

Product Specification Sheet

**Human Alpha-Thrombin (Factor IIa) Protein and antibodies**

– Cat. # TBNA16-N-100 Human Alpha-Thrombin (human plasma), purified

**SIZE:** 100 ug

Thrombin (EC 3.4.21.5, fibrinogenase, thrombase, thrombofort, topical, thrombin-C, tropostasin, activated blood-coagulation factor II, blood-coagulation factor IIa, factor IIa, E thrombin, beta-thrombin, gamma-thrombin) is a serine protease that in humans is encoded by the F2 gene. **Prothrombin** (coagulation factor II or **F II**) is proteolytically cleaved to form thrombin in the coagulation cascade, which ultimately results in the reduction of blood loss. Thrombin in turn acts as a serine protease that converts soluble fibrinogen into insoluble strands of fibrin, as well as catalyzing many other coagulation-related reactions. Prothrombin is produced in the liver and is post-translationally modified in a vitamin K-dependent reaction that converts ten glutamic acids on prothrombin to gamma-carboxyglutamic acid (Gla). In the presence of calcium, the Gla residues promote the binding of prothrombin to phospholipid bilayers (see the picture). Deficiency of vitamin K or administration of the anticoagulant warfarin inhibits the production of gamma-carboxyglutamic acid residues, slowing the activation of the coagulation cascade. Activation by prothrombinase occurs by sequential cleavage after residue Arg320 then after Arg271 to produce the active protease - **thrombin** (37 kDa) and the byproduct prothrombin fragment 1.2 (35 kDa). The product thrombin further cleaves prothrombin fragment 1.2 after residue Arg155 into individual prothrombin fragments 1 and 2. The concentration of prothrombin in plasma is ~100 µg/ml (~1.4 µM).

The molecular weight of prothrombin is approximately 72,000 Da. The catalytic domain is released from prothrombin fragment 1.2 to create the active enzyme thrombin, which has a molecular weight of 36,000 Da. Activation of prothrombin is crucial in physiological and pathological coagulation. Various rare diseases involving prothrombin have been described (e.g., hypoprothrombinemia). Anti-prothrombin antibodies in autoimmune disease may be a factor in the formation of the lupus anticoagulant also known as (antiphospholipid syndrome). Hyperprothrombinemia can be caused by the G20210A mutation.

**Source of Antigen and Antibodies**

Human Alpha-Thrombin was purified from human plasma. All human derived material has been tested negative for HIV, HCV, and HbSAg. Nevertheless, all precautions should be taken and samples be treated as potentially hazardous.

The product is supplied in 50% glycerol.

**Specific activity** is determined by fibrinogen clotting assay relative to human NIH standard thrombin. The activity of a typical lot is >2500 units/mg and lot specific activity is provided on the vial.

**Form & Storage**

**Storage**

**Short-term:** unopened, undiluted liquid vials at -20°C and powder at 4°C or -20°C..

**Long-term:** at -20°C or below in suitable aliquots after reconstitution. Do not freeze and thaw and store working, diluted solutions.

**Stability:** 6-12 months at -20°C or below.

**Specificity & Cross-reactivity**

Human Prothrombin protein (protein accession # P000734) sequence is highly conserved in various species: Chimp (99%), Pig 983%, Dog (85%), Cat (84%), Horse (81%), Cow/bovine (81%), Mouse (81%), Rat (79%), rabbit (78%), and Chicken (75%). Antibody to human prothrombin (#PRTN11-A) found to be crossreactive with mouse, rat, rabbit, pig, and dog. Other species not tested. Purified human, bovine, rabbit, and mouse prothrombin proteins are also available for control studies. Prothrombin Fragment 1 and 2 and Factor II deficient plasma are also available.

**General References:** Royle NJ (1987) Somat. Cell Mol. Genet. 13, 285-292; Degen SJ (1987) Biochem. 26, 6165-6177; Huang M (2003) Nat. Struct. Biol. 10, 751-756;

\*This product is for In vitro research use only.

**Related material available from ADI**

Anti-human Factor II, VII, Willebrand Factor, factor IX, factor X, Factor XIII, Protein C, Proteins S, Plasminogen, Fibrinogen, Fibrin, and anti-thrombin (ATIII).

**Human Prothrombin ELISA**

TBNA16-N-100

150608A

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