

## Titania-coated Monolith Extraction Tip (MonoTip™ TiO<sub>2</sub>) for Purification of Phosphopeptides

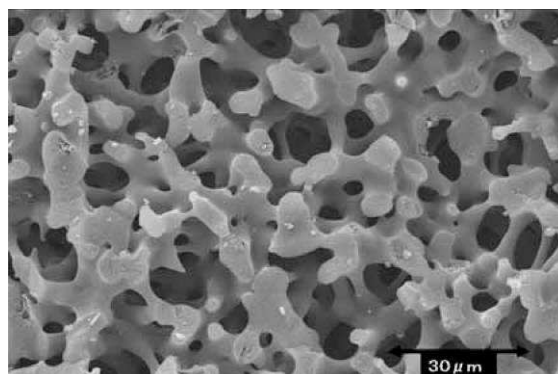
MonoTip TiO<sub>2</sub> is designed for the purification and enrichment of phosphopeptides prior to MALDI-MS and LC-MS analyses. Monoliths consist of double pore structures, having continuous through-pores (macropores) and skeletons which have mesopores. Monolith skeletons make a network structure, as shown below. The unique monolith structure leads to low pressure-drop and strong analyte-to-surface interactions.

It has been reported that HPLC columns packed with titanium dioxide (TiO<sub>2</sub>) particles can be successfully applied to the HPLC analysis of phospho-compounds (1-4).

We have developed a novel procedure utilizing titania-coated monolithic silica for the micropurification of phosphorylated peptides (5-6).

MonoTip TiO<sub>2</sub> enables selective capture of phosphopeptides from a comparatively large background of unmodified peptides.

MonoTip TiO<sub>2</sub> is a highly efficient and versatile tool for purifying phosphorylated peptides from proteolytic digests prior to mass spectral analysis. (7)



1. Pinkse MW, Uitto PM, Hilhorst MJ, Ooms B, Heck AJ, *Anal. Chem.* **2004**, *76*, 3935-43
2. Kuroda I, Shintani Y, Motokawa M, Abe S, Furuno M, *Ana. Sci.* **2004**, *20*, 1313-93
3. Kimura Y, Shibasaki S, Morisato K, Minakuchi H, Nakanishi K, Matsuo M, Amachi T, Ueda M, Ueda K, *Analytical Biochem.* **2004**, *326*, 262-266
4. Sekiguchi Y, Mitsuhashi N, Mimura T, *Plant Biotechnology* **2004**, *21*, 143-150
5. Miyazaki S, Miah MY, Morisato K, Kuroha T, Nakanishi K, *J. Sep. Sci.* **2005**, *28*, 39-44
6. Miyazaki S, Morisato K, Ishizuka N, Minakuchi H, Shintani Y, Furuno M, Nakanishi K, *J. Chromatogr. A.* **2004**, *1043*, 19-25
7. Miyazaki S, Morisato K, Suzuki K, Nakanishi K, Ueda M, *53<sup>rd</sup> ASMS*, **2005**

### Features of MonoTip™ TiO<sub>2</sub>

- Faster sample preparation
- Low sample loss
- High selectivity

### Specifications of MonoTip™ TiO<sub>2</sub>

Monolith	: Titania-coated High purity sol-gel silica gel
Specific surface area	: 200m <sup>2</sup> /g
Through-pore size	: 10-20mm
Meso-pore size	: 20nm
Tip volume	: 200μL
Sample capacity	: 15μg of Tyrosine Phosphopeptide

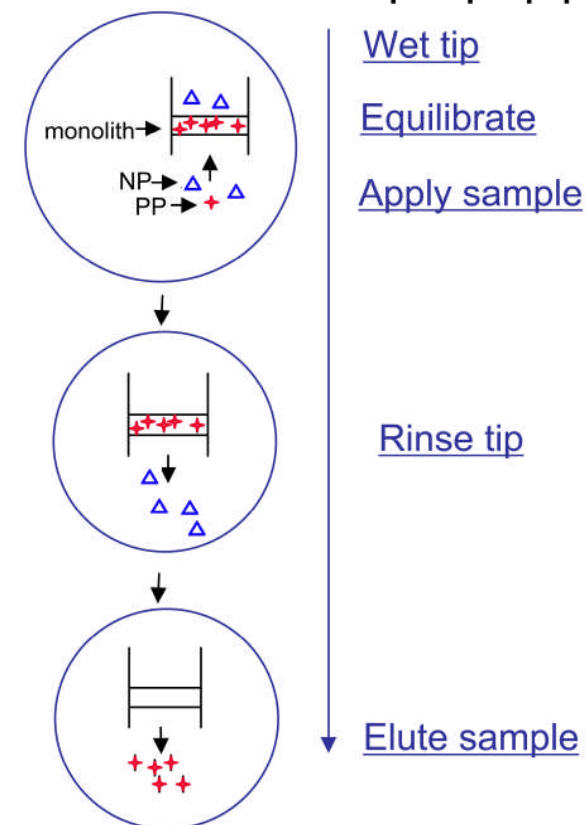


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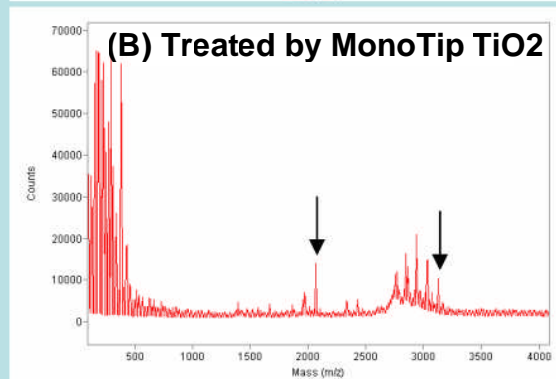
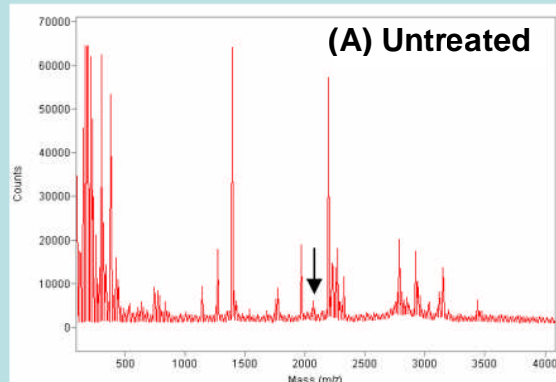
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## Scheme of Purification of phosphopeptides



NP: non-phosphopeptide ► ▲  
PP: phosphopeptide ► +



MALDI-TOF/MS spectra of tryptic digest of beta-casein  
Arrows indicate phosphopeptides (m/z:2061, 3122)

In addition to elution with phosphate buffer (pH 7.0), MonoTip TiO<sub>2</sub> can elute phosphopeptides with dilute base (0.5-5% ammonium). Base elution enables direct MS analysis without having to remove salt with RP microtips, thereby saving time and analyte.

Moreover, mild base conditions could be favourable for phosphopeptide analysis by ESI-MS in the negative ion mode. MonoTip TiO<sub>2</sub> offers advantages in terms of both selectivity and recovery, including base elution.

## Ordering Information

Description	Catalogue No.
MonoTip TiO <sub>2</sub> , 96/Box	5010-21005
MonoTip TiO <sub>2</sub> , 24/Box	5010-21007
MonoTip TiO <sub>2</sub> , 8/Box	5010-21006

“Based on monolithic technology, Merck KGaA, Darmstadt, Germany”

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