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Radar Is Required for the Establishment of Vascular Integrity in the Zebrafish

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Abstract


The precise assembly of an integrated network of blood vessels is essential for the survival of vertebrate embryos. However, the processes by which primitive endothelial cells form mature vessels capable of supplying oxygen and nutrients to developing tissues remain incompletely understood. Here, we propose a role for Radar, one of the zebrafish orthologues of *gdf6*, in establishing integrity of the trunk vasculature in zebrafish embryos. We show that *radar* expression is appropriately placed, both spatially and temporally, to perform such a role. Transcripts for *radar* are detected in the hypochord and the primitive gut endoderm. These tissues intimately flank developing axial vessels in the trunk and have been previously implicated in the regulation of vascular development. Morpholino-based targeted gene knock-down has generated a Radar-specific loss-of-function zebrafish model. These embryos display normal initiation of vascular patterning and commencement of circulation. However, by day 2 of development, the integrity of the axial vasculature is compromised with hemorrhages and circulation short-circuits throughout the developing trunk. We show that this aberrant vascular development is specific to a reduction of the *radar* gene product. These results suggest that Radar is involved in a signaling pathway required for establishing the integrity of the axial vessels during zebrafish development.

Keywords






radar; GDF6a; BMP; TGF- β ; zebrafish; angiogenesis; hypochord; vasculogenesis; morpholino; microangiography[Recommended articles](#) [Citing articles \(18\)](#)

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