

“The objective of this study was to clarify the antifungal properties of cerium, a lanthanide member, against *Candida* species” Silva-Dias et al (2015).

Reference:

Silva-Dias, A., Miranda, I.M., Branco, J., Cobrado, L., Monteiro-Soares, M., Pina-Vaz, C. and Rodrigues, A.G. (2014) In vitro antifungal activity and in vivo antibiofilm activity of cerium nitrate against *Candida* species. *The Journal of Antimicrobial Chemotherapy*. January 3rd. .

Preventing the formation of biofilm-associated CVAD infections [#ivteam](http://ctt.ec/7Ua5W+@ivteam)

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Abstract:

OBJECTIVES: The objective of this study was to clarify the antifungal properties of cerium, a lanthanide member, against *Candida* species. A comprehensive study with planktonic and sessile cells was performed. The ability of cerium nitrate (CN) to impair in vitro and in vivo biofilm formation was evaluated and its potential use in biofilm treatment was also evaluated.

METHODS: Forty-eight clinical isolates of different *Candida* species and the type strain ATCC 90028 were tested according to the protocol M27-A3. The MICs and minimum lethal concentrations were determined. A time-kill assay was performed and a cytometric kinetic study was performed using live/dead markers. Biofilm inhibition and biofilm susceptibility in the presence of cerium was evaluated by quantification of the biofilm metabolic activity and total biomass with XTT and crystal violet assays, respectively. CN in vivo efficacy as a coating for medical indwelling devices was evaluated for the first time for *Candida parapsilosis*, using a mouse subcutaneous foreign body model using polyurethane catheter segments. Scanning electron microscopy was used to assess biofilm architecture after CN treatment.

RESULTS: The MICs for planktonic cells correlated with severe cellular metabolic activity impairment and membrane damage after 3 h of incubation. Moreover, CN efficiently prevented biofilm formation both in vitro and in vivo in segments of polyurethane catheters. At higher concentrations, it was also able to disorganize and almost eradicate preformed

biofilms.

CONCLUSIONS: Our results strongly suggest that CN application in the clinical setting might be effective in preventing the formation of biofilm-associated infections, namely through catheter coating and ultimately as an antimicrobial lock therapy.

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