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On the dose of plasma medicine: Equivalent Total Oxidation Potential (ETOP) XINPEI LU, HE CHENG, Huazhong University of Science Technology — This paper provides a new insight into the fundamentals of plasma medicine: The definition of plasma dose. Based on the dominant role of reactive oxygen nitrogen species (RONS) in plasma biological effects, we firstly propose the equivalent total oxidation potential (ETOP), as the definition of plasma dose. The ETOP includes three parts, i.e. the item H, which is the equivalent total oxidation potential (ETOP) of the RONS generated by plasma; the item T, which is associated with the reactive agents unrelated to RONS, such as UV/VUV emission of plasma; and the item $f(H,T)$, which is related the synergistic effects between H and Tfactors. To evaluate the feasibility of the ETOP as plasma dose, the bacterial reduction factor (BRF), which is the log reduction of bacteria colony-forming units (CFU), is selected as the indicator of plasma biological effect. A model establishing the relationship between the ETOP and BRF is presented. For the first try of this paper, linear relationship between the lgETOP and BRF is assumed. The model is initially validated by the published data from literatures. Further simulation and experiment are also conducted, and the positive correlation between the ETOPs and BRFs in the model again suggests that the ETOP could be a reasonable solution as the plasma dose.

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