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The comparison of DNA damage induced by micro DBD plasma and low energy electron for curing human diseases YEUNSOO PARK, National Fusion Research Insititute — It is well known that low energy electrons (LEE, especially below 10 eV) can generate DNA damage via indirect action named dissociative electron attachment (DEA). We can now explain some parts of the exact mechanism on DNA damage by LEE collision with direct ionization effect when cancer patients get the radiotherapy. It is kind of remarkable information in the field of radiation therapy. However, it is practically very difficult to directly apply this finding to human disease cure due to difficulty of LEE therapy actualization and request of further clinical studies. Recently, there is a novel challenge in plasma application, that is, how we can apply plasma technology to diagnosis and treatment of many serious diseases like cancer. Cold atmospheric pressure plasma (CAPP) is a very good source to apply to plasma medicine and bio-applications because of low temperature, low cost, and easy handling. Some scientists have already reported good results related to clinical plasma application. The purposes of this study are to further find out exact mechanisms of DNA damage by LEE at the molecular level, to verify new DNA damage like structural alteration on DNA subunits and to compare DNA damage by LEE and plasma source. We will keep expanding our study to DNA damage by plasma source to develop plasma-based new medical and biological applications. We will show some recent results, DNA damage by LEE and non-thermal plasma.

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