

## Active Native Bovine Prothrombin

**Cat. No.** Prothrombin-270B    **Lot. No.** (See product label)

### SPECIFICATION

#### Product Overview

**Species** Bovine

**Source** Plasma

#### Description

Prothrombin is a vitamin K-dependent plasma protein which is synthesized in the liver. Prior to secretion into plasma, prothrombin undergoes post-translational modification by a vitamin K-dependent carboxylase which converts ten specific glutamic acid residues to  $\gamma$ -carboxyglutamic acid (gla). The ten gla residues are located within the first 40 amino acids of the mature protein and contribute to the ability of prothrombin to bind to negatively charged phospholipid membranes. Prothrombin contains two regions of internal homology which are referred to as "kringle" structures. These regions of conspicuous secondary structure are located between residues 40 and 270 of the mature plasma protein and replace the growth factor domains found in several other plasma serine proteases. Thus far, no function has been ascribed to these regions, but there is suspicion that they may play a role in one of several binary protein interactions involving prothrombin. The mature single chain protein circulates in plasma as a zymogen and, during coagulation, is proteolytically activated to the potent serine protease  $\alpha$ -thrombin. This proteolysis is catalyzed by the prothrombinase enzyme complex. During activation, prothrombin is cleaved at Arg271-Thr272 (human) / Arg273-Thr274 (bovine) and at Arg320-Ser321 (human) / Arg323-Ser324 (bovine) to a "pro" fragment (fragment 1.2) and thrombin, the latter of which is composed of two chains covalently linked by a disulfide bond. In the case of human prothrombin/thrombin, there is an additional thrombin feed-back

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|                       |                                                                                                                                                                                                       |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | cleavage at Arg284-Thr285 resulting in an additional 13 amino acids being removed from the mature thrombin "A" chain.                                                                                 |
| <b>Form</b>           | 50% (vol/vol) glycerol/H <sub>2</sub> O                                                                                                                                                               |
| <b>Bio-activity</b>   | Clotting assay                                                                                                                                                                                        |
| <b>Molecular Mass</b> | 72000                                                                                                                                                                                                 |
| <b>Purity</b>         | >95% by SDS-PAGE. NOT tissue/cell culture grade. Not tested for endotoxin.                                                                                                                            |
| <b>Characteristic</b> | Extinction coefficient: 14.4, Plasma concentration:100 µg/ml, Isoelectric point:4.4-4.9, Percent carbohydrate:0.1, Structure: single chain, NH <sub>2</sub> -terminal gla domain, two kringle regions |
| <b>Storage</b>        | -20°C                                                                                                                                                                                                 |

## GENE INFORMATION

|                        |                                                    |
|------------------------|----------------------------------------------------|
| <b>Gene Name</b>       | F2 coagulation factor II (thrombin) [ Bos taurus ] |
| <b>Official Symbol</b> | F2                                                 |
| <b>Synonyms</b>        | prothrombin; thrombin                              |
| <b>Gene ID</b>         | 280685                                             |
| <b>mRNA Refseq</b>     | NM_173877                                          |
| <b>Protein Refseq</b>  | NP_776302                                          |

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|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UniProt ID</b>          | P00735                                                                                                                                                                                                          |
| <b>Chromosome Location</b> | chromosome: 15                                                                                                                                                                                                  |
| <b>Pathway</b>             | Cell surface interactions at the vascular wall, organism-specific biosystem;<br>Complement and Coagulation Cascades, organism-specific biosystem; G alpha (q)<br>signalling events, organism-specific biosystem |
| <b>Function</b>            | calcium ion binding; fibrinogen binding; protein binding                                                                                                                                                        |

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