A Novel Pathway of Arachnid Immune System

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Introduction: A wide variety of organisms produce antimicrobial peptides as part of their first line of defense. This spider can live in different kind of ambient and it's regularly exposed to environmental contaminants. We found an antifungal peptide in the plasma of *Acanthoscurria rondoniae* named rondonin with antifungal activity, non-haemolytic, but the mechanism of action at a molecular level is not understood. Objectives: The objective of this study was verifying the citotoxicity, activity against human viruses and membrane interactions. **Methods:** Synthetic rondonin was obtained by China Peptides at degree 98%. This peptide was evaluated against *Candida albicans* MDM8 at different pH (4-8). Influenza, Measles and EMC viruses were used to determine the antiviral activity of rondonin. Virus titers were determinate by monitoring the cytopathic effect in an endpoint dilution assay. The citotoxic effects of the rondonin were assessed by using a standard VERO cell assay. In order to gather information about their mechanisms we performed fluorescence studies to evaluate if rondonin interact with model membranes. We used large unilamellar vesicles (LUV) composed of POPC and POPC:POPG 7:3 (mol/mol) to mimic mammalian and microbial membranes, respectively **Results and Conclusion:** According our results, rondonin has identity with C-terminus of subunit "D" of haemocyanin and suggests a novel pathway of arachnida's immune system by proteolytic cleavage of this protein like the first line of defense against infection from microorganisms. The antifungal activity was pH dependent against *C. albicans* with best result in acid pH, no citotoxic at 100 µM against VERO cells and antiviral activity against measles, influenza and EMC virus. This peptide not interacts with the model membranes, suggesting that mechanism of action probably is intracellular. These results led us understand why this animal can live in theses environment and survive for a long time without change in evolution.