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Biomedical applications of the cold atmospheric plasma jets OLGA VOLOTSKOVA, ALEXEY SHASHURIN, GWU, SEAS, MARY ANN STEPP, GWU, SMHS, LUBOS BRIEDA, GWU, SEAS, SONALI PAL-GHOSH, GWU, SMHS, MICHAEL KEIDAR, GWU, SEAS — The unique chemical and physical properties of cold atmospheric plasmas enable their numerous recent applications in biomedicine. This report is focused on the investigation of the interaction between the cold helium atmospheric plasma jet and living tissue. This study considers the ability of cold atmospheric plasmas to impact cell migration rates as a function of 1) the length of the plasma treatment time, 2) the number of hours after treatment that cell migration is assessed, and 3) localization of the treatment zone. Data show that the ability of plasma to reduce cell migration rates increases as a function of treatment time with a maximum of 30% and that this affect persists for 33 hours after plasma treatment. Further, the persistence of the cells migration was studied as well. Fluorescence microscopy was used to evaluate inter-cellular changes. In order to characterize the optimal condition for cell treatment with plasma jet, its UV-vis-NIR spectrum was evaluated, as well as simulation of the cold plasma jet behavior was performed.

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