

# Investigation of Bactericidal Effect of an Air Plasma Jet with Mixing Vaporized $H_2O_2$ on *S. aureus* and *P. aeruginosa*

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The air plasma has been developed as the effective medical instruments due to providing breakthrough solutions to challenging medical problems. Air plasma selectivity and the emerging of reactive oxygen and nitrogen species (RONS) play a key role in numerous biochemical pathways in living organisms i.e. nitric oxide (NO) contributes to promote wound healing processes, hydroxyl radicals ( $OH$ ) and ozone ( $O_3$ ) have been investigated for having a significant antibacterial effect. In this work, we studied the bacterial inactivation effect of air plasma jet on Gram-positive bacteria *Staphylococcus aureus* and Gram-negative bacteria *Pseudomonas aeruginosa* by varying time of treatment. The results indicated that the increase of clear inhibition zones with longer of time of treatment. Furthermore, the bactericidal effect of mixing vaporized 3% hydrogen peroxide ( $H_2O_2$ ) together with air plasma resulted in higher antimicrobial activity compared with the control group which treated by air plasma only.

Keyword: cold air plasma, reactive oxygen and nitrogen species (RONS), hydrogen peroxide ( $H_2O_2$ ),

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