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Antioxidant activity of Bios-p peptide analogue in HEK293T cells and three-dimensional structure prediction

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ABSTRACT

Studies had indicate that excessive production of reactive oxygen species (ROS) affect cellular signaling pathways, which is associated with pathological and physiological conditions such as cancer, diabetes and neurodegenerative diseases In this context, our laboratory has obtained the Bios-p, a ROS modulator, peptide analogue by sequencing from the seed of *Bauhinia bauhinoides*, which represents the active 12-amino acid, obtained from the inhibitor BbKI protease and we predicted the three-dimensional structure of Bios-p analogue peptide using homology modeling, being patented by the working group of Dr. Maria Luiza Vilela Oliva of UNIFESP, Brazil (a member of our cluster). The protective effect on the viability and antioxidant capacity of Bios-p was studied in HEK 293T cells under oxidative stress induced by hydrogen peroxide (H₂O₂) using SYTOXGREEN/DHE and luminescence assay. The three-dimensional structure of Bios-p peptide analogue was predicted by homology-based modeling using Modeller9v8. The pretreatment with different concentrations of Bios-p (1 µM - 10 µM) showed an increase of 53.83% ± 3.86% the cellular viability in under oxidative stress compared to control. Furthermore, the results to indicate that HEK293T cells by incubating for 24 h with Bios-p shown a significant decreased of basal extracellular ROS on total cell population in 89.67% ± 0.76%, compared to control in the absence of the analogue. Similarly it is observed that Bios-p has a significant antioxidant effect on extracellular ROS production when cells are subjected to oxidative stress induced by 200 µM H₂O₂ in 64.37% ± 4.63%, compared to control in absence of H₂O₂ and Bios-p. These results suggest that Bios-p has potential as antioxidant agent in cells HEK293T under H₂O₂-induced oxidative stress and that can protect the cells viability as concentration-dependent, and we propose a new biotechnological tool for modulate the ROS production.

KEYWORDS

Antioxidant; Bios-p; *Bauhinia bauhinoides*

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