# A New Lock Solution for Preventing Biofilm Formation in Endotracheal Tube in Mechanically Ventilated Patients

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## Abstract

Nearly one-fourth of all nosocomial infections is caused by medical indwelling devices. Bacteria frequently form biofilms by adhering to indwelling medical devices and producing polymeric material to enclose the attached cells. Bacteria show more resistant to antibiotics or disinfectants within these biofilms. Endotracheal tubes (ETTs) are used for tracheal intubation in critically ill patients to reduce the risk of aspiration, facilitate the efficient use of mechanical ventilation, and handle the problem of controlling excessive airway secretions. Using ETTs is one of the major factor raising the risk of biofilm ventilator associated pneumonia (VAP). Given that increased prevalence rates of VAP result in higher mortality, length of stay, and treatment costs, this shows that VAP poses a global challenge with implications for healthcare systems.

The rising prevalence of antibiotic resistance linked to ETTs highlights the critical need for ongoing study, development, and application of practical measures to fight this dangerous infection. In this study we investigate the antibacterial, antibiofilm and as a lock solution of different compounds: cranberry (C), graphene oxide (GO) and cranberry graphene oxide nanoparticles (C-GO-N) against resistant bacteria isolated bacteria from ETTs of patients admitted to ICU in chest department, Zagazig University hospitals, Egypt. Our results revealed that all compounds showed variation in their antibacterial, antibiofilm and as a lock solution with the best results for decreasing attachment of biofilm with cranberry graphene oxide nanoparticles by 67-70 %.

## Keywords

Biofilm, Endotracheal tube, Cranberry, Nanoparticles, Lock solution.