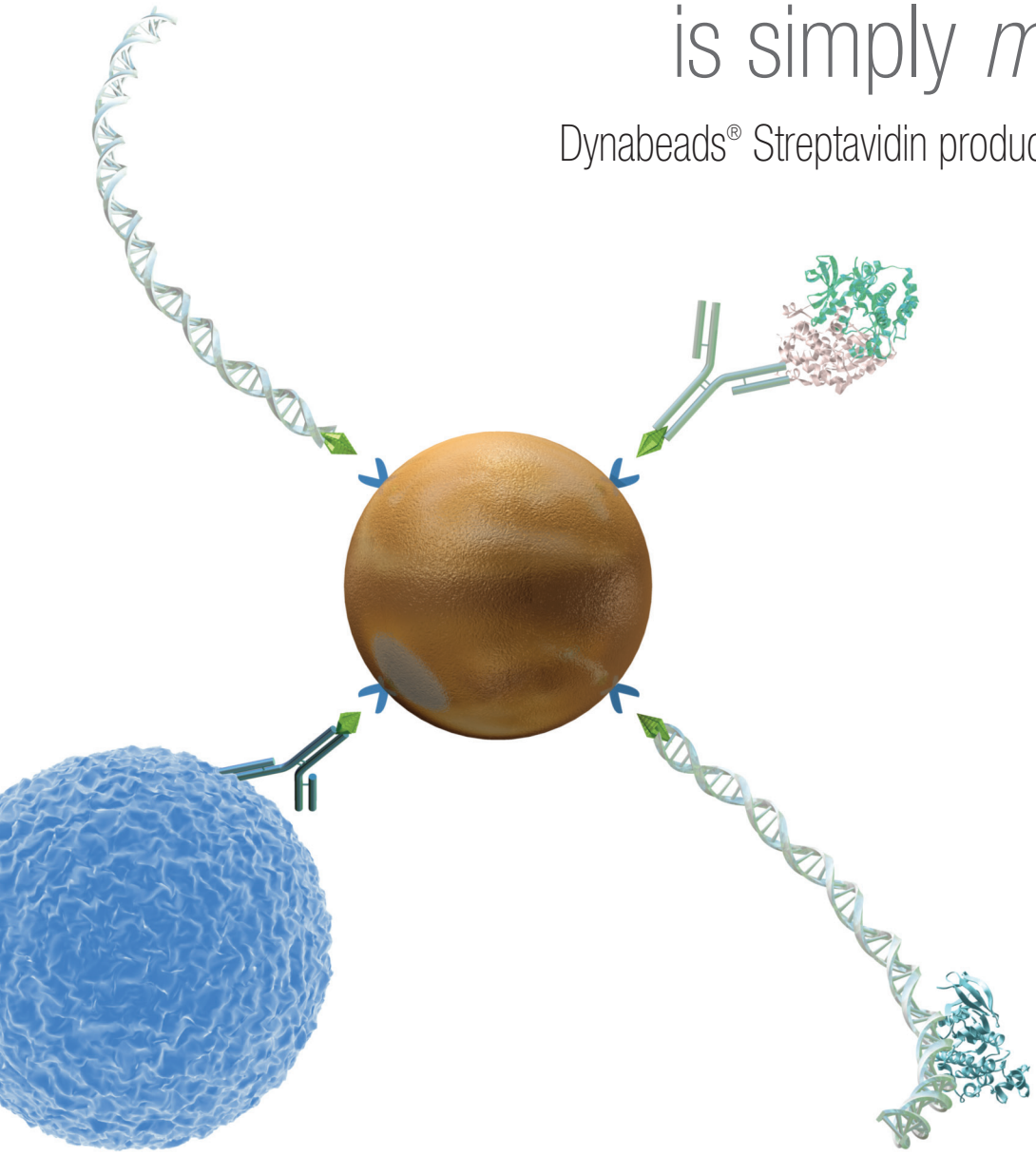
The attraction is simply *magnetisk*

Dynabeads® Streptavidin products and applications



DYNAL®

invitrogen™
by life technologies™

Instant capture of any biotinylated molecule

The gold standard for magnetic separations

- → No centrifugation, precipitation, or columns
- → In-solution reaction with rapid kinetics
- → Excellent mechanical and chemical stability
- → Remove variability and increase consistency

Dynabeads® Streptavidin is the gold standard for capturing, isolating, and handling biotinylated molecules. Invented in Norway and used in laboratories worldwide for more than twenty years, these groundbreaking magnetic beads are irresistibly attractive for a wide variety of applications.

The *magnetisk* quest of Dynabeads®

Magnetisk is the Norwegian word for magnetic, the property that makes Dynabeads® so attractive for a wide range of research interests, including proteomics, nucleic acid isolation, cell separation and expansion, and IVD assay development. This rapid and flexible technology makes even complicated protocols simple.

Pioneered in the 1980s by Dynal Biotech, now part of Life Technologies, Dynabeads® are based on technology developed by the late John Ugelstad, a professor of chemistry at the University of Trondheim, Norway. Ugelstad succeeded in making spherical polystyrene beads of exactly uniform size, a feat previously achieved only by NASA in the weightless conditions of space. When the uniform beads were made magnetizable, this revolutionized separation methodologies and enabled researchers to get results once considered unattainable. Today, Dynabeads® have become the first choice among researchers for magnetic separation technology, and are used in academic and industry laboratories worldwide. They're employed on more than 25,000 IVD instruments. Some 10,000 scientific articles have been published that involve their use.

The monosized Dynabeads® provide a consistent and defined surface for the adsorption or coupling of various bioreactive molecules. Their superparamagnetism means they exhibit magnetic properties only in a magnetic field, with no residual magnetism once the field is removed. When added to a sample, Dynabeads® bind to the desired target—cells, nucleic acids, proteins, or other biomolecules. When placed in a magnetic field, bound material is rapidly and efficiently separated from the rest of the sample.

Try Dynabeads® for your next research application challenge. To learn more, please visit us at www.invitrogen.com/dynabeads.

Easy handling

Magnetic separation is surprisingly easy. No tedious centrifugation, precipitation, filtration, or columns. Magnetic handling enables easy washing, separation, and concentration of your target. Excellent dispersion abilities and the lack of magnetic remanence make Dynabeads® ideal for manual as well as automated protocols, including microfluidic systems. Depending on your specific application and target molecule, a direct or indirect capture method is applied (Figure 1).

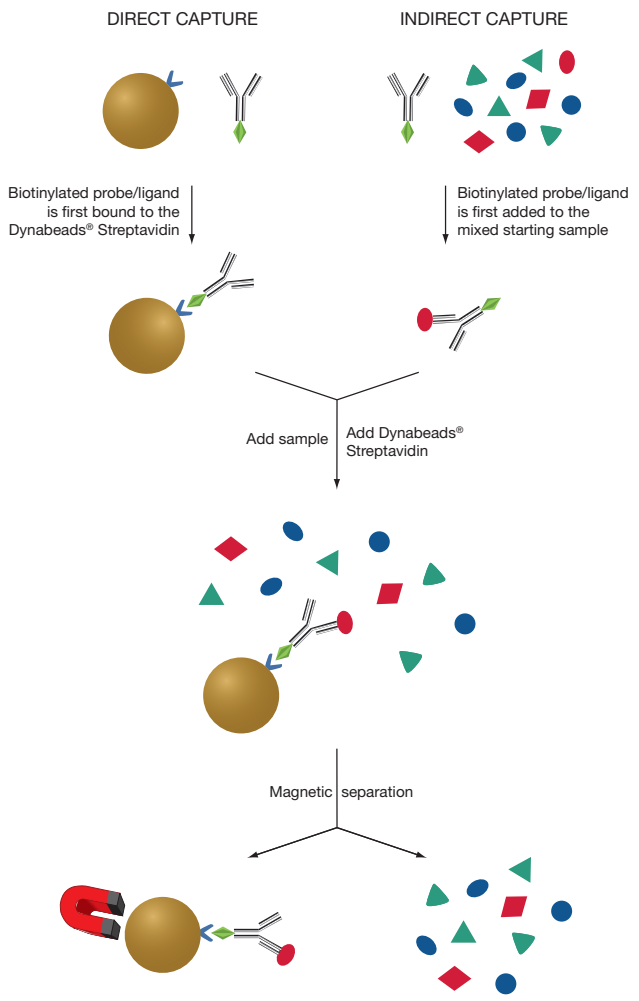


Figure 1. Direct and indirect approach for magnetic separation. In direct capture, the target-specific ligand is bound to the Dynabeads® and then added to the sample. For some applications, this enables reuse of the beads, thereby reducing costs. In indirect capture, the ligand is first allowed to bind to the target, prior to addition of Dynabeads®. This can be beneficial when the concentration of the target is low, the specific affinity is weak, or the binding kinetics are slow.

Fast and flexible

Dynabeads® Strepavidin enables instant and efficient capture of biotinylated molecules via rapid liquid-phase kinetics. This increases speed and sensitivity compared to filters and plate-based approaches (Figure 2). Dynabeads® are truly spherical and have a large surface area per volume. This ensures a high and constant binding capacity. Figure 3 highlights some selected application examples.

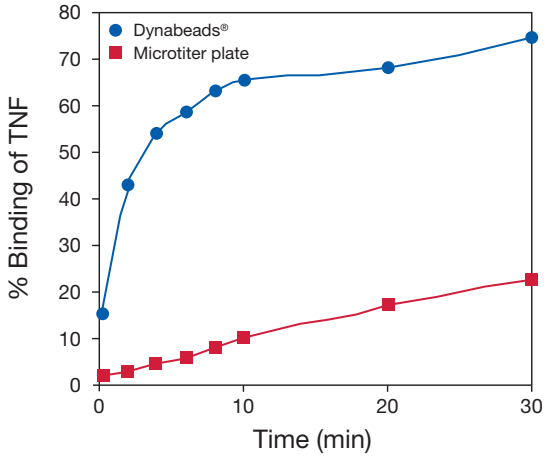
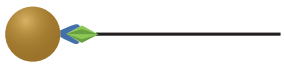


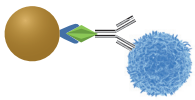
Figure 2. Dynabeads® binding kinetics are superior to traditional microtiter plates. The graph shows % binding of tumor necrosis factor (TNF) to immobilized antibody as a function of time. Courtesy of Dr. N-B Liabakk, University of Trondheim, Norway.

Sequence-specific capture
- → Low-abundance cDNA from libraries
- → Mutated sequences[5]
- → RNA/DNA infectious agents[1]
- → Microsatellite enrichment[12]

Immobilized DNA/cDNA
- → DNA-/RNA-binding protein isolation[19]
- → Solid-phase DNase footprinting[7]
- → Solid-phase S1 nuclease mapping[6]
- → Subtractive hybridization[8]
- → Differential display[13]
- → Limes[8]
- → 5'RACE[14]
- → SAGE®[15]
- → TOGA[16]
- → RAGE[17]

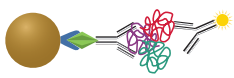


Single-stranded template
- → Solid-phase sequencing
- → Pyrosequencing®[6]
- → MALDI-MS®[3]
- → Probe generation[9]
- → Allele-specific extension[5]
- → *In vitro* mutagenesis



Specific cell isolation
- → Cell culture[29]
- → Flow cytometry
- → Cell–cell interactions
- → Chemokine and immunological assays[27]
- → Bacterial pathogen detection[30]
- → Molecular analyses[28]

Protein purification
- → Intact protein complexes
- → Active enzymes[36]
- → Immunoprecipitation[22]
- → Protein interaction studies
- → Protein depletion
- → SDS-PAGE
- → MALDI-TOF[19]



Immunoassays
- → Competitive[34]/noncompetitive[23]
- → Homogeneous[33]/heterogeneous[24]
- → Sandwich assays[2]

Biopanning
- → Phage display[34,36]
- → Cell-based screening[35]
- → SELEX®[32]
- → Affibody® selection[31]
- → Drug screening[23]

Figure 3. Selected applications using Dynabeads® Streptavidin.

Robust and gentle

Dynabeads® Streptavidin features excellent mechanical and chemical stability. No iron leakage. No inhibition of enzyme activity. The monolayer of recombinant streptavidin ensures that the vast majority of biotin-binding sites are left sterically available for binding.

The technology is also extremely gentle, allowing isolation of proteins as well as large or unstable complexes. The native state of proteins is preserved, and fragile cells remain viable. Flexible volumes may be used, enabling isolation of low-abundance molecules. A high signal-to-noise ratio also contributes to increased sensitivity.

Absolute reproducibility

All Dynabeads® are produced with full control of parameters such as bead size, surface area, iron content, and magnetic mobility. The absence of excess physically-adsorbed streptavidin ensures negligible leakage, and secures a minimal batch-to-batch variation. The uniform characteristics and unique reproducibility within (CV <3%) and between batches reduce costs associated with quality control testing (Figure 4). Whether for your research project or IVD testing activities, you can rely on the consistent performance of Dynabeads®.

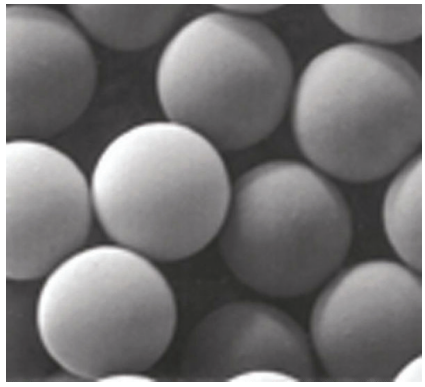


Figure 4. Monosized superparamagnetic Dynabeads®. Each bead has an even dispersion of magnetic material, encased within a thin polymer shell. This provides a specific and defined surface for binding your ligand. The true uniformity of all beads within each batch (typical CV <3%) provides consistent physical and chemical properties. Unique batch-to-batch reproducibility (typical CV <5%) secures reproducibility and quality of results.

Choose your favorite

Four different types of Dynabeads® Strepavidin are available (Table 1). Your choice should be guided by your sample and target properties, buffers and solutions applied, and specific downstream application needs.

Dynabeads® M-280 Streptavidin and Dynabeads® MyOne™ Streptavidin T1 are commonly used for protein and nucleic acid applications. Dynabeads® M-270 Streptavidin and Dynabeads® MyOne™ Streptavidin C1 are preferred for nucleic acid protocols involving high chaotropic salt concentrations, for immunoassays involving small biotinylated antigens, and applications incompatible with BSA. The smaller MyOne™ beads offer increased binding capacity and slower sedimentation rate, making them ideal for automated applications.

Table 1. An overview of the different Dynabeads® Streptavidin, and their qualities based on selected applications.

Product	Binding capacities	Characteristics and properties	Ideal for
Dynabeads® M-280 Streptavidin	Free biotin: 650–900 pmol/mg beads Biotinylated Ig: Up to 10 µg/mg beads	• Hydrophobic bead surface • Based on tosylactivated beads • Diameter: 2.8 µm • Size distribution: CV <3% • BSA as blocking protein • Isoelectric point: pH 5.0 • Low charge (–10 mV (at pH 7)) • Iron content (ferrites): 12% (17%)	• Immunoassays • Purification of DNA-/RNA-binding proteins • Protein purification • Phage display • Biopanning • Cell isolation
Dynabeads® MyOne™ Streptavidin T1	Free biotin: 1,100–1,700 pmol/mg beads Biotinylated Ig: Up to 20 µg/mg beads	• Hydrophobic bead surface • Based on tosylactivated beads • Diameter: 1.05 µm • Size distribution: CV <3% • BSA as blocking protein • Isoelectric point: pH 5.0 • Low charge (–10 mV (at pH 7)) • Iron content (ferrites): 26% (37%) • Low sedimentation rate and faster reaction kinetics compared to M-280/M-270 beads	• Immunoassays • Purification of DNA-/RNA-binding proteins • Protein purification • Phage display • Biopanning • Cell isolation • Well suited for automated applications
Dynabeads® M-270 Streptavidin	Free biotin: ≥950 pmol/mg beads Biotinylated Ig: Up to 10 µg/mg beads	• Hydrophilic bead surface • Based on carboxylic acid beads • Diameter: 2.8 µm • Size distribution: CV <3% • No blocking proteins used • Isoelectric point: pH 4.5 • High charge (–50 mV (at pH 7)) • Iron content (ferrites): 14% (20%) • Low aggregation of beads in high-salt solutions	• Sequence-specific DNA/RNA capture in nucleic acid research • Protocols that require GTC lysis or high salt concentrations • Preparation of single-stranded DNA • Immunoassays with hydrophobic targets
Dynabeads® MyOne™ Streptavidin C1	Free biotin: ≥2,500 pmol/mg beads Biotinylated Ig: Up to 20 µg/mg beads	• Hydrophilic bead surface • Based on carboxylic acid beads • Diameter: 1.05 µm • Size distribution: CV <3% • No blocking proteins used • Tween 20 in the buffer • Isoelectric point: pH 5.2 • Medium charge (–35 mV (at pH 7)) • Iron content (ferrites): 26% (37%) • Low sedimentation rate and faster reaction kinetics compared to M-280/M-270 beads • Low aggregation	• Sequence-specific DNA/RNA capture in nucleic acid research • Preparation of single-stranded DNA • High-throughput nucleic acid clean-up protocols • Sample preparation of proteins for mass spectrometry • Well suited for automated applications

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Ordering information

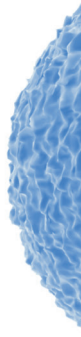
Products	Quantity	Cat. No.
Dynabeads® M-280 Streptavidin 2.8 µm magnetic beads with covalently coupled recombinant Streptavidin and a hydrophobic surface	2 mL 10 mL 100 mL	112-05D 112-06D 602-10
Dynabeads® MyOne™ Streptavidin T1 1 µm magnetic beads with covalently coupled recombinant Streptavidin and a hydrophobic surface	2 mL 10 mL 100 mL	656-01 656-02 656-03
Dynabeads® M-270 Streptavidin 2.8 µm magnetic beads with covalently coupled recombinant Streptavidin and a hydrophilic surface	2 mL 10 mL	653-05 653-06
Dynabeads® MyOne™ Streptavidin C1 1 µm magnetic beads with covalently coupled recombinant Streptavidin and a hydrophilic surface	2 mL 10 mL	650-01 650-02
Dynabeads® Streptavidin Trial Kit Contains 1 mL each of the four bead-types listed above	4 x 1 mL	658-01D
Dynal® kilobaseBINDER™ Kit Contains 1 mL Dynabeads® M-280 Streptavidin, Binding and Washing Solution sufficient for 200 isolations	1 kit	601-01
Dynabeads® Biotin Binder For cell isolation or depletion, using your own biotinylated antibody	5 mL	110-47
CELLection™ Biotin Binder Kit— For positive cell isolation and detachment, using your own biotinylated antibody	5 mL	115-33D

Related products	Quantity	Cat. No.
DynaMag™ magnets	See www.invitrogen.com/magnets for magnet recommendations	
HulaMixer™ Sample Mixer	Holds 0.5 mL–50 mL tubes	159-20D

Learn more and order your Dynabeads® Streptavidin today at www.invitrogen.com/dynabeads.

MAKE THE MOST OF EVERY CELL

DYNAL® has pioneered magnetic separation technologies for biological discovery that are both simple and highly reproducible. Based on their patented superparamagnetic, monodisperse beads, Dynabeads® technologies represent a superior paradigm for cell and biomolecule separation in a wide range of basic and clinical research applications, diagnostic assays, and therapeutic protocols.



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