Contribution ID: **37** Type: **Oral presentation**

Chitosan hydrogel based on silver nanoparticles-nanocomposites for tissue engineering applications

Thursday, 7 March 2024 12:15 (15 minutes)

Silver nanoparticles are metallic particles with versatile properties and applications. Nowadays, the need of alternative methods for infections, such as hydrogels dressings, is imperative since drugs or antibiotics are not accessible for every patient. Therefore, hydrogels based on natural polymers, such as chitosan and silver nanoparticles are evolving due to their high biocompatibility and their easy production as solutions in tissue engineering.
The aim of the current research was to develop an affordable medical biomaterial for antibacterial applications due to the high percentage of deaths reported in last years caused by bacterial infections.
Therefore the hydrogel proposed was chemically synthesized in the laboratory using a matrix based on 3% chitosan in which silver nanoparticle nanocomposites were integrated. The nanocomposites were characterized for structural and dimensional analysis using techniques such as UV-VIS spectroscopy or DLS and once their nanometric dimensions were confirmed, they were integrated in the hydrogel matrix. The microscopy performed proved the integration of particles in gel's layers, therefore the hydrogel can be considered a potential alternative method for antibacterial purposes since it is an affordable and comfortable medical device.

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Session Classification: The role of life sciences in an increasingly aging society

Track Classification: General sessions: Role of life sciences in an increasingly aging society