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Using Bioinformatics Analysis to Suggest Combating Anti- venom against the Palestinian Viper Snake

Hammam Rabai, Zina Omar, Maysam Khateeb, Jawaher Shojaei, Mohammad qabaja.

Faculty of Health Professions, Medical Laboratory, Al-Quds University, Palestine.

Background: Palestine viper venom is known to possess potent toxic effects and poses a significant risk to human health. Developing effective anti-venom is crucial for mitigating the consequences of envenomation. In this study, we aimed to propose anti-venom against Palestine viper venom through bioinformatics analysis and tools.

Methods: A comprehensive analysis was conducted using multiple databases and articles to gather relevant data on the venom and snake. PubMed and the Toxins Library were utilized for venom information, while enzyme sequences were obtained from the PDB database. Drug sequences were sourced from PubChem and DrugBank. Paymol software was used to detect the active sites of the enzymes, Autodock software facilitated drug-to-protein docking, STITCH enabled the assessment of drug- to-drug interactions, and SWISS Adem was utilized to evaluate enzyme toxicity.

Results: Our analysis identified three proteins as potential inhibitors for the four enzymes present in Palestine viper venom: azabicyclic carbamates showed inhibitory effects on snake venom metalloprotease (SVMP), snake venom serine protease (SVSP), phospholipase A2 (PLA2), and C-type lectin. Additionally, varespladib methyl exhibited specificity as an inhibitor for PLA2, and tirofiban demonstrated specificity as an inhibitor for C-type lectin. Importantly, the suggested drugs exhibited no toxicity in humans and

Correspondence concerning this article should be addressed to the mentioned authors at the mentioned institutes.

E-mail: research@admin.alquds.edu
Palestine, Abu Dis, Al-Quds University

had controlled side effects. Furthermore, no interactions were observed between the suggested drugs.

Conclusion: Based on our bioinformatics analysis, we propose three drugs as potential inhibitors for Palestine viper venom. Two plans were devised to develop appropriate anti-venom: Plan-A, utilizing one drug as an inhibitor for all four enzymes, and Plan-B, utilizing three drugs in single dose for the four enzymes. These findings provide valuable insights for the development of effective anti-venom against Palestine viper venom.

Keywords: Anti- venom, Palestinian viper snake, azabicyclic carbamates, varespladib methyl, tirofiban.

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