Stabilized silver nanoparticles with carboxylate groups: effect of stabilization, generation of reactive oxygen species (ROS) and antibacterial activity

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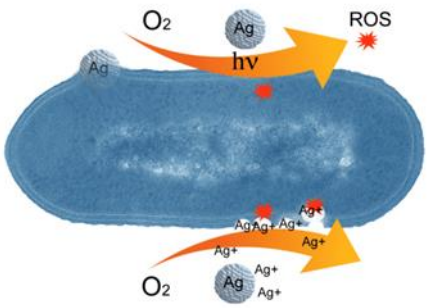

Figure 1. Antibacterial activity of Silver Nanoparticles against *E. coli* bacteria.

Since ancient times, silver ions have been known to be effective against a broad range of microorganisms, but in the last decade this metal has been greatly studied as nanosized metallic particles because of their antimicrobial capability against a wide range of bacteria, viruses, and fungi. From this perspective, silver nanoparticles have also found diverse applications in wound dressings, coatings for medical devices, creams, impregnated textile fabrics, etc.
Most studies have determined that the antimicrobial activity of silver nanoparticles is governed by their size, shape, and capping agent.
A series of silver nanopaticles coated with carboxylic ligands was studied in our group[1,2]. The antibacterial activity of the AgNPs was evaluated over time, in the presence and absence of light and against *Staphylococcus aureus*.
The results showed that caping agents can play an important role in the antibacterial capacity through the formation of reactive oxygen species such as superoxide anion, the control of the size of the AgNPs and additionally in the stability over time.

References

[1] Alarcon, R.; Walter, M.; Paez, M.; Azócar, M.I. Nanomaterials, 13, 428 (2023).
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Figures