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# DETERMINING TOXICITY OF METAL NANOPARTICLES COMBINED WITH KANAMYCIN: COMPARISON OF SILVER NANOPARTICLES AND COPPER NANOPARTICLES

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**Abstract:** Within the last decade, studies have been done to combat the rapidly growing resistance bacteria are developing against antibiotics. One of the most studied methods to combating resistance is the use of nanomaterials to enhance the antibacterial activity of antibiotics. This study focuses on silver nanoparticles (AgNPs) and copper nanoparticles (CuNPs) in combination with kanamycin, an aminoglycoside antibiotic, against the multi-drug resistant *Escerichia coli*. AgNPs are synthesized using the sodium citrate method, and CuNPs are synthesized using combined synthesis methods from previous studies. The combination effect of the metal nanoparticles combined with kanamycin is determined and analyzed using the spread plate method. The metal nanoparticles in combination with kanamycin have shown increased inhibition against *E. coli*.

**Keywords:** Silver nanoparticle; copper nanoparticle; antibiotic; kanamycin; bacteria; toxicity

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