MagReSyn® Streptavidin MAX

Affinity binding/capture of biotinylated biomolecules

Ordering Information	
Cat. No.	**Quantity**
MR-STM002	2 ml
MR-STM005	5 ml
MR-STM010	2 x 5 ml

This product is for research use only

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1. Product Description

1.1. Overview

MagReSyn® Streptavidin MAX is a proprietary magnetic polymeric microparticle support that provides a simple and convenient method for the isolation or immobilization of biotinylated biomolecules, including proteins and nucleic acids. ReSyn microparticle technology is differentiated from conventional solid or cracked bead technologies in that it is a hyper-porous polymer network, which allows penetration and binding of biomolecules throughout the volume of the microparticle. This enables exceptional streptavidin binding capacity that in turn translates to high capacity for the binding of target biotinylated biomolecules. The product consists of recombinant streptavidin (55 kDa) covalently linked to magnetic microparticles. The high functional group density used for immobilization allows for maximum biomolecule loading, increased stability and reduced potential for streptavidin leaching. MagReSyn® Streptavidin MAX provides four-fold the capacity of MagReSyn® Streptavidin for biotinylated oligonucleotides and proteins. Applications for this product include the isolation of biotinylated nucleic acids and proteins, the isolation of DNA/RNA-binding proteins, cell isolation and immunoassays.

1.2. Advantages of MagReSyn® Technology

The exceptional biological binding capacity of MagReSyn® allows for miniaturization of experimental protocols by using reduced volumes of highly active functional microparticles and further minimizes the volume of reagents required, allowing recovery of valuable biologicals in reduced volumes. In addition, the compressibility of the microparticles reduces the interstitial spaces between the microparticles during washing and elution procedures, leading to increased efficiencies and recoveries. MagReSyn® microparticles are separated rapidly (<10 s) using a standard magnetic separator, in comparison to alternative microparticle technologies that may take up to 4 min to clear. The strong magnetic property of MagReSyn® further minimizes potentially costly loss of sample by preventing accidental discarding/aspiration of the microparticles, resulting in improved experimental reproducibility. The microparticles and recommended buffers are engineered to deliver target proteins of exceptional purity to meet your stringent R&D requirements.

MagReSyn® Technology Advantages	End-user Benefits
High specificity for biotinylated biomolecules	High purity of target proteins (≥97%) Minimizes additional isolation steps Low non-specific interactions
Exceptionally high biological binding capacity	Miniaturization of experimentation Reduced reagent volumes Increased sample concentration Improved recovery of valuable biologicals
Rapid magnetic separation	Reduced particle carry-over Improved experimental reproducibility Rapid protocols
Multipoint covalent attachment of Streptavidin	Improved streptavidin stability Reduced streptavidin leaching Possibility of working under non-standard denaturing conditions
Resistant to oxidation (rust)	Reduced sample contamination Longer shelf life

1.3. Product Information

Product Specifications	
Description	Iron oxide-containing magnetic polymer microparticles
Application	Isolation and purification of biotinylated biomolecules
Matrix	Proprietary polymer
Core	Iron (II, III) oxide (Magnetite)
Functional group	Recombinant streptavidin (55 kDa)
Binding capacity	≥12,000 pmoles.mg^{-1} biotinylated oligonucleotide (24 mer) ≥600 µg.mg^{-1} biotinylated IgG (protein dependent)
Particle Size	~5–10 µM
Formulation	1%: 10 mg.ml^{-1} in 80 mM Phosphate, pH 7.5, 150 mM NaCl, 1.5 mM EDTA, 0.05% Tween® 20, 0.02% sodium azide (NaN_3)
Stability	pH 3–10; 4–60°C
Storage	Store at 4–8°C until expiry date on label **DO NOT FREEZE**

1.4. Additional Equipment and Materials

Magnetic separator, Vortex mixer, Buffers and solutions

2. Binding and Elution Procedure

Factors that may affect the attachment of biotinylated biomolecules include buffer composition and pH, and the presence of contaminants/interfering compounds. Although both large and small molecules can be immobilized on the MagReSyn® Streptavidin MAX microparticles, the size of the biotinylated molecule may affect the overall binding capacity. The quantity of microparticles required may therefore require optimization for your application. Best results for downstream applications may be achieved with microparticles saturated with biotinylated molecules. The efficiency of biotinylated molecule binding can be determined by comparing the molecule concentration in solution before and after coupling reactions. MagReSyn® Streptavidin MAX is compatible with various commonly used buffers, including Tris, Phosphate and SSC (sodium saline citrate).

NOTE: All reagents should be freshly prepared and of analytical grade to ensure optimal performance. The procedures, methods and buffer solutions serve as an example and are not intended to be limiting. MagReSyn® Streptavidin MAX is compatible with a range of different buffers commonly used for capturing and/or immobilizing biotinylated molecules. Achievable purity and yield are ligand dependent and experimental conditions should be optimized to ensure desired results.

2.1. MagReSyn® Streptavidin MAX Equilibration

MagReSyn® Streptavidin MAX is supplied as a 10 mg.ml^{-1} suspension (80 mM Phosphate, pH 7.5, 150 mM NaCl, 1.5 mM EDTA, 0.05% Tween® 20, 0.02% sodium azide (NaN_3)). The shipping solution needs to be removed and the microparticles equilibrated in binding buffer (e.g. 80 mM sodium phosphate, pH 7.4–8.0, 150 mM NaCl, 0.05% Tween® 20) before use. Equilibrate aliquots of MagReSyn® Streptavidin MAX for your requirements as outlined below. A minimum volume of 10 µl microparticle suspension is required per reaction to ensure a suitable pellet size for aspiration of buffers.

1) Resuspend MagReSyn® Streptavidin MAX thoroughly by vortex mixing or inversion to ensure a homogenous suspension.
2) Transfer at least 10 µl MagReSyn® Streptavidin MAX to a new tube.
3) Place the tube on the magnetic separator and allow the microparticles to clear.
4) Remove the shipping solution by aspiration with a pipette.
5) Wash/equilibrate the microparticles in 200 µl binding buffer.
6) Place the tube on the magnetic separator and allow the microparticles to clear.
7) Remove the binding buffer by aspiration with a pipette and repeat steps 5 and 6 twice for a total of three washes.
8) After removal of the binding buffer from step 5, MagReSyn® Streptavidin MAX is ready for binding of your biotinylated molecules.

2.2. Immobilization of Biotinylated Oligonucleotide

1) Calculate the amount of MagReSyn® Streptavidin MAX microparticles required for your application and transfer to a clean tube.
2) For example, 10 µl MagReSyn® Streptavidin MAX microparticles (100 µg) is sufficient to bind ≥1,200 pmol biotinylated oligonucleotide (24 mer).
3) Add the biotinylated oligonucleotide to the equilibrated MagReSyn® Streptavidin MAX from **2.1**. Adjust the total reaction volume to at least 100 µl with binding buffer and mix thoroughly by continuously agitating the tube.
4) Allow the biotinylated oligonucleotide to bind to the microparticles for 15–30 min at room temperature.
5) Place the tube on the magnetic separator and allow the microparticles to clear.
6) Aspirate the coupling supernatant with a pipette. The supernatant can either be discarded or used to quantify by difference the concentration of biotinylated oligonucleotide attached to the microparticles.
7) Remove any unbound oligonucleotide from the microparticles by washing the microparticles with 3 x 200 µl binding buffer each.
8) Following each wash, place the tube on the magnetic separator and allow the microparticles to clear.
9) Remove the supernatant with a pipette.
10) The supernatants from the wash steps can either be discarded or pooled with the coupling supernatant for the purpose of quantification.

2.3. Immobilization of Biotinylated Protein

1) Calculate the amount of MagReSyn® Streptavidin MAX microparticles required to immobilize your protein of interest. For example, 10 µl MagReSyn® Streptavidin MAX microparticles (100 µg) is sufficient to bind approximately ≥60-120 µg Biotinylated IgG (protein dependent).
2) Add the biotinylated protein to the equilibrated MagReSyn® Streptavidin MAX from **2.1**. Adjust the total reaction volume to at least 100 µl with binding buffer and mix thoroughly by continuously agitating the tube.
3) Allow the biotinylated protein to bind to the microparticles for at least 1 hr. ***NOTE: For high protein quantities, it is recommended to increase the binding time to 16-24 hr to ensure sufficient microparticle-protein interaction***.
4) Place the tube on the magnetic separator and allow the microparticles to clear.
5) Remove the coupling supernatant with a pipette. The supernatant can either be discarded or used to quantify the concentration of biotinylated protein attached to the microparticles by difference.
6) Remove any unbound protein from the microparticles by washing with 3 x 200 µl binding buffer.
7) Following each wash, place the tube on the magnetic separator and allow the microparticles to clear.
8) Aspirate the supernatant with a pipette.
9) The supernatants from the wash steps can either be discarded or pooled together with the coupling supernatant for quantification.

3. Recommended Storage

MagReSyn® Streptavidin MAX is supplied as a 10 $mg.ml^{-1}$ suspension of microparticles in 80 mM Phosphate, pH 7.5, 150 mM NaCl, 1.5 mM EDTA, 0.05% Tween® 20, 0.02% sodium azide (NaN_3) and should be stored at 2–8°C. **DO NOT FREEZE**. Improper storage, drying of microparticles, bacterial contamination, or centrifugal recovery may result in irreversible loss of capacity. Resuspend well by vortex mixing before use.

4. Reagent Compatibility

MagReSyn® Streptavidin MAX is compatible with samples containing the following buffering components:

Reagent	Concentration
Tween® 20	≤1%
Tris, Saline Sodium Citrate (SSC), Sodium phosphate	≤100 mM
NaCl	≤2 M

5. General Information & Disclaimers

Contact us at info@resynbio.com for larger microparticle quantities or customized microparticle solutions for your application. Visit our website (***www.resynbio.com***) for more information on the ReSyn technology platform and other available products. This product is for research purposes only. The product contains 20% ethanol as a preservative. The product is meant for single use only and not recommended for reuse. When working with laboratory reagents, always wear suitable personal protective equipment including a lab coat, disposable gloves, and safety glasses. For further safety information please consult our Material Safety Data Sheet (**MSDS**), which is available for download at www.resynbio.com. Storage solutions, chemical reagents, buffers and biologicals should be suitably disposed of with adherence to your local waste-disposal legislation. MagReSyn® is a registered trademark of ReSyn Biosciences (Pty) Ltd, South Africa. ReSyn Biosciences (Pty) Ltd, distributors, agents or representatives, will not be held responsible for patent violations or infringements occurring as a result of using our products. In no event shall ReSyn Biosciences (Pty) Ltd be liable for any direct, indirect, punitive, incidental or consequential damage to property or life, whatsoever arising out of or connected with the use or misuse of its products. Please consult our website for further general disclaimers.

6. Troubleshooting Guide

Identified Problem	Possible Cause	Suggested Remedy
Biotinylated biomolecules do not bind to the microparticles as expected	Incorrect binding pH	Increase pH of binding buffer to pH 7.5–8.0
	Insufficient reaction time	Incubate biotinylated molecules with the microparticles for at least 1 hr. For higher protein quantities, increase the binding time to 16-24 hr to improve protein-microparticle interaction
	Interfering compounds in sample prevent binding	Desalt or dialyze sample into recommended binding buffer to remove media components or other contaminants
	Insufficient microparticle quantity	Increase amount of MagReSyn® Streptavidin MAX microparticles
	Biomolecule content too low	Increase protein or oligonucleotide content by sample concentration or by preparing more starting material
	Inefficient biotinylation of target molecule	Refer to the troubleshooting guide of the supplier of your biotin-labelling kit or revisit the literature
Non-specific binding of non-biotinylated molecules to the microparticles	Non-specificity due to ionic or electrostatic forces	Increase NaCl concentration in binding/wash buffers. Increase the concentration of Tween® 20 in binding/wash buffers. Increase quantity of biotinylated molecule-containing sample.
	Insufficient washing	Increase number or volume of wash steps. Carefully aspirate excess remaining wash buffer from the microparticles to avoid carry-over.

Please contact us via e-mail at info@resynbio.com should your specific problem not be addressed in our troubleshooting guide.