Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

Fabrication of two types of atmospheric pressure microplasma jet sources: A capillary electrode and a single pin electrode surrounded by tapered insulator with eight holes TAE HUN CHUNG, SUN JA KIM, HYE SUN PARK, SE HWAN BAE, Dong-A University — Atmospheric pressure microplasma jet sources driven by radio-frequency wave and by low frequency pulsed wave of several kilohertz were specially fabricated and characterized. Two different types of jet were developed. The first one consists of a sharpened metal pin which is covered with a cone type Teflon layer confined in an acrylic tube. This structure allows an efficient ignition since the electrical field is concentrated at the end of electrode. The second one is a jet with a capillary electrode in which the working gas, helium or argon, and the additive gas, oxygen, are fed into the tube. The electrical properties of the discharges have been studied by means of voltage and current probes. The neutral gas temperature and the electron temperature are measured by optical emission spectroscopy. The neutral gas temperature is compared with the results obtained by optical fiber thermometer. To study the effect of pulsed discharges, we utilized a pulsed high voltage source with the variable frequency of 10-60 kHz and the voltage of 1-10 kV_{PP}. The effects of various design configurations and operation parameters were investigated. The cultured mammalian cells were treated using the plasma jet sources. The effects of plasma jet treatment were observed with a special focus on the cell apoptosis.

Tae Hun Chung
Dong-A University

Date submitted: 15 Jun 2009 Electronic form version 1.4