

〈一般論文〉

エラスチン結合タンパク質の細胞外マトリックス構造への関与と 培養線維芽細胞の帯状集合形成

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Involvement of Elastin Binding Proteins in Extracellular Matrix Structure and Band-Like Assemblies of Culture Fibroblasts

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Abstract

Elastic fibers which contribute to contractility of tissue play an important role in elasticity of skin. Although it is suggested that elastin binding proteins such as 67-kDa elastin binding protein, galectin-3 and -9 are related to cell-extracellular matrix (ECM) interactions, their functions are still not fully understood. In this study, we observed structures formed by fibroblasts and their secreted ECM, and investigated effects of elastin binding proteins on contractility of ECM structure. As a result, elastic fibers were formed by treatment of transforming growth factor- β 1 (TGF- β 1) to fibroblasts. Then, cells and fibers assembled in band-like form as they shrank. These assemblies were attenuated by cellular senescence, and the elastin binding proteins were decreased at the same time in mRNA expression. These assemblies were also attenuated by treatment of lactose which inhibits binding activity to elastin in the elastin binding proteins. In addition, mechanical stretch stimulation significantly decreased matrix metalloproteinase 1 (MMP1) mRNA expression and increased elastin (ELN) mRNA expression in fibroblasts. These results suggest that the reduction of elastin binding proteins caused by cellular senescence affects the contractility of ECM structures and the transcriptional regulation of ECM-related proteins in fibroblast. Prevention of decrease in elastin binding proteins may be a new target for preventing skin aging.

Key words: elastin binding proteins, fibroblasts, contractility, elastic fibers.