PLASMA - NO_X INDUCED APOTOSIS ON VARIOUS CELL STRUCTURES

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Air plasma systems have demonstrated its potential use in the treatment of suppurated burn wounds and pyonecrotic ulcers of different microbial etiology[1, 2]. This system has also been demonstrated to cause apoptosis of cells of a melanoma cell line[3]. We have developed air-plasma source which generates plasma containing a relatively high concentration of nitrogen oxide. It has been reported that NO_x induces upregulation of Fas, a membrane receptor which mediate death signal[4]. However, many cells expressing Fas do not respond to Fas-induced apoptosis. This project investigates and will present the response of different cell type to plasma and nitrogen oxide induced apoptosis for different plasma conditions. In this research project macrophage, mucosal epithelial cell, and melanoma cell lines were used and results will be presented. The results of spatial and temporal profiles of NO_x generated by the plasma source and its temperature profiles are characterized and will be presented.

1. Lipatov, K.V., et al., Surgical treatment of complex phlegmous-nectoric ulcers by local application of nitrogen oxide and ozone. Annals of Surgery, 2002. 1:58-61.
2. Fridman, G., et al., Applied Plasma Medicine. Plasma Process. Polym., 2008. 5 (6), 503-533.
3. Fridman, G., et al., Floating Electrode Dielectric Barrier Discharge plasma in Air Promoting Apoptotic Behavior in Melanoma Skin Cancer Cell Lines. Plasma Chemistry and Plasma Processing, 2007. 27(2):163-167.
4. Keisuke, F., et al., Nitric Oxide Induces Upregulation of Fas and Apoptosis in Vascular Smooth Muscle. Hypertension, 1996. 27:823-826.

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