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ABSTRACT

In this PhD thesis LCLB56_AgCs, CGG11n_BioAgNPs and HGG1 6n_BioAgNPs, silver nanoparticles synthesized by different bacterial strains (*Lactococcus lactis* LCLB56, *Streptacidophilus sp.* CGG11n and *Streptacidiphilus dr.* HGG16n) were investigated. A new safe and inexpensive source of bioactive silver composites was developed. Moreover, the obtained silver composites were characterized by various physico-chemical techniques and investigated for their antimicrobial activity and cytotoxicity. The high efficacy and low cytotoxicity of LCLB56 silver composites were demonstrated. This work presents interest for future since problems such as skin, throat or ear infections are continuously increasing and combating the phenomenon of drug resistant bacteria, thus the result of mold body is urgently needed.

Primary, the presence of silver biocolloids was proved by EA, EDX and ICP-MS methods. Size distribution analysis was carried out by Dynamic Light Scattering methods. The organic surface was registered in MIR range as well as MALDI TOF MS technique. The size distribution and morphology of silver nanoparticles were done using Transmission electron microscopy and Scanning electron microscopy in tandem with EDX detector. Fluorescence resonance energy transfer processes and electron transfer of silver biocolloids have been measured by Spectrofluorometer technique. Characterization aspects of silver composites based on dynamic light scattering was performed in tandem with asymmetric flow field-flow fractionation (AF-FFF) coupled with UV-MALLS-DLS detectors; in order to received deeper and complimentary information of silver biocolloids.

Finally, bioassays applied for evaluation of the antimicrobial and cytotoxic effect of silver biocomposites prove the synthesized bioactive silver composites as a new potential agent against Gram(+) and Gram(-), specially for drug-resistant strains of bacteria, as demonstrated in the results assessed by flow cytometry, fluorescence microscopy and agar diffusion assays. These conclusions are particularly relevant for biomedical applications since it reported drug resistance, environmental problems and size-dependent cytotoxicity.