

Fungi provide tools to fight clinical pathogens using an eco-friendly method

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### **Abstract:**

Nosocomial infections are a threat to hospitalized patients and the advent of antimicrobial resistance has aggravated this scenario. In this presentation, you will learn how proteins secreted by *Bionectra ochroleuca* and *Aspergillus tubingensis* fungi were employed to synthesize silver nanoparticles (AgNP) that presented excellent antimicrobial properties. Using an eco-friendly approach, we obtained nanoparticles that proved effective against *S. aureus*, *E. coli* and several clinically relevant *Candida* strains. The nanoparticles' characterization was carried out using several methods, such as dynamic light scattering (DLS), transmission electron microscopy (TEM), and gel electrophoresis. Further experiments revealed that cotton and polyester fabrics impregnated with AgNP also exhibit antimicrobial properties against such pathogens, reaching up to 100% bacterial inhibition. The proteins capping the nanomaterial were identified, providing more insights into the mechanism of metal reduction. Recently, investigations on the nanoparticles' interaction with *Bacillus subtilis* biofilm showed inhibition over 70% at 8  $\mu\text{M}$ . These results pave the way for the exploration of biological nanoparticles in clinical applications. We propose the material to be used as a means to prevent and /or decrease hospital-acquired infections.

### **Biography:**

Alexandre Gomes Rodrigues received his BSc in pharmacy in 2011 in Brazil. He expanded his interests into biotechnology and completed his MSc in an interdisciplinary project involving fungal proteins and metallic nanoparticles at Sao Paulo University. In 2014 he moved to Germany to pursue his PhD in pharmaceutical technology at Martin-Luther-University. His research interests cover the fields of pharmaceutical technology, biomaterials, and biotechnology. He has published scientific peer-reviewed articles and book chapters and has participated in international congresses and conferences in biotechnology and pharmaceuticals.

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