Recombinant Protein G

Catalogue Number: 13103-PNAE

Sino Biological Inc.
Biological Solution Specialist

Expression System: *E coli.*
Molecular Mass: 31kD
Form: Liquid or lyophilized
Storage: -20℃ or below
Purity: >95% by SDS-PAGE
Concentration: Refer to the label on the vial

Description

Protein G is a bacterial cell wall protein expressed at the cell surface of certain group C and group G Streptococcal strains.

It has affinity for both Fab- and Fc-fragments of human IgG by independent and separate binding sites. Binding to the Fc region of immunoglobulins from several species by a non-immune mechanism exhibits great affinity for almost all mammalian immunoglobulin G (IgG) classes, including all human IgG subclasses (IgG1, IgG2, IgG3 and IgG4) and also rabbit, mouse, and goat IgG. Protein G bound all tested monoclonal IgG from mouse IgG1, IgG2a, and IgG3, and rat IgG2a, IgG2b, and IgG2c. In addition, polyclonal IgG from man, cow, rabbit, goat, rat, and mouse bound to protein G, whereas chicken IgG did not. Protein G has also been shown to bind human serum albumin but at a site that is structurally separated from the IgG-binding region. Protein G shows a broader range of binding to IgG subclasses than staphylococcal protein A. This applies to polyclonal IgG from cow, rat, goat, human and rabbit sources as well as several of rat and mouse monoclonal antibodies. In contrast, protein A shows stronger interaction with polyclonal IgG from human, guinea-pig, pig, dog and mouse. Both proteins interacted with same relative strength to polyclonal rabbit IgG.

Protein G consists of nearly 600 amino acid residues. The carboxy-terminal half contains three immunoglobulin G (IgG)-binding domains which are referred to as domains I, II, and III or units C1, C2 and C3, each containing 55 amino acid residues with two 'spacers', of 16 amino acids, Dl and D2. Following the IgG-binding regions there is a region W, which most likely is involved in cell wall interactions. Domains in the NH_2-terminal half of the protein have been found to bind human serum albumin (HSA).

Application

Protein G was found to be a powerful reagent for the detection of IgG, and consequently the antigen against which these antibodies are directed. It was used in Western blot analyses to detect various antigen-antibody complexes on nitrocellulose membranes. Moreover, protein G is widely used as a ligand coupled to resins in affinity chromatography for antibody purification.

IgG binding comparison of Protein A and Protein G

Species	Subclasses	Protein A	Protein G
Human	IgG	+++	+++
	IgG1	++++	++++
	IgG2	++++	++++
	IgG3	-	+++
	IgG4	++++	++++
	IgA	variable	-
	IgA1	+	-
	IgA2	+	-
	IgD	-	-
	IgE	++	-
Human	IgM	variable	-
Rabbit	No distinction	+++	+++
Cow	IgG	+	+++
	IgG1	+	+++
	IgG2	+++	+++
Cat	IgG	+++	+
Horse		++	++++
Goat	IgG	+	++
	IgG1	+	+++
	IgG2	+++	+++
Guinea-pig	IgG1	++	+
	IgG2	++	+
Sheep	IgG	+	++
	IgG1	+	++
	IgG2	+++	+++
Dog		++	+
Pig		+++	++
Rat	IgG	+	++
	IgG1	-	+

	IgG2a	-	++++
	IgG2b	-	++
	IgG2c	++	++
	IgG3	+	++
Mouse	IgG	++	++
	IgG1	+	++++
	IgG2a	++++	++++
	IgG2b	+++	+++
	IgG3	++	+++
	IgM	-	-
Chicken	IgY	-	-
Monkey(rhesus)		++++	++++
Hamster		+	++
Koala		-	+
Llama		-	+

Related products

rProtein A /resin
rProtein G resin
rProtein L/resin

References

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4. B Akerstrom, *et al*. (1985) Protein G: a powerful tool for binding and detection of monoclonal and polyclonal antibodies. The Journal of Immunology, Vol 135, Issue 4: 2589-2592
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