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Treatment of oral cancer cells with nonthermal atmospheric pressure plasma jet[1] JAMES YURKOVICH, XU HAN, BENJAMIN COFFEY, MATEJ KLAS, SYLWIA PTASINSKA, University of Notre Dame — Non-thermal atmospheric pressure plasmas are specialized types of plasma that are proposed as a new agent to induce death in cancer cells. The experimental phase of this study will test the application of such plasma to SCC-25 oral cancer cells to determine if it is possible to induce apoptosis or necrosis. Different sources are used on the cells to find a configuration which kills cancer cells but has no effect on normal cells. The sources have been developed based on the dielectric barrier discharge between two external electrodes surrounding a dielectric tube; such a configuration has been shown to induce breaks in DNA strands. Each configuration is characterized using an optical emission spectrophotometer and iCCD camera to determine the optimal conditions for inducing cell death. The cells are incubated after irradiation with plasma, and cell death is determined using microscopy imaging to identify antibody interaction within the cells. These studies are important for better understanding of plasma species interactions with cancer cells and mechanisms of DNA damage and at latter stage they will be useful for the development of advanced cancer therapy.

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