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Topographic patterns of vascular disease - *Hox* proteins as determining factors?

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#### Abstract

Steadily increasing evidence supports the idea that genetic diversities in the vascular bed are, in addition to hemodynamic influences, a major contributing factor in determining region-specific cardiovascular disease susceptibility. **Members of the phylogenetically highly conserved *Hox* gene family of developmental regulators have to be viewed as prime candidates for determining these regional genetic differences in the vasculature. During embryonic patterning, the regionally distinct and precisely choreographed expression patterns of HOX transcription factors are essential for the correct specification of positional identities. Apparently, these topographic patterns are to some degree retained in certain adult tissues, including the circulatory system. While an understanding of the functional significance of these localized *Hox* activities in adult blood vessels is only beginning to emerge, an argument can be made for a role of *Hox* genes in the maintenance of vessel wall homeostasis and functional integrity on the one hand, and in regulating the development and progression of regionally restricted vascular pathologies, on the other. Initial functional studies in animal models, as well as**

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