

## New insights into antimicrobial peptides isolated from Brazilian natural sources

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### Abstract

The increasing rate of antimicrobial resistance and the diversity of resistant bacteria are two of the main explanations for research into the production of new antimicrobial drugs. Antimicrobial peptides (AMPs) represent an interesting alternative to commercial antibiotics due to factors such as their low toxicity to eukaryotic cells and specificity for microbial cell membranes. These factors are related to microbial membrane features and physical chemistry properties of the peptide, hinders the development of evasion mechanisms by the microorganism. Thus, our field of study on Butantan Institute is to identify AMPs from different natural sources, including chicken eggs, pineapple, garlic and invertebrates, such as kissing bugs, spiders, centipedes and scorpions among others. A wide broad of molecules have been isolated and had their antimicrobial potential confirmed. Serrulin from the scorpion *Tityus serrulatus*, Lacrain from the centipede *Scolopendra viridicornis*, Sarconesin from the fly *Sarconesiopsis magellanica* and Juruin from the spider *Avicularia juruensis* are some of the examples. Interestingly, during these studies we were able to identify different sources of AMPs. Some can be a result of intrinsic protein cleavage on the animal hemolymph, as Rondonin from *Acanthoscurria rondoniae*, others can be constitutively produced as part of the organism's defense, such as Tachykinin-related peptides 1 and 2 from *Triatoma infestans* and others can have their origin from food ingestion, might suffer degradation, be absorbed and still be active inside the insect, on the digestive tract or hemolymph, which are the case of two other recent works involving *T. infestans*, where it was proven that human Fibrinopeptide A with antimicrobial activity can be isolated from this insect's hemolymph, and that the cleavage of the hemoglobin ingested forms several antimicrobial peptides. Therefore, these molecules have relevant therapeutic potential representing an ideal alternative to the available antibiotics.



### Biography

Laura Lima Diniz has BSc degree (2013) in Biomedical Sciences from Federal University of Triangulo Mineiro and MSc degree (2016) in Biotechnology from University of São Paulo and Butantan Institute. Currently, she is Doctoral Student in Biotechnology, also from University of São Paulo and Butantan Institute, where she studies antimicrobial peptides isolated from *Triatoma infestans*. She has published 3 papers in reputed journals and is currently applying for a post-doctoral scholarship.

### Publications

Diniz LCL, Miranda A and da Silva PI Jr (2018) Human Antimicrobial Peptide Isolated from *Triatoma infestans* Haemolymph, Trypanosoma cruzi-Transmitting Vector. *Front. Cell. Infect. Microbiol.* 8:354. doi: 10.3389/fcimb.2018.00354

Diniz, L.C.L.; da Silva Junior, P.I. Hemoglobin Reassembly of Antimicrobial Fragments from the Midgut of *Triatoma infestans*. *Biomolecules* 2020, 10, 261.

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