

Abstract Submitted
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Cold atmospheric air plasma jet for medical applications JUERGEN F. KOLB, ROBERT O. PRICE, MICHAEL STACEY, R. JAMES SWANSON, ANGELA BOWMAN, ROBERT L. CHIAVARINI, KARL H. SCHOENBACH, Frank Reidy Research Center for Bioelectrics, Old Dominion University — By flowing ambient air through the discharge channel of a microhollow cathode geometry, we were able to sustain a stable 1.5-2 cm long afterglow plasma jet with dc voltages of only a few hundred volts. The temperature in this expelled afterglow plasma is close to room temperature. Emission spectra show atomic oxygen, hydroxyl ions and various nitrogen compounds. The low heavy-particle temperature allows us to use this exhaust stream on biological samples and tissues without thermal damage. The high levels of reactive species suggest an effective treatment for pathological skin conditions caused, in particular, by infectious agents. In first experiments, we have successfully tested the efficacy on *Candida kefyr* (a yeast), *E.coli*, and a matching *E.coli* strain-specific virus. All pathogens investigated responded well to the treatment. In the yeast case, complete eradication of the organism in the treated area could be achieved with an exposure of 90 seconds at a distance of 5 mm. A 10-fold increase of exposure, to 900 seconds caused no observable damage to murine integument.

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