Candida biofilms: development, architecture and perfusion of antifungal agents

Subha TS[1], A.Gnanaman A[2], Biswas AK[3], Sekaran G[3].

[1]Bharathi Women's College, Microbiology Division, Environmental Technology

[2]Central Leather Research Institute

[3] Indian statistical Institute, Chennai, India.

From International Conference on Biosciences- Trends in Molecular Medicine.

Post Graduate Department of Biochemistry, Dwaraka Doss Goverdhan Doss Vaishnav College, Arumbakkam, Chennai 600 106, India. 7-8 February 2012.

American J of Bio-pharm Biochem and Life Sci 2012 March, Vol. 1 (Suppl 1): A49.

ABSTRACT

The paper describes development of biofilm by Candida albicans on fifteen different clinically important substrate materials. The substrate material was characterised for its physical properties. Upon adherence to the substrate materials, candida albicans develops into biofilm. Substrates were grouped on the basis of their adherence promoting nature as measured by five different parameters namely biomass- fresh weight, dry weight, colony forming units, growth OD and metabolic activity, using cluster analysis. Effects of five drugs on Candida Biofilms grown on fifteen substrate materials were compared amongst each other. The combinations of substrate materials and drugs were analysed and it was found that in certain drug-substrate combinations there is a reduction in biofilm growth, however complete lysis of the biofilm was not encountered. The perfusion studies reveal that none of the drugs were able to perfuse through biofilms completely. Reason behind such non-perfusing nature of biofilm was further investigated through CLSM studies. The results illustrate presence of "wafer" type of biofilm formation with continuous "-cells-matrix-cells-matrix-cells-"layering in biofilm. This layer forming mechanism of biofilm could be one of the reasons for non-perfusion of drugs.

Published: 1 March 2012.