

Development of metal nanoparticles synthesized on graphene oxide nanosheets for the antibacterial and antibiofilm applications

장재희, 윤세미, 최종훈<sup>†</sup>  
중앙대학교  
(nanomed@cau.ac.kr<sup>†</sup>)

The chronic diseases caused by bacterial infections are challenging to be treated because of their inherent resistance to antibiotics. The biofilm is a polymeric conglomeration of extracellular polysaccharides, proteins, lipids and DNA of bacteria provides a rigid barrier that the external anti-bacterial reagents cannot easily penetrate into. Synergy effect of antibiotic resistant bacteria and biofilm make them more resistant to chemicals and antibiotics. In order to overcome the problems of bacterial resistance and biofilm formation, we aimed to prepare diverse metal nanoparticles synthesized on graphene oxide (GO) nanosheets. Copper, silver, platinum and/or their bi-metallic nanoparticle are prepared on GO nanosheets that may be able to synergistically increase the efficacy of killing bacteria and destroying biofilms with the minimum amount of them to be biocompatible to mammalian cells. Prepared metal nanoparticle on GO nanosheets were characterized by XRD, TEM, and FT-IR. The antibacterial activity was evaluated by colony counting assay and live/dead assay against common bacteria samples. The anti-biofilm property of nanocomposites was tested in a microfluidic channel.