Regulation of Proteoglycan Production in Vascular Endothelial Cells by TGF-β
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B-18 TGF-βによる増殖期血管内皮細胞のプロテオグリカン産生の制御

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[Introduction] We have previously isolated an extracellular matrix (ECM) 22 kDa protein (22K). It has been revealed that this molecule modulates the collagen fibrillogenesis and interacts with decorin which is known to bind transforming growth factor-β1 (TGF-β1). In this study we focused on the novel function of 22K concerning the interaction with decorin and TGF-β1, and the effect on the bioactivity of this cytokine.

[Materials and Methods] Molecular interactions between 22K, decorin, and 125I-TGF-β1 were analyzed by solid phase assay. A bioassay of TGF-β1 was done using the mink lung epithelial cells transfected with plasminogen activator inhibitor 1 promoter-luciferase construct (Abe, M. et al. Anal. Biochem. 216: 276-284, 1994) in the presence or the absence of 22K or decorin.

[Results] Decorin and 22K could bind TGF-β1. 22K-TGF-β1 interaction was inhibited by decorin, and decorin-TGF-β1 interaction was partially inhibited by 22K. Decorin-22K complex could bind nearly threefold of TGF-β1 than decorin or 22K could alone. Decorin released TGF-β1 from the complex with 22K, but 22K had little effect upon the release of decorin-bound TGF-β1. The TGF-β1-induced luciferase expression was enhanced by 22K, but not by decorin.

[Discussion] The binding partner of TGF-β1 depends on whether decorin and 22K form complex before or not. Decorin, by interacting with TGF-β1 molecule, cancels its biological activity (Yamaguchi, Y. et al. Nature 346: 281-284, 1990). On the other hand, 22K enhanced the TGF-β1 bioactivity in this study. There is a possibility that 22K and decorin influence the TGF-β1 bioactivity through the order of the interactions which they make in the ECM microenvironment.