

[Free Radical Biol. Med., 16, 501-507 (1994)]

[Lab. of Pharmaceutics]

**Internalization of human extracellular-superoxide dismutase by bovine aortic endothelial cells.**

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The high heparin-affinity subtype C of the secretory enzyme extracellular-superoxide dismutase (EC-SOD) mainly exists on the outside of endothelial cell surface in the vasculature. Radioiodinated recombinant EC-SOD C (r-EC-SOD C) bound to cultured bovine aortic endothelial cells (BAE cells). When incubated at 37°C for 1 h, <sup>125</sup>I-r-EC-SOD C was internalized by BAE cells. Much of internalized <sup>125</sup>I-r-EC-SOD C was degraded to low molecular weight peptides. These findings suggest that expressed EC-SOD is internalized, followed by being metabolized or recycled by endothelial cells. This process may contribute to the regulation of the EC-SOD concentration in vascular system and heparin-binding ability of this enzyme.

[Biochemistry, 33, 1843-1849 (1994)]

[Lab. of Pharmaceutics]

**Purification and characterization of bothrombin, a fibrinogen-clotting serine protease from the venom of *Bothrops jararaca*.**SACHIYO NISHIDA, YOSHIHIRO FUJIMURA, SHUJI MIURA, YUKIO OZAKI,  
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Bothrombin was purified from the venom of *Bothrops jararaca*. Bothrombin showed  $M_r$  values of 35000 on SDS-PAGE and specific fibrinogen-clotting activity. Unlike  $\alpha$ -thrombin, bothrombin split off fibrinopeptide A without releasing fibrinopeptide B. Several of the presence findings suggest that bothrombin binds to glycoprotein Ib on platelet initially. Bothrombin is composed of 232 amino acid residues and contains three Asn-linked oligosaccharide chains. The sequence is homologous to those of other serine proteases; in particular, batroxobin from the *Bothrops atrox moojeni* venom.

[Biochem. Biophys. Res. Commun., 201, 331-339 (1994)]

[Lab. of Pharmaceutics]

**A 28 kDa-protein with disintegrin-like structure (jararhagin-C) purified from *Bothrops jararaca* venom inhibits collagen- and ADP-induced platelet aggregation.**YOSHIKO USAMI\*, YOSHIHIRO FUJIMURA, SHUJI MIURA, HIROKO SHIMA,  
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A 28 kDa-protein with inhibitory activity on collagen- and ADP-induced platelet aggregation was purified from the venom of the snake *Bothrops jararaca*. Its complete amino acid sequence corresponded to the carboxyl-terminal region consisting of disintegrin-like and cysteine-rich domains of jararhagin, a high molecular weight hemorrhagic metalloprotease. Sequence homology of the protein to other disintegrins and disintegrin-like proteins from various snake venoms is also presented.