

FLEXIBLE COLD ATMOSPHERIC MICROPLASMA JETS GENERATED IN BIOCOMPATIBLE DIELECTRIC TUBES

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The flexible microplasma jet device using a biocompatible dielectric tube has been proposed for the purpose of bio/medical applications. Tygon[®] tubes which had 254 μm of the inner diameter were employed as flexible biocompatible tubes, and a high purity helium gas was used as a discharge gas. When the sinusoidal voltage waves with the voltage of 6 KV and the frequency of 36 KHz were applied to the plasma jet device with a single electrode, the produced plasma plume had the length of 5 mm. However, stronger plasma emission and longer plasma plume was observed if a grounded material contacted with the plasma plume. The results of plasma emission showed the generated plasma jets from the Tygon[®] tube were stable and had a same performance with the plasma jets from other millimeter or centimeter sized plasma jet devices.¹⁻³ Therefore, this flexible microplasma jet device could be applied to the direct treatment of tumor cells. In order to observe the effect of plasma treatments, the microplasma jets were applied to both murine tumor cells and non-tumor cells. As a result, microplasma jets induced cultured murine cells to undergo apoptosis. And it was also observed that mouse melanoma B16F0 tumor cells were more sensitive to plasma treatment than mouse fibroblast CL7 cells. This result was significant because plasma treatments may be used to selectively destroy tumor cells without harm to non-tumor cells at certain condition.

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