

## Identification and Characterization of a Novel Neurotoxin from *Phoneutria nigriventer* Spider Venom

Gomes, P.C.<sup>1,2</sup>; Silva-Filho, L.C.<sup>3</sup>; De Souza, B.M.<sup>1</sup>; Cesar-Tognoli L.M.M.<sup>1</sup>; Tormena, C.F.<sup>4</sup>; Rittner, R.<sup>4</sup>; Richardson, M.<sup>2</sup>; Cordeiro, M.N.<sup>2</sup>; Palma, M.S.<sup>1</sup>.

<sup>1</sup>Department of Biology, Institute of Biosciences, Laboratory of Structural Biology and Zoochemistry, São Paulo State University (UNESP), Rio Claro-SP, Brazil; <sup>2</sup>Research and Development Center, Ezequiel Dias Foundation (FUNED), Belo Horizonte-MG, Brazil; <sup>3</sup>Department of Chemistry, São Paulo State University (UNESP), Bauru, SP, Brazil; <sup>4</sup> Chemistry Institute, State University of Campinas, Campinas-SP, Brazil.

A large number of neurotoxins have been purified from the venoms of *Phoneutria* spiders. However, the non-proteic low molecular mass neurotoxins must be isolated and structural and functionally characterized. These toxins have an interesting potential in neurochemistry as tools for investigations of nervous system. The objective of present study was the structural and functional characterization of "Nigriventrine", a novel non-proteic low molecular mass neurotoxin, isolated from the hydrophilic fraction of *P. nigriventer* venom by (RP-HPLC) under gradient of acetonitrile. The structural elucidation was carried out with HRESIMS, ESIMS, ESI - MS/MS, <sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectroscopy. The toxin presented molecular of 422Da and was characterized as hydroxyl-hydrazylpiperidine. The biological characterization was performed by the i.c.v application of nigriventrine in rat brain, followed by the monitoring of the expression of c-fos protein and double-labeling immunohistochemistry. All doubly labeled neurons were associate to N-methyl-D- aspartate/subtype of ionotropic glutamate receptor (NMDA-NR1). The nigriventrine presented affinity mainly to cortical regions, which are linked to perceptions and the voluntary muscles control of the animals and may thus serve as an instrument for neurochemistry investigations areas and as model for the development of new drugs for the treatment of neurodegenerative diseases.

**Key Words:** *Phoneutria nigriventer*, Spider Venom, Low Molecular Mass neurotoxins, Spectroscopy, Neurochemistry.

Financial support: FAPESP, CAPES and CNPQ.