Study of deposition and maturation of tropoelastin molecule on elastic fiber assembly

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Objective: Elastin is a highly insoluble extracellular matrix protein and the core protein of the elastic fibers that impart resilience to elastic tissues. Loss of elasticity is observed in a range of serious diseases or age-related lesions. However the mechanisms of elastic fiber formation remains unclear, it is believed that deposition onto microfibrils and maturation of tropoelastin (TE) is important. In this study, characterization of TE molecule was demonstrated on the deposition and maturation of TE in elastic fiber formation.

Methods: We demonstrated the deposition and maturation of TE using an in vitro model of elastic fiber assembly. Elastic fiber was evaluated by immunofluorescence staining, the quantitative analysis of cross-linked amino acids, and semi-quantitative analysis of matrix-associated tropoelastin.

Results: Our data showed that C-terminal of TE and whole molecule of TE is required for the deposition and maturation of TE, respectively. Moreover it is suggested that molecular interaction between TE and DANCE/fibulin-5 is important for the maturation of TE.

Conclusion: This study would provide new information for the mechanism of formation and regeneration of elastic fibers.