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Effect of direct irradiation of room-temperature helium plasma jet to fission yeast cells SHINJI YOSHIMURA, YOKO OTSUBO, National Institute for Fusion Science, AKIRA YAMASHITA, National Institute for Basic Biology, KAZUNORI KOGA, Kyushu University, MITSUTOSHI ARAMAKI, Nihon University — We have recently developed a room-temperature atmospheric-pressure plasma-jet device with feeding-gas cooling section which utilizes a Peltier device [1]. The device configuration was a single electrode one without a ground electrode, and the applied voltage and frequency were 5.4 kV peak-to-peak and 15 kHz, respectively. The flow rate of helium gas was 3 SLM. A wild-type fission yeast *S. pombe* was directly exposed to the plasma plume for one minute and incubated at 30 °C for 24 hours. We observed that a few percent of the plasma-treated cells induced anomalous cell elongation, which is not seen in wild-type cells under normal conditions, and the elongated cells were not able to grow and produce colonies. It is suggested that the cell cycle control may be impaired by plasma exposure. In addition, a temperature-sensitive cell-division-cycle (cdc) mutant *cdc2-L7* was also directly exposed to the plasma plume. A preliminary result showed that the cell elongation, which is a typical phenotype of *cdc2* mutants, was observed even under the restrictive temperature (36 °C). Comparison with oxidative stress induced by adding hydrogen peroxide will also be presented.

[1] S. Yoshimura *et al.*, Jpn. J. Appl. Phys. **58**, SEEG03 (2019).

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