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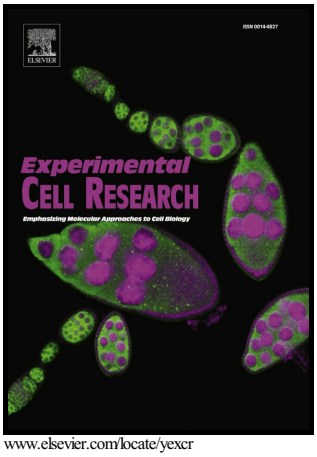

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Mini-peptide RPL41 attenuated retinal neovascularization by inducing degradation of ATF4 in oxygen-induced retinopathy mice

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Abstract

Endoplasmic reticulum (ER) stress signaling is activated in retinal degeneration disease. Activating transcription factor 4 (ATF4), an important mediator of the unfolded protein response (UPR), is a key element that maintains cell survival and proliferation in hypoxic conditions. Our previous studies showed that a small ribosomal protein L41 (RPL41) inhibits ATF4 by inducing its phosphorylation and degradation. In the present study, the effects of mini-peptide RPL41 on retinal neovascularization (RNV) in oxygen-induced retinopathy (OIR) mice was investigated. We induced OIR in C57BL/6 mice and obtained retinas from normoxia, OIR, OIR control (treated with PBS), and OIR treated (treated with RPL41) mice. Our results showed that ER stress signaling was activated and ATF4 was overexpressed in the retinas of OIR mice. After intravitreal injection of RPL41, the size of RNV and vaso-obliteration, and the number of preretinal neovascular cell nuclei in the retinas of OIR mice were significantly decreased. Western blot analysis and quantitative real-time polymerase chain reaction (qPCR) showed ATF4 and VEGF expression decreased after intravitreal injection of RPL41. Furthermore, the expression levels of