Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Effects of Nitrogen and Oxygen Radicals on Low-temperature Bio-molecule Processing IULIANA MOTRESCU, AKIHISA OGINO, SHIGEYASU TANAKA, TAKETOMO FUJIWARA, SHINYA KODANI, HIROKAZU KAWAGISHI, Shizuoka University, GHEORGHE POPA, Alexandru Ioan Cuza University, MASAAKI NAGATSU, Shizuoka University — For the past few decades the field of plasma medicine has been gaining a lot of interest and therefore extending its focus towards various spectra of applications. In spite of this growth, the depth of knowledge in each application is evolving with a much slower speed. Our interest in this huge field of plasma medicine is developing an efficient, non toxic, low temperature method to inactivate toxic proteinaceous molecules, such as endotoxin. We have recently carried out the experiment to investigate the possibility of inactivation of peptide molecules, Arginine Vasotocin (AVT), using nitrogen and oxygen plasmas. After plasma irradiation, these bio-molecules change their conformation to lose the biological function. Especially, the AVT treated by nitrogen plasma shows the interesting phenomenon, where the AVT changes its property from water-solubility to water insolubility after nitrogen plasma treatment. To diagnose the plasma characteristics during processing, optical emission and quadrupole mass spectroscopic measurements were carried out. The mechanisms by which microwave plasma is able to modify the structure and bio-function of proteinaceous molecules are investigated.

Masaaki Nagatsu
Shizuoka University

Date submitted: 15 Jun 2010 Electronic form version 1.4