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Proliferation promotion of fibroblast cells using atmospheric-pressure radical source.[1] NAOYUKI IWATA, Nagoya University, YUKI HORI, Meijo University, OH JUN-SEOK, Osaka City University, TOMIYASU MURATA, Meijo University, KENJI ISHIKAWA, MASARU HORI, Nagoya University, MASAFUMI ITO, Meijo University — Recently, biological applications of atmospheric-pressure plasmas have been extensively researched. In this study, we investigated that the proliferation promotion of fibroblast cells in phosphate buffered saline (PBS) using a non-equilibrium radical source which selectively supplies electrically neutral radicals. The radical source was driven with Ar, O_2 and N_2 gases. The flow rate of Ar was fixed at 4 slm and the flow ratio of N_2 against the sum of N_2 and O_2, hereafter $N_2/(N_2+O_2)$, was varied within 1 slm. The species and densities of supplied neutral radicals were investigated using a mass spectrometer (Hiden Analytical). As a result, N•, O•, NO•, NO_2•and O_3 were found to be major species. 3ml PBS with fibroblast cells were placed in a dish and the sample was treated for 10, 15, 20 and 30 s using the radical source with $N_2/(N_2+O_2)$ of 60, 70 and 80 %. Cell viability was promoted compared to untreated samples with various exposure times and $N_2/(N_2+O_2)$, and the maximum promotion ratio was 34% at a $N_2/(N_2+O_2)$ of 70% and 15 s exposure. Also, the promotion ratio showed strong dependency only on the NO•dose. This result strongly suggests that NO•is the responsible factor for the proliferation promotion of fibroblast cells using atmospheric-pressure plasmas.

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