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Bactericidal active ingredient in cryopreserved plasma-treated water with the reduced-pH method for plasma disinfection[1] KATSUHISA KITANO, Eng., Osaka Univ., SATOSHI IKAWA, YOICHI NAKASHIMA, TRI Osaka, ATSUSHI TANI, Sci., Osaka Univ., TAKASHI YOKOYAMA, Eng., Osaka Univ., TOMOKO OHSHIMA, Dental Medicine, Tsurumi Univ. — For the plasma disinfection of human body, plasma sterilization in liquid is crucial. We found that the plasma-treated water (PTW) has strong bactericidal activity under low pH condition. Physicochemical properties of PTW is discussed based on chemical kinetics. Lower temperature brings longer half-life and the bactericidal activity of PTW can be kept by cryopreservation. High performance PTW, corresponding to the disinfection power of 22 log reduction (*B. subtilis* spore), can be obtained by special plasma system equipped with cooling device. This is equivalent to 65% H_2O_2, 14 % sodium hypochlorite and 0.33 % peracetic acid, which are deadly poison for human. But, it is deactivated soon at higher temperature (4 sec. at body temperature), and toxicity to human body seems low. For dental application, PTW was effective on infected models of human extracted tooth. Although PTW has many chemical components, respective chemical components in PTW were isolated by ion chromatography. In addition to peaks of H_2O_2, NO_2^- and NO_3^-, a specific peak was detected. and only this fraction had bactericidal activity. Purified active ingredient of PTW is the precursor of HOO•, and further details will be discussed in the presentation.

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Katsuhisa Kitano
Eng., Osaka Univ.

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