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Exploration of the antithrombotic effect of a C type lectin purified from Cerastes cerastes venom by protein-protein docking

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Fatah Cherifi1, Samah Saoud2, Fatima Laraba-Djebari3
1 Research Director, Department of Cellular and Molecular Biology, Faculty of Biological Sciences, University of Sciences and Technology Houari Boumediene, Algiers, Algeria.
2 Ph.D in Biochemistry-Immunology and Innovative Biotherapies, Department of Cellular and Molecular Biology, Faculty of Biological Sciences, University of Sciences and Technology Houari Boumediene, Algiers, Algeria.
3 Professor, Department of Cellular and Molecular Biology, Faculty of Biological Sciences, University of Sciences and Technology Houari Boumediene, Algiers, Algeria.
cherififatah@yahoo.fr

Abstract:
Background: Thromboembolic diseases are a major clinical problem due to their high prevalence and their often fatal consequences. In the present study, an anticoagulant galactoside binding C type lectin "Cc-Lec" was purified and characterized.
Methods: Cc-Lec was purified by affinity chromatography on a column of Sepharose 4B coupled with D-lactose. Its homogeneity was verified by SDS-PAGE and ESI-MS. Cc-Lec 3D structure modelization was achieved by homology to Convulxin a snake venom C type lectin. Cc-Lec anticoagulant effect was explored *in vivo* by i.p. administration to mice, *invitro* by native PAGE analysis and *in silico*by protein-protein docking approach.
Results: Cc-Lec is a *34 271,59 Da* protein, composed of 160 residues of amino acids for each subunit. Its 3D structure is organized into a homodimer cross-linked with a disulfide bridge and composed of three alpha helices and seven beta strands for each monomer. Cc-Lec functional characterization revealed a durable anticoagulant effect *in vivo* after 6 and 48h of i.p. administration to mice. This anticoagulant effect is mediated by interaction with FXa and FIXa as showed by native PAGE analysis. Moreover, protein-protein docking results reinforced this data and showed that Cc-Lec interacts with coagulation factors X and IX through their · -carboxyglutamic domains. The interaction with factors X and IX requires calcium or calcium and magnesium ions respectively.
Conclusion: The anticoagulant effect of Cc-Lec makes it a promising pharmacological target for the diagnosis and/or the therapy of the thromboembolic diseases.
Key words: C type lectin, Molecular docking, Anticoagulant, Coagulation factors, Treatment of thromboembolic diseases

1. Conflict of intereststatement

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2. Authors' biography

No Biography

3. References

No references