

Name:	SC5b-9 Complex
Catalog Number:	A127
Sizes Available:	100 µg/vial
Concentration:	1.0 mg/mL (see Certificate of Analysis for exact conc.)
Form:	Liquid
Purity:	>90% by SDS-PAGE
Buffer:	10 mM sodium phosphate, 145 mM NaCl, pH 7.3
Extinction Coeff.	$A_{280\text{ nm}} = 1.03$ at 1.0 mg/mL
Molecular Weight:	~1,030,000 Da (~13 chains)
Preservative:	None, 0.22 µm filtered
Storage:	-70°C or below. Avoid freeze/thaw.
Source:	Normal human serum (shown by certified tests to be negative for HBsAg and for antibodies to HCV, HIV-1 and HIV-II).
Precautions:	Use normal precautions for handling human blood products.
Origin:	Manufactured in the USA.

General Description

Vitronectin (S Protein) binds to membrane attack complexes that fail to insert into membranes. The result is a soluble complex of S Protein and C5b-9 and this has been named SC5b-9 (Dodds, A.W. and Sim, R.B. (1997)). Activation of complement in the absence of bilipid layer membranes results in most of the activated C5 forming SC5b-9 complexes. This can occur with activating particles such as immune complexes, yeast and bacterial cell walls. The SC5b-9 complexes can have more than one C9 (usually three) and more than one S Protein (usually three) per complex. Thus, the typical molecular weight is ~1,030,000 Da.

One C5b-7 complex can bind up to three molecules of S Protein. If C8 or C8 and C9 have already bound to the C5b-7 complex three S Protein molecules will bind to these complexes as well. The C5b6 and C5b-7 complexes sometimes diffuse away from the target cell and enter the membrane of a nearby cell. This is called bystander lysis or “reactive lysis” and can be a significant source of pathology. Binding of S Protein blocks this non-specific lysis. Diffusion of these early complexes away from the activating surface may result in addition of C8 and C9 to the complex prior to S Protein binding. Once S Protein binds to these complexes it prevents their membranolytic functions, thus creating soluble complexes that are subsequently cleared from circulation.

Physical Characteristics & Structure

The molecular weight of SC5b-9 Complex has a maximum approximate molecular weight of 1,030,000 Da and it is composed of ~13 polypeptide chains. Variations in molecular weight may occur due to the fact that SC5b-9 complexes may have 1 to 3 C9 molecules and 1 to 3 S Protein molecules per complex.

Function

See General Description above.

Assays

SC5b-9 has no functional activity. Several commercial ELISA kits specific for SC5b-9 are available. These are sold by BD Biosciences, Technoclone Ltd, Quidel, and

HyCult Biotechnology. Most rely on capture of the SC5b-9 with antibodies specific for neo-antigens on the complex and secondary detection with antibodies to complement proteins of the C5b-9 complex.

Applications

See General Description above.

In vivo

The normal serum concentration of SC5b-9 is low. Normal baseline levels for properly stored plasma range from less than 100 ng/mL to 600 ng/mL SC5b-9 or less than 0.1% of maximal conversion. Elevated levels of circulating SC5b-9 complexes have been associated with bacterial infections and other diseases where complement activation is known to occur.

Regulation

SC5b-9 complexes form spontaneously and the process has no known regulators. S Protein does compete for newly formed C5b-9 with other lipid-binding molecules in plasma such as LDL and HDL. After formation SC5b-9 complexes are cleared from the circulation.

Deficiencies

Deficiencies of C5, C6, C7, C8, C9 or S Protein will prevent formation of complete SC5b-9 complexes.

Diseases

As stated above, deficiencies of C5, C6, C7, C8, C9 or S protein will prevent formation of complete SC5b-9 complexes. The inability to form MAC (C5b-9 complexes) is a serious problem due to the high susceptibility to bacterial infections. No known diseases are specifically associated with the inability to produce soluble SC5b-9 complexes.

Precautions/Toxicity/Hazards

This protein is purified from human plasma, therefore precautions appropriate for handling any blood-derived product must be used even though the source was shown by certified tests to be negative for HBsAg, HTLV-I/II, STS, and for antibodies to HCV, HIV-1 and HIV-II.

Hazard Code: B

MSDS available upon request.

References

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