Collagen VIII is expressed by vascular dmooth muscle vells in response to vascular injury.

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Abstract

To identify genes involved in vascular remodeling, we applied differential mRNA display analysis to the rat carotid artery balloon injury model. One polymerase chain reaction product showing increased expression at days 2 to 14 after vascular injury was nearly identical to the mouse α1 chain of type VIII collagen, a heterotrimeric short-chain collagen of uncertain function expressed by a limited number of cell types. By Northern analysis, expression of both chains of the type VIII collagen heterotrimer increased: collagen α1 (VIII) mRNA expression was almost 4-fold higher than control by 7 days after vascular injury, and collagen α2 (VIII) mRNA expression reached a maximum of almost 6-fold above baseline by 3 days after injury. By immunohistochemical analysis, type VIII collagen expression increased in the media and neointima in a localized pattern consistent with the distribution of activated dedifferentiated vascular smooth muscle cells (VSMCs). Cultured VSMCs expressed higher levels of type VIII collagen in response to serum and growth factors, notably platelet-derived growth factor (PDGF)-BB. VSMCs adhered significantly less to type VIII collagen than to type I collagen substrata and showed greater PDGF-BB-stimulated migration (by 2.2-fold) on type VIII collagen than on type I collagen. We hypothesize that increased expression of type VIII collagen by VSMCs after arterial injury may contribute to vascular remodeling through the promotion of VSMC migration.