

Abstract Submitted  
for the DPP11 Meeting of  
The American Physical Society

**Cold plasma selectivity in the interaction with various types of the cells** OLGA VOLOTSKOVA, MARY ANN STEPP, MICHAEL KEIDAR, The George Washington University — Present research in the area of cold atmospheric plasma (CAP) demonstrates great potential in various areas including medicine and biology. Depending on their configuration they can be used for wound healing, sterilization, targeted cell/tissue removal, and cancer treatments. Here we explore potential mechanisms by which CAP alters cell migration and influences cell adhesion. The migration studies are focused on the CAP interaction with fibroblasts and corneal epithelial cells. Data show that various types of cells have different thresholds (treatment times) required to achieve maximum inhibition of cell migration which is around  $\sim 30\text{-}40\%$ . Studies to assess the impact of CAP treatment on the activation state of integrins and focal adhesion size by immunofluorescence showed more active  $\beta 1$  integrin on the cell surface and large focal adhesions after CAP treatment. Based on these data, a thermodynamic model is presented to explain how CAP leads to integrin activation and focal adhesion assembly. Also responses of the various types of the cells to the cold plasma treatment on the example of the epithelial keratinocytes, papilloma and carcinoma cells are studied. Cell cycle, migration and cell vitality analysis were performed. The goal of this study is to understand the mechanism by which the CAP jet alters cell migration, influences adhesion and cell survival.

Olga Volotskova  
The George Washington University

Date submitted: 15 Jul 2011

Electronic form version 1.4