Name:	**C1q Protein (Cyno)**
Catalog Number:	**CY099**
Sizes Available:	100 µg/vial
Concentration:	1.0 mg/mL (see Certificate of Analysis for actual concentration)
Form:	Frozen liquid
Purity:	$\geq$ 85% by SDS PAGE
Buffer:	10 mM HEPES, 300 mM NaCl, pH 7.2
Extinction Coeff.	$A_{280\ nm}$ = 0.682 at 1.0 mg/ml for pure C1q
Molecular weight:	420,720 Da (18 chains)
Preservative:	None, 0.22 µm filtered.
Storage:	-70^{o}C or below. Avoid freeze/thaw.
Source:	Normal cyno serum from healthy animals
Precautions:	Use normal precautions for handling animal blood products.
Restrictions:	Not available for sale or usage outside the USA due to international endangered species laws.
Origin:	Manufactured in the USA.

General Description

Cynomolgus (*Macaca fascicularis*) monkey (cyno) C1q is purified from pooled normal cyno serum. C1q is part of the C1 complex, which is the first complement component in the classical pathway of complement. The C1 complex is a non-covalent assembly of three different proteins (C1q, C1r, and C1s) bound together in a calcium-dependent complex. C1q has six extended arms with domains at the end of each arm that bind to the Fc domains of immunoglobulins such as IgG or IgM. When antibodies bind to antigens, forming immune complexes, they cluster allowing two or more of the six C1q arms to bind to the Fc domains of antibodies. The binding of multiple arms of C1q to immune complexes causes the two C1r proteins in the complex (protease zymogens) to auto-activate. The activated C1r proteases cleave and activate the two C1s protease zymogens in the complex. The activated C1s cleaves complement component C4 releasing C4a and initiating covalent attachment of C4b to the activating surface. Activated C1s also cleaves C2 and the larger fragment of C2 binds to the surface-attached C4b forming C4b,C2a, the C3/C5 convertase of the classical pathway.

Physical Characteristics & Structure

Cyno C1q is a high molecular weight complex of 18 polypeptide chains with a calculated molecular weight of about 420,720 daltons based on the amino acid sequence of the A chain (23,756 Da), B chain (23,688 Da) and C chain (22,675 Da). Each of the six arms of cyno C1q contains three chains, an A chain, a B chain and a C chain. Analysis by SDS/polyacrylamide gel electrophoresis (Invitrogen) under reduced conditions shows the three chains of cyno C1q (A, B and C) separated in contrast to the human C1q in which the A and B chains do not separate and are seen as a single band.

The concentration of purified cyno C1q (Cat# CY099) was determined using the extinction coefficient of human C1q $E^{1\%}/_{280nm}$ = 6.82. The calculated extinction coefficient for cyno C1q based on the amino acid sequence of its A, B and C chains was determined to be $E^{1\%}/_{280nm}$ = 6.6 using ProtParam and assuming all pairs of Cys residues form cystines.

Function

The biological functions of C1q are described above in the General Description and Physical Characteristics sections. Cyno C1q functional activity may be assayed using human C1q-depleted serum (CompTech #A300) and EA cells (CompTech #B200).

Assays

The unit of classical pathway activity is the CH50. A similar unit, the C1qH50, is used to quantitate the activity of C1q. A C1qH50 unit is the amount of functional cyno C1q needed to lyse 50% of 3 x 10^7 EA cells (antibody-sensitized sheep erythrocytes (CompTech #B200)) when that amount of cyno C1q (CompTech #CY099) is incubated with 5-20 µL of human C1q-Dpl in GVB^{++} (CompTech #B100) in a total volume of 500 µL for 30 min at 37ºC. This amount of C1q indicates the sensitivity of the assay for C1q. Cyno C1q is expected to exhibit a sensitivity similar to that reported for human C1q, which is typically about 1 ng human C1q with 10 µL C1q-Dpl (Dodds, A.W. and Sim, R.B. (1997); Morgan, B.P. (2000)). The functional activity of purified cyno C1q is compared to the activity of C1q in normal cyno serum and reported as percent based on a mg/mg basis. For this assay the C1q concentration in cyno serum was assumed to be 0.07mg/ml similar to that of C1q in human serum. See the Certificate of Analysis for lot specific values.

Function

The biological functions of C1q are described above in the General Description and Physical Characteristics sections.

Applications

Cyno C1q can be used to coat ELISA plates to capture and quantitate immune complexes in samples from mouse models used for studying immune complex related diseases and conditions.

Genetics

The NCBI Gene ID numbers for cyno C1q are: C1q A chain (107126479), C1q B chain (102139434), C1q C chain (102130549) and the UniProt accession numbers are: C1q A chain (A0A2K5WJV6**)**, C1q B chain (A0A2K5WNK0) and C1q C chain (A0A2K5WNV2). The genes for cyno C1q chains A, B and C are all located on chromosome 1.

Precautions/Toxicity/Hazards

This protein is purified from animal plasma/serum and therefore precautions appropriate for handling any animal blood-derived product must be used.

References

Dodds, A.W. and Sim, R.B. editors (1997) Complement. A Practical Approach (ISBN 019963539) Oxford University Press, Oxford.

Morgan, B.P. ed. (2000) Complement Methods and Protocols. (ISBN 0-89603-654-5) Humana Press, Inc., Totowa, New Jersey.

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