

Tissue Factor, recombinant human

REF 4500

Description

Tissue Factor (TF) is a 45 kD transmembrane cell surface glycoprotein known for its role in initiating coagulation for the past 90 years.¹ TF is comprised of three domains: an extracellular domain (aa 1-219), followed by a hydrophilic spanning domain (aa 220-242) and a cytoplasmic tail (aa 243-263).² It functions as a receptor and cofactor for the latent serine proteases factor VII and VIIa.^{3,4} Contact between TF and blood is sufficient to initiate the extrinsic pathway of coagulation. TF is located on the cells in the adventitia and variably on cells in cell culture.

In vitro studies reveal that once TF complexes with factor VII, factor VII is efficiently activated by factor Xa. As with all vitamin K-dependent zymogens, activation requires the presence of calcium ions and phospholipids. Formation of this TF/FVIIa complex renders the factor VII bond at Arg152 - Ile153 susceptible to cleavage by trace amounts of factor Xa and factor IXa. Activation by factor Xa is profoundly enhanced by lipidated TF but not by soluble TF (aa 1-219).^{5,6}

While predominantly found in lung, brain, trophoblastic microvilli, placenta and some neoplastic tissues (e.g. benign breast carcinomas and melanomas), recent investigations have revealed increased tissue factor levels in patients diagnosed with malignant solid tumors.^{7,8} When monocytes and macrophages are stimulated by endotoxins, cytokines and lectins, TF is upregulated in these cells with an increase in procoagulant activity (PCA). The cellular distribution of TF in the extravascular compartments (e.g. epidermis, placenta and organ capsules and in the central nervous system) suggests that TF represents a hemostatic barrier.

Tissue Factor is released into the blood stream following disruption of the endothelium. The initiation of the coagulation pathways requires the participation of a series of molecules; TF and its ability to complex with, factor VII⁹, factor X or factor IX, charged phospholipids and calcium (the catalytic activity of factor VIIa in comparison to VII is insignificant.¹⁰). The TF/FVIIa complex efficiently activates both factor X and factor IX, thus initiating both the intrinsic and extrinsic coagulation pathways.¹¹

REF 4500 is full length recombinant human tissue factor, produced by a Baculovirus transfer vector expression system. The protein consists of amino acids 1-263, comprising the extracellular, transmembrane and cytoplasmic domains. While amino acid analysis predicts a molecular weight of 35,000 D, the protein is visualized at approximately 38,000 D under SDS gel electrophoresis under reducing conditions.

Presentation

Screw capped clear glass vials of 25 µg of protein lyophilized from 10 mM TRIS-HCl, 150 mM NaCl, 0.01% CHAPS, pH 8.0, with 200 mM mannitol.

Activity

Upon relipidation, REF 4500 will promote clotting in a two-stage prothrombin time test.

Reconstitution

Add 1.0 mL of filtered deionized or sterile water to generate a 25 µg/mL.

Storage

Store lyophilized vials at 2°-8°C. Store reconstituted protein in aliquots frozen at -20°C or colder, avoid freeze-thaw cycles.

Warnings and Precautions

For Research Use Only.

This product contains source material of a biological origin. As no known test method can provide complete assurance that biologicals will not transmit pathogens, this reagent should be handled as recommended for any potentially infectious human specimen.

Related Products

Relipidated recombinant human Tissue Factor, REF 4500L/B
ACTICHROME® TF, REF 846

References

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5. Bach, R., *et al.* Factor VII binding to tissue factor in reconstituted phospholipid vesicles: induction of cooperativity by phosphatidylserine. *Biochemistry* 1986, **25** (14): 4007-4020.
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8. Carson, S. D., and Ramsey, C. A. Tissue Factor (Coagulation factor III) is present in placental microvilli and cofractionates with microvilli membrane proteins. *Placenta* 1985; **6**: 5.
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10. Ruf, W., *et al.* Structural biology of tissue factor, the initiator of thrombogenesis in vivo. *FASEB Journal* 1994, **8**(6): 385-390.
11. Edgington, T. S., *et al.* The structural biology of expression and function of tissue factor. *Thrombosis and Haemostasis* 1991; **66**(1): 67.

Definition of Symbols

	Consult instructions for use
	Manufacturer
	Refer to Safety Data Sheet
	Temperature Limitation
	Lot Number
	Expiration Date
	Catalog Number