Fungal silver nanoparticles

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Due to the outbreak of infectious diseases caused by different pathogenic microorganisms and the development of drug resistance, nanoscale materials have emerged up as novel antimicrobial agents. Nanomaterials can be synthesized by conventional chemical methods, but most of them are regarded as highly environmental cost. Generally, the chemical methods are low-cost for high volume; however, their drawbacks include contamination from precursor chemicals, use of toxic solvents, and generation of hazardous by-products. Development of reliable and eco-friendly processes for synthesis of metallic nanoparticles is an important step in the field of application of nanotechnology. Also the importance of bactericidal nanomaterials study due to the increase in new resistant strains of bacteria and fungi against most potent antibiotics has promoted research in the well known activity of silver ions and silver-based compounds [1]. For this reason, there is an essential need to develop environmentally benign procedures for synthesis of silver nanoparticles for commercialization purposes.

In relation to other microorganisms fungi present key characteristics such as tolerance and metal bioaccumulation abilities that are advantageous for production of nanoparticles. In this study, silver nanoparticles were synthesised extracellularly from silver nitrate using the fungi supplied by Micoteca da Universidade do Minho (MUM) fungal culture collection, and the morphology of the nanoparticles was characterised The potential to manipulate key parameters, which control growth and other cellular activities, to achieve an optimised production of nanoparticles were also investigated. In addition, a preliminary study was performed to assess the anti-fungal silver nanoparticles activity against bacteria.

[1] Monteiro DR, Gorup LF, Takamiya AS, Ruvollo-Filho AC, de Camargo ER, Barbosa DB “The growing importance of materials that prevent microbial adhesion: antimicrobial effect of medical devices containing silver”, *Int. J. Antimicrob. Agents* (2009) **34**: 103–110.