PD **MiniTrap** G-10, PD **MidiTrap** G-10

PROTEIN SAMPLE PREPARATION

PD MiniTrap™ G-10, and PD MidiTrap™ G-10 columns (Fig 1) are prepacked, single-use gravity columns for buffer exchange and cleanup of biological samples, for example peptides, small proteins, and oligosaccharides. These gravity columns give fast and simple cleanup without a purification system. PD MiniTrap G-10 and PD MidiTrap G-10 are members of the Trap platform, which addresses the need for flexible, small-scale preparation of protein samples prior to downstream analytical techniques such as gel electrophoresis, liquid chromatography, and LC-MS.

Gel filtration, based on Sephadex™ G-10 chromatography medium, provides group separation of biomolecules with a molecular weight above 700 from contaminants such as salts, dyes, and radioactive labels. Gel filtration separates molecules on the basis of differences in size.

The key benefits of PD MiniTrap G-10 and PD MidiTrap G-10 columns are:

- Rapid cleanup of peptides, small proteins, and carbohydrates with molecular weights above 700 prior to downstream analysis
- Efficient removal of contaminants such as salts, dyes, and radioactive labels
- High desalting capacity
- Preparation of samples in the range of 100 µl to 1 ml

Characteristics

PD MiniTrap G-10 and PD MidiTrap G-10 columns are prepacked with Sephadex G-10, a medium well suited for separating biomolecules such as peptides, small proteins, and carbohydrates (M_r > 700) from smaller molecules (M_r < 100). The columns are manufactured from biocompatible polypropylene. The main characteristics of the medium and the prepacked columns are listed in Tables 1 and 2.

Fig 1. PD MidiTrap G-10 (left) and PD MiniTrap G-10 (right) columns are prepacked with Sephadex G-10.

Table 1. Characteristics of Sephadex G-10 medium

Matrix	Cross-linked dextran
Separation mechanism	According to size
Particle size range	55–165 µm
Exclusion limit (M_r)	700
Chemical stability	All commonly used buffers
Working pH range	2–13

Table 2. Characteristics of PD MiniTrap G-10 and PD MidiTrap G-10 columns prepacked with Sephadex G-10

	MiniTrap G-10	**MidiTrap G-10**
Volume of prepacked medium	2.1 ml	5.3 ml
Packed bed dimensions	0.97 × 2.8 cm	1.3 × 4.0 cm
Column volume	5 ml	8.5 ml
Void volume	700 µl	1.6 ml
Maximum sample volume	300 µl	1.0 ml
Volume of eluted sample	0.5 ml	1.2 ml
Recovery[1]	70% to 90%	70% to 90%
Desalting capacity	> 75%	> 75%
Column material	polypropylene and polyethylene	polypropylene and polyethylene
Storage solution	20% ethanol	20% ethanol
Storage temperature	4°C to 30°C	4°C to 30°C

[1] Biomolecule dependent

cytiva

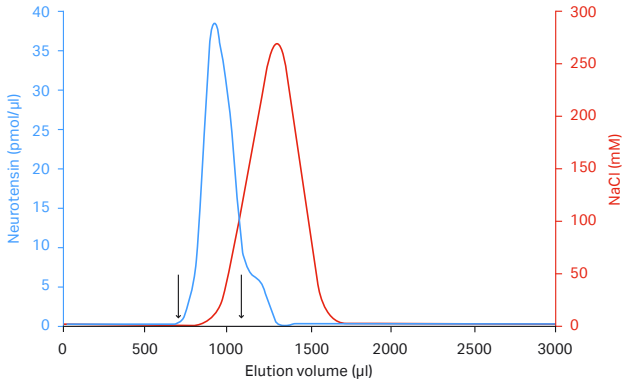
Efficient removal of contaminants using gravity

PD MiniTrap G-10 and PD MidiTrap G-10 columns are designed for cleanup of samples in the range of 100 µl to 1 ml. The typical desalting capacity is above 75% with recoveries between 70% and 90% (biomolecule dependent). Elution profiles for a neurotensin solution is shown in Figure 2.

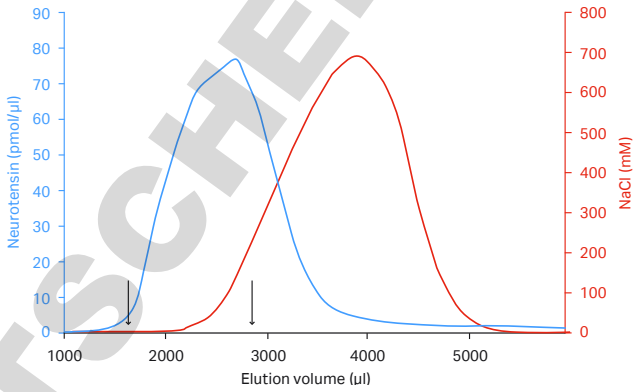
Sample: 100 pmol/µl neurotensin in 1 M NaCl
Sample volume: 100 µl
Equilibration buffer: Milli-Q™ water

Sample: 100 pmol/µl neurotensin in 1M NaCl
Sample volume: 1000 µl
Equilibration buffer: Milli-Q water

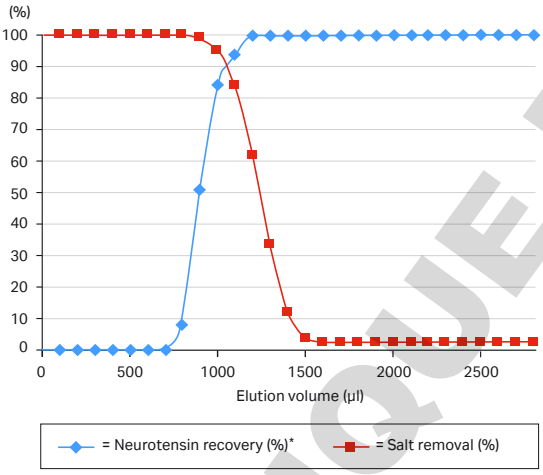
(A) **Elution profile**



(C) **Elution profile**



(B) **Neurotensin recovery and salt removal***



(D) **Neurotensin recovery and salt removal***

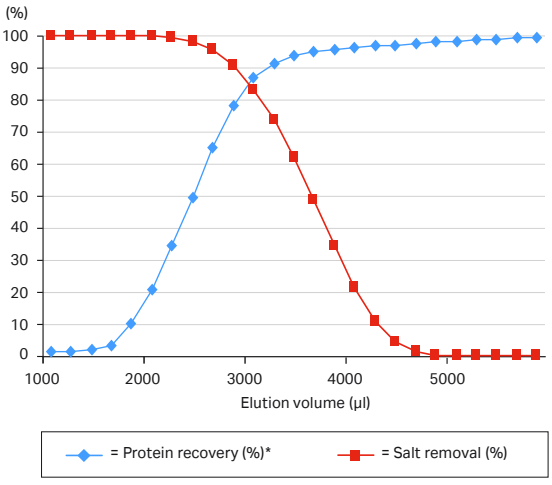


Fig 2. Removal of NaCl from a neurotensin solution. The neurotensin recovery was 81% and the desalting capacity was 84% (between arrows) for the PD MiniTrap G-10 (A & B). For the PD MidiTrap G-10 (C & D) neurotensin recovery was 79% and desalting capacity was 91% (between arrows). The recovery was calculated by measuring the absorbance at 215 nm and the desalting capacity was measured by conductivity. Graphs (B) & (D) show neurotensin recovery and salt removal versus the total elution volume on the column for PD MiniTrap G-10 and PD MidiTrap G-10, respectively.

* The recovery curves are normalized against the total amount of loaded sample.

Convenient cleanup of low molecular weight oligosaccharides

Low molecular weight carbohydrates, such as oligosaccharides, can be difficult to separate from contaminants. Methods such as ion exchange may not be suitable due to strong hydrophilicity. As shown in Figure 3, the PD MiniTrap G-10 column efficiently removes salt from an oligosaccharide-containing solution.

Sample: 10 000 cpm ^{3}H-heparan sulfate octamer in 0.5 M NaCl
Sample volume: 100 µl
Equilibration buffer: Milli-Q water

Elution profile

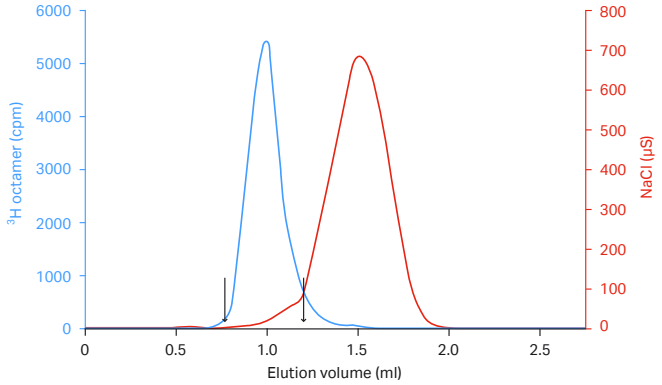


Fig 3. Removal of NaCl from a ^{3}H-heparan sulfate octamer solution on a PD MiniTrap G-10 column. The fractions were analyzed with regard to conductivity and radioactive content. The oligosaccharide recovery was approximately 95% and the desalting capacity was 94% (between arrows).

Ordering information

Products	Quantity	Code no.
PD MiniTrap G-10	50 columns	28-9180-10
PD MidiTrap G-10	50 columns	28-9180-11

Related products

PD-10 Desalting Columns	30 columns	17-0851-01
PD SpinTrap™ G-25	50 columns	28-9180-04
PD MultiTrap™ G-25	4 × 96 well plates	28-9180-06
PD MiniTrap G-25	50 columns	28-9180-07
PD MidiTrap G-25	50 columns	28-9180-08
HiTrap™ Desalting	5 × 5 ml	17-1408-01
HiTrap Desalting[1]	100 × 5 ml	11-0003-29
HiPrep™ 26/10 Desalting	1 × 53 ml	17-5087-01
HiPrep 26/10 Desalting	4 × 53 ml	17-5087-02

[1] Pack size available by special order

Literature

Gel filtration Principles and Methods, Handbook	18-1022-18
Gel filtration columns and media, Selection guide	18-1124-19
Desalting and buffer exchange of proteins and peptides in less than 5 min, Selection guide	18-1128-62
Protein Purification, Handbook	18-1132-29

cytiva.com/trap

CY13578-05Aug20-DF