MESTRADO EM Ciências do Mar
Temas de Dissertação
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TÍTULO	**Can Microalgae Fight Human Neurodegenerative Disorders?**
RESUMO	
	The incidence of neurodegenerative disorders (NDs), such as Parkinson's disease (PD), is expected to increase in the coming years, due to the progressive aging of the population. This pathology is responsible for cognitive impairment, morbidity and mortality. The etiology of PD remains unknown; however, dopaminergic (DA) neuron death during PD progression has been associated with oxidative stress, mitochondrial dysfunction, neuroinflammation, and apoptosis. Despite the latest scientific advances, the drugs used to treat PD are not effective in controlling or blocking its development. It is therefore crucial to discover and develop innovative medicines. Some species of Dinoflagellates produce biotoxins with impacts on human health. Recent work on the potential pharmacological activities of these bioactive compounds has revealed promising applications, such as analgesics, antitumor and anti-inflammatory. However, investigation into derived bioactive compounds, including exopolysaccharides (EPS) and dinoflagellate biotoxins, for the development of neuroprotective agents has been neglected in the biodiscovery pipeline. As such, the main objective of this project will consist of evaluating the neuroprotective activities of components derived from two dinoflagellates that produce distinct groups of toxins and metabolites: *Protoceratium reticulatum* and *Gymnodinium catenatum*. Prior knowledge in the following aspects is advisable, but not mandatory: • Theoretical and practical knowledge on maintenance and cultivation of microalgae. • Basic knowledge of extraction and fractionation processes. • Theoretical and practical knowledge for maintenance and cultivation of animal cells. Work plan: 1. Cultivation of marine microalgae with known bioactivity; 2. Extraction, fractionation and isolation of compounds of interest (exopolysaccharides, toxins, secondary metabolites) by chromatography techniques (TLC, VLC; preparative column chromatography; HPLC); 3. Assessment of cytotoxic activity in the SH-SY5Y cell line; 4. Assessment of neuroprotective activity in a cellular model (SH-SY5Y) induced with 6-hydroxy-dopamine; 5. Study of intracellular signaling pathways associated with the processes of oxidative stress, apoptosis, and the NF-kB pathway.
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