Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.19484

Taking advantage of Nucleolipid-Silver interactions for the construction of nanoparticles

MOHAMED AMINE OUELHAZI[1], PHILIPPE BARTHELEMY[1] AND **BRUNO ALIES**[2]

[1]ChemBioPharm - ARNA - Université de Bordeaux - Inserm U1212 - UMR CNRS 5320
[2]ChemBioPharm - ARNA
Presenting Author: bruno.alies@u-bordeaux.fr

Silver nanoparticles (AgNPs) have gained significant attention due to their unique properties that make them useful in various applications such as optics, electronics, catalysis, and biology. In this study, we are taking advantage of nucleolipids-silver interaction to create a new method of AgNPs synthesis. NLs are biomolecule (combining DNA and phospholipid) that can be used to synthesize AgNPs of different sizes and shapes without the need for external additives. The method involved hydrating a sub milligrams quantity of NLs that spontaneously self-assemble into nano-objects in aqueous media. Then addition of $AgNO_3$ to NLs nano-object induce the formation of AgNPs. The resulting AgNPs were monitored, isolated and characterized by UV-Vis spectroscopy, DLS, and TEM (coupled to EDX) to study their size and shape.

The UV-Vis spectral studies showed an increase in absorbance values at different wavelength bands with an increase in reaction time, depending on the nucleoside used. A spontaneous coloration shift was observed when the silver nitrate was allowed to react with NLs, indicating the formation of AgNPs of various sizes and shapes. DLS and TEM results showed AgNPs of 20 nm and 30 nm. Control experiments were carried out without the addition of NL or using simple nucleoside, but no color changes were observed.

The proposed method is biogenic, simple, and environmentally safe. NLs can be used as both reducing agents and capping agents, making the method rapid and easy to perform. The study demonstrates the potential of NLs as a versatile platform for the synthesis of AgNPs of various sizes and shapes at room temperature without the need for external additives.