# Exploration of Enzymes Effects by Silver Nanoparticles Synthesized from Various Botanical Extracts

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| **ABSTRACT**  Many Antibiotics and vaccines no longer prevent and cure microbial illnesses [1]. Antiviral and antimicrobial drugs were essential in battling infectious disorders caused by viruses, bacteria, and fungus decades ago, but antibiotic-resistant bacteria and viruses remain a worry today. Virus and bacteria-induced medicine resistance makes this obstacle tough to overcome. It's vital to find medications that suppress these pathogens' proliferation and treatment resistance [2]. Pharmaceutical companies, universities, and biomedical research organisations tout nanotechnology as a revolutionary weapon against viral and microbial infections. Silver nanoparticles are chemically stable, conductive, and biologically active (antimicrobial, antiviral, antifungal, anti-inflammatory) [3]. Bio-labeling, food preservation, anticancer, wound healing, water purification, antioxidant, and cosmetics employ AgNPs. Green manufacturing of metal nanoparticles is popular owing to its optical, chemical, and electrical characteristics and use in textile, catalysis, and paint industries [4]. Nanotechnology has made AgNPs simpler to make, increasing their medicinal use and anti-decay properties. Recent results show that AgNPs may kill fungus, Gram-positive and Gram-negative bacteria, and antibiotic-resistant strains [5]. Although there are other techniques to synthesise AgNPs, the biological method is still popular. Plant-assisted AgNPs synthesis is second only to microbial synthesis in merit, due to its availability, reliability, and potential for large-scale production. It has been reported that bark, flower, root, stem, fruit, pulp, seed, callus, peel, bulb, and leaves may be employed to synthesise AgNPs. The best conditions for managing plant AgNP synthesis parameters were established[6].  **References:**  [1] Balouiri, M., Sadiki, M., & Ibnsouda, S. K. (2016). Methods for in vitro evaluating antimicrobial activity: A review. *Journal of pharmaceutical analysis*, *6*(2), 71-79.  [2] Freire-Moran, L., Aronsson, B., Manz, C., Gyssens, I. C., So, A. D., Monnet, D. L., ... & ECDC-EMA working group. (2011). Critical shortage of new antibiotics in development against multidrug-resistant bacteria—Time to react is now. *Drug resistance updates*, *14*(2), 118-124.  [3] Selvaraj, V., Sagadevan, S., Muthukrishnan, L., Johan, M. R., & Podder, J. (2019). Eco-friendly approach in synthesis of silver nanoparticles and evaluation of optical, surface morphological and antimicrobial properties. *Journal of Nanostructure in Chemistry*, *9*, 153-162.  [4] El-Saadony, M. T., El-Wafai, N. A., El-Fattah, H. I. A., & Mahgoub, S. A. (2019). Biosynthesis, optimization and characterization of silver nanoparticles using a soil isolate of Bacillus pseudomycoides MT32 and their antifungal activity against some pathogenic fungi. *Adv. Anim. Vet. Sci*, *7*(4), 238-249.  [5] Pirtarighat, S., Ghannadnia, M., & Baghshahi, S. (2019). Green synthesis of silver nanoparticles using the plant extract of Salvia spinosa grown in vitro and their antibacterial activity assessment. *Journal of Nanostructure in Chemistry*, *9*, 1-9.  [6] Vergara-Castañeda, H., Granados-Segura, L. O., Luna-Bárcenas, G., McClements, D. J., Herrera-Hernández, M. G., Arjona, N., ... & Pool, H. (2019). Gold nanoparticles bioreduced by natural extracts of arantho (Kalanchoe daigremontiana) for biological purposes: physicochemical, antioxidant and antiproliferative evaluations. *Materials Research Express*, *6*(5), 055010. |

# Keywords: AgNPs, Enzyme, Plant

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