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DNA Repair and Photoaging

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Photoaging is a complex condition but its hallmark is the destruction of dermal collagen. This has been attributed to the direct activation of fibroblast matrix metalloproteinases by solar UV. However, we report here that unirradiated fibroblasts increase metalloproteinase production and digest collagen when exposed to cell culture media from irradiated keratinocytes. Enhanced DNA repair in the keratinocytes ameliorates this response. This suggests that soluble factors induced by DNA damage in UV exposed epidermal keratinocytes signal collagen degradation by fibroblasts in the dermis. This motif of DNA damage in keratinocytes producing effects on other cell types mediated by soluble factors was first identified by Kripke and colleagues in studying UV-induced immune suppression.