

# Antibody & Protein Purification Resins

BioVision offers a wide range of Agarose, Sepharose & Magnetic beads coupled to Protein A, Protein G, Protein L, Protein A/G, Protein A/G/L or Jacalin to purify monoclonal and polyclonal antibodies from culture media, serum, ascites fluid or hybridoma supernatants and to isolate antibody/antigen complexes in immunoprecipitation experiments. In addition, BioVision also offers Glutathione and Heparin-Sepharose that are routinely used for purification of GST-tagged fusion proteins and heparin-binding proteins respectively.

## Antibody Purification Resins

Proteins A, G and L have been widely used for IgG purification. BioVision's Protein A, G and L resins consist of purified recombinant protein A, G & L respectively that have been covalently coupled to 6% cross-linked Agarose/Sepharose beads. The recombinant protein A and G contain only IgG binding domains and are purified from E. coli via multiple chromatographic steps (not affinity purified with human IgG). The albumin binding domain, cell wall binding domain and other non-specific regions have been removed to ensure the maximum specific IgG binding. Unlike Protein A and Protein G, which bind primarily through Fc regions (i.e., heavy chain) of immunoglobulin, Protein L binds Igs through interaction with the light chains. The recombinant Protein L contains only Kappa light chain binding region and thus has the ability to bind a wider range of Ig classes (IgG, IgM, IgA, IgE and IgD) and subclasses. Single chain variable fragments (ScFv) and Fab fragments also bind to Protein L. Purity of these recombinant proteins is > 98% by SDS-PAGE and HPLC. Endotoxin level is < 0.1 EU/mg of Protein. The 6-His-tag on N-terminus can be used for affinity purification or detection using anti-His-tag antibodies. BioVision has performed extensive research to prepare special Hi-Bind™ protein A & Hi-Bind™ protein G-Agarose beads that give a higher binding capacity for IgG, higher flow rate & minimal leaching of the ligand than the other regular Protein A & Protein G-Agarose on the market. The Protein A, G and L resins display high chemical and physical stability as well as show high flow rate, hydrophilicity & high gel strength. These resins are available in several convenient pack sizes and can be regenerated and reused multiple times when stored properly.

## Protein Purification Resins

Expression & purification of recombinant proteins is important to study protein regulation, structure & function studies. Majority of the recombinant proteins are expressed as fusion proteins with short affinity tags or small proteins, such as GST. GST binds specifically to reduced glutathione. BioVision's Glutathione-Sepharose® is prepared by covalently coupling glutathione to epoxy-activated 4% cross-linked sepharose beads to form a stable thioether linkage. Heparin-Sepharose® is widely used for purifying serum proteins including coagulation factors, lipases, lipoproteins, hormone receptors and growth factors. BioVision's Heparin-Sepharose® is prepared by covalently coupling heparin to epoxy-activated 6% cross-linked sepharose beads. The coupling technique for Glutathione and Heparin-Sepharose® is optimized to exhibit high binding capacity ( $\geq 5$  mg GST/ml Glutathione-Sepharose resin &  $\geq 0.4$  mg heparin-binding protein/ml of Heparin-Sepharose® resin), high flow rate & minimal leaching of the ligand.

## Protein A & Resins

Product Name	Cat. No.	Size
Protein A (liquid), Recombinant	6500	10 mg, 25 mg, 100 mg, 1 g
Protein A (lyophilized), Recombinant	6500B	10 mg, 25 mg, 100 mg, 1 g
Protein A Antibody	5500	100 µg
Protein A IgG Purification Buffer Kit	K6529	3 Buffers
Protein A Magnetic Beads	6507	1 ml
Protein A Sepharose®	6501	1 ml, 5 ml, 25 ml, 100 ml
Protein A Sepharose® Column	6508	1 ml, 5 ml
Protein A Sepharose® (Endotoxin-free)	M1300	1 ml, 5 ml, 25 ml
Protein A-Agarose	6526	1 ml, 5 ml, 25 ml, 100 ml
Hi-Bind™ Protein A-Agarose	6520	1 ml, 5 ml, 25 ml, 100 ml

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## Protein G & Resins

Product Name	Cat. No.	Size
Protein G - Biotinylated	6512	100 µg, 1 mg
Protein G Antibody	5510	100 µg
Protein G Coated 96-well Plates	6522	5 x 96-well plates
Protein G Magnetic Beads	6517	1 ml
Protein G Sepharose®	6511	1 ml, 5 ml, 25 ml, 100 ml
Protein G Sepharose® Column	6518	1 ml, 5 ml
Protein G, Recombinant	6510	1 mg, 5 mg, 10 mg, 100 mg, 1 g
Protein G Sepharose® (Endotoxin-free)	M1301	1 ml, 5 ml, 25 ml
Hi-Bind™ Protein G-Agarose	6513	1 mg, 5 mg, 25 mg, 100 mg

## Protein L & Resins

Product Name	Cat. No.	Size
Protein L Antibody	5530	100 µg
Protein L Magnetic Beads	6537	1 ml
Protein L Sepharose®	6531	1 ml, 5 ml, 25 ml, 100 ml
Protein L Sepharose® Column	6538	1 ml, 5 ml
Protein L, Recombinant	6530	1 mg, 5 mg, 25 mg, 100 mg

## Protein A/G

Product Name	Cat. No.	Size
Protein A/G - Biotin	6506	100 µg, 1 mg
Protein A/G - FITC	6504	100 µg, 1 mg
Protein A/G Magnetic Beads	6527	1 ml
Protein A/G Sepharose®	6503	1 ml, 5 ml, 25 ml, 100 ml
Protein A/G Sepharose® Column	6528	1 ml, 5 ml
Protein A/G, Recombinant	6502	1 mg, 5 mg, 25 mg, 100 mg, 1 g

## Protein A/G/L & Resins

Product Name	Cat. No.	Size
Protein A/G/L Magnetic Beads	6547	1 ml
Protein A/G/L Sepharose®	6541	1 ml, 5 ml, 25 ml, 100 ml
Protein A/G/L Sepharose® Column	6548	1 ml, 5 ml
Protein A/G/L, Recombinant	6540	1 mg, 5 mg, 25 mg, 100 mg, 1 g

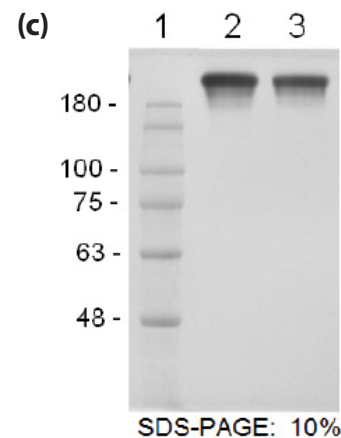
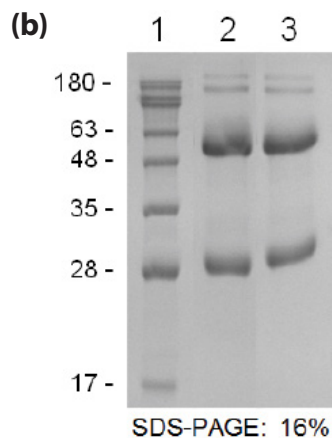
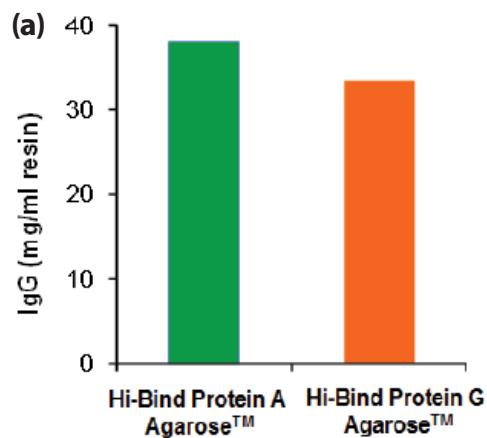
## Jacalin Sepharose®

Product Name	Cat. No.	Size
Jacaline-Sepharose®	6561	1 ml, 5 ml, 25 ml

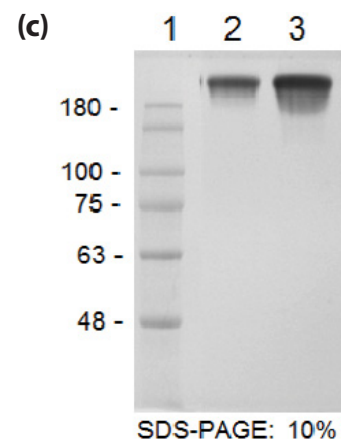
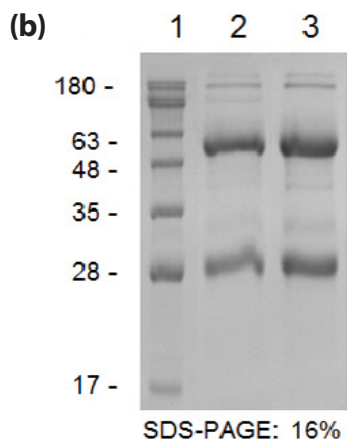
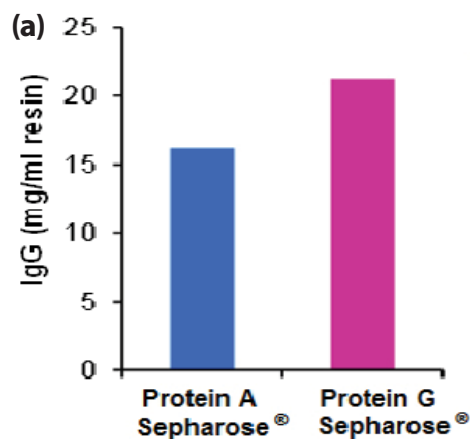
## Protein Purification Resins

Product Name	Cat. No.	Size
Calmodulin-Sepharose Beads	7934	1ml, 10ml, 5ml
Hi-Bind™ Albumin-IgG Depletion Beads	7933	1ml, 5ml, 25ml
Hi-Bind™ Cibacron Blue-Agarose Beads	7923	10ml, 50ml
Glutathione Sepharose®	6555	1 ml, 10 ml, 50 ml
Heparin Sepharose®	6553	1 ml, 10 ml, 50 ml
Heparin Sepharose® Column	6554	1 ml, 5 ml
Immobilized Catalase Beads	7931	1ml, 10ml

Note: SEPHAROSE is a registered trademark of GE Healthcare companies

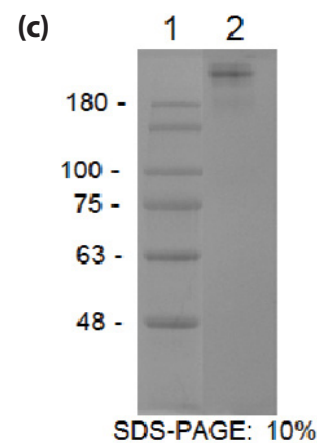
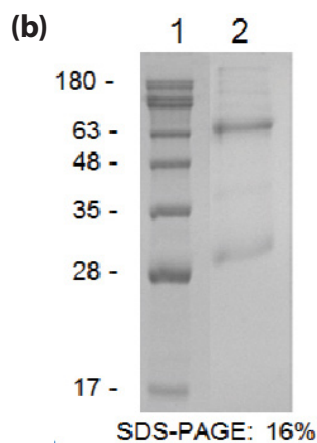
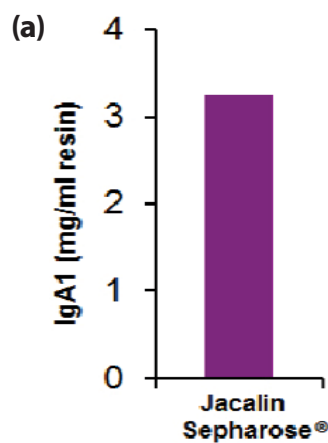


**Figure 1:** Hi-Bind™ Protein A & Hi-Bind™ Protein G-Agarose is an efficient resin for simple, rapid, specific and high-yield purification of IgG. (a) Purification of IgG from human serum using Hi-Bind™ Protein A & Hi-Bind™ Protein G-Agarose. (b) & (c) SDS-PAGE of purified IgG under reduced and non-reduced conditions respectively. Lane 1: Marker; Lane 2 & Lane 3: IgG fraction (5 µg) purified using BioVision Hi-Bind™ Protein A Agarose (Cat # 6520) & Hi-Bind™ Protein G Agarose (Cat # 6513) respectively.



**Figure 2:** (a) Purification of IgG from human serum using BioVision's Protein A and Protein G- Sepharose®. (b) & (c) SDS-PAGE of purified IgG under reduced and non-reduced conditions respectively. Lane 1: Marker; Lane 2 & Lane 3: IgG fraction (5 µg) purified using BioVision Protein A Sepharose® (Cat # 6501) & Protein G Sepharose® (Cat # 6511) respectively.

**Jacalin Sepharose®:** Jacalin, an alpha-D-galactose binding lectin extracted from Jackfruit seeds, binds with high specificity to human IgA1. BioVision's high-quality Jacalin Sepharose exhibits specific, high-yield purification of human IgA from serum or colostrum and thus can also be used for removing contaminating IgA from IgG.



**Figure 3:** Jacalin Sepharose® for specific, high-yield purification of human IgA1. (a) Purification of IgA1 from human serum. Elution was performed with 0.1 M melibiose. (b) & (c) SDS-PAGE of purified IgA1 under reduced and non-reduced conditions respectively. Lane 1: Marker; Lane 2: IgA fraction (5 µg) purified using BioVision Jacalin Sepharose® (Cat # 6561).

**Table 1.** Properties of BioVision's Protein A, G and Jacalin resins

Features	Protein A- Agarose [6526]	Hi-Bind™ Protein A- Agarose [6520]	Protein A-Sep- harose® [6501]	Protein A- Magnetic beads [6507]	Hi-Bind™ Protein G Agarose [6513]	Protein G Sepha- rose® [6511]	Protein G- Magnetic beads [6517]	Jacalin Sepha- rose® [6561]
Ligand	rProtein A	rProtein A	rProtein A	rProtein A	rProtein G	rProtein G	rProtein G	Jacalin
Number of IgG binding sites per ligand	5	5	5	5	3	3	3	-
Source	E. coli	E. coli	E. coli	E. coli	E. coli	E. coli	E. coli	Jackfruit seed
MW	39.21 KDa	39.21 KDa	39.21 KDa	39.21 KDa	26.1 KDa	26.1 KDa	26.1 KDa	23.4 KDa
pI	5.4	5.4	5.4	5.4	4.9	4.9	4.9	6.6
Coupling method	CNBr	CNBr	CNBr	CNBr	CNBr	CNBr	CNBr	CNBr
Matrix	Agarose 6BCL	Agarose 6BCL	Sepharose CL-6B	Paramagnetic, Agarose 6BCL	Agarose 6BCL	Sepharose CL-6B	Paramagnetic, Agarose 6BCL	Sepharose CL-6B
Flow rate tested* (cm/min)	4	4	0.85	-	4	0.85	-	0.85
Binding Capacity								
Human IgG (mg/mL)	≥ 20	≥ 36	≥ 16	≥ 20	≥ 30	≥ 20	≥ 15	-
Rabbit IgG (mg/mL)	≥ 20	≥ 36	≥ 16	≥ 20	≥ 30	≥ 20	≥ 15	-
Human IgA1 (mg/ml)	-	-	-	-	-	-	-	2-3

\*Linear flow rate determined in 2 ml column with internal diameter of 1.5 cm.

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