

JOINT EVENT

22nd Global Congress on **Biotechnology**&
5th International Conference on**Enzymology and Protein Chemistry**

February 28-March 02, 2019 | Berlin, Germany

Engineered Erwinase with possible fewer adverse effects for treatment of acute lymphoblastic leukemiaIris Munhoz Costa, Débora Custódio Moura, Adalberto Pessoa Jr. and Gisele Monteiro
University of Sao Paulo, Brazil

Acute lymphoblastic leukemia (ALL) is the most frequent neoplasm in children and adolescents. Treatment of the disease is performed with L-asparaginase (ASNase), an enzyme obtained from the bacteria *Escherichia coli* and *Erwinia chrysanthemi* (Erwinase). ASNase hydrolyzes L-asparagine and prevents tumor cells from obtaining this amino acid from the bloodstream for protein synthesis, leading to ALL cell death by apoptosis. However, both formulations are associated with a high rate of adverse effects as the production of anti-asparaginase antibodies and hypersensitivity, which compromise the efficacy of the treatment. The development of mutant proteoforms from commercially available bacterial enzymes may contribute to the development of an enzyme with lower adverse effects. Therefore, we created a mutant library using the ASNase of *E. chrysanthemi* by error prone PCR, and a double mutant proteoform (DM) presented higher specific activity for L-asparagine and a 30% increase in the *k_{cat}* in relation to the wild-type (WT) enzyme. In addition, DM enzyme showed less recognition by anti-asparaginase antibodies and is able to kill the same amount of ALL cell line MOLT-4 than WT enzyme, using a smaller amount of protein. The results indicated that the DM enzyme has cytotoxic potential and may have fewer adverse effects.

Biography

Iris Munhoz Costa is a PhD student in the graduate program in Pharmaceutical Technology-Biochemistry in the School of Pharmaceutical Sciences at University of São Paulo. She works with biopharmaceutical research for the treatment of acute lymphoblastic leukemia. She has obtained her Master's degree in Pharmaceutical Technology-Biochemistry at University of São Paulo in 2015; Graduation in Pharmacy and Biochemistry at Universidade Paulista in 2012. She was a student of scientific initiation in the Department of Pharmaceutical Biochemical Technology in the Faculty of Pharmaceutical Sciences at the University of São Paulo in the area of molecular biology and antioxidant response in 2011.

iris.munhoz@hotmail.com

Notes: