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GHK-Cu-liposomes accelerate scald wound healing in mice by promoting cell proliferation and angiogenesis.

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Abstract

Glycyl-L-histidyl-L-lysine (GHK)-Cu is considered to be an activator of tissue remodeling, and has been used in cosmetic products. In this study, we prepared liposomes encapsulating GHK-Cu and analyzed their effect on human umbilical vein endothelial cells (HUVECs) proliferation and scald wound healing in mice. The nanoscaled GHK-Cu-liposomes promoted HUVECs proliferation, with a 33.1% increased rate. Flow cytometry analysis showed increased cell number at G1 stage and decreased cell number at G2 stage after GHK-Cu-liposomes treatment. Western blotting indicated that the expression of vascular endothelial growth factor and fibroblast growth factors-2 were both enhanced, as well as cell cycle-related proteins CDK4 and CyclinD1. In a mice scald model, angiogenesis in burned skin treated with GHK-Cu-liposomes was better compared with free GHK-Cu, and immunofluorescence analysis showed enhanced signal of CD31 and Ki67 in GHK-Cu-liposomes treated mice. Moreover, the wound healing time was shortened to 14 days post injury. Our results provide the evidence that GHK-Cu-liposomes could be utilized as a treatment for skin wounds.

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