Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Comparing plasma and X-ray exposure and identifying vulnerable cell parts[1] BILL GRAHAM, Queen's University Belfast — Here two issues in plasma medicine that are being addressed in a collaboration between the Centre of Plasma Physics and the School of Pharmacy at Queen's University Belfast and the Plasma Institute at York University UK will be discussed. Recent measurements of the interaction of plasmas created directly in DMEM cell medium and MDAMB-231, a human breast cancer cell line, showed evidence of reduced cell viability and of DNA damage. The same set of experiments were undertaken but with X-ray exposure. A correlation of the dependence on plasma exposure time and X-ray dose was observed which might point the way to dose definition in plasma medicine. We have also been working to identify the cell parts most vulnerable to plasma exposure. In this study a 10 kHz atmospheric pressure non-thermal plasma jet, operating in He/0.5%O_2 and characterized to determine the behavior of many of the plasma species, was incident onto the surface of media containing either bacterial strains, in their planktonic and biofilm forms, or isolated bacterial plasmid DNA. The results of measurements to look for changes in plasmid structural conformation, rates of single and double strand breaks, the catalytic activity of certain bacterial enzymes, the peroxidation of lipid content of the bacterial cells, the leakage of ATP and Scanning Electron Microscope (SEM) images will be discussed.

[1]Supported in part by UK EPSRC Science and Innovation Grant.

Bill Graham
Queen's University Belfast

Date submitted: 29 Jun 2012 Electronic form version 1.4