

Abstract Submitted
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Characterization of Atmospheric Pressure Plasma Jet (APPJ) and Its Effect on Plasmid DNA¹ EK ADHIKARI, SYLWIA PTASINSKA, University of Notre Dame, Notre Dame, IN — A helium atmospheric pressure plasma jet (APPJ) source was constructed and then characterized by monitoring a deflected current on a high voltage electrode and a potential difference between two electrodes. The deflected current was also monitored for the APPJ source with varied electrical and fed gas composition e.g. admixtures of He and water vapor. The deflected power per cycle for gas admixtures was decreased with the increase in fraction of water vapor. In addition, this APPJ source was used to induce damage to aqueous plasmid DNA. The fraction of supercoiled, single-strand breaks and double-strand breaks in DNA were quantified by using agarose gel electrophoresis. The number of DNA strand breaks increased as a function of plasma irradiation time and decrease as a distance between APPJ and DNA sample increased. The APPJ with the gas admixture, in which the fraction of water vapor was varied, was also used to induce damage to aqueous DNA samples. The damage level decreased with the increase in a fraction of water vapor under specific experimental conditions. The change in numbers of DNA strand breaks irradiated by a pure He plasma and a plasma with a gas admixture is predicted by different physical and chemical process in the APPJ.

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