Letter to the Editor

Contribution of Endothelial Cells of Hematopoietic Origin to Blood Vessel Formation

To the Editor:

Crosby et al.1 noted in their report that the recruitment of bone marrow–derived endothelial progenitor cells to newly forming blood vessels might have been hitherto overlooked. Postulated already a century ago,2 there is now ample evidence for a close association between blood progenitor cells and angiogenesis3 and the existence of a hemangioblastic progenitor capable of generating blood cells as well as endothelial cells.4–6 Also, the integration of bone marrow–derived endothelial cells or their progenitors into sites of neangiogenesis is well-known.7–9 Their view that bone marrow–derived endothelial cells do not contribute substantially to the endothelium of blood vessels in stable adult tissue is equivocal. Endothelial cells are among those exhibiting the lowest replication level in the body with only 0.01% cells engaged in cell division at any time.10 Nevertheless, vascular endothelial cells that are lost from the vessel intima through necrosis or apoptosis must be replaced (maintenance angiogenesis). We are not aware of data showing that maintenance angiogenesis occurs through proliferation of adjacent endothelial cells. Thus, most likely, bone marrow–derived endothelial cells contribute to this maintenance angiogenesis.11 Vascular endothelial growth factor (VEGF) can mobilize endothelial cells or their progenitors from the bone marrow,9 and the delivery of VEGF to subjects may be deleterious.12,13 Hypoxia can also launch mobilization of endothelial precursor cells from the bone marrow, as hematopoietic cytokines (granulocyte/macrophage colony-stimulating factor) can do.14 Malignant tumor growth results in hypoxia within the neoplastic tissue, potentially mobilizing bone marrow–derived endothelial cells as well in a paracrine fashion, thus contributing to the sprouting of new tumor vessels. Moreover, cytokines accelerating hematopoietic recovery after myelotoxic chemotherapy might also promote the growth of tumor vessels by recruiting endothelial cells from the bone marrow, an issue that deserves critical evaluation.

Eberhard Gunsilius
Hans-Christoph Duba
Andreas L. Petzer
Christian M. Kähler
 Günther A. Gastl
University of Innsbruck
Anichstrasse 35
6020 Innsbruck, Austria
eberhard.gunsilius@uibk.ac.at

Contribution of Endothelial Cells of Hematopoietic Origin to Blood Vessel Formation
Eberhard Gunsilius, Hans-Christoph Duba, Andreas L. Petzer, Christian M. Kähler and Günther A. Gastl

Circ Res. 2001;88:e1
doi: 10.1161/01.RES.88.1.e1

Circulation Research is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2001 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7330. Online ISSN: 1524-4571

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circres.ahajournals.org/content/88/1/e1

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation Research can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation Research is online at:
http://circres.ahajournals.org//subscriptions/