Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

A possible mechanism of the selective effect of a non-equilibrium plasma on healthy and cancer cells in a physiological solution MIKHAIL SHNEIDER, Princeton University, MIKHAIL PEKKER, Retired — A possible mechanism for the selective effect of weakly ionized nonequilibrium plasma and currents in electrolyte on healthy and cancerous cells in physiological saline in a Petri dish is considered. The interaction with the plasma source leads to a change in osmotic pressure [1], which affects the electro-mechanical properties of cell membranes in healthy and cancerous cells in different ways. The currents arising in the electrolyte charge the membranes of healthy and cancerous cells to a different potential difference due to the different values of the membranes' dielectric constant. We hypothesized that the dielectric permeability of cancer cell membranes is lower than that of healthy cells, as is the capacity of a unit of the membrane surface, and therefore, the additional potential difference acquired by the membrane through charging with currents induced in the intercellular electrolyte is greater in cancer cells. This can lead to electroporation of cancer cell membranes, resulting in their apoptosis, but does not affect healthy cells. 1. M.N. Shneider, M. Pekker, J. Appl. Phys. 123, 204701 (2018)

Mikhail Shneider
Princeton University

Date submitted: 27 May 2019 Electronic form version 1.4