

Studies on anti-neoplasic enzyme: enhanced L-asparaginase activity by filamentous fungus from the Brazilian Savanna using Plackett-Burman Design for screening of culture medium variables

Marcela Medeiros de Freitas[1], Paula Monteiro Souza[1], Samuel Cardoso[1], Edilvaldo Ximenes[2], Adalberto Pessoa[3] and **Pérola Magalhães[1]**

[1]Department of Pharmacy, University of Brasília, Campus Darcy Ribeiro, Asa Norte, 70910-900 Brasília, Brazil

[2]Department of Cellular Biology, University of Brasília, Campus Darcy Ribeiro, Asa Norte, 70910-900 Brasília, Brazil

[3]Department of Pharmacy, University of São Paulo, Av. Professor Lineu Prestes 580, Butantã, 05508-000 São Paulo, Brazil

L-asparaginase is an enzyme used for treatment of Acute Lymphoblastic Leukemia (ALL) in children. Neoplastic cells cannot synthesize L-asparagine unlike normal cells due the absence of L-asparagine synthetase; therefore they obtain the required asparagine from circulating pools. It is important to find new sources of L-asparaginase producing microorganisms that can avoid adverse effects obtained from bacterial L-asparaginase, such as anaphylactoid reactions. Screening and selection of the fungi and optimum concentration of the medium component are very important to determine the overall economic feasibility of the production process. Therefore, the purpose of this study was to evaluate the important variables that influence L-asparaginase activity by a filamentous fungus isolated from the Brazilian Savanna soil. Eleven independent variables were considered to evaluate their effect on L-asparaginase activity by a filamentous fungus (DCFS10) in submerged fermentation. The different variables were prepared in two concentration levels, (-1) low level and (+1) high level. L-asparaginase activity was assayed by measuring the amount of aspartate hydroxamate produced from asparagine and hydroxylamine according to Drainas et al. (1977). The results obtained from PBD showed a wide range of L-asparaginase activity, from 0.5 U/g ± 0.018 to 6.5 U/g ± 0.284. Studies are being conducted in order to purify L-asparaginase produced in this culture medium. This study showed that the screening of culture medium variables using Plackett-Burman Design increased L-asparaginase activity of a filamentous fungus isolated from the Brazilian Savanna soil as a potential novel anti-leukemic source from eukaryote cell.

Biography

Pérola Magalhães is Associate Professor of the Pharmacy Department at University of Brasília, Brazil. She holds degrees in Pharmacy from the University of the Alfenas and her PhD in 2005 (University of São Paulo). Completed her postdoctoral studies from Biochemical Pharmaceutical Technology at the University of São Paulo (2007). Realize research project linked at prospecting biomolecules of pharmacological interest derived from microorganisms and plant species (supported by National Council for Scientific and Technological Development and Ministry of Science and

Technology). She has published more than 37 papers in reputed journals. Today coordinates the Natural Products Laboratory of the Brasilia University.

Presenting author details
Full name: Pérola Magalhães
Contact number: +55 61 31071806
Session name/ number: Cancer Drugs
Category: (Oral presentation/ Poster presentation): Poster