

Preliminary evaluation of *in vitro* cytotoxic effect of non-thermal plasma on fibroblast cells

Waraluk Yarangsee^{1,2}, Pornsiri Pitchakarn³, Supakit Khacha-ananda^{4,*}

¹ Master's Degree in Toxicology, Department of Forensic Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand; waraluk_ya@cmu.ac.th

² Graduate School, Chiang Mai University, Chiang Mai 50200, Thailand

³ Department of Biochemistry, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand; pornsiri.p@cmu.ac.th

⁴ Department of Forensic Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand; supakit.kh@cmu.ac.th

* Correspondence: supakit.kh@cmu.ac.th; Tel.: +6689-5537211

Abstract: Non-thermal plasma (NTP) is an ionized gas generated by the ionization between gas

molecules (carrier gas) and an electric field under atmospheric pressure. The various kinds of reactive oxygen/nitrogen species (ROS/RNS) were suddenly generated during gas ionization. An appropriate reactive species exerted beneficial effects in medicine, therefore, NTP technology has been recommended and developed to use in medical treatments. However, the excesses of reactive species have been reported to disturb cellular physiology such as cell death, neurodegeneration, and cancer. Hence, this study aimed to investigate the cytotoxic effect of non-thermal plasma (NTP) on cell viability and proliferation of murine embryonic fibroblast cell lines (3T3-L1 cells). The MTT and colony formation assay were performed to demonstrate the cytotoxic and proliferative activity of NTP-exposed cells. Our result showed that the percentage of the cell viability and colony formation was significantly decreased after treatment of the cells with all doses of NTP. The highest cytotoxicity was observed in the cells which were exposed with NTP at intensity 10 pluses under air flow rate 11 L/min. In addition, the greatest toxicity to inhibit cell proliferation was found in the cells which were exposed with NTP at intensity 7 and 10 pluses under air flow rate 11 L/min. In conclusion, the results suggested that NTP treatment affected cell viability and cell proliferation of 3T3-L1 cell.

Keywords: Non-thermal plasma/carrier gas/ reactive oxygen/nitrogen species (ROS/RNS)



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