Proliferation promotion of fibroblast cells using atmospheric-pressure radical source.\cite{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\textsubscript{2} and N\textsubscript{2} gases. The flow rate of Ar was fixed at 4 slm and the flow ratio of N\textsubscript{2} against the sum of N\textsubscript{2} and O\textsubscript{2}, hereafter N\textsubscript{2}/(N\textsubscript{2}+O\textsubscript{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\textbullet, O\textbullet, NO\textbullet, NO\textsubscript{2}\textbullet and O\textsubscript{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\textsubscript{2}/(N\textsubscript{2}+O\textsubscript{2}) of 60, 70 and 80\%. Cell viability was promoted compared to untreated samples with various exposure times and N\textsubscript{2}/(N\textsubscript{2}+O\textsubscript{2}), and the maximum promotion ratio was 34\% at a N\textsubscript{2}/(N\textsubscript{2}+O\textsubscript{2}) of 70\% and 15 s exposure. Also, the promotion ratio showed strong dependency only on the NO\textbullet dose. This result strongly suggests that NO\textbullet is the responsible factor for the proliferation promotion of fibroblast cells using atmospheric-pressure plasmas.

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