43 | P A

DETERMINATION OF TOXICOLOGICAL IMPACT OF COMBINING SILVER NANOPARTICLES WITH NEOMYCIN

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Abstract: Studies have shown that combining silver nanoparticles (AgNPs) with an antibiotic inhibit bacterial growth, especially against the multi-drug resistant *Escherichia coli*. However, the impact of the synergistic effect of this combination is not fully understood. The objectives of this study are to investigate various concentrations of neomycin, an aminoglycoside antibiotic, combined at various concentrations with AgNPs against the multi-drug resistant bacterium *Escerichia coli*. AgNPs are synthesized using the sodium citrate reduction method. Growth inhibition is confirmed and analyzed via the spread plate method. The results show that neither AgNPs nor neomycin effectively inhibited growth of multi-drug resistant of *E.*coli alone. Combination of the two is needed to have a significant inhibition against the bacteria. Further analysis using ICP-MS and TEM are executed to observe the effect of Ag^+ ions and the morphological changes to *E. coli* when AgNPs are combined with neomycin.

Keywords: Silver nanoparticle; antibiotic; neomycin; bacteria; synergistic toxicity

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