

High Performance Magnetic Nanoparticles

FG beads[®]

The FG (Ferrite-glycidyl methacrylate) beads developed by Tokyo Institute of Technology consist of 200 nm-diameter ferrite nanoparticles coated firmly with a polymer layer.

The FG Beads are used as carriers for affinity purification of target proteins. ¹⁾

Features

▶ **Extremely low non-specific binding**

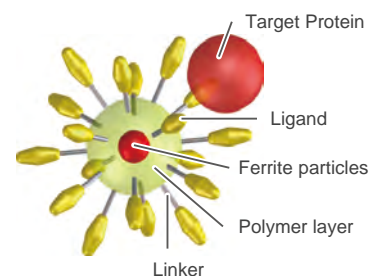
Poly-GMA (Glycidyl methacrylate) coated magnetic nanoparticles.

▶ **Excellent recovery of target proteins**

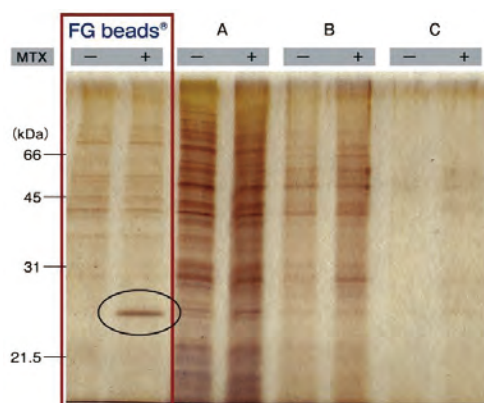
200 nm particles have a large surface area and a high dispersibility.

▶ **High stability in organic solvents**

Various compounds can be immobilized on the beads.



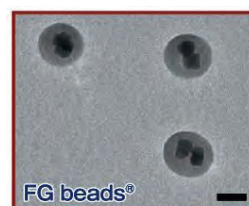
Comparison with other magnetic beads ²⁾



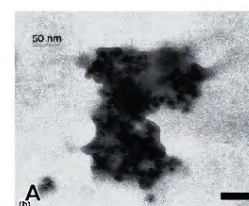
Affinity purification of MTX binding proteins

Affinity purification of MTX binding proteins. Immobilization of MTX on commercial magnetic beads was done in the same manner as in the case of FG beads.

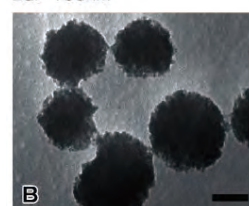
Electric microscope images



Bar=100nm



Bar=50nm



Bar=100nm



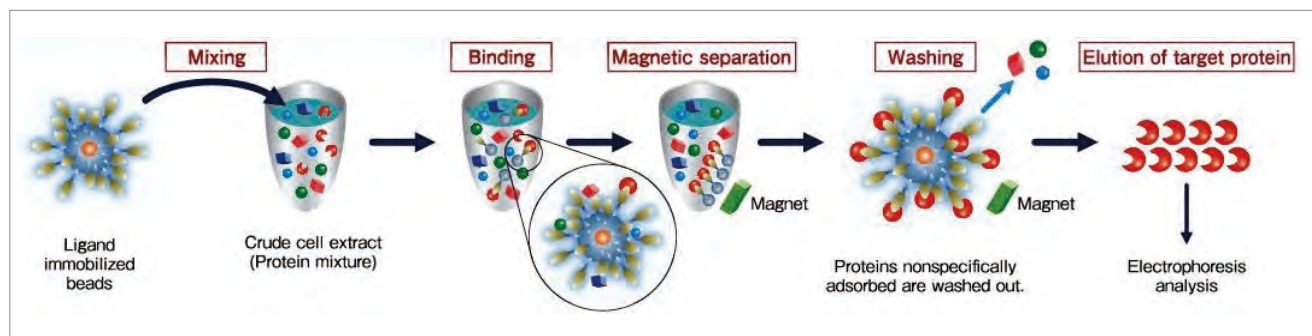
Bar=500nm

Linkers and Functional Groups

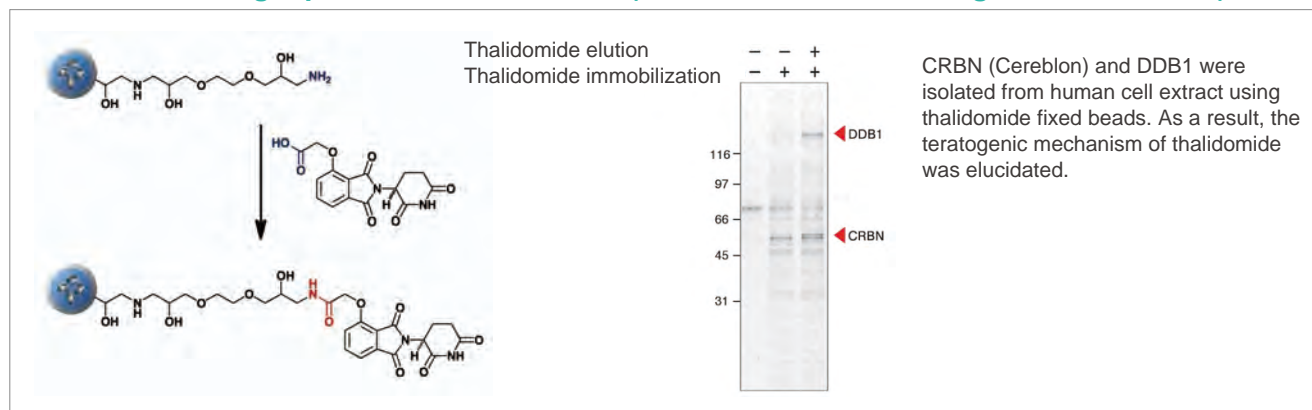
Linker and Function Group		Ligands to be fixed
Plain beads		R-NH ₂ (Amino group)
Linker beads (epoxy beads)		R-SH (Thiol group) R-OH (Hydroxy group)
NH ₂ beads		R-COOH (Carboxy group)
COOH beads		R-NH ₂ , R-NHR' (Amino group)
NHS beads		
Azide beads		Alkynes

Linker and Function Group		Ligands to be fixed
Streptavidin		Biotinylated compounds
NeutrAvidin™		Biotinylated compounds
Protein A		IgG
Protein G		IgG

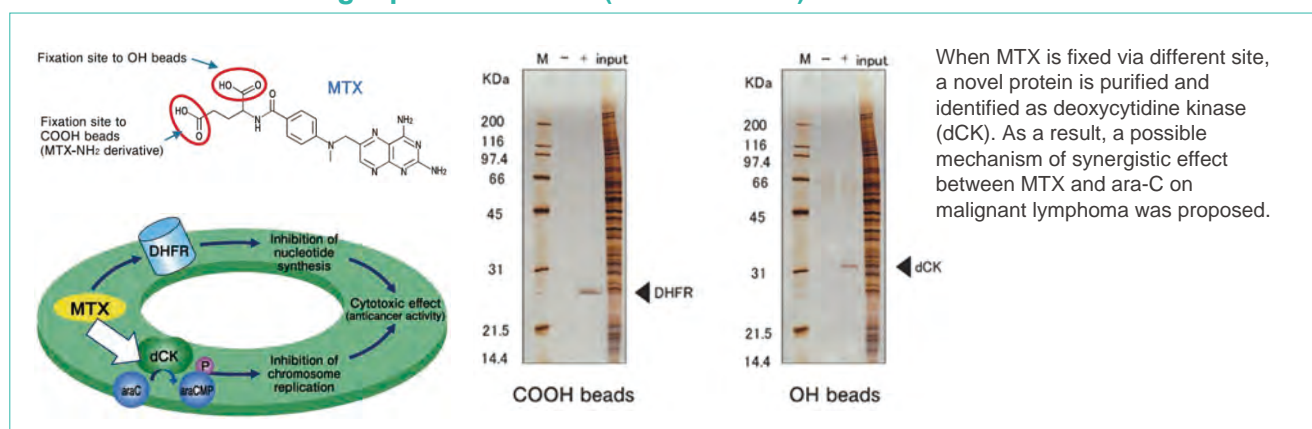
Purification process



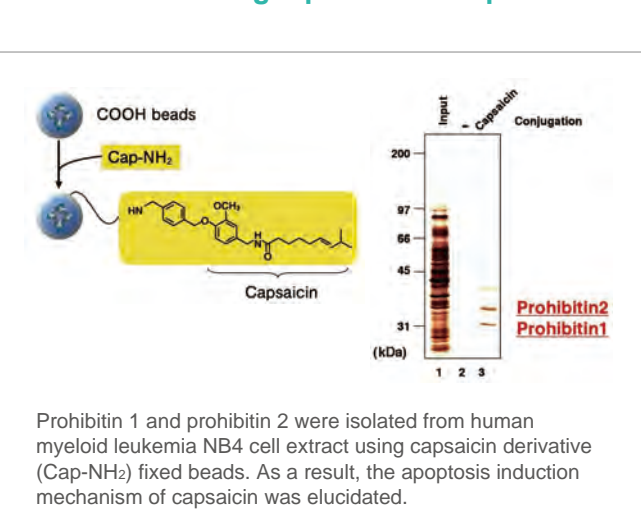
Purification of target protein of Thalidomide (elucidation of the teratogenic mechanism) ³⁾



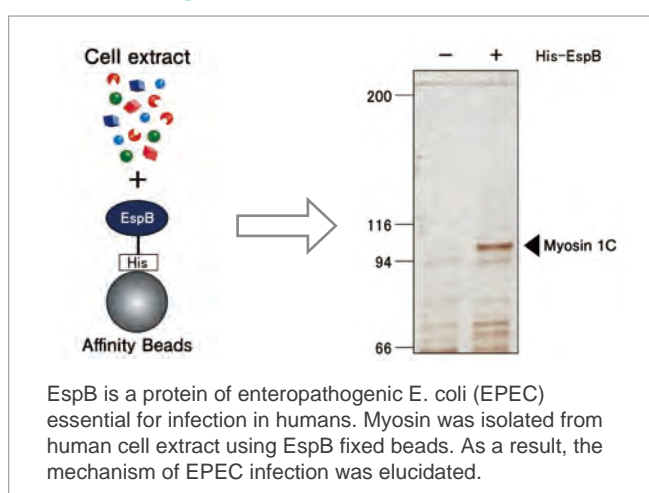
Purification of novel target protein of MTX (methotrexate) ⁴⁾



Purification of target protein of Capsaicin ⁵⁾



Elucidation of the mechanism of enteropathogenic E. coli infection ⁶⁾



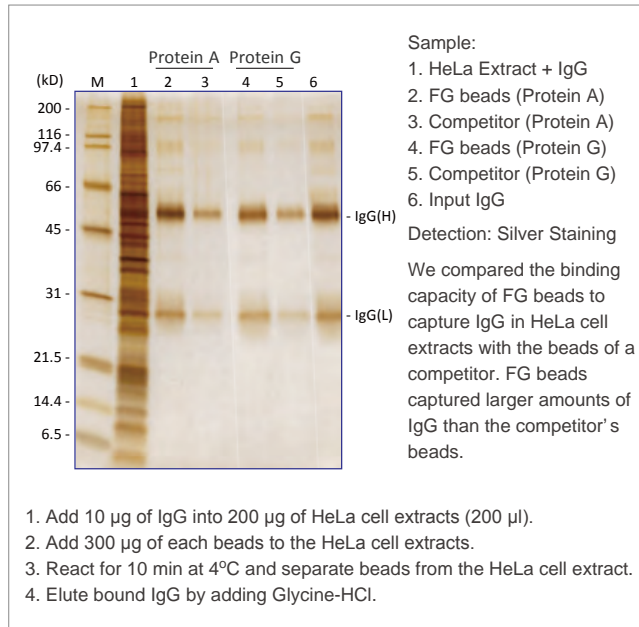
Protein A / Protein G beads

- **High recovery** *IgG binding capacity*
– more than twice the amount of a competitor.
- **High purity** *Extremely low non-specific adsorption.*
- **Quick processing** *30 minutes for IgG binding*

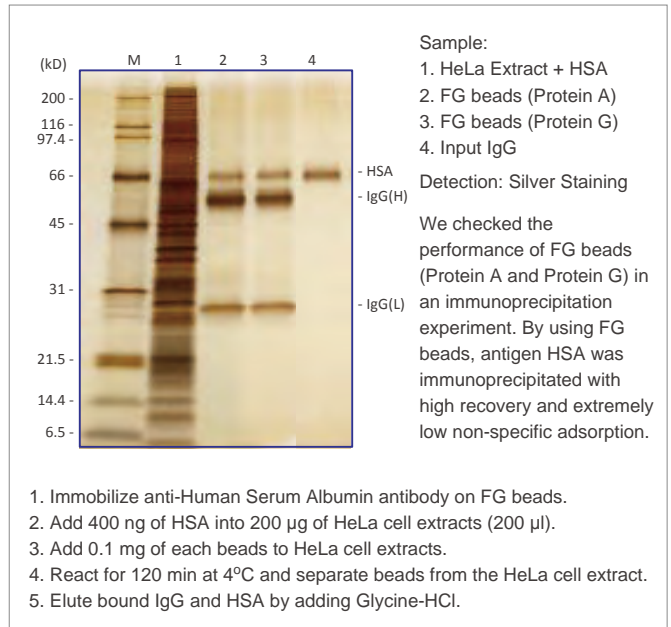
Applications

- IgG purification
- Immunoprecipitation (IP)
- Chromatin Immunoprecipitation (ChIP)
- Protein separation

IgG Purification



Immunoprecipitation



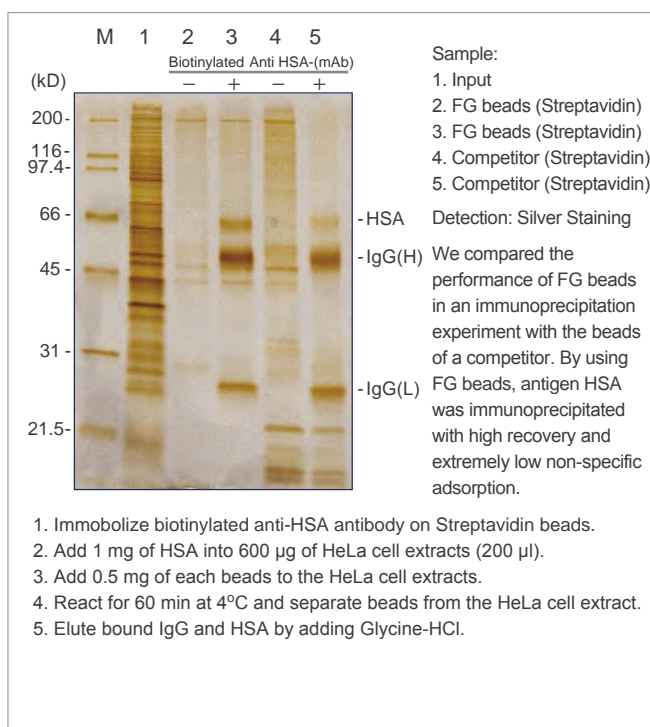
Streptavidin / NeutrAvidin beads

- **High recovery** *Biotin binding capacity*
– more than twice the amount of a competitor.
- **High purity** *Extremely low non-specific adsorption.*

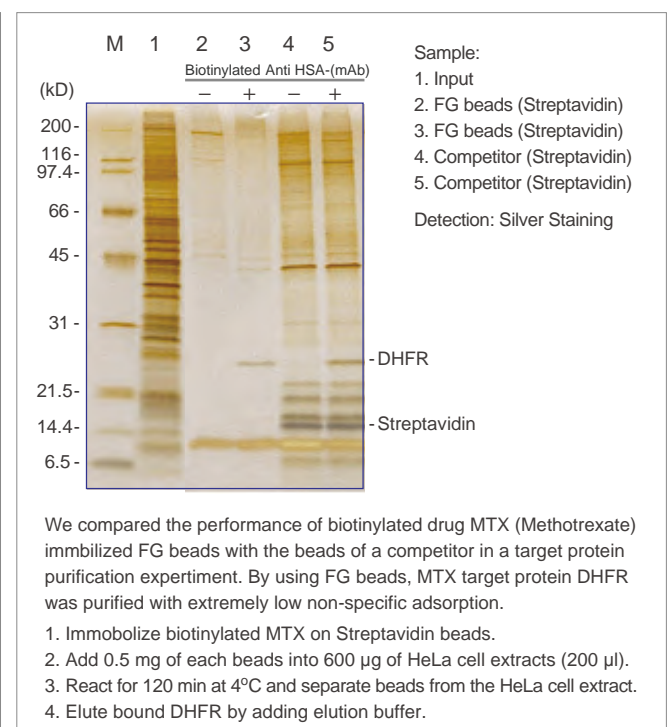
Applications

- Immunoprecipitation (IP)
- Chromatin Immunoprecipitation (ChIP)
- Cell separation
- Affinity purification of drug target proteins

Immunoprecipitation



Affinity purification of drug target protein



Magnetic Stand



TA4899 N12



TA4899 N30

- Quick cooling down

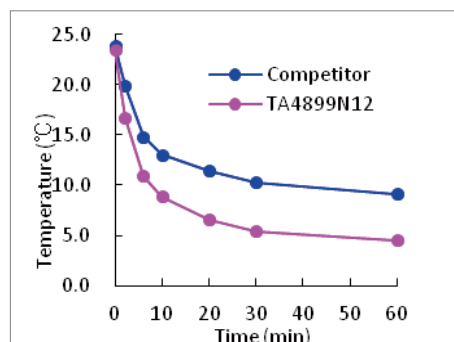
The magnetic stand made of metal can quickly cool down samples on ice. you can experiment without protein denaturation.

- High speed separation

The magnetic stand separates magnetic nanoparticles in shorter time than competitors because shape and placement of magnets are well designed.

Reference

- 1) S. Sakamoto et al., Chem. Rec. 9 (2009) 66
- 2) K. Nishio et al., Colloids Surfaces. B. 64 (2008) 162
- 3) T Ito et al., Science 327 (2010) 1345
- 4) H. Uga et al., Mol. Pharmacol. 70 (2006) 1832
- 5) C. Kuramori et al., Biochem. Biophys. Rec. Commun. 379 (2009) 519
- 6) Y. Iizumi et al., Cell Host & Microbe. 2 (2007) 383



Comparison of cooling speed of samples

Ordering Information

Product Name	Storage	Product No.	PKG Size
Plain beads	R	TAS8848N1010	10 mg
Linker beads (epoxy beads)	R	TAS8848N1110	5 mg
NH ₂ beads	R	TAS8848N1130	5 mg
COOH beads	R	TAS8848N1140	5 mg
NHS beads	F	TAS8848N1141	5 mg
Azide beads	R	TAS8848N1160	5 mg
Streptavidin beads	R	TAS8848N1170	5 mg
NeutrAvidin™ beads	R	TAS8848N1171	5 mg
Protein A beads	R	TAS8848N1172	5 mg
Protein G beads	R	TAS8848N1173	5 mg

Othres

Magnetic stand (for 1.5 ml tube)	RT	TA4899N12	1 ea
Magnetic stand (for 15 ml tube)	RT	TA4899N20	1 ea
Magnetic stand (for 50 ml tube)	RT	TA4899N30	1 ea
MTX derivatives	R	TAS8849N101	0.1 mg

(Storage) RT: Room Temperature R: Refrigerator F: Freezer
 NeutrAvidin™ is a trademark of Thermo Fisher Scientific, Inc. and its subsidiaries.



For research use only, not intended for diagnostic or drug use.

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