
Cold plasma promotes angiogenesis in acute rodent wounds

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Phases of tissue repair are complex and dynamically regulated during physiological wound healing and dependent on reactive species-mediated signaling, redox level and wound oxygenation. By using cold physical plasmas generating or mimicking physiologically active oxygen or nitrogen species a beneficial strategy of tissue repair in humans seems possible. In this study, a rodent full-thickness skin wound model was employed to investigate angiogenesis triggered by plasma treatment with kINPen. Cold plasma showed a strong wound healing promoting activity in association with a vigorous wound healing response and earlier development and accumulation of granulation tissue (1-2). Using a broad spectrum of molecular biological analyses, we found that cold plasma triggered the expression of a number of pro-angiogenetic genes and proteins accounting for beneficial plasma effects on wound healing. Moreover, we showed the outgrowth of newly formed blood vessels in the regenerating skin by intravital microscopy (3). Through an early and local plasma-induced p53 inhibition with a concomitant stimulation of proliferation, angiogenetic and growth factor expression, our findings explain why dermal skin repair is accelerated (4). Our data showed that a therapeutic, plasma-induced angiogenesis remains an attractive treatment modality for wound healing.

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