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**DNA damage in oral cancer cells induced by nitrogen atmospheric pressure plasma jets** XU HAN, MATEJ KLAS, YUEYING LIU, M. SHARON STACK, SYLWIA PTASINSKA, University of Notre Dame — The nitrogen atmospheric pressure plasma jet (APPJ) has been shown to effectively induce DNA double strand breaks in SCC-25 oral cancer cells. The APPJ source constructed in our laboratory consists of two external electrodes wrapping around a quartz tube and nitrogen as a feed gas and operates based on dielectric barrier gas discharge. Generally, it is more challenging to ignite plasma in N2 atmosphere than in noble gases. However, this design provides additional advantages such as lower costs compared to the noble gases for future clinical operation. Different parameters of the APPJ configuration were tested in order to determine radiation dosage. To explore the effects of delayed damage and cell self-repairing, various incubation times of cells after plasma treatment were also performed. Reactive species generated in plasma jet and in liquid environment are essential to be identified and quantified, with the aim of unfolding the mystery of detailed mechanisms for plasma-induced cell apoptosis. Moreover, from the comparison of plasma treatment effect on normal oral cells OKF6T, an insight to the selectivity for cancer treatment by APPJ can be explored. All of these studies are critical to better understand the damage responses of normal and abnormal cellular systems to plasma radiation, which are useful for the development of advanced plasma therapy for cancer treatment at a later stage.

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