Effect of surface plasma irradiation on *Escherichia coli* colonies

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Plasma irradiation to microorganism has been focused on one of the plasma applications for life science. Mechanism of inactivation of microorganism irradiated by surface discharge (SD) has been studied using *Escherichia coli*, NBRC3301, cultured on 802 agar medium for making colonies. SD is generated by 10kV-10kHz energy source (Logy electric Co.; LHV-10AC), and a few colonies are exposed to SD vary from 0~35sec. The colony of *E. coli* after treated by plasma is cultured in 702 liquid medium for 24 hours at 37 degrees, and inactivation is evaluated by optical absorbance at 660nm. Figure 1 indicates that the activation of *E. coli* decreased with increasing the irradiation period of SD. It is supposed that the reaction between microorganism and plasma has threshold for inactivation. Furthermore, effect of irradiation of SD on nucleic acid of *E. coli* is analyzed by SDS agarose gel electrophoresis. SD treatment to *E. coli* causes to molecular damage of nucleic acid, and single-stranded RNA tends to become low-molecular easily compared to DNA.

Fig.1 Inactivation of *E. coli* colonies treated by surface discharge

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