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## Synergy of Cold Atmospheric Plasma and Electroporation for Treatment of Cancer Cells

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### ABSTRACT

Cancer kills about 1500 people every day in the United States alone. Treatments for cancer patients like chemotherapy and radiation are invasive, aggressive, expensive, and can sometimes do more harm than good. There is a need for instrumentation and procedures that reduce toxicity to the human body and are more mobile and accessible to cancer and tumor patients. Electroporation and Cold Atmospheric Plasma (CAP) are two methods being explored to treat cancerous cells without affecting the healthy cells through a minimally invasive treatment. This study will focus on the optimization of parameters for both procedures for efficient apoptosis of cancer cells. This study used different cancer cells lines for both procedures in sequence and simultaneously with the goal of understanding the synergy of both techniques. The viability of cells was analyzed through the use of emission spectroscopy, fluorescence, and microscopy. Initial results show that sequential electroporation was successful at leading cells to apoptosis. These results are very encouraging and have the potential of significant advantages over current methods and techniques. Further work and studies are currently in progress to study the synergetic effect of CAP with electroporation.

### KEYWORDS

Cold Atmospheric Plasma, CAP, electroporation, cancer cells, spectroscopy