

## 57. Effect of silver nanoparticles against *Candida albicans* and *Candida glabrata* biofilms

*Douglas Roberto Monteiro*<sup>1,2</sup>, *Sônia Silva*<sup>1</sup>, *Melyssa Negri*<sup>1</sup>, *Emerson Rodrigues de Camargo*<sup>3</sup>, *Rosário Oliveira*<sup>1</sup>, *Mariana Henriques*<sup>1</sup>, *Débora Barros Barbosa*<sup>2</sup>

<sup>1</sup>*Institute for Biotechnology and Bioengineering, Universidade do Minho, Campus de Gualtar 4710-057, Braga, Portugal*

<sup>2</sup>*Department of Dental Materials and Prosthodontics, Araçatuba Dental School – UNESP, Araçatuba/São Paulo, 16015-050, Brazil*

<sup>3</sup>*Exact Science and Technology Center, Federal University of São Carlos – UFSCar, São Carlos/São Paulo, 13565-905, Brazil*

**Objectives:** Fungal infections in immunocompromised patients have been contributing to the increasing morbidity and mortality of these patients, especially associated to yeast resistance to antifungal therapy. The increase in antibiotic-resistant microorganisms has prompted interest in the use of silver as an antimicrobial agent. Thus, the aim of this study was to evaluate the antifungal efficacy of silver nanoparticles against *Candida albicans* and *Candida glabrata* biofilms.

**Methods:** Spherical nano-silver (average diameter 5nm) particles were synthesized by silver nitrate reduction with sodium citrate. Minimal inhibitory concentration (MIC) tests were performed for *C. albicans* (n=2) and *C. glabrata* (n=2) grown in suspension using the microbroth dilution method. Silver nanoparticles were applied on adhered cells (2 h) or biofilms (48 h) and after 24h biofilms were characterized by colony forming units (CFUs) enumeration and total biomass quantification (using crystal violet staining).

**Results:** Interestingly, *C. glabrata* MIC values were higher (0.4 – 3.3 µg/mL) than *C. albicans* (0.4 – 1.6 µg/mL). Furthermore, the results obtained revealed that silver nanoparticles were more effective in reducing 24h biofilms' biomass when applied onto adhered cells (2h) than on pre-formed biofilms (48h), with the exception of *C. glabrata* clinical isolate, which in both cases had a reduction around 90%. Regarding cell viability, silver nanoparticles were highly effective on adhered *C. glabrata* (reduction of around 70%) and respective biofilms (reduction of around 50%). On *C. albicans* the effect was not so notorious but there was also a reduction on the number of biofilm viable cells.

**Conclusion:** Silver nanoparticles have great potential to be an effective alternative to antifungal agents for future therapies in *Candida* infections.