Name:	**C3 Protein (Cynomolgus monkey)**
Catalog Number:	**CY113**
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 sodium phosphate, 145 mM NaCl, pH 7.2
Extinction Coeff.	$A_{280\ nm}$ = 0.974 at 1.0 mg/ml for pure C3
Molecular weight:	185,000 Da (2 chains)
Preservative:	None, 0.22 µm filtered.
Storage:	-70°C or below. Avoid freeze/thaw.
Source:	Normal cynomolgus serum from healthy animals of mixed gender
Precautions:	Use normal precautions for handling animal blood products.
Restrictions:	Not available for sale outside the USA due to international endangered species laws.
Origin:	Manufactured in the USA.

General Description

Cynomolgus monkey C3 (cyno C3) is purified from pooled normal cynomolgus monkey serum. C3 is central to the activation of all three pathways of complement activation (Law, S.K.A. and Reid, K.B.M. (1995)). Initiation of each pathway generates proteolytic enzyme complexes (C3 convertases) which are bound to the target surface. These enzymes cleave a peptide bond in C3 releasing the anaphylatoxin C3a and activating C3b. For a brief time (~60 µs) this nascent C3b is capable of reacting with and covalently coupling to hydroxyl groups on the target surface. Carbohydrates are the favored target, but protein hydroxyls and amino groups also react. This process of tagging the target surface with C3b is called opsonization. The reactive site in nascent C3b is a thioester (Tack B.J., et al. (1980); Pangburn M.K. and MüllerEberhard H.J. (1980)) and C3b is linked to the target through a covalent ester bond (an amide bond is formed if C3b is attached to amino groups). Most of the C3 activated during complement activation never attaches to the surface because its thioester reacts with water forming fluid phase C3b which is rapidly inactivated by factors H and I forming iC3b. Surface-bound C3b is necessary in all three pathways for efficient activation of C5 and formation of C5b-9 complexes that lyse the target cell membrane. Surface-bound C3b and its breakdown products iC3b and C3d are recognized by numerous receptors on lymphoid and phagocytic cells which use the C3b ligand to stimulate antigen presentation to cells of the adaptive immune system. The end result is an expansion of target-specific B-cell and T-cell populations.

Physical Characteristics & Structure

Cynomolgus monkey C3 is an uncharacterized protein. The calculated molecular weight based on its amino acid sequence is 184,926 daltons similar to that of human C3 (185,000 daltons). Like human C3, cyno C3 is composed of two disulfide-linked chains. Analysis of purified cyno C3 by SDS/polyacrylamide gel electrophoresis under non-reduced conditions shows the mobility of cyno C3 to be similar to that of human C3. Under reduced conditions, the migration of the alpha chain of cyno C3 is comparable to that of human C3 alpha chain (110,000

daltons) while the beta chain migrates slightly ahead of the human C3 beta chain (75,000 daltons).

The extinction coefficient of cyno C3 is calculated from its amino acid sequence using ProtParam and assumes all pairs of Cys residues form cystines (i.e. a pair of cystine molecules are joined by a disulfide bond). The theoretical pI value for cyno monkey C3 is 6.03. Employing immunoturbidimetric method the serum concentration of cyno C3 has been reported to be 1.27 mg/ml in males and 1.1 mg/ml in female monkeys (Park H-K et al., (2016)).

Function

The biological functions of C3 are described above in the General Description and Physical Characteristics sections.

Genetics

Cynomolgus monkey C3 chromosome location 19. The NCBI Gene ID number for Cynomolgus monkey C3 is 102131458 and UniProt accession number is A0A2K5VPN1**.**

Precautions/Toxicity/Hazards

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

References

Law, S.K.A. and Reid, K.B.M. (1995) Complement 2nd Edition (ISBN 0199633568) Oxford University Press, Oxford.

Tack BF, Harrison RA, Janatova J, Thomas ML, Prahl JW. (1980) Evidence for presence of an internal thiolester bond in third component of human complement. Proc Natl Acad Sci U S A. 77:5764-8.

Pangburn M.K. and Müller-Eberhard H.J. (1980) Relation of putative thioester bond in C3 to activation of the alternative pathway and the binding of C3b to biological targets of complement. J Exp Med. 152:1102-14.

Park H-K, Cho J-W, Lee B-S, Park H, Han J-S, Yang M-J, Im W-J, Park D-Y, Kim W-J, Han S-C, Kim Y-B. (2016) Reference values of clinical pathology parameters in cynomolgus monkeys (Macaca fascicularis) used in preclinical studies. Lab Anim Res. 32(2):79-86.

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Complement Technology, Inc.
4801 Troup Hwy, Suite 701
Tyler, Texas 75703 USA
Phone: 903-581-8284
FAX: 903-581-0491
Email: contactCTI@ComplementTech.com
Web: www.ComplementTech.com