



# -Photocatalytic Study and Anticancer activity of Green Synthesized Ag Nanoparticles Using Drumstick Leaf Extract

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## Abstract:

Rapid preparation of silver nanoparticles (Ag-NPLs) using Drumstick (*Moringa Oleifera*) leaf extract has been developed for the photocatalytic and anticancer activities. Ag-NPLs were characterized by FTIR, UV-vis, XRD, TEM, SAED, SEM, and EDAX. FTIR confirmed that Ag-NPLs were coated and stabilized with the biomolecules present in the plant extracts. UV-visible studies showed an SPR characteristic peak of Ag metal at 408 nm with energy bandgap = 2.3 eV. Reduction mechanism of Ag<sup>+</sup> to Ag<sup>0</sup> was presented. XRD showed that the Ag-NPLs were of face-centered cubic structure which consistent with the SAED profile. TEM observations show the formation of sphere-shaped Ag-NPLs with an average size of 5-15 nm. EDAX spectrum confirmed the elemental composition of the Ag-NPLs (3.0 eV). The electrical conductivity of Ag-NPLs was  $2.2 \times 10^{-11}$  S cm<sup>-1</sup>. Ag-NPLs as a photocatalyst exhibit an awesome performance towards sunset yellow (SSY) dye. Ag-NPLs have been shown to be effective against three types of human cancers (Caco-2 cells, HepG2 cells, and MCF-7 cells). Ag-NPLs as anticancer agents inhibited the growth of the three types of human cancer cells as indicated by the IC<sub>50</sub> values. The proposed biosynthesis of Ag-NPLs can be recommended as a potential route for technological applications such as water treatment and a chemotherapeutic agent for some human cancer treatment.

## Keywords:

Silver; Nanoparticles; Green Chemistry; Photocatalytic; Anticancer

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