

Antifungal Photodynamic Efficacy of Benzo[a]phenoxazinium Chlorides against *Candida albicans* Biofilms (Poster 13)

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Introduction and aims

The use of photodynamic therapy (PDT) as a new approach to treat localized *Candida* infections is an emerging and promising field. The aim of this study was to verify the photodynamic efficacy against *Candida albicans* biofilms of two new benzo[a]phenoxazinium photosensitizers, *N*-[5-(3-hydroxypropylamino)-10-methyl-9*H*-benzo[a]phenoxazin-9-ylidene]ethanaminium chloride (FSc) and *N*-(5-(11-hydroxyundecylamino)-10-methyl-9*H*-benzo[a]phenoxazin-9-ylidene)ethanaminium chloride (FSd).

Methods

C. albicans biofilms previously formed were incubated in the dark with both photosensitizers in the range of 100-300 μM for 3 or 18 h followed by illumination at fluences of 12 or 36 J cm^{-2} , using an arc xenon lamp and a bandpass filter (600 \pm 2 nm). The cellular viability was determined by counting colony forming units. Dye absorption by the biofilm matrix and cells during dark incubation was also evaluated by spectrofluorimetric analysis (λ_{ex} =590 nm; λ_{em} =645 nm) of the resulting supernatants and lysates of resuspended pellets, respectively, as well as by fluorescence microscopy.

Results and Discussion

FSc was highly effective against *C. albicans* biofilms, whereas FSd showed no inactivation effect in all conditions tested. For 18 h of dark incubation with fluence of 36 J cm^{-2} , FSc at 300 μM showed a total photoinactivation of *C. albicans* biofilms. Spectrofluorimetric analysis and fluorescence microscopy assays indicated that the differences in efficacy of FSc over FSd and the increasing of its effectiveness with incubation time are due to a higher dye absorption by the biofilm matrix and cells. In summary, data suggests that FSc-mediated PDT might be used to treat *Candida* infections.

Keywords: Photodynamic therapy, *Candida albicans*, Benzo[a]phenoxazinium chlorides