Neuropeptides in *Rhodnius prolixus*.

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Knowledge of neuropeptide physiology in insects can provide tools for the design of peptidomimetics or pseudopeptides capable of disrupting physiological processes, to be developed as a novel generation of insecticides. Advances in mass spectrometry (MS) and related techniques allow the simultaneous identification of many peptides from an organism, revolutionizing insect endocrinology in the lasts years. Surprisingly however, a systematic screen for regulatory peptides in a disease vector insect had not been carried out so far. We have performed a peptidomic analysis of the brain of *Rhodnius prolixus*, one of the main vectors of Chagas Disease. This is the first comprehensive high throughput neuropeptidomic study of a disease vector to date. Performing online nanoLC-MALDI TOF- MS/MS analysis with subsequent *de novo* sequencing and database search, we have identified 42 novel neuropeptides from *R. prolixus*. From these, we have performed genetic and physiological studies with orcokinins, a novel family of peptides detected in only a few species, whose role in insect physiology has not been clarified so far. We describe orcokinin gen sequence in *R. prolixus*, determinate its presence in hemolimph by MS and study the pattern of orcokinin-like immunoreactivity in the nervous system. We have although studied the lethal effects of an orcokinin peptide inundation in *R. prlolixus* nymphs. The results suggest an important role of orcokinin in *R. prolixus* physiology, providing the firsts evidences of their expression in nervous ganglia and releasing to the hemolymph in insects. Our work provides useful information towards the annotation of genes in the ongoing *R. prolixus* genome sequence project, opens new paths of research in vector biology and in comparative and evolutionary studies of the neuroendocrine system.
Key Words: insect neuropeptides, orcokinins, *Rhodnius prolixus*