

Abstract Submitted
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Evaluation of the Efficacy of the Plasma Pencil Against Cancer Cells SOHEILA MOHADES, NAZIR BAREKZI, HAMID RAZAVI, MOUNIR LAROUSSE, Old Dominion University — The plasma pencil generates low temperature and atmospheric pressure plasma. To generate the plasma, high voltage pulses with short width (from nanosecond to microsecond) are applied to a noble gas. The working gas can be helium, argon or a mixture of these with air or oxygen. Generating plasma with helium provides a tolerable temperature for biological cells and tissues. Diagnostic measurements on the plasma plume has revealed the presence of active agents such as reactive oxygen species (ROS) and nitrogen reactive species (RNS), which are known to have biological implications. Recently, low temperature plasma has drawn attention to its potential in cancer therapy. In our lab, the plasma pencil has been used to treat leukemia, prostate and epithelial cancer cells [1]. The cancer cell line used here is the SCaBER (ATCC®HTB3TM) cell line originating from a human bladder cancer. The results indicate that specific species induce the molecular mechanisms associated with cell death. The death of cells after plasma treatment will be studied using assays, such as DNA laddering and Caspase-3 activation, to elucidate the mechanism of the apoptotic or necrotic pathways.

[1] N. Barekzi and M. Laroussi, *Plasma Process. Polym.* **10**, 1039 (2013).

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