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PaperTitle **Advances in chemical disinfection technology to curb microbial resistance**

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ABSTRACT

It has often been said that microbiologists are interested in either growing bacteria or killing them. Through the ages people have realized the importance of eliminating unwanted microorganisms. Many cultures invented methods to make food last longer by manipulating the conditions under which the food was prepared and stored. Heating is probably the oldest way used to eliminate microorganisms. Joseph Lister was the first scientist who applied chemical disinfection techniques during surgery. Scientists soon realized that there were a variety of different techniques that one could use to control bacteria, these included chemical methods, heat, filtration and irradiation.

A range of disinfectants are available, all of which are claimed by their producers to kill bacteria. Biocides target a range of cellular loci, from the cytoplasmic membrane to respiratory functions, enzymes and the genetic material. However, different bacteria react differently to disinfectants, either due to inherent differences such as unique cell envelope composition and non-susceptible proteins, or to the development of resistance, either by adaptation or by genetic exchange.

The advantages of Electrochemically Activated Water (ECA) technology has been confirmed, wherein the biocidal activity of hypochlorous acid generated by the current ECA technology is 300 times more active than the sodium hypochlorite generated by earlier systems. The current study investigated the effect of ECA Anolyte on the protein profiles of different bacteria. Proteins were extracted from bacteria and analysed using SDS-PAGE. Fewer and faint protein bands were observed for halide Anolyte treated bacteria when compared to untreated bacteria while equal protein bands were obtained for non-halide anolyte treated bacteria and their controls though the band intensities of proteins from treated cells were higher. Anolyte caused bacterial death by complete destruction of proteins or by causing oxidative stress which resulted in protein fragmentation or formation of altered and possibly, non-functional proteins.