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Plasma chemistry simulation of surface microdischarge in humid air for wound healing DAVID GRAVES, YUKINORI SAKIYAMA, MARAT ORAZOV, University of California at Berkeley, GREGOR MORFILL, Max Planck Institute for Extraterrestrial Physics — Controlling fluxes of reactive oxygen species and reactive nitrogen species (RONS) created in humid air plasma is important for biomedical applications of surface micro-discharges (SMD). We report results from a well-mixed, dual-zone model that couples a plasma region with a reaction-transport region, and incorporates about 50 charged and neutral species coupled through about 500 elementary reactions. Dominant species in dry air are O3, NO2, and N2O5, while HNO3 and H2O2 approach similar densities in humid air. Finally, we report initial results from coupling the plasma chemistry model to a transient, one-dimensional wound-healing model. Wound-healing models, based on a reaction-diffusion description of cell dynamics, describe the spatial and temporal variations of chemo-attractants, blood vessels, fibroblasts and the extracellular matrix.

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