



Tipo	Periódico
Título	Box Jellyfish (Cnidaria, Cubozoa) Extract Increases Neuron's Connection: A Possible Neuroprotector Effect
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Programa/Curso (s)	Programa de Pós-Graduação Stricto Sensu em Ciências da Saúde
DOI	10.1155/2021/8855248.
Assunto (palavras chaves)	Box Jellyfish extract, Neuron, neurodegeneration
Idioma	inglês
Fonte	Título do periódico: BioMed Research International ISSN: 2314-6141 Volume/Número/Paginação/Ano: Article ID 8855248, p.1-12, 2021
Data da publicação	05 Mar 2021
Formato da produção	Impressa ou digital
Resumo	Neurodegenerative diseases are one of the major causes of death worldwide, characterized by neurite atrophy, neuron apoptosis, and synapse loss. No effective treatment has been indicated for such diseases so far, and the search for new drugs is being increased in the last years. Animal venoms' secretion/venom can be an alternative for the discovery of new molecules, which could be the prototype for a new treatment. Here, we present the biochemical characterization and activity of the extract from the box jellyfish <i>Chiropsalmus quadrumanus</i> (Cq) on neurites. The Cq methanolic extract was obtained and incubated to human SH-SY5Y neurons, and neurite parameters were evaluated. The extract was tested in other cell types to check its cytotoxicity and was submitted to biochemical analysis by mass spectrometry in order to check its composition. We could verify that the Cq extract increased neurite outgrowth length and branching junctions, amplifying the contact between SH-SY5Y neurons, without affecting cell body and viability. The extract action was selective for neurons, as it did not cause any effects on other cell types, such as tumor line, nontumor line, and red blood cells. Moreover, mass spectrometry analysis revealed that there are no proteins but several low molecular mass compounds and peptides. Three peptides, characterized as cryptides, and 14 low molecular mass compounds were found to be related to cytoskeleton reorganization, cell membrane expansion, and antioxidant/neuroprotective activity, which act together to increase neuritogenesis. After this evaluation, we conclude that the Cq extract is a promising tool for neuronal connection recovery, an essential condition for the treatment of neurodegenerative diseases.
Fomento	(FAPESP) Fundação de Amparo à Pesquisa do Estado de São Paulo ; (GSK) GlaxoSmithKline ; (CNPq) Conselho Nacional de Desenvolvimento Científico e Tecnológico