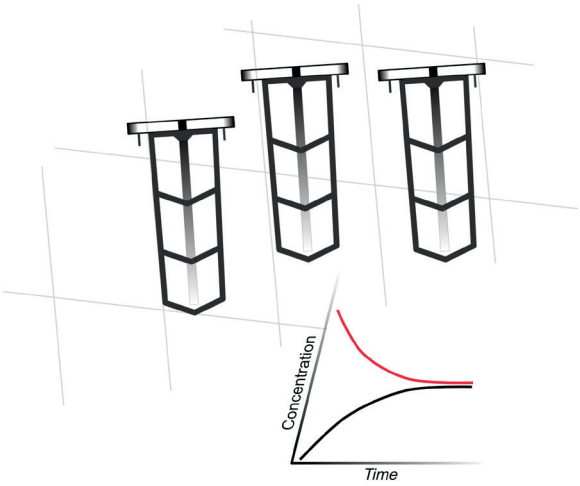
scienova™

Xpress Dialysis Reactor

XDR-1

Manual & Data Sheet



General Information

The Xpress Dialysis Reactor 1 (XDR-1) is a unique system designed for processing large quantities of samples for a variety of applications. The XDR-1 is delivered ready-to-use in a 6 deep well plate or as a single dialyzer for the usage in other buffer vessels. The exclusive design of the XDR-1 allows up to 6 samples to be loaded and removed from the top of the device without removing the XDR-1. The construction of the XDR-1 enables flexible handling and numerous applications that go beyond sample dialysis. It is compatible with the SBS microplate standard.

XDR-1 Dialyzer in 6-deep well plate

Product Features and Benefits

Feature	Benefit
Pipette in sample or remove test dialysate from the top of the device without removing sample vessel.	Simple to process large quantities of samples.
Top side with luer compatible openings.	Versatile applications and flexible extensions.
Regenerated cellulose membrane.	Low protein and hormone binding for high recovery of test samples.
High membrane surface area per sample.	Short incubation time to reach equilibrium.

◀ ***Table 1***
Product overview

Applications

- Protein and peptide sample purification (eg. desalting before mass spectrometry)
- Optimization of protein renaturation with different renaturation buffers and steps
- Removal of dyes after protein labeling
- Protein sample rebuffering
- Protein in vitro translation
- Cell cultivation
- Enzyme activity assays
- Plasmid or primer purification

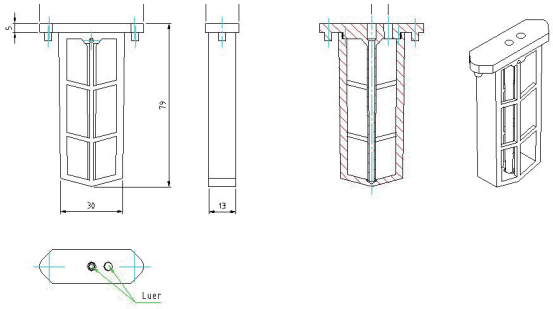
Specifications

Application conditions

Sample volume	1–19 ml
Buffer volume	8–48 ml*
Temperature	1–60 °C
pH	4–8
Sample	Aqueous solutions only
Membrane	Low binding regenerated cellulose Contains glycerol to prevent embrittlement and traces of elements like sulphides and heavy metals
Cutoffs (MWCO)	3.5 | 6–8 | 12–14 kDa
Weight	230 g (6 dialyzers in 6-deep well plate)
Dimensions (plate)	13.0×8.5×9.0 cm (L×W×H)

** max. filled well with XDR*

◀ ***Table 2***
Specifications XDR-1



◀ ***Figure 1***
Engineering drawing of XDR-1

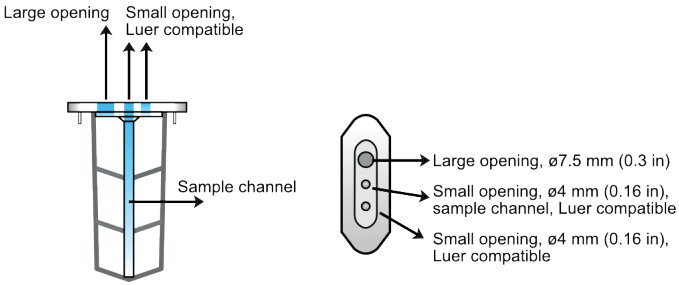
Side view and view from above, unit: mm

Video demonstration

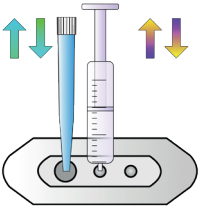
For a demonstration of the Dialyzer Family go to our website:

https://www.scienova.com

Handling



◀ ***Figure 2***
Sample openings and sample channel of the XDR-1
left: front view, right: view from above



▲ ***Figure 3***
Openings on the top of the XDR-1

◀ ***Table 3***
Features and possible applications of the XDR-1 and accessories

Component	Feature
Small opening (luer)	Sample loading and removing Usage with pipette tips or syringe
Small opening with channel	Removing sample from bottom of XDR-1, Gas supply for cell cultures
Large opening	Sample loading and removing Use with pipette tips or syringe
Stopper for small and large opening	Protection against contamination and evaporation
Tube connection (luer)	External sample vessel for increasing sample volume (circulation by peristaltic pump, fig. 6), Mixture of sample, Gas supply (O_2) for cell culture
6-deep well plate (Hitplate)	Usage of up to six XDR-1 dialyzer in parallel
Floater	Usage of one XDR-1 in a beaker glas with higher buffer volume

Instructions

Preparing before usage

- The XDR-1 is delivered ready-to-use and no special preparation is necessary.

Loading sample and buffer

- It is recommended to start with loading the sample and then filling the outer buffer.
- The XDR-1 can be used in 6-deep well plates (Hitplate) with up to 48 ml buffer volume,
- Or with the XDR-1 floater in a beaker glas (at least Ø 8 cm / 3.15 inch) with a buffer volume of choice.
- It is advantageous to insert the XDR-1 into deep well plate diagonally (figure 4).
- Recommended buffer volumes are listed in table 3.
- The top of the XDR-1 has three openings (figure 2 and 3) which offer a variety of application options (table 3).
- Fill in gently the sample with a pipette (5 ml or 10 ml) or a syringe by using one of the three openings.
- Carefully load the sample into the Dialyzer.
- The sample can be filled in the XDR-1 if the dialyzer is located in the 6- deep well plate or if removed from the deep well plate.

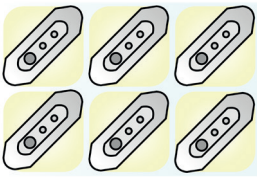
Starting dialysis

- If the XDR-1 dialyzer were located in the deep wells the dialysis starts subsequently after buffer is filled into each well.
- If the XDR-1 dialyzer were filled outside the deep well plate or beaker glas, the dialysis starts when the XDR-1 is placed into the buffer filled vessel.

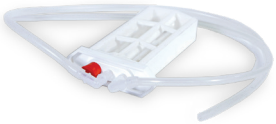
Removing dialysed sample and buffer

- Remove sample by using the opening, use preferably the middle opening with the sample channel.
- It is recommended to remove the dialyzer from the buffer container before removing the sample.

▼ ***Figure 4***



XDR-1 in 6-deep well plate (Hitplate) (view from above)



▲ ***Figure 5***
XDR-1 segment with connections and tubing

▲ ***Figure 6***
Circulation of dialysis with bigger volume using a peristaltic pump.

Recommendations

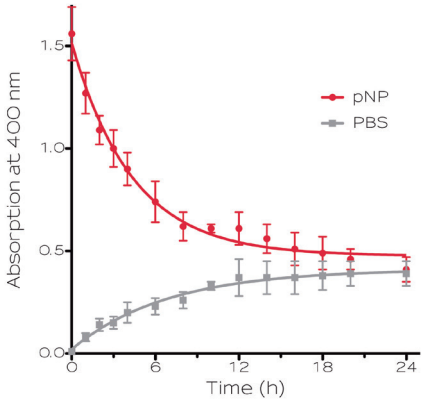
- When pipetting into and from sample openings, be sure pipette tip is firmly seated into opening. Also reduce pipetting speed slightly especially during sample introduction.
- The usage of pipettes or syringes enables high recovery rates (more than 90 %).
- Samples less than 5 ml may have reduced volume recovery (less than 90 %).
- For effective dialysis, it is important to have the buffer level above the level of the sample (see table 4).
- At higher temperatures, dialysis takes place at a faster rate.

Sample volumes and corresponding buffer volumes

sample (ml)	buffer (ml)*	ratio
1	8	1:9
5	16	1:4.2
10	27.5	1:3.75
15	40.5	1:3.7
19	48	1:3.53

*** in 6-deep well plate (Hitplate), liquid in sample chamber and sample channel on same level, XDR-1 completely inserted into well**

◄ ***Table 4***
Sample volumes and corresponding buffer volumes



◄ ***Figure 6***
Example: Dialysis of the dye p-nitrophenol in XDR-1

Conditions: XDR-1 in 6-deep well plate, MWCO 6–8 kDa, **dialysis buffer:** 50 ml Phosphate buffered saline pH=7.4 (PBS), **sample:** 15 ml para-nitrophenol (0.5 mM in PBS), **method:** preincubated in deep well plates, 80 µl samples were taken at different points, **determination method:** TECAN Sunrise Photometer, measure wavelength: 400 nm, reference wavelength: 620 nm, performed at room temperature, non-shaking, n=6.

Chemical Resistance

G	Acetonitrile	G	Acetic acid 25 %
G	Acetone	G	Acetic acid 96 %
G	Chloroform	G	Formic acid 25 %
G	Sodium hydroxide 32 %	N	Formic acid 100 %
G	Ethanol 70 %	L	Hydrochloric acid 10 %
G	Ethanol 98 %	N	Hydrochloric acid 25 %
G	Ethylacetate	N	Hydrochloric acid 37 %
G	Ethylene glycole	N	Hydrofluoric acid 50 %
G	Glycerol	N	Nitric acid 25 %
G	n-Hexane	N	Nitric acid 65 %
G	iso-Propanol	L	Phosphoric acid 25 %
G	Methanol 98 %	N	Phosphoric acid 85 %
G	Methylene chloride	N	Sulfuric acid 98%
G	1-Propanol	L	Ammonium hydroxide 1 N
G	Tetrahydrofuran	L	Ammonium hydroxide 25 %
G	Toluene	L	Potassium hydroxide 1 N
G	Hydrogen peroxide 30 %	N	Potassium hydroxide 32 %
		L	Sodium hydroxide 1 N
		N	Sodium hydroxide 32 %

G	Good chemical resistance
L	Limited chemical resistance, e.g. pore size cannot be guaranteed
N	No chemical resistance, use not recommended

◀ ***Table 5***
Sample volumes and corresponding buffer volumes

Note

Tested MWCO:
3.5 | 6–8 | 12–14 kDa
Incubation: 18 h
Determination Method: Optical integrity and leak-tightness to air pressure

Notes

This product ("Product") is warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Product documentation, specifications and/or accompanying package inserts ("Documentation") and to be free from defects in material and workmanship. Unless otherwise expressly authorized in writing, Products are supplied for research use only. No claim of suitability for use in applications regulated by FDA is made. The warranty provided herein is valid only when used by properly trained individuals. Unless otherwise stated in the Documentation, this warranty is limited to one year from date of shipment when the Product is subjected to normal, proper and intended usage. This warranty does not extend to anyone other than the original purchaser of the Product ("Buyer").

No other warranties, express or implied, are granted, including without limitation, implied warranties of merchantability, fitness for any particular purpose, or non infringement. Buyer's exclusive remedy for non-conforming Products during the warranty period is limited to replacement of or refund for the non-conforming Product(s).

There is no obligation to replace Products as the result of (i) accident, disaster or event of force majeure, (ii) misuse, fault or negligence of or by Buyer, (iii) use of the Products in a manner for which they were not designed, or (iv) improper storage and handling of the Products.

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