Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

DNA damage in oral cancer and normal cells induced by nitrogen atmospheric pressure plasma jets[1] XU HAN, JAMES KAPALDO, YUEYING LIU, M. SHARON STACK, SYLWIA PTASINSKA, University of Notre Dame — Nitrogen atmospheric pressure plasma jets (APPJs) have been shown to effectively induce DNA double strand breaks in SCC25 oral cancer cells. The APPJ source constructed in our laboratory operates based on dielectric barrier discharge. It consists of two copper electrodes alternatively wrapping around a fused silica tube with nitrogen as a feed gas. It is generally more challenging to ignite plasma in N2 atmosphere than in noble gases. However, N2 provides additional advantages such as lower costs compared to noble gases, thus this design can be beneficial for the future long-term clinical use. To compare the effects of plasma on cancer cells (SCC25) and normal cells (OKF), the cells from both types were treated at the same experimental condition for various treatment times. The effective area with different damage levels after the treatment was visualized as 3D maps. The delayed damage effects were also explored by varying the incubation times after the treatment. All of these studies are critical for a better understanding of the damage responses of cellular systems exposed to the plasma radiation, thus are useful for the development of the advanced plasma cancer therapy.

[1]The research described herein was supported by the Division of Chemical Sciences, Geosciences and Biosciences, Basic Energy Sciences, Office of Science, United States Department of Energy through Grant No. DE- FC02-04ER15533.

Xu Han
Univ of Notre Dame

Date submitted: 15 Jun 2015 Electronic form version 1.4