The relevance of the protease cleavage site in generation of bioactive peptides: In silico and in vitro approaches

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Introduction: Proteases are biocatalysts that hydrolyze polypeptides into peptides and/or amino acids. Each enzyme has specificity to substrate and cleavage site, these characteristics influence the product sequence and consequently the potential application. The proteases have been used to obtain peptides from food proteins, these products can present biological activities such as antioxidant, antitumor, antimicrobial and anti hypertensive and currently the main source of peptides are milk proteins.

Aim: The aim of this work was to evaluate the correlation between inhibitory activity of angiotensin converting enzyme of peptides from casein in vitro and in silico.

Methodology: The peptide sequences were predicted based on the relation between the specificity of the microbial protease secreted by Myceliophthora thermophila and the possible hydrolysis of casein sodium salt. The found sequences were analyzed according to their activities in the literature by BIOPEP.

Results: For in silico analysis the peptide sequences considered were until 20 amino acids. Trypsin generated more peptides than microbial protease from Myceliophthora thermophila, among these peptides 32.4% (trypsin) and 15.2% (microbial protease) presented inhibitory activity of angiotensin converting enzyme. In vitro analysis of the peptides from the hydrolysis of casein by trypsin also presented more promising results than microbial protease with twice of the inhibitory potential.

Conclusion: According to the results, in silico and in vitro approaches showed a correlation when considered the inhibitory activity of angiotensin converting enzyme.

Biography
Youssef Ali Abou Hamin Neto has completed his Master of Science from the Faculty of Pharmaceutical Sciences of Ribeirão Preto (2012) and graduate degree in Pharmacy from the Federal University of Alfenas (2009). He is currently pursuing PhD in Pharmaceutical Sciences at the concentration area of Natural and Synthetic Products under the guidance of Professor Dr. Hamilton Cabral, Faculty of Pharmaceutical Sciences of Ribeirão Preto of University of São Paulo.

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