In vivo pathogenicity of *C. albicans* exposed to sublethal conditions of photodynamic inactivation

I.T. Kato*, R.A. Prates, and M.S. Ribeiro

Center for Lasers and Applications, IPEN-CNEN/SP
Av. Prof. Lineu Prestes, 2242 - Cidade Universitária - São Paulo - SP - 05508-000 – Brazil
** phone: + 55 11 3133-9197, fax: + 55 11 3132-9374, e-mail: itkato@usp.br*

Photodynamic therapy has been proposed to treat infections using a light source, mostly lasers, associated whith a photosensitizing drug. Although high rates of killing effects have been demonstrated *in vitro*, variables of *in vivo* infection are potential obstacle for total microorganism inactivation when this therapy aims to treat human disease. In this study, we tested the hypotesis that *Candida albicans* exposed to sublethal conditions of photodynamic inactivation may exhibited transitorily altered virulence characteristics that could change an infection process. *C. albicans* (ATCC 90028) were exposed to sublethal photodynamic parameters and were submitted to germ tube formation analysis and *in vivo* pathogenicity assay. Yeasts viability curve was determined using 100μM methylene blue as photosensitizer, associated with a diode laser irradiation (λ=660nm). Time of exposure from 2 to 6 min were evaluated with out-put power of 30 mW, which generates fluences from 12 to 36J\cm². Parameters of irradiation that promoted no reduction of the viable cells were chosen as sublethal condition. Following PDT, *C. albicans* were incubated in calf serum to induce germ tube formation. A mice model of hematogenously disseminated candidiasis was used for investigating the pathogenesis alterations caused by photodynamic effect. Fourteen female BALB/c were injected in the lateral caudal vein with 0,1mL containg aproximatly $2x10^6$ cells. Animal survival was evaluated every day. Germ tube formation was significantly reduced in *C. albicans* treated with PDT, when compared to untreated cells. In adittion, mice infected with sublethal PDT treated cells survived for a longer period of time than mice infected with untreated cells. Exposure to sublethal condition of photodynamic inactivation reduced germ tube formation and *in vivo* pathogenicity of *C. albicans*.