The Effect of Using Spidroin Protein and Spider Silk Web on Wound Healing Period Reduction

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In this study, spider silk protein employment in topical wound dressings helps to shorten the wound healing period. In normal cases, it takes 12 days to heal the earthworm wound as a robust human skin model. However, how to shorten the period much more is still a question that needed to be addressed. In this project, it was hypothesized that using spidroin protein with spider web fibers will reduce wound healing time. Herein, spidroin protein has been extracted from spider silk web by using SDS-PAGE and proteomics identification using LC / MS / MS has been performed. Furthermore, evaluation of wound healing after dressing with spider webs protein and spidroin extract via a topical application on surgical wounds revealed a significant reduction in wound healing time and re-epithelialization. The sample of wounded earthworms took only two days for wound healing, dramatic reductions in time of wound closure and re-epithelialization duration have been observed microscopically when compared with control (12 days to wound healing). In conclusion, these results showed that the dressing with spider webs and spidroin extract reduces the wound healing period. Future studies would be directed toward investigating the healings mechanisms underlying this effect and in other medical and genetic engineering applications.

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