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Cold Atmospheric Plasma Stimulated Monocyte Derived Macrophages and Induced Molecular Pattern for Cancer Treatment

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The application of plasma medicine technology has been actively explored over the last decade. Recently, non-thermal plasmas have demonstrated potential as a safe anticancer therapeutic approach that can kill various types of cancer targets [1-11]. There is the urgent need of new human health care's technology against cancers based on immuno-modulation. Our research work mainly comprises plasma induced activation of immune cells or system; which find applications for curing various kinds of resistant tumors and other dreadful diseases [2, 10, 11]. Our main objectives are (i) to clarify basic mechanism on plasma induced immuno-modulations (ii) to develop immunomodulation based strategy for the treatment of various dreadful diseases including cancers (iii) to perform pre-clinical and standardization study. Recent preliminary study suggests that plasma significantly modulated immune cells and can induce cancer cell death in co-culture conditions. Recently, we have reported that plasma-modulated cytotoxic macrophages release TNF-α, and other relevant cytokines which blocks cancer cell growth and can have the potential to contribute to reducing tumor growth in patients in the near future. Also, we have investigated plasma induced molecular patterns to activate cancer immunity cycle for the cancer treatment.

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References

[1] N. K. Kaushik et al. Biomaterials, 87, 118-130, 2016.
[2] N. Kaushik et al. Cell Communication and Signaling, 17, 12, 2019.
[3] N. K. Kaushik et al. Cancers, 11 (6), 842, 2019.
[4] N. Kaushik et al. Scientific Reports, 5, 8587, 2015.
[5] N. Kaushik et al., Scientific Reports, 5, 8726, 2015.
[6] N. Kaushik et al. Plasma Processed and Polymers, 12, 1392-1399, 2015.
[7] NK Kaushik et al. Oxidative Medicine and Cellular Longevity, 7542540, 2017.
[8] N. K Kaushik et al. PLoS One, 9, e103349, 2014.
[9] N. K. Kaushik et al. Biological Chemistry, 400, 39-62, 2018.
[10] N. K. Kaushik et al. Journal of Physics D: Applied Physics, 49, 084001, 2016.
[11] N. K. Kaushik et al. Clinical Plasma Medicine, 9, 15, 2018.