## Abstract Submitted for the GEC13 Meeting of The American Physical Society

Plasma-activated medium induced apoptosis on tumor cells MASARU HORI, HIROMASA TANAKA, MASAAKI MIZUNO, KAE NAKAMURA, HIROAKI KAJIYAMA, KEIGO TAKEDA, KENJI ISHIKAWA, HIROYUKI KANO, FUMITAKA KIKKAWA, Nagoya University — The nonequilibrium atmospheric pressure plasma (NEAPP) has attracted attention in cancer therapy. In this study, the fresh medium was treated with our developed NEAPP, ultra-high electron density (approximately  $2 \times 10^{16} \ \mathrm{cm}^{-3}$ ) [1,2]. The medium called the plasma-activated medium (PAM) killed not normal cells but tumor cells through induction of apoptosis. Cell proliferation assays showed that the tumor cells were selectively killed by the PAM. Those cells induced apoptosis using an apoptotic molecular marker, cleaved Caspase3/7. The molecular mechanisms of PAM-mediated apoptosis in the tumor cells were also found that the PAM downregulated the expression of AKT kinase, a marker molecule in a survival signal transduction pathway. These results suggest that PAM may be a promising tool for tumor therapy by downregulating the survival signals in cancers.

- [1] M. Iwasaki et al. Appl. Phys. Lett. 92, 081503 (2008);
- [2] H. Tanaka, et al. Plasma Medicine 1(3-4) 265-277 (2011).

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