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Effect of active species on animal cells in culture media induced by DBD Plasma irradiation using air TETSUYA OHTSUBO, REOTO ONO, NOBUYA HAYASHI, Kyushu University — Little has been reported on action mechanism of active species produced by plasmas affecting living cells. In this study, active species in culture medium generated by torch type DBD and variations of animal cells are attempted to be clarified. Animal cells are irradiated by DBD plasma through various media such as DMEM, PBS and distilled water. Irradiation period is 1 to 15 min. The distance between the lower tip of plasma touch and the surface of the medium is 10 mm. Concentrations of NO2-, O3 in liquid are measured. After the irradiation, the cells were cultivated in culture medium and their modifications are observed by microscope and some chemical reagents. Concentration of NO2-and H2O2 in all media increased with discharge period. Increase rate of NO2- concentration is much higher than that of hydrogen peroxide. After plasma irradiation for 15 min, concentrations of NO2 were 80mg/L in DMEM, 30 mg/L in PBS and 15mg/L in distilled water. Also, the concentration of H2O2 became 3mg/L in DMEM, 6.5 mg/L in PBS and 6.5mg/L in distilled water. The significant inactivation of cells was observed in the PBS. Above results indicate that, in this experiment, H2O2 or OH radicals would affect animal cells in culture media.

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