

A Promising Thrombolytic and Anticoagulant Serine Protease Purified from Lug Worms Inhabiting Tidal Flats

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Abstract : Ischemic stroke means the caused brain damage due to neurological defects, occurring occlusion of cerebral vascular resulting in thrombus or embolism. t-PA (tissue Plasminogen Activator) is the only thrombolytic agent passed the FDA (Food and Drug Administration). However, t-PA directly dissolves the thrombus (direct activity) through fibrinolysis, showing side effects such as re-occlusion. In this study, we evaluated the thrombolytic activities of the serine protease extracted from lugworms inhabiting tidal flats. The new serine protease identified as 38 kDa by SDS-PAGE was not toxic to brain endothelial cells line (hCMEC/D3). Also, the plasmin synthesis inhibition activity (indirect activity) of the new serine protease was confirmed through fibrin zymography assay and fibrin plate assay. It was higher than direct activity as compared to u-PA (urokinase Plasminogen Activator). The activities were found to be maintained at a wide range of temperature (4-70 °C) and pH 7-10 compared to previous thrombolytic agents from the azocasein assay. In addition, the new serine protease has shown anticoagulant activity from fibrinogenolytic activity assay. In conclusion, the serine protease in lug worms inhabiting the tidal flats could be considered a promising thrombolytic candidate for the treatment of ischemic stroke.

Keywords : alkaline serine protease, bifunctional thrombolytic activity, fibrinolytic activity, ischemic stroke, lug worms

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