PARTICLES

VARIAN, INC.

LodeStars™

BIOMAGNETIC SEPARATION TECHNOLOGY

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VARIAN

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Biomagnetic Separation Technology

LodeStars™ Beads

Biomagnetic separation today is a mainstream technology in bioscience and life science research. With so many new and demanding applications, it is vital that research scientists, product developers, manufacturers and healthcare professionals have access to top quality paramagnetic particle products which they can rely on for performance and consistency.

Varian's LodeStars beads are high performance, superparamagnetic particles with excellent physical and chemical characteristics designed for biomagnetic separations. Based on patented technology and experience, the beads are a powerful magnetic platform for bioscience and life science applications.

The beads are polymer microparticles with a microcrystalline ferric oxide component uniformly dispersed throughout the bead. This provides the beads with their superparamagnetic properties, causing them to move rapidly in an applied magnetic field. Also, because no permanent magnetism is induced, the beads fully disperse once the field is removed.

The beads are coated in a polymer shell which provides two key properties, firstly the iron is protected inside the bead and secondly it ensures that the iron cannot interfere with biological reagents. In addition, the polymer coating provides chemical groups for covalent attachment of biological molecules, eg, antibodies for immunocapture.

LodeStars beads are used as a solid phase in manual and automated bioassay, and to isolate and manipulate targets in biological samples, eg, cells, proteins and other molecules.

Key Benefits:

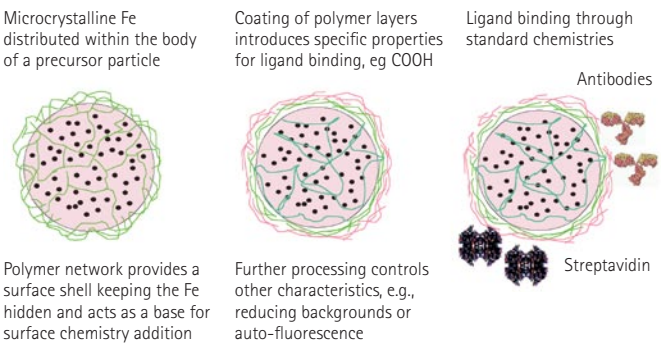
- Highly selective ligand capture due to controlled surface functionality
- Excellent assay performance due to low backgrounds
- Improved productivity due to speed of response
- Reduced costs due to ease of use and efficiency
- Peace of mind due to controlled batch-to-batch reproducibility

Principle of Operation

LodeStars beads, coupled with the chosen biomolecule, are allowed to bind and form a complex with the target. For example, LodeStars 2.7 Streptavidin beads will bind a biotinylated ligand. After a short reaction time, a magnetic field is applied with a PL-MCS Magnetic Capture Stand, and the LodeStars beads recovered from the sample solution. The separation is fast, efficient and gentle. It requires no columns or centrifugation. Washing and handling using magnetic particles lends itself to automated processing that is quick and highly reproducible.

The beads' polymer surface is highly controlled to provide ultra-low non-specific binding of unwanted sample components and to reduce non-covalent biomolecule attachment that might cause loss of biomolecules from the surface in storage or during a procedure. LodeStars beads are highly resistant to mechanical stress and reducing conditions, and stable over a wide pH range.

Based on Varian's patented technology, LodeStars products have applications across numerous areas of bioscience and life science research, diagnostics and therapeutics, as well as the development of new products in molecular medicine.



Superior Performance

Binding Capacity Comparisons

Table 1. LodeStars 2.7 Streptavidin beads compared with an alternative 2.7 µm Streptavidin product.

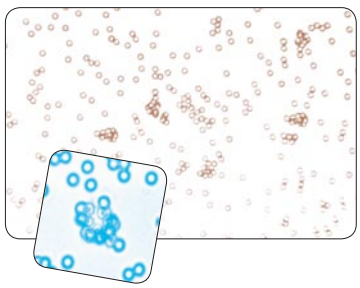
	Biotin binding capacity (Oregon Green® 488 -desthiobiocytin conjugate)	Biotinylated antibody binding capacity (Biotinylated IgG goat anti-fluorescein)
LodeStars 2.7 Streptavidin	>900 pmole/mg	6.3 µg/mg
Alternative 2.7 µm Streptavidin particle	>800 pmole/mg	3.0 µg/mg

In each case, LodeStars 2.7 Streptavidin beads showed improved performance

Table 2. LodeStars 2.7 Carboxyl beads compared with an alternative 2.7 µm Carboxyl product.

	Affinity-purified polyclona goat anti-mouse IgG (Fc)	Immunocapture of mouse IgG	Performance efficiency µg mouse IgG/µg goat anti-mouse IgG
LodeStars 2.7 Carboxyl	9 µg/mg	4.0 µg/mg	0.44
Alternative 2.7 µm Carboxyl particle	11 µg/mg	2.8 µg/mg	0.25

In these experiments, LodeStars 2.7 Carboxyl beads consumed less goat-anti mouse first antibody and captured significantly more mouse IgG than another vendor's 2.7 µm Carboxyl particle. The LodeStars beads' surface allows high functional availability of bound ligand leading to better all round performance metrics.



Cell Isolation - Human CD8+ suppressor/cytotoxic T lymphocytes isolated with LodeStars™ Streptavidin coated with biotinylated monoclonal mouse anti-human CD8 α-chain.

Manufacturing Capabilities

Varian is one of the world's largest producers of particles for bioseparations. We are ISO 9001:2000 accredited, with over 30 years' experience in bead manufacture and applications development. Varian's technologies are widely used in chromatography, life science and pharmaceutical chemistries. We manufacture reliable products for bead-based assays, resins for combichem, chromatography media and supports for peptide and oligonucleotide synthesis according to patented processes owned by, or licensed to, Varian. LodeStars beads are manufactured under stringent controls to ensure batch-to-batch reproducibility of physical and chemical properties.

Varian manufactures polymer microparticles with engineered structure and highly controlled surfaces with consistency between production runs. In response to client partners' needs, Varian applies its abilities and technologies to make bead products directed towards specific applications. As a result, Varian is a key OEM development partner and supplier of beads to major diagnostic and bioscience companies worldwide.

Varian's particle technologies are supported by patents, exclusive licenses, non-exclusive licenses, trademarks and more than 30 years of proprietary experience.

- Microparticles for Life Science & Bioscience
- Synthesis & Purification of Oligonucleotides & Peptides
- Analytical and Preparative Chromatography

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Lodestars™

BIOMAGNETIC SEPARATION TECHNOLOGY

Varian offers robust instrumentation, application-based consumables, and customer-focused services, backed by our global team of product and applications experts, ready to help you solve your analytical challenges. Whether you're monitoring impurities in drinking water, designing new therapeutic drugs, or developing cleaner fuels, our solutions deliver the sensitivity, flexibility and productivity your laboratory requires.

Varian Care Program

Our goal is to help you increase your productivity, maximize your uptime and achieve the highest return possible on your investment. Our experienced and highly-qualified support organization is strategically located throughout the world to ensure rapid response.

Be confident knowing that your instrument will deliver maximum performance, your users are fully trained and expert technicians will respond quickly to your support needs — because Varian cares.

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