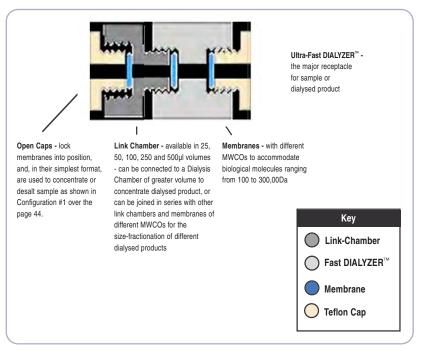
- Faster dialysis times due to movement of charged molecules in the electric field
- Re-usable
- Available for most sample sizes large or small
- Membranes available with MWCO's to suit almost any application
- Easy to use
- Leak proof
- Autoclaveable
- Low protein binding
- High sample recovery
- Made of Teflon totally inert

applications 🔹 🖬 📥 🖷

- Electro-elution from gels and solutions
- Electro-dialysis (with an average buffer exchange time of 5 to 10 minutes)
- On-line electro-dialysis
- Electro-concentration
- Selective electro-filtration
- Size fractionation
- Primer removal
- Salt removal
- Detergent removal
- Dye-Terminator removal
- See some examples on the following pages



The ElectroPrep system from Harvard Apparatus is an extremely versatile patented sample prep technology based on (2D) dialysis electrophoresis. This ElectroPrep system is ideal for the rapid purification of proteins, nucleic acids, carbohydrates and other biomolecules. With a run-time of 5 to 10 minutes, ElectroPrep provides speed and convenience, even at the very low currents (5 to 10 mA) used with this system. The sample chambers are made of Teflon, a completely inert material especially suited for high sample recovery. Membranes of different MWCO (molecular weight cut off), from 100 to 300,000 Daltons, can be used for selective elution, filtration, dialysis, fractionation and concentration. Ultra-Fast DIALYZER can be joined with each other or with multiple link chambers in different combinations (see pages 43 & 44) and membranes (see page 46).



As shown above, multiple link chambers can be joined together with membranes of different MWCOs placed between them for highly selective electro-filtration and separation.

ElectroPrep[™] System Configurations

Electroprep System Configurations

1. Decide Application:

- Electro-Dialysis Configuration #1
- Electro-Concentration Configuration #2
- Electro-Separation Configuration #2
- Electro-Elution Configuration #2
- Electro-Filtration Configuration #3
- Electro-Fractionation Configuration #4

2. Slect Dialysis Chamber Volume

50 µl to 1500 µl (a Chamber can be connected to an Union for increased volume)

3. Choose suitable size, type and MWCO Dialysis Membranes

for desired configurations

4. Connect Dialysis Chamber

- with a membrane and open-ended Caps for Desalting or Buffer Exchange (Configuration #1)
- with a membrane, Union and a smaller volume Chamber for Electro-Concentration (Configuration #2)
- with a membrane, Union and equal volume Chamber for Electro-Separation & Electro-Elution (Configuration #2)
- with a membrane and Link Chambers for Electro-Filtration (Configuration #3)
- with membranes of different MWCO and multiple Link Chambers for Electro-Fractionation (Configuration #4)

Example Configurations

Most Basic: To Desalt or Buffer Exchange





Two Different Volume Chambers: To Selectively Concentrate

Configuration #3: One Chamber connected to a Link

Larger Volume Chambers: To Purify and Concentrate or Filter

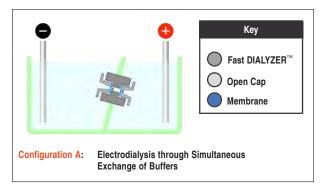
Complex Configuration: for Concentration/Filtration/Separation

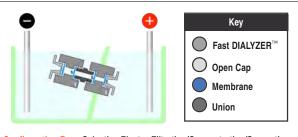


Configuration #4: Two Chambers with an Union and two Links

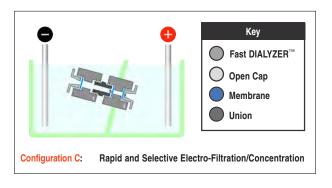
ElectroPrep[™] System (continued)

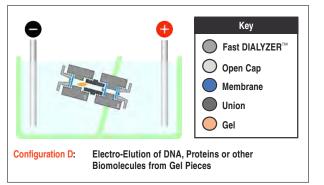
Configurations





Configuration B: Selective Electro-Filtration/Concentration/Separation Based on Different Charges on Biomolecules





Electro-Dialysis through Simultaneous Exchange of Buffers

A sample is placed in the dialysis chamber between Membranes (a) and (b), both of which have MWCOs (Molecular Weight Cut-Off) lower than the molecular weight of the desired biomolecules. The sample is dialyzed through the simultaneous exchange of buffers in the electric field. This method is very fast and very effective. For example, after a PCR reaction, it can be used to rapidly (5 to 10 minutes) remove 100% of the primer. Electrodialysis is also effective for desalting neutral molecules that do not move in an electric field (such as sugars) or charged molecules at their isoelectric point.

Selective Electro-Filtration/Concentration/ Separation Based on Different Charges of Biomolecules

In this configuration of the ElectroPrep, the sample is placed in an union between two membranes (b), both of which should have a MWCO larger than the desired biomolecules. Membranes (a) and (c) should have MWCOs smaller than the biomolecules. Based on their charges, the desired biomolecules will move to either dialysis Chamber (1) or Chamber (2), whereas the lowest molecular weight molecules will migrate through membranes (a) and (c) into the tank. Biomolecules with unknown isoelectric points can also be separated and purified using this method. Dialysis chambers of smaller volume can be used to concentrate samples.

Rapid and Selective Electro-Filtration or Concentration

The sample is placed in the sample compartment comprised of a Chamber (1) and the Union connected to a receiving Chamber (2) of same or smaller volume. The MWCO of membrane (b) should be larger than the molecular weight of the biomolecules and the MWCO of membrane (a) should be smaller. Upon the passage of electric current, the biomolecules will pass through membrane (b) and collect in Chamber (2) while smaller molecules will continue to pass through membrane (b) and (a). This is a fast and effective method for selective filtration, and for the concentration of small samples.

Electro-Fractionation During Elution of DNA, Proteins or Other Biomolecules from Gel Pieces

Using the ElectroPrep system in this configuration, elution of DNA, proteins, or any other biomolecules from a gel slice/plug can be achieved quickly and easily with excellent recovery. Using an union, Chambers can be joined in any combination necessary to accommodate the required gel volume. Samples can be concentrated if desired, by choosing a receiving chamber of suitable smaller volume. The MWCO of the membranes (a and b) can also be chosen to achieve very selective filtration or size fractionation during the electro-elution process.

ElectroPrep[™] System (continued)



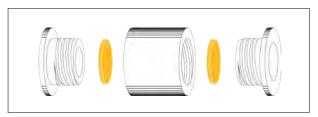
The ElectroPrep System must use at least one Fast DIALYZER unit (range of 50 μ l to 1,500 μ l volume).

Dialysis Chambers					
Chamber Volume	Pkg of 2				
50 µl	SRD 00502D				
100 μl	SRD-1002D				
250 μl	SRD-2502D				
500 μl	SRD-5002D				
1000 µl	SRD-10002D				
1500 μl	SRD-15002D				

Dialysis Chambers are the major receptacles for either samples or dialyzed materials. Included with each Fast DIALYZER are one main Chamber with two open ports and two matching end caps.

- Chambers can have dialysis membranes of appropriate MWCO at one or both ends.
- Chambers can be joined to each other with a Union or connected directly to one or more Link Chambers separated by dialysis membranes.
- Chambers of different volumes in the colored Fast DIALYZER series can be connected together or intermixed using Unions.

Union			
Joins Dialysis Chambers of	Pkg of 2	Chamber Volume	
Any two chambers with volume range of 50 μl to 1500 μl	SRU 50-1500.1	500 µl	



The joining of multiple Fast DIALYZERS units requires a Union of the appropriate size.

Unions can join two main Dialysis Chambers:

- Without membranes to make larger volume chambers, or;
- With dialysis membranes of appropriate MWCO for serial dialysis.

Union SRU 50-1500.1 with 500 ul volume can join two Chambers of the Fast DIALYZERS with volumes from 50 ul to 1500 ul.

Link Chambers					
Chamber Volume	Pkg of 2				
50 µl	SRD-502L				
100 µl	SRD-1002L				
250 µl	SRD-2502L				
500 μl	SRD-5002L				
1000 µl	SRD-10002L				
1500 μl	SRD-15002L				

Link Chambers of various volumes can be easily attached to a main Chamber of the Fast DIALYZERS when volumes smaller than that of the main Chamber are required, by placing membranes at either end.

- Links can be used as a single Link directly attached to one Main Chamber without the need of a Union.
- Unlike Unions, Links do not connect to each other or to the main Chamber without a dialysis membrane.
- Without Unions, Links can be directly connected to main Dialysis Chambers. Only the 50 µl and 100 µl Links can be joined together or interchanged, but not the other volume Links

See next page for ElectroPrep Product List and Ordering Information.

DIALYZERS, Chambers & Membranes for ElectroPrep Ordering Information

ElectroPrep DIALYZERSTM, Additional or Connector Chambers & Membranes for ElectroDialysis

Chamber Volume:	50 µl	100 µl	250 µl	500 µl	1000 µl	1500 µl			
ElectroPrep DIALYZER									
Qty. of 2	SRD 7411-502D	SRD 7411-1002D	SRD 7411-2502D	SRD 7411-5002D	SRD 7411-10002D	SRD 7411-15002D			
Additonal (Link)									
Qty. of 2	SRD 7411-502L	SRD 7411-2502L	SRD 7411-2502L	SRD 7411-5002L	SRD 7411-10002L	SRD 7411-15002L			
Connector (Union)									
	600	600 µl, 3500 µl (to join 50 µl, 100 µl, 250 µl, 500 µl, 1000 µl or 1500 µl ElectroPrep DIALYZERS)							
Qty. of 2		SRU 50-1500.1							
Membranes: Pack of 25									
for Chamber Volume			50µl, 100µl, 250ul, 50)0ul, 1000µl or 1500ul					
A. Regenerated Cellulose N	IEMBRANES:								
1k Da MWCO		Body:	SCP010S.24 LINK1:	SB010S.24 LINK2: SA	010S.24				
2k Da MWCO	Body: SCP020S.24 LINK1: SB020S.24 LINK2: SA020S.24								
5k Da MWCO	Body: SCP050S.24 LINK1: SB050S.24 LINK2: SA050S.24								
10k Da MWCO	Body: SCP100S.24 LINK1: SB100S.24 LINK2: SA100S.24								
25k Da MWCO		Body:	SCP250S.24 LINK1:	SB250S.24 LINK2: SA	250S.24				
50k Da MWCO		Body:	SCP500S.24 LINK1:	SB500S.24 LINK2: SA	500S.24				
B. Cellulose Acetate MEME	BRANES:								
100-500 Da MWCO		Body:	SCP005K.24 LINK1:	SB005K.24 LINK2: SA	005K.24				
1k Da MWCO		Body:	SCP010K.24 LINK1:	SB010K.24 LINK2: SA	010K.24				
2k Da MWCO		Body:	SCP020K.24 LINK1:	SB020K.24 LINK2: SA	020K.24				
5k Da MWCO		Body:	SCP050K.24 LINK1:	SB050K.24 LINK2: SA	050K.24				
10k Da MWCO		Body:	SCP100K.24 LINK1:	SB100K.24 LINK2: SA	100K.24				
25k Da MWCO		Body:	SCP250K.24 LINK1:	SB250K.24 LINK2: SA	250K.24				
50k Da MWCO				SB500K.24 LINK2: SA					
100k Da MWCO				SB111K.24 LINK2: SA					
300k Da MWCO	NEC.	Body: S	56P333K.24 LINK1: \$	SB333K.24 LINK2: SA3	5551K.24				
C. Polycarbonate MEMBRA	NNES:	D. I. 0			0001 0 24				
0.01 um Pore Size 0.05 um Pore Size		•		SB0001P.24 LINK2: SA					
0.10 um Pore Size		•		\$B0005P.24 LINK2: SA \$B0010P.24 LINK2: SA					
0.60 um Pore Size				SBOOTOP.24 LINK2: SA SBOO60P.24 LINK2: SA					
Accessories: Quantity of 1		Douy: 3	OF DOUDT 24 LINKT: 3	5500001.24 LINKZ: 5A	100001.24				
-				2000					
ElectroPrep Tank				D002					
ElectroPrep Connector	SR1197								
Power Supply, 110V Power Supply, 220V				1198 /-1199					

Membranes are supplied either as dry or in 0.05% sodium azide solution. They are ready to use after rinsing with deionized water and buffer. Regenerated Cellulose membranes are more stable in organic solvents, but the MWCO range is not as sharply defined as that of Cellulose Acetate membranes. Cellulose Acetate membranes have a sharp MWCO range. They are intended only for aqueous solutions, and the presence of an organic solvent is not recommended. Polycarbonate membranes are more stable in organic solvents. They are available in four highly controlled pore sizes for a well defined MWCO range.