Removal of Endotoxin Using Amphiphilic Coreshell Nanosorbents

Nanotechnology

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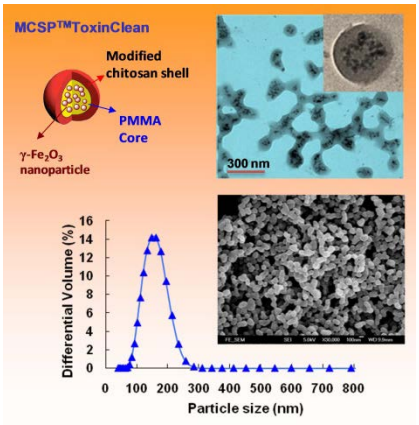
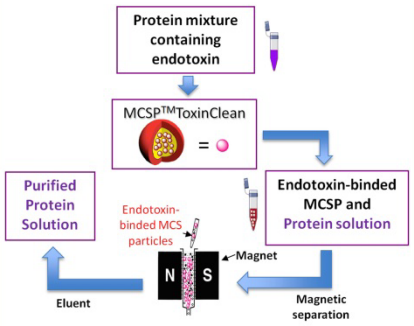
. MCSP™Toxin Clean – Highly Selective Endotoxin Removal .

The technology provides a fast and simple solution for selective removal of endotoxin from protein solutions in physiological buffers. It adopts a type of magnetic core-shell (MCS) composite particle, which can selectively bind endotoxin in protein mixtures and are easily removed by a magnetic separation. The endotoxin level of the treated protein solution is low enough (<10 EU/mL) to allow for further processing, analysis or even administration to mammals. The method has the following advantages:

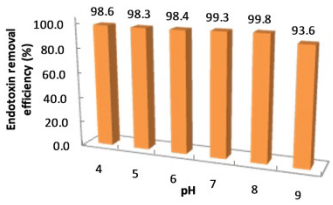
- High selectivity for endotoxin adsorption in both basic and acidic protein mixtures, e.g. bovine serum albumin
- Effective in broad working conditions (different pHs, electrolyte concentrations and buffer types)
- Simple process which does not require multiple extraction steps (unlike Triton X-114 extraction method)
- Low cost, avoiding the use of expensive reagent, e.g. polylysine
- Fast purification process without common problems such as filter blocking in microfiltration and time-consuming process when using porous adsorbents





Endotoxin Adsorption Capacity in Various Buffer and pH solutions

Buffer/reagent	pH range	Electrolyte concentration
Acetate buffer	4 – 5	10 mM
Sodium phosphate	6 – 8	10 mM
TRIS buffer	9 – 10	10 mM



Representative Publications

1. Lee, C.H., Ho, K.M., Harris, F.W., Cheng, S.Z.D., and Li, P. Formation of nanostructured materials using inexpensive hollow particles of amphiphilic graft copolymers as building blocks: 1. Insight into the mechanism of nanotube formation. *Soft matter* 5 (24) 4914-4921 (2009)
2. Ho, K.M., Mao, X., Gu, L., & Li, P. Facile Route to Enzyme Immobilization: Core-Shell Nanoenzyme Particles Consisting of Well-Defined Poly(methyl methacrylate) Cores and Cellulase Shells. *Langmuir* 24 (19), 11036-11042 (2008)
3. Ho, K.M., Mao, X., Gu, L., & Li, P. Design and Synthesis of Novel Magnetic Core-Shell Polymeric Particles. *Langmuir* 24 (5), 1801-1807 (2008)

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