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21780 | Neuroprotective effects of cyanobacterial extracts

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Background & Aim: Neurodegenerative diseases (ND), namely Alzheimer's disease (AD) affects millions of people worldwide. Despite their high incidence there is still no effective medical therapy [1], [2]. Cyanobacteria have been in the frontline of the search for therapies for ND [3]. Several in silico, in vitro, and in vivo studies have provided support for the neuroprotective potential of cyanobacterial natural products, particularly in AD [4], [5]. In this context, the aim of this work was to screen cyanobacterial strains from the Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC) for its anti-AD potential. **Methods:** 10 cyanobacterial strains (LEGE CC 06072, 06131, 06155, 06361, 07168, 07175, 07189, 11394, 11439, 16525) were cultivated and their dry biomass was extracted and fractionated by reverse-phase HPLC resulting in 8 fractions per strain [6]. Fractions were evaluated for their ability to inhibit enzymes associated with AD pathogenesis, such as acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE), using Ellman's colorimetric method. In addition, their cytotoxicity was assessed against three cell lines, two of them related to the nervous system. The neuroblastoma cell line SH-SY5Y, usually used as model for neurotoxicity studies and the human cerebral microvascular endothelial cell line hCMEC/D3, representative of the blood-brain barrier. The mouse fibroblast cell line 3T3-L1 was used as a representation of the conjunctive tissue. Cell viability was measured after 24 and 48 hours using the MTT assay. **Results:** The fractions did not shown cytotoxicity against the cell lines used. The preliminary results regarding enzyme inhibition were not promising, with less than 30% inhibition. **Conclusions:** Our preliminary suggest that further confirmation tests need to be performed on the AD related enzymes (AChE and BuChE), and the study should be extended to include other cyanobacterial strains.

Keywords: Cyanobacteria, Neurodegenerative Diseases, Acetylcholinesterase, Butyrylcholinesterase.

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