A Novel Small Compound HSc025 Enhances Dermal Wound Healing by Stimulating Cell Proliferation and Migration.

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A novel small compound HSc025 has been developed, which accelerates nuclear translocation of YB-1, a repressor of collagen transcription. It has been reported to suppress murine skin and liver fibrosis. YB-1 is also suggested to influence cell proliferation. Dermal wound healing is a complex process orchestrated by a number of humoral factors and cellular components such as epidermal keratinocytes, dermal fibroblasts and infiltrating inflammatory cells. Here, we examined the effects of HSc025 administration using a murine incisional wound healing model and primary cultures of keratinocytes and fibroblasts. In the wound healing process, oral administration of HSc025 significantly accelerated the wound closure from day 2 to 6 after the wounding. Experiments using transgenic type I collagen promoter/luciferase reporter mice indicated that HSc025 treatment did not affect collagen promoter activation during physiological wound healing process. Furthermore, while treatment of primary human keratinocytes with HSc025 alone did not affect either proliferation and migration, it antagonized TGF-beta inhibited cell growth and migration. On the contrary, migration of primary dermal fibroblasts was stimulated by HSc025 treatment both in the presence and absence of TGF-beta. Profiling of humoral factors in HSc025-treated fibroblasts showed downregulation of several TGF-beta-related factors, together with accelerated levels of VEGF production. These results lead to the better understanding of the cooperation of keratinocytes and fibroblasts in the wound healing process and provide a novel insight into the therapy for impaired wound healing by using YB-1 modulators.