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3P59 - Inactivation process observation of HeLa cells induced by atmospheric-pressure pulsed plasma jet

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Atmospheric-pressure pulsed plasma jet has recently received significant attention due to their unique capabilities. Among the biomedical field, atmospheric-pressure plasma jet has been utilized to inactivate human cell for the development of new cancer treatment. In the literatures, it has been reported that H₂O₂ produced by plasma is one of the main factors for inactivation of HeLa cell viability. In this study, H₂O₂ concentration in cell culture medium after plasma irradiation was measured by titanyl sulfate method. In addition, to compare the effects of H₂O₂ on HeLa cells in the cases of plasma irradiation and direct addition to the cell culture medium, two experiments were carried out. One is the measurement of cell survival ratio of both cases. The other is the observation of the cell death process by fluorescence microscopy and three-dimensional holographic/tomographic laser microscopy. The results of this work clearly demonstrated that H₂O₂ generated by atmospheric-pressure pulsed plasma jet is the main factor of HeLa cell death.

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