Crystal structure of BmooMPalpha-I, a fibrin(ogen)olytic zinc-dependent metalloproteinase from *Bothrops moojeni* venom

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Snake venom metalloproteinases (SVMPs) are multimodular proteins that comprise a metalloproteinase domain (class PI), a disintegrin-like domain (class PII), a cysteine-rich domain (class PIII) and a C-type lectin-like domain (class PIV). These hemostatically-active toxins exhibit both anti- and coagulant activities due to the ability either to degrade fibrinogen and fibrin or to activate prothrombin and factor Xa. Based on these activities, the fibrino(geno)lytic non-hemorrhagic SVMPs can be used as thrombolytic agents, and prothrombinase and factor X-activating enzymes are already applied in coagulation research and diagnosis. Beyond clinical applications, the SVMPs can be explored as biochemical tools for molecular studies, biotechnology industry applications, studies of the action mechanism of venoms, design of metalloproteinases inhibitors and comprehension of other metalloproteinases features. In this work, we have determined at 1.75 Å resolution the crystal structure of BmooMPalpha-I, a fibrin(ogen)olytic zinc-dependent metalloproteinase from *Bothrops moojeni* venom using molecular replacement techniques. The refinement converged to a crystallographic residual of 17.9% (Rfree = 20.5%) and the final model displays good overall stereochemistry with RMSD values of 0.012 Å and 1.517° for bond lengths and bond angles, respectively. Our structural results dealing with its pharmacological activities could bring new insights into the molecular mechanisms and regulation of SVMPs.

Keywords: snake venom metalloproteinases, X-ray structure determination, structure-function relationship.

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