BIOTECH SUPPORT GROUP

NuGel™ Poly-Hydroxy

Polymer Coated Silica Affinity Matrices

Special Features of NuGel™:

- Non-specific sites are virtually eliminated by a polymer coating
- Stable across a wide pH range 2 - 10
- 1000Å, 50µm Silica suitable for LC and batch processes

Special Features of Poly-Hydroxy ligand:

- Covalently couples ligands containing free terminal glycol groups in the presence of a Carbonyl diimidazole.
- Covalently couples non-polar ligands in organic solvents.
- pH stable from 2 to 9.

Silica has been an industry standard as an advantageous matrix suitable for high performance liquid chromatography. With NuGel™, non-specific sites have been virtually eliminated making it an ideal support for affinity purification. Through a proprietary polymer coating, Silica is cross linked forming a reactive Poly-Epoxy functionality stable across a wide pH range (pH 2 to 10). From this foundational chemistry, all of the NuGel™ affinity products are derived.

For Immobilization of Proteins, Antibodies, Hormones, Peptides, Haptens, Drugs, Etc.						
Product Name	**Matrix Reactive Group**	**Ligand Reactive Group**	**Special Features**	**Size**	**Column Volume (Approx)**	**Item No.**
NuGel™ Poly-Epoxy	Terminal Epoxy	Amino	Direct Coupling of Amino Groups	25 Grams	50 ml	NPEY-25
NuGel™ Poly-Amine	Terminal Amine	Carboxylic Acid, or Carbohydrate	Carbodiiamide reaction, or $NaIO_4$ derived Aldehyde	25 Grams	50 ml	NPAM-25
NuGel™ Poly-Aldehyde	Terminal Aldehyde	Amino	Direct Coupling of Amino Groups	25 Grams	50 ml	NPAY-25
NuGel™ Poly-Hydroxy	Terminal Glycol	Amino	Carbonyl diimidazole mediated reaction	25 Grams	50 ml	NPHX-25
NuGel™ Poly-Carboxy	Terminal Carboxylic Acid	Amino	Carbodiiamide mediated reaction	25 Grams	50 ml	NPCY-25

* Kilogram quantities and other particle sizes and porosity of NuGel™ are also available upon request.

BIOTECH SUPPORT GROUP

NuGel™ Poly-Hydroxy Protocol

NuGel™ Poly-Hydroxy support has a terminal glycol group(cis-diol). This alpha glycol group can be activated either by sodium-m-periodate to form active aldehyde groups at the end or by a variety of leaving groups such as carbonyldiimidazole, chloroformates, sulfonates, etc. These leaving groups are easily replaced by nucleophilic ligands containing amino and thiol groups.

Technical Data	
Spacer Arm	Polymerized hydrophilic carbon chain
Porosity	1000Å
Average Particle Size	50um
Substitution Level	100-200 uEq/gm of hydroxy groups

Special Features:

- Couples ligands containing free terminal glycol groups in the presence of a Carbonyl diimidazole.
- Couples non-polar ligands in organic solvents.
- pH stable from 2 to 9.

Carbonyl Diimidazole (CDI)-Mediated Protocol for Solvent Coupling of Poly-Hydroxy to Amine-Containing Ligands

(For Aqueous or Protein Ligands, contact Technical Services)

1. *N,N'*-Carbonyl diimidazole (CDI) reacts with hydroxyl matrices to form an intermediate imidazolyl carbamate that can react with amines on peptides or other ligands. Since CDI-activation affords half-lives in hours rather than minutes, and because there is no remaining charge either within the bond or after hydrolysis back to the original hydroxyls, it is particularly useful for solvent soluble amine-containing ligands, 3-5 mg/ml concentration. CDI is extremely unstable in aqueous environments so be sure the solvents are free of water. Carry out solvent reactions in a fume hood away from sources of ignition.

2. One gram of NuGel™ produces approximately 2 ml column (or bed) volume. Weigh out required amount and suspend in acetone; other solvents such as dioxane, DMSO or DMF also can be used. Add 100 mg CDI per ml acetone slurry to mixing vessel. Mix by orbital shaker or overhead stirrer. Do not use magnetic stirrer. Mix at room temperature for 1 hour.

3. Using a filter or column, wash the activated suspension with several volumes of solvent to remove the CDI. Transfer back to mixing vessel and add the solvent-ligand solution. Mix for at least 24 hours at 4°C.

4. Wash the gel extensively with solvent to remove unreacted ligand. Then sequentially wash back to an aqueous environment. Store at 4°C in a well-sealed container.

BIOTECH SUPPORT GROUP

Operating Modes

Since the support matrix is based on a rigid 50 µm particle, NuGel™ can be operated in low pressure pump or gravity flow columns, or in batch mode.

Related NuGel™ References

Patents

Monoclonal antibodies directed to the cytotoxic lymphocyte maturation factor European Patent EP0790255

Purification of immunoglobulins using affinity chromatography and peptide US 2006/0153834 A1

Affinity

Chaumet, Alexandre, Sandrine Castella, Laïla Gasmi, Aurélie Fradin, Gilles Clodic, Gérard Bolbach, Robert Poulhe, Philippe Denoulet, and Jean-Christophe Larcher. "Proteomic analysis of Interleukin enhancer binding factor 3 (Ilf3) and Nuclear Factor 90 (NF90) interactome." *Biochimie* (2013).

Dermot Walls, Robert McGrath and Sinéad T.Loughran A Digest of Protein Purification. *Methods Molecular Biology.* Volume 681: 3-23 (2011)

Ehrlich, G. K., Michel, H., Chokshi, H. P. and Malick, A. W. Affinity purification and characterization of an anti-PEG IgM. *Journal of Molecular Recognition*, 22: 99–103 (2009).

Development of hepatitis B virus capsids into a whole-chain protein antigen display platform: New particulate Lyme disease vaccines. *International Journal of Medical Microbiology* Volume 298, Issues 1-2, 3 January 2008, Pages 135-142

A sensitive and high-throughput assay to detect low-abundance proteins in serum Hongtao Zhang, Xin Cheng, Mark Richter & Mark I Greene. *Nature Medicine* 12, 473 - 477 (2006)

Transformation of a L-peptide epitope into a D-peptide analog. *Peptides Frontiers of Peptide Science American Peptide Symposia*, 2002, Volume 5, Session XI, 769-770

Expression and folding of an antibody fragment selected in vivo for high expression levels in Escherichia coli cytoplasm. *Research in Microbiology* Volume 153, Issue 7, September 2002, Pages 469-474

BIOTECH SUPPORT GROUP

Identification of model peptides as affinity ligands for the purification of humanized monoclonal antibodies by means of phage display *Journal of Biochemical and Biophysical Methods* Volume 49, Issues 1-3.2001

George K. Ehrlich, Pascal Bailon, Wolfgang Berthold. Phage Display Technology - Identification of Peptides as Model Ligands for Affinity Chromatography *Affinity Chromatography Methods in Molecular Biology*, 2000, Volume 147, 209-220

A Digest of Protein Purification and partial amino acid sequence of a 28 kDa cyclophilin-like component of the rat liver sigma receptor. *Life Sciences* , Volume 55, Issue 8, 1994.

Nachman, M., Azad, A. R. M. and Bailon, P. (1992), Efficient recovery of recombinant proteins using membrane-based immunoaffinity chromatography (MIC). *Biotechnology and Bioengineering*, 40: 564–571.

Kinetic aspects of membrane-based immunoaffinity chromatography. Journal of Chromatography A Volume 597, Issues 1-2, 24 April 1992, Pages 167-172

Identification of model peptides as affinity ligands for the purification of humanized monoclonal antibodies by means of phage display. Methods in Molecular Biology, 2000, Volume 147, 209-220

Membrane-based receptor affinity chromatography. Journal of Chromatography A Volume 597, Issues 1-2, 24 April 1992, Pages 155-166 9th International Symposium on Affinity Chromatography and Biological Recognition

Ion Exchange

Levin W Protein Purification of recombinant human secretory phospholipase A2 (group II) produced in long-term immobilized cell culture. *Expr Purif* 1992 Feb;3(1):27-35.

Contact Us

We welcome your questions and comments regarding our products.

Address 1 Deer Park Drive Suite M Monmouth JCT, NJ 08852,USA
Call 732-274-2866, 800-935-0628 Monday – Friday 9am-6pm EST.
Fax 732-274-2899
Email sales@biotechsupportgroup.com