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Tracing the Progeny of the Aortic Hemangioblast in the Avian Embryo

Thierry Jaffredo¹ ... F. Dieterlen-Lièvre [Show more](#)<https://doi.org/10.1006/dbio.2000.9799>[Get rights and content](#)Under an Elsevier [user license](#)[open archive](#)

Abstract

A population of hematopoietic progenitors becomes committed within the embryo proper in the floor of the aorta (P-Sp/AGM in the mouse). In birds, this first aspect of intraembryonic hematopoiesis is prominent during embryonic day 3 (E3) as endothelium-associated “intra-aortic clusters.” Between E6 and E8, diffuse hematopoiesis then occurs as “para-aortic foci” located in the dorsal mesentery ventral to the aorta. These foci are not associated with endothelium. Whether these two hematopoietic cell populations arise from distinct or common progenitors is not known. We could recently trace back the origin of intra-aortic clusters in the avian embryo by labeling aortic endothelial cells (EC) *in vivo* with acetylated low-density lipoproteins. This approach established the derivation of early intraembryonic hemopoietic cells from the endothelium, but did not indicate how long during ontogeny such a relationship may exist, since the progeny of EC labeled at E2 could be traced for 1–2 days at most. Here we report that, when E2 aortic ECs were infected prior to the formation of intra-aortic clusters with a nonreplicative LacZ-bearing retroviral vector, numerous cells were labeled in the para-aortic foci at E6. In contrast, when the retroviral vector was inoculated at E4 rather than E2, that is, after the disappearance of intra-aortic clusters, no cells in the para-aortic foci were labeled. Taken together, our results demonstrate that ECs from the aortic floor seed the two aspects of aorta-associated hemopoiesis and that these ECs with hemangioblastic potential are present only transiently in the aorta.


Keywords

chick embryo; hematopoiesis; hemangioblast; CD45; retroviral vectors






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- 1 To whom correspondence should be addressed. Fax: (1) 48 73 43 77. E-mail: jaffredo@infobiogen.fr.

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