MicroRNA profiling in cutaneous wounds of diabetic rats

Y.-F. Liu1,2, M. Ding2, D.-W. Liu1, Y. Liu1, Y.-G. Mao1 and Y. Peng1

1First Affiliated Hospital of Nanchang University, Nanchang, China
2Guangzhou Integrated Traditional Chinese and Western Medicine Hospital, Guangzhou, China

Corresponding author: D.-W. Liu
E-mail: dewuliu@126.com

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ABSTRACT. Despite years of effort, current therapies for diabetic wounds are still not fully efficacious. Emerging evidence has suggested that microRNAs (miRNAs) play key roles in multiple physiological and pathological processes in eukaryotes, and could potentially be powerful therapeutic tools. This study investigated the differential expression profiling of miRNAs in cutaneous wounds in streptozotocin-induced diabetic rats and normal rats, and its significance in diabetic wound healing. Using microarrays, 18 miRNAs were identified as being upregulated and 65 as being downregulated in the diabetic group. The miRNA profiling results were validated by quantitative reverse transcriptase polymerase chain reaction. Finally, functional annotation analysis using the DAVID and miR2Subpath databases revealed that the differentially expressed miRNAs were involved in MAPK signaling pathways, the Wnt signaling pathway, and other signaling pathways that may be closely linked to wound healing. This study provides an experimental foundation for further investigation of mechanisms that underlie poor diabetic wound healing, and of miRNA-based therapies that are associated with wound healing.

Key words: Diabetes mellitus, experimental; Skin; Wound healing; MicroRNA profiling