

The Effects of In-vivo Application of Nonequilibrium Atmospheric Plasmas on Corneal Wound Healing in New Zealand White Rabbits

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The application of atmospheric plasmas in medicine began about 20 years ago and has grown into the separate field of Applied Plasma Medicine, attracting great attention from researchers due to potential applications in dentistry, drug delivery, dermatology, cosmetics, wound healing, cellular modifications, scar formation control, cancer treatment etc. Recently we demonstrated efficiency of cold plasmas for ablation of mid-sized subcutaneous bladder cancer tumors on mice [1].

In this work we studied the effects of cold plasma therapy on corneal wound healing. Due to the transparent nature of the cornea, controlled wound healing is essential to ensuring ideal corneal clarity and optimum visual acuity following a corneal injury. A small group of 12 New Zealand white rabbits was used for these studies. The procedure included surgery, where epithelial defects to rabbits' corneas were induced, followed by immediate application of cold plasma, and then post-surgical monitoring of corneal clarity and epithelial healing time. Microscopic features of the treated corneas were compared with control corneas, which were not treated with cold plasma. Monitoring of the wound size at about 30 hours after the surgery indicated faster wound healing for the rabbits treated with plasmas compared with controls.

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References

- [1] M. Keidar, R. Walk, A. Shashurin, P. Srinivasan, A. Sandler, S. Dasgupta, R. Ravi, R. Guerrero-Preston and B. Trink, *British Journal of Cancer* (2011) 105, 1295.