

Name:	C1-INH Dpl
Catalog Number:	A440
Sizes Available:	0.25 ml/vial
Concentration:	>50 mg/ml (see Certificate of Analysis for exact conc.)
Form:	Frozen liquid
Activity:	>70% versus normal human serum standard
Purity:	No C1 INH detectable by immunodiffusion
Buffer:	10 mM Sodium phosphate, 145 mM NaCl, pH 7.3
Preseervative:	None, 0.22 µm filtered
Storage:	-70°C or below. Minimize freeze/thaw cycles.
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

Normal human serum was depleted of C1-Inhibitor (C1-INH) by immunoaffinity chromatography. The product is tested for the absence of C1-INH by double immunodiffusion. C1-INH is a regulator of the classical pathway of complement activation. The protease inhibitor C1-INH prevents the spontaneous activation of complement and limits consumption of C2 and C4 by rapidly inactivating C1r, C1s and MASP2 enzymes. The process of making C1-INH depleted serum (C1-INH Dpl) results in the activation of classical pathway components C2 and C4 and hence their consumption. Thus C1-INH Dpl does not possess a functional classical pathway of complement.

In the absence of C1-INH, initial assays indicated that a fully functional classical pathway of complement could be restored by adding purified C2 and C4 proteins at their respective normal serum concentrations to the C1-INH Dpl. However, this was not reproducible. Additional CH50 assays conducted exhibited a lot of variability with $\leq 35\%$ restoration of the CH50 activity. Increasing the C4 and C2 concentration improved the activity but did not restore it to $\geq 80\%$. The inconsistency in the CH50 assays suggested variability in C4 and C2 activation and hence in their consumption. Since C1s enzyme activates C4 and C2, the results implied that in the absence of C1-INH, depending on how the C1-INH-Dpl was handled for the assays (number of freeze/thaw cycles, thawing time, etc.) activation of C1s proenzyme by C1r to its enzymatic form had occurred in the depleted serum, thus generating C1s enzyme, the amount of which varied from assay to assay. For this reason, the C1-INH Dpl should not be subjected to more than one freeze/thaw cycle and should be kept in an ice-water bath at 0 °C for usage.

Full restoration of the classical pathway activity was achieved by first adding sufficient amounts of purified C1-INH, either at its normal or at times even in excess of its normal serum concentration, so that the C1-INH could complex with the C1r/C1s enzyme in the C1-INH-Dpl prior to reconstituting the depleted serum with purified C4 and C2 at their respective normal serum concentrations. The restoration of the classical pathway activity suggests that besides C2 and C4 and in the absence of C1-INH all the other complement components necessary for

classical pathway activation are present in C1-INH Dpl (CH50 assay) (Morgan, B.P. (2000); Dodds, A.W. and Sim, R.B. (1997)).

C1-INH Dpl was also tested for and certified to contain a functional alternative pathway indicating that all other complement components necessary for alternative pathway activation are present (Morgan, B.P. (2000); Dodds, A.W. and Sim, R.B. (1997)).

Physical Characteristics & Structure

C1-INH Dpl is supplied as a clear, straw-colored liquid and lacks C1-INH. The C1-INH Dpl serum is not functionally deficient in alternative pathway activity but lacks classical pathway activity due to activation of C2 and C4. The C1-INH Dpl thus lacks C2 and C4 activity but contains their activated fragments.

Function

The depleted serum is tested for remaining classical pathway activity (CH50 assay) by hemolytic assays using antibody-sensitized sheep erythrocytes (CompTech #B200) and for alternative pathway function (AP50 assay) using rabbit erythrocytes (CompTech #B300). The Certificate of Analysis provided with each lot gives a description of the assays and specific titers for the depleted serum compared to normal human serum.

Assays

The unit of classical pathway activity is the CH50. The classical pathway activity is reported as the standard CH50 value for C1-INH Dpl. The CH50 activity is determined as the amount of C1-INH Dpl serum needed to lyse 50% of 1×10^8 EA cells (antibody-sensitized sheep erythrocytes (CompTech #B200)) when incubated for 60 min at 37 °C in a total volume of 1.5mL GVB⁺⁺. Normal human serum is used as standard. See the Certificate of Analysis for lot specific titer values.

The C1-INH-Dpl serum is functionally deficient in classical pathway activity due to activation of both C2 and C4. The C1-INH Dpl thus lacks C2 and C4 activity but contains their activated fragments. In the presence of C1-INH, a fully functional classical pathway of complement can be restored to the C1-INH-Dpl by first adding sufficient amounts of purified C1-INH, either at its normal (160ug/ml Dpl) or even in excess of its normal serum concentration, so that the C1-INH can complex with the C1r/C1s enzyme in the C1-INH-Dpl and then reconstituting it with purified C2 (20ug/ml) and C4 (400ug/ml) proteins.

Alternative pathway titers are performed to document that this pathway of complement activation is fully functional in C1-INH Dpl. Lectin pathway activity is not tested.

Applications

C1-INH Dpl is used to assay C1-INH in samples and to supply an alternative pathway activating system.

Precautions/Toxicity/Hazards

The source is human serum, 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 and for antibodies to HCV, HIV-1 and HIV-II.

Hazard Code: B

MSDS available upon request.

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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