

PST/PBM-02-3-I-TU

Epigenetic regulation of microRNAs by cold atmospheric plasma contributes to proliferation inhibition of breast cancer cells

Sun Jung KIM*

Department of Life Science, Dongguk University, Korea

Cold atmospheric plasma (plasma) has obtained credits of potentials as a useful cancer treatment option after showing higher induction of cell death in cancer cells than in normal cells. Although a few studies have contributed to elucidating the molecular mechanism that plasma differentially inhibits cancer cell proliferation, no result is yet to be reported related with microRNA (miR). In this study, miR-19a-3p (miR-19a) was identified as a mediator of the cell proliferation-inhibitory effect of plasma in the MCF-7 breast cancer cell. Plasma treatment onto the MCF-7 induced hypermethylation at the promoter CpG sites and downregulation of miR-19a which was known as an oncomiR. Overexpression of the miR-19a in MCF-7 increased cell proliferation and plasma deteriorated the effect. Target genes of miR-19a such as HBP1 and GJA1 that had been suppressed by the miR recovered their expression by plasma treatment. In addition, an inhibitor of reactive oxygen species that is produced by plasma suppressed the effect of plasma on the cell proliferation. Taken together, the present study is the first to identify the involvement of a miR which is dysregulated by the plasma and manifests the anti-proliferation effect of plasma on cancer cells.

