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Plasma activated Ringer's lactate solution affected cellular respiratory system on HeLa cells. HIROMASA TANAKA, SHOGO MAEDA, KAE NAKAMURA, HIROSHI HASHIZUME, KENJI ISHIKAWA, MIKAKO ITO, KINJI OHNO, MASAAKI MIZUNO, SHINYA TOYOKUNI, HIROAKI KAJIYAMA, FUMITAKA KIKKAWA, MASARU HORI, Nagoya University — We have previously developed low temperature plasma with high electron density, and we have applied for cancer treatments. We found that plasma irradiated solutions exhibited anti-tumor effects, and we have further developed plasma-activated medium (PAM) and plasma-activated Ringer's lactate solution (PAL). We have investigated extracellular and intracellular reactive oxygen and nitrogen species (RONS) in PAL-treated HeLa cells, and we analyzed roles of extracellular hydrogen peroxide and the other components in PAL. We further investigated cellular respiratory system of PAL-treated HeLa cells using an extracellular flux analyzer and a probe to measure mitochondrial membrane potential, and we found that the plasma-activated lactates inhibited cellular respiratory system on HeLa cells. These findings shed light on a new mechanism that plasma-activated lactates induce cell death. This work was partly supported by a Grant-in-Aid for Specially Promoted Research (No. 19H05462) and a Grant-in-Aid for Scientific Research (C) (No. 18K03599) from the Ministry of Education, Culture, Sports, Science and Technology of Japan.

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