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Mathematical modeling of purified L-asparaginase activity from axenic cultures of *Actinobacteria* isolated from the Arauca River bank

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Enzymes of microbial origin have been proven to be useful in different fields such as medicine and the food industry. L-asparaginase, of microbial origin is an amidohydrolase enzyme, which catalyzes the conversion of L-asparagine to aspartate and ammonium cation. L-asparaginase is known as an anti-cancer agent, which prevents the proliferation of tumor cells by decreasing the level of asparagine in the blood. This enzyme has been shown to be a form of treatment for acute lymphocytic leukemia (ALL), extracted from *E. coli* and *Erwinia chrysanthemi*, which have a high commercial value and multiple side effects due to L-glutaminase activity produced by them. In this research, 25 Streptomyces isolated from the Arauca River bank (Equatorial zone, Colombia) with L-asparaginase activity were found by the Nessler method. Studies have shown that Streptomyces, in addition of being a source of easy access and production, produce L-asparaginase with less or none L-glutaminase activity. Streptomyces isolated were identified morphologically and molecularly. Plackett-Burman design established that at 30 °C, 200 rpm, pH 7, lactose (1%) and malt extract/asparagine (0.15%) were the best conditions for the fermentation of the isolates and enzyme production. This enzyme secreted in the medium will be purified by dialysis, lyophilization and ion exchange chromatography to establish a mathematical model to simulate the effect of the substrate, pH and temperature on L-asparaginase activity.

Biography

Estefania Arevalo-Tristancho is currently pursuing Master's degree in Design and Process Management with emphasis on Bioprocesses.

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