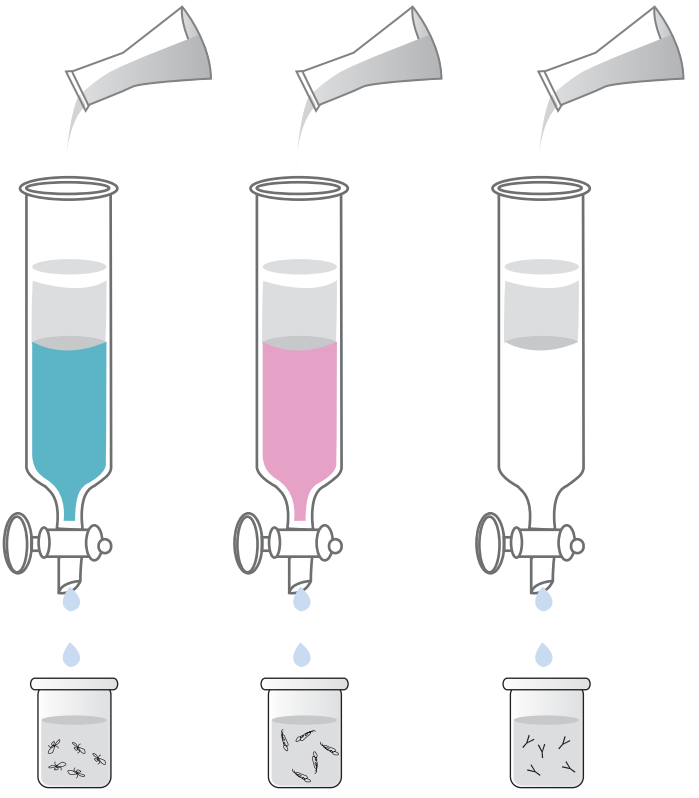
Products

Affinity Chromatography Resins

Complete Choices for Easy, One-Step Protein Purification



GenScript
The Biology CRO

Affinity Chromatography Resins

- **Fast and simple procedures for batch or gravity-flow operation**
- **High binding capacity with ultra low nonspecific binding**
- **Compatible with a variety of sample formats and buffer additives**
- **Boosted cost-effectiveness due to reusability for several times**

Protein purification is vital for the characterization of the function, structure and interactions of the protein of interest. Among various protein purification technologies, affinity chromatography is the important and powerful method since it can offer high selectivity, high resolution, and high capacity for target proteins. GenScript provides a variety of simple-to-use affinity purification resins for batch/gravity purification, allowing for efficient, convenient and reliable separation of proteins and antibodies from your crude samples for further applications (Table 1).

Table 1 – Selection Guide of GenScript Affinity Chromatography Resins

Application	Product	Binding capacity	Size	Cat. No.
Antibody purification	Protein A Resin	> 20 mg porcine IgG/ml settled resin	5 ml	L00210
	Ultra Protein A Resin	30 - 40 mg hIgG/ml settled resin	5 ml	L00400
	Protein G Resin	> 20 mg sheep IgG/ml settled resin	5 ml	L00209
	Protein L Resin	> 15 mg porcine Ig/ml settled resin	2.5 ml	L00239
His-tagged protein purification	High Affinity Ni-Charged Resin	> 20 mg 6xHis-tagged protein (50 kD) /ml settled resin	10 ml	L00223
GST fusion protein purification	Glutathione Resin	> 6 mg horse liver GST (26kD)/ml settled resin	10 ml	L00206
	GST Fusion Protein Purification Kit		1 kit	L00207
Expression and purification of GST fusion protein	Protein Expression and Purification kit		1 kit	L00208
Purification of streptavidin, avidin or their conjugates	IminoBiotin Resin	> 12 mg streptavidin/ml settled resin	5 ml	L00272
Purification of biotinylated protein, antibody, lectin *etc*	Streptavidin Resin	> 120 nmol D-Binotin/ml settled resin	5 ml	L00353
Immobilization of sulfhydryl-containing peptides, proteins and other ligands for following purification	High-Affinity Iodoacetyl Resin	> 8 mg rabbit IgG/ml settled resin	10 ml	L00403
	High-Affinity Antibody Purification Kit		1 kit	L00404

Protein A, G and L Resins for Antibody Purification

The basis for antibody affinity chromatography is the high affinity and specificity of Protein A and Protein G for the Fc-region of IgG from a variety of specie, and also that of Protein L for kappa light chain of IgG. By immobilizing recombinant forms of these proteins to 4% highly cross-linked agarose, GenScript provides the Protein A, G and L Resins for easy and one-step purification of poly- and monoclonal antibody from cell culture supernatants, serum, and ascites at laboratory and larger scale.

Greater antibody yields

Protein A, Protein G and Protein L are surface proteins originally found in cell wall of bacteria *Staphylococcus aureus*, Group G Streptococci and *Peptostreptococcus magnus*, respectively. GenScript Protein A, G and L Reins use genetically engineered forms of Protein A, Protein G and Protein L expressed in *E.coli*. Non-essential regions, such as albumin and cell-surface binding sites have been removed respectively, but all native IgG binding domains remain. When coupled to 4% highly cross-linked agarose, they provide greater recovery of target antibody (Figure 1).

Quick and simple procedures for batch/gravity purification

With GenScript Protein A, G and L Resins, the target antibody can be easily purified by using standard batch or gravity-flow operation procedures. The protocol can also be scaled to match your specific purposes and sample volume requirements.

Which resin is best for your research?

Protein A, Protein G and Protein L have high specificity for immunoglobulins(Ig). The specific binding strength will depend on the species and Ig subclass (Table 2). You can select the resin suited for your research. The predominant Fc and kappa binding allow optimal Ig orientation and enhance performance in purification.

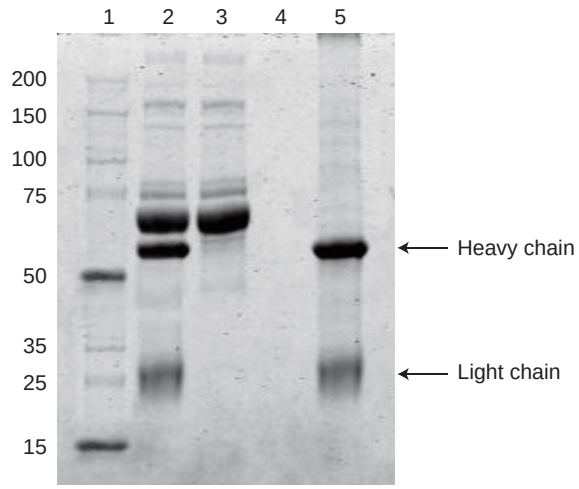


Figure 1. Affinity purification of rabbit IgG from rabbit serum, using GenScript Protein A Resin. Lane 1: Protein standards; Lane 2: Rabbit serum; Lane 3: Flow-through of serum; Lane 4: Wash; Lane 5: Eluted rabbit IgG (50 kDa and 25 kDa).

Table 2. Binding Characteristics of Protein A, G and L to different species of Igs and their subclasses

Species	Antibody Class	Protein A	Protein G	Protein L
Human	Total IgG	+++	+++	+++
	IgG1	+++	+++	+++
	IgG2	+++	+++	+++
	IgG3	+	+++	+++
	IgG4	+++	+++	+++
	IgM	+	-	+++
	IgD	-	-	+++
	IgA	+	-	+++
	Fab	+	+	+++
	ScFv	+	-	+++
Mouse	Total IgG	+++	+++	+++
	IgM	-	-	+++
	IgG1	+	++	+++
	IgG2a	+++	+++	+++
	IgG2b	+++	+++	+++
	IgG3	+++	+++	+++
Rat	Total IgG	+	++	+++
	IgG1	+	++	+++
	IgG2a	-	+++	+++
	IgG2b	-	+	+++
	IgG2c	+++	+++	+++
Goat	Total IgG	+	+++	-
	IgG1	+	+++	-
	IgG2	+++	+++	-
Sheep	Total IgG	+	+++	-
	IgG1	+	+++	-
	IgG2	+++	+++	-
Rabbit	Total IgG	+++	+++	-
Horse	Total IgG	+	+++	?
	IgG(ab)	+	-	?
	IgG(c)	+	-	?
	IgG(T)	-	+++	?
Bovine	Total IgG	+	+++	-
	IgG1	+	+++	-
	IgG2	+++	+++	-
Guinea Pig	Total IgG	+++	-	?
Pig	Total IgG	+++	+	+++
Dog	Total IgG	+++	-	?
Cat	TotaIgG	+++	-	?
Chicken	Total IgY	-	-	-

Tagged Protein Purification Resins

To simplify the purification of recombinant proteins by affinity chromatography, a tag of protein/peptide or other molecule with known size is usually incorporated into the proteins. Polyhistidine, glutathione S-transferase (GST), biotin and streptavidin are commonly applied tags enabling simple affinity purification. GenScript provides several affinity purification resins and kits for convenient and reliable purification of tagged proteins.

High Affinity Ni-Charged Resin

GenScript High Affinity Ni-Charged Resin is a high performance Ni-IMAC resin for routine affinity purification of polyhistidine tagged fusion proteins. The specially prepared support consists of 4% cross-linked agarose coupled with the chelation moiety and charged with Ni^{2+}. The High Affinity Ni-Charged Resin provides exceptional binding capacity with low Ni^{2+} leakage, ensuring reliable purification of recombinant polyhistidine tagged protein (Figure 2). The Ni-IMAC resin is compatible with a wide range of additives used in protein purification.

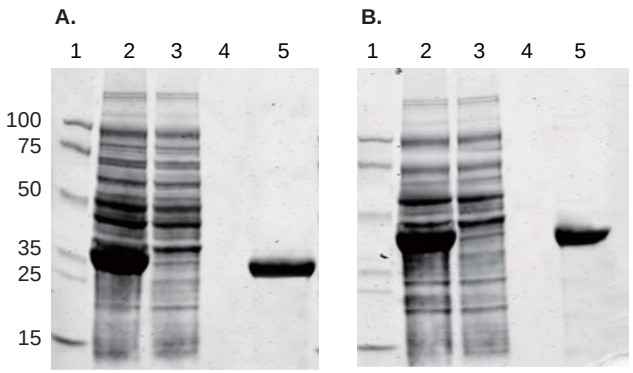


Figure 2. Affinity purification of polyhistidine-tagged proteins under native (A) and denaturing (B) conditions using GenScript High Affinity Ni-Charged Resin. Panel A, Lane 1: Protein standards; Lane 2: Bacterial lysate expressing a 36 kD polyhistidine-tagged protein; Lane 3: Flow-through of lysate; Lane 4: Wash; Lane 5: Eluted polyhistidine-tagged protein. Panel B, Lane 1: Protein standards; Lane 2: Inclusion body expressing a 42 kD polyhistidine-tagged protein; Lane 3: Flow-through of inclusion body; Lane 4: Wash; Lane 5: Eluted polyhistidine-tagged protein.

GST Fusion Protein Expression and Purification System

GenScript GST Fusion Protein Expression and Purification System consist of Glutathione Resin, GST Fusion Protein Purification Kit and Protein Expression and Purification kit. This system provides complete solutions for the expression and purification of Glutathione S-transferase (GST) tagged proteins (Figure 3).

Glutathione Resin provides easy and one-step purification of GST fusion proteins and other glutathione binding proteins expressed in *E. coli*, insect cells and mammalian cells. High binding capacity of the 4% cross-linked agarose matrix make it an excellent choice for protein preps by batch or column purification and scale-up.

GST Fusion Protein Purification Kit greatly facilitates the purification of GST fusion protein by providing the Glutathione Resin, reduced glutathione and disposable columns.

Protein Expression and Purification kit provides all the major reagents and materials for the cloning, expression and purification of target protein, including expression vector pGS-21a, Glutathione Resin, reduced glutathione, recombinant porcine Enterokinase and disposable columns.

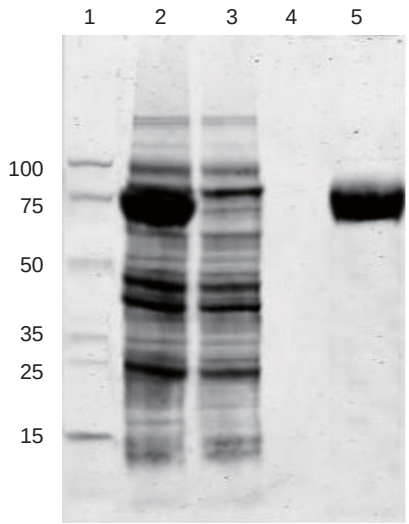


Figure 3. Affinity purification of GST fusion proteins using GenScript Glutathione Resin. Lane 1: Protein standards; Lane 2: Bacterial lysate expressing GST–tagged protein (75 kD); Lane 3: Flow-through of lysate; Lane 4: Wash; Lane 5: Eluted GST-tagged protein.

Streptavidin Resin

GenScript Streptavidin Resin is designed for the purification of biotinylated macromolecules, including separation of biotinylated molecules from samples, and immunoprecipitation of antigens using biotin-labeled antibod. The native streptavidin isolated from culture broth of *Streptomyces avidinii* is carbohydrate-free, has an acidic pI of 5.5 and a mass of 75 kDa. GenScript uses a recombinant form of streptavidin with a mass of 54 kDa and a near-neutral pI. The resin is prepared by covalently coupling streptavidin to 4% cross-linked agarose using efficient and stable chemistries, thereby becoming the excellent choices for a variety of small- or large-scale affinity purification applications.

IminoBiotin Resin

GenScript IminoBiotin Resin is developed for the purification of avidin, streptavidin or their conjugates. Iminobiotin is the guanido analog of biotin that has a lower affinity constant for binding avidin, streptavidin. The Iminobiotin Resin can be used in situations requiring mild dissociation of the avidin-biotin complex. Normally, disrupting an avidin-biotin interaction requires 6-8 M guanidine•HCl, pH 1.5, an environment that is often too harsh for proteins to maintain native structure or activity. Iminobiotin binds at pH values above 9.5 and elution is performed at pH 4.0. Because no denaturing agents used in the purification, the avidin, streptavidin or their conjugates have a better chance to maintain its activity during purification.

Surface Activated Resin

GenScript provides the surface-activated resin with specific active groups on their surface, allowing for flexible experimental design in affinity purification of macromolecules. The products offer specific surface chemical functionalities, enabling convenient binding of a wide range of ligands for maximum flexibility for target isolation.

High-Affinity Iodoacetyl Resin and High-Affinity Antibody Purification Kit

GenScript High-Affinity Iodoacetyl Resin is designed for simple and efficient covalent immobilization of peptides, proteins and other ligands through their sulfhydryl groups (-SH) to the 4% cross-linked agarose medium for the following use in affinity purification. The beaded resin has been chemically modified to form an 11-atom spacer arm that terminates in an iodoacetyl group, which is capable of reacting with sulfhydryl groups to generate a stable thioether linkage, enabling covalent immobilization of peptide, protein or other sulfhydryl-containing ligands (Figure 4). 1 ml settled resin can be coupled with more than 1 mg sulfhydryl-containing peptides of 7 amino-acids. The High-Affinity Iodoacetyl Resin is ideal for conjugating sulfhydryl-containing peptide for subsequent antibody purification (Figure 5).

The High-Affinity Antibody Purification Kit provides all the components needed for sulfhydryl-containing peptide coupling and antibody purification, including the High-Affinity Iodoacetyl Resin and all the necessary buffers.

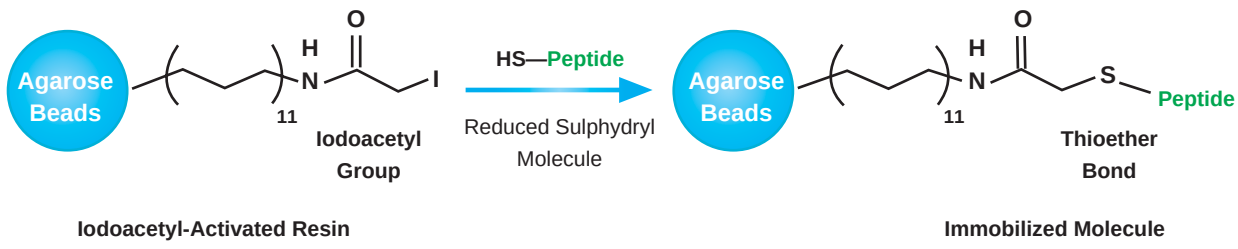


Figure 4. GenScript Iodoacetyl Resin immobilization chemistry. Iodoacetyl groups of the activated resin react spontaneously with sulfhydryl groups on proteins, peptides or other ligands to form stable thioether bonds, conjugating the molecule by a 11-atom spacer arm.

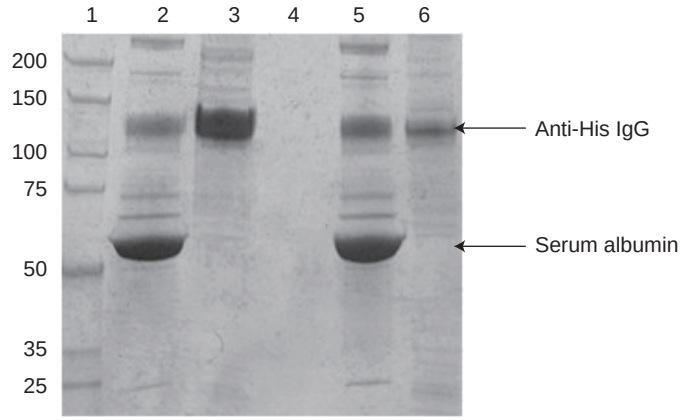


Figure 5. SDS-PAGE analysis of Anti-His Tag IgG purified using Iodoacetyl Resins from GenScript and Pierce. 1 mg (His)6-Cys peptide were coupled to 1ml resins from GenScript and Pierce, and then the peptide bound resins were used to separate anti-His poly-Ab from 10 ml rabbit serum, 8mg (GenScript) and 3mg (Pierce) anti-His poly-Ab were finally acquired respectively. Lane 1: Protein Standard; Lane 2: Flow-through of serum (GenScript); Lane 3: Eluted Anti-His Tag IgG (GenScript); Lane 5: Flow-through of serum (Pierce); Lane 6: Eluted Anti-His Tag IgG (Pierce).

Ordering Information

Product	Quantity	Cat. No.	Price
Protein A Resin	5 ml	L00210	$98.00
Ultra Protein A Resin	5 ml	L00400	$249.00
Protein G Resin	5 ml	L00209	$129.00
Protein L Resin	2.5 ml	L00239	$145.00
High Affinity Ni-charged Resin	10 ml	L00223	$80.00
Glutathione Resin	10 ml	L00206	$98.00
GST Fusion Protein Purification Kit	1 kit	L00207	$139.00
Protein Expression and Purification kit	1 kit	L00208	$335.00
Streptavidin Resin	5 ml	L00353	$139.00
IminoBiotin Resin	5 ml	L00272	$118.00
High-Affinity Iodoacetyl Resin	10 ml	L00403	$150.00
High-Affinity Antibody Purification Kit	1 kit	L00404	$139.00

Customer References

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Suh-Lailam, B. B. et al. A fast and efficient method for quantitative measurement of S-adenosyl-l-methionine-dependent methyltransferase activity with protein substrates. Anal Biochem. 2010; 398(2): 218-224.

Yang, X. et al. Stepwise Maturation of Apicobasal Polarity of the Neuroepithelium Is Essential for Vertebrate Nititeurulat J. Neurosci. 2009; 29(37): 11426-11440.

For more information, visit http://www.genscript.com/affinity chromatography resins

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