Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Verification of antitumor effect in vivo using nanosecond pulsed streamer discharge KENTA YONETAMARI, YUKI SHIRAKAWA, TAKETOSHI AKIYAMA, KAZUE MIZUNO, RYO ONO, The University of Tokyo — Cancer treatment using plasma has intensively studied these days. In this work, antitumor effect by nanosecond pulsed streamer discharge was investigated. Nanosecond pulsed streamer plasma was used as a plasma source, which can generate stable streamer discharge by using a nanosecond pulsed power supply. The rod electrode of 3 mm diameter is made of copper. Its end is formed into a semispherical shape of 1.5 mm curvature. The electrode is inserted into a quartz tube (inner diameter: 4 mm, thickness: 1 mm) concentrically, so any gas can be introduced. B16F10 cells were selected to perform in vivo antitumor study. These cells were injected under the skin of leg of mice to make cancer tumor. One week later from injections, plasma was applied to the cancer tumor. Mice were randomly assigned into three groups which were one control group and two plasma treatment groups. In the control group, mice were not treated. In the plasma treatment groups, plasma with dry N2 and wet O2 as a working gas were irradiated for 5 consecutive days. Processing time was 10 min and the gap distance between the electrode and tumor was 4 mm. After 5 days plasma treatment, antitumor effect was observed. The result indicates that the streamer discharge has a potential for cancer treatment.

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Date submitted: 03 Jun 2015 Electronic form version 1.4