L-column Micro

High-performance column for nano and micro HPLC

L-column Micro is a nano/micro column with 0.075–0.3 mm I.D. It is a high-performance column that was manufactured by combining low-absorption packing materials, including ***L-column2 ODS***, an originally developed packing technique and a column structure with a small dead volume.

■ Features

- The packing materials can be selected from ***L-column*** series including ***L-column2 ODS***.
- Highly sensitive analyses are possible because of the negligible adsorption of basic peptides and proteins.
- Stabilization time can be shortened and highly sensitive analyses are possible because of low column bleed.
- An inert fused silica capillary is used as the column body, with two kinds of column structures available.

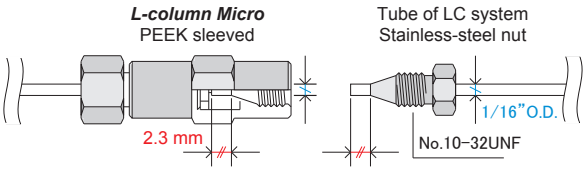
■ Column Structure

[Non-sleeved type]
The chromatography tube is a fused silica capillary. The dead volume of the column is reduced through direct connection of the column with the chromatograph (Fig. 21). This column is most suitable for the identification of phosphorylated peptides by LC/MS/MS because metallic parts are not used.

- Inner diameter: 0.075 mm and 0.1 mm
- External diameter: 0.360 mm

[PEEK-sleeved type]
This column is easy to handle because it is a fused silica capillary with an outer sleeve of PEEK resin. Connection to MS is easy because connecters are attached to the column.

- Inner diameter: 0.075 mm–0.3 mm
- Connection: 1/16 inch stainless-steel connector



■ Proteome analysis

BSA tryptic digest was analyzed using LC/MS/MS and the sample concentration and cover ratio was determined using ***L-column Micro*** and another brand. A higher cover ratio means that more amino acid sequences are read.
L-column Micro shows advantage at all concentration levels, but excels at the lower levels (Fig. 22). With superior end-capping and very high theoretical plate numbers per column, ***L-column Micro*** permits identification of many proteins and is the optimum choice for proteome analysis (Fig. 23).

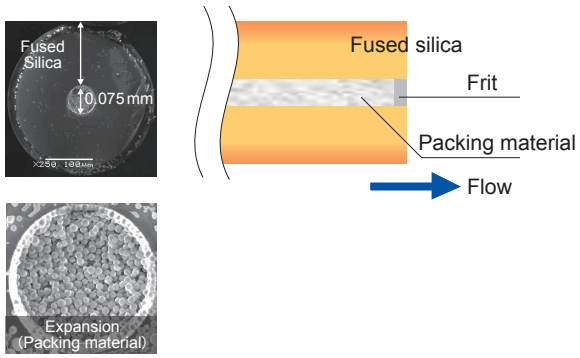
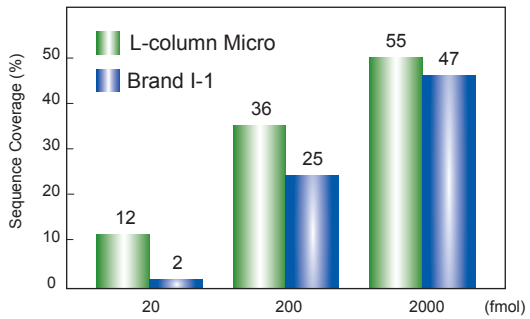
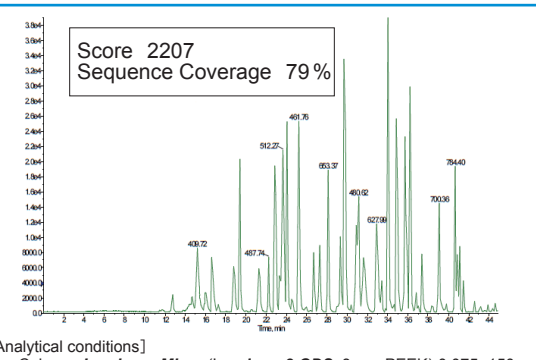


Fig. 21 Electron microgram (non-sleeved type: 0.075 mm I.D.).



[Analytical conditions]
Column: ***L-column Micro*** (***L-column ODS***, 3 µm, PEEK) 0.075×150 mm
Brand I-1 (C18, 3 µm) 0.075×150 mm
Mobile phase: CH_3CN/0.1 % HCOOH in H_2O
Temp.: Ambient
Sample: BSA tryptic digest
System: LC: Cap LC (Waters Co.); MS: Q-TOF micro (Waters Co.)

Fig. 22 Sequence coverage (BSA trypic digest).

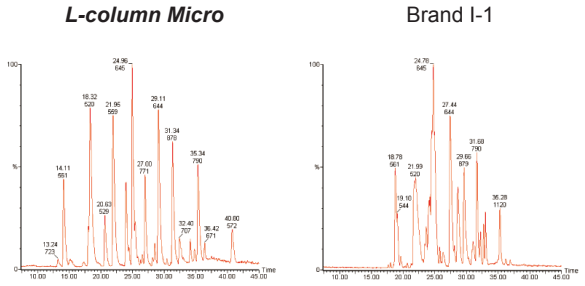


[Analytical conditions]
Column: ***L-column Micro*** (***L-column2 ODS***, 3 µm, PEEK) 0.075×150 mm
Mobile phase: 0.1 % HCOOH in CH_3CN gradient
Flow rate: 0.2 µL/min
Sample: 50 fmol BSA tryptic digest
System: LC: ParadigmMS2+PAL; MS: QSTAR-Elite
※Courtesy of Dr. Ueda, RIKEN center for Genomic Medicine

Fig. 23 Analysis of a small amount of BSA tryptic digest.

■ Low adsorption and high efficiency

L-column Micro can separate many peptides because of the low-adsorption packing materials (Fig. 24). This is effective for the identification of proteins.
The column has a high theoretical plate number and high durability because it is packed homogeneously by a patented technique.



[Analytical conditions]
Column: ***L-column Micro*** (***L-column ODS***, 3 µm, non) 0.075×150 mm
Brand I-1 (C18, 3 µm) 0.075×150 mm
Mobile phase: A/B, 5/95–40/60 (0–30 min)
A: 0.1 % HCOOH in CH_3CN; B: 0.1 % HCOOH in H_2O
Temp.: Ambient; Inj.vol.: 1 µL
Sample: 100 fmol enolase1 tryptic digest
System: LC: Cap LC (Waters Co.); MS: Q-TOF micro (Waters Co.)
Application No. 1073

Fig. 24 TIC of enolase1 tryptic digest.

■ Trap column

In proteomic analysis using LC/MS/MS, the trap column is indispensable for increasing the injection volume. A small dead volume, low-adsorption property and high retention ability that traps target constituents are required effectively in a trap column.

[Cartridge trap column]
This trap column does not decrease the theoretical plate number because of its very small dead volume. Not only that, because it is a cartridge-type trap column, it is more economical (Fig. 25).

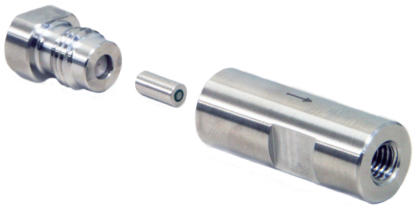
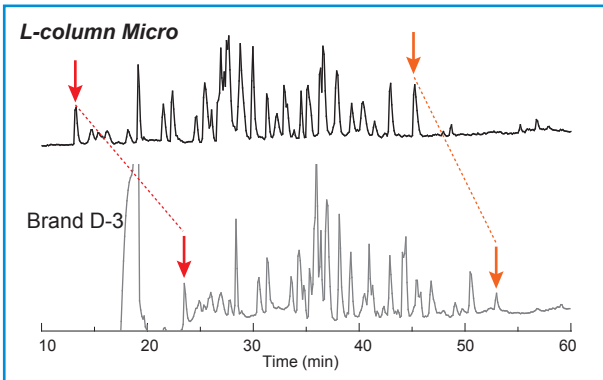


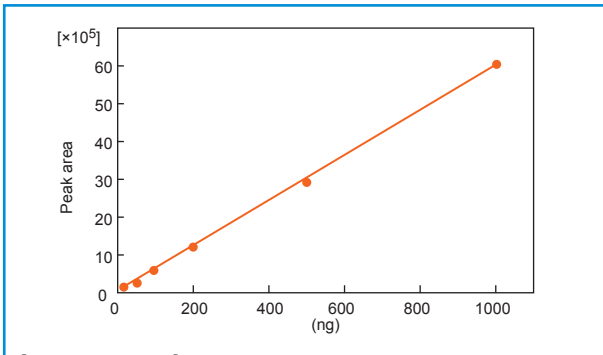
Fig. 25 Structure of Trap column



[Analytical conditions]
Column: ***L-column Micro*** (***L-column ODS***, 3 µm, non) 0.075×150 mm
Trap column: ***L-column Micro*** (***L-column ODS***, 5µm) 0.3×5 mm
Brand D-3 (C18) 0.2×150 mm
Mobile phase: A/B, 5/95–40/60 (0–60 min)
A: 0.1 % HCOOH in CH_3CN; B: 0.1 % HCOOH in H_2O
Detection: UV 215 nm; Inj.vol.: 1 µL
Sample: 500 fmol BSA tryptic digest
Application No. 1071

Fig. 26 Comparison of trap column (BSA tryptic digest).

This trap column retains the target constituents firmly and its media has little irreversible adsorption of the target constituents. Therefore, the actual loss of target constituents is negligible (Fig. 26). In the range of 20–1000 ng for the insulin B chain, a linear relationship is obtained between the injection volume and the peak area (Fig. 27).



[Analytical conditions]
Trap column: ***L-column Micro*** (***L-column ODS***, 5 µm) 0.3×5 mm
Mobile phase: A/B, 5/95–40/60–90/10 (0–10–15 min)
A: 0.1 % HCOOH in CH_3CN; B: 0.1 % HCOOH in H_2O
Detection: UV 215 nm (6 nL cell); Inj.vol.: 1 µL; Sample: Insulin B chaine

Fig. 27 Load capability of trap column (insulin B chain).

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