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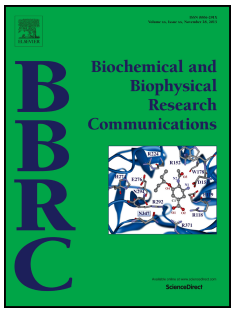

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Circular RNA profiling reveals that circCOL3A1-859267 regulate type I collagen expression in photoaged human dermal fibroblasts

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Abstract:

Production of type I collagen declines is a main characteristic during photoaging, but the mechanism is still not fully understood. Circular RNAs (circRNAs) are a class of newly identified non-coding RNAs with regulatory potency by sequestering miRNAs like a sponge. It's more stable than linear RNAs, and would be a useful tool for regulation of gene expression. However, the role of circRNAs in collagen expression during photoaging is still unclear. Here we performed deep sequencing of RNA generated from UVA irradiated and no irradiated human dermal fibroblasts (HDFs) and identified 29 significantly differentially expressed circRNAs (fold change $\geq$1.5, $P < 0.05$), 12 circRNAs were up-regulated and 17 circRNAs were down-regulated.3 most differentially expressed circRNAs were verified by qRT-PCR and the down-regulated circCOL3A1-859267 exhibited the most significantly altered in photoaged HDFs. Overexpression of circCOL3A1-859267 inhibited UVA-induced decrease of type I collagen expression and silencing of it reduced type I collagen intensity. Via a bioinformatic method, 44 miRNAs were predicted to binding with circCOL3A1-859267, 5 of them have been confirmed or predicted to interact with type I collagen. This study show that circCOL3A1-859267 regulate type I collagen expression in photoaged HDFs, suggesting it may be a novel target for interfering photoaging.

Keywords: circRNAs; photoaging; fibroblast; collagen; high throughput sequencing