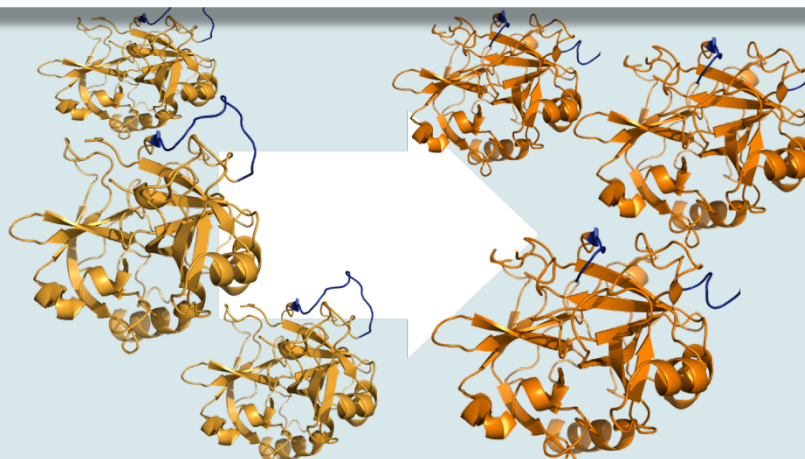


## Hemostatic drug & biochemical tool Recombinant autocatalytic human & murine thrombin

Priority date: November 4, 2011

Unique and stable recombinant Prethrombin-2 activated into autocatalytic  $\alpha$ -Thrombin in the presence of traces of natural Thrombin.



### Background:

$\alpha$ -Thrombin plays an important role in hemostasis and it is widely used in surgery to control minor bleeding. Other uses of  $\alpha$ -thrombin include sensitivity improvement of bioanalytical assays by exploiting its protease activity in a double amplification cascade with ecarin, contained in snake venom. Current sources for  $\alpha$ -thrombin are pooled human plasma and recombinant prothrombin, which is further activated by use of factor Xa or ecarin. However, health concerns associated to the potential presence of human viruses in the final product when the source is human plasma, or traces of ecarin or factor Xa following activation of recombinant prothrombin lead to expensive production processes. Therefore, a viable source of a stable prethrombin is highly sought.

### Technology:

The present invention provides recombinant mutant human and murine prethrombin-2 with autocatalytic activity. The product resulting from the activation of this proenzyme with thrombin, catalyzes the activation of the proenzyme in an autocatalytic activation process. The result is a rapidly spreading cascade of prethrombin conversion that results in an immediate effect associated to the thrombin activity. In the absence of thrombin or other activating agent, the proenzyme is completely stable.

### Example applications:

Hemostatic drug (surgery and minor bleeding);  $\alpha$ -Thrombin detection; Prothrombin detection in human plasma; biochemical tool (readout signal amplification in bioanalytical assays).

### References:

•Ana Virel, Laura Saa, and Valeri Pavlov. Quantification of Prothrombin in Human Plasma Amplified by Autocatalytic Reaction. Anal. Chem. 2012, 84, 2380–2387