

Abstract Submitted
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An Atmospheric Pressure Cold Plasma Plume for Biomedical Applications¹ XINPEI LU, College of EEE, HuaZhong University of Science & Technology — The roles of various plasma agents in the inactivation of bacteria have recently been investigated. However, up to now, the effect of the charge particles on the inactivation of bacteria is not well understood. In this paper, an atmospheric pressure plasma jet device, which generates a cold plasma plume carrying a peak current of 300 mA, is used to investigate the role of the charge particles in the inactivation process. It is found that the charge particles play a minor role in the inactivation process when He/N₂(3%) is used as working gas. On the other hand, when He/O₂(3%) is used, the charge particles is expected to play an important role in the inactivation of bacteria. Further analysis shows that the negative ions O₂⁻ might be the charge particles that are playing the role. Besides, it is found that the active species including O, O₃, and metastable state O₂^{*}, can play a crucial role in the inactivation of the bacteria. But the excited He^{*}, N₂C³Π_u, and N₂⁺B²Σ_u⁺ have no significant direct effect on the inactivation of bacteria. It is also concluded that heat and UV play no or minor role in the inactivation process.

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