# EC-18 (1-palmitoyl-2-linoleoyl-3-acetyl-rac-glycerol) Exhibits the Immune Regulatory Role through HSC Differentiation of Bone Marrow Cells in Mice

Ha-Reum Lee, Su-Hyun Shin, Nina Yoo, Sun Young Yoon, Myung-Hwan Kim, Cheolwon Suh, Ki-Young Sohn, Heung-Jae Kim, Yong-Hae Han, Saeho Chong, and Jae Wha Kim

Blood 2015 126:4757;



**Abstract**

EC-18 (1-palmitoyl-2-linoleoyl-3-acetyl-rac-glycerol) was originally isolated as a component of an extract from deer antler is traditionally used as an oriental medicine for hematopoiesis. A trace of MADG (monoacetyldiacylglyceride) could be detected in the deer antler, animal tissue, seed oils and bovine udder, which is identical to its natural source of MADG was chemically synthesized with glycerol, palmitic acid and linoleic acid. Previous study described that EC-18 has effect on the proliferation of hematopoietic stem cells (HSCs) (Biol. Pharm. Bull. 2004, 27(7): 1121-1125). Successively, we investigated the biological role of EC-18 in the differentiation of bone marrow cells into progenitor cell population in mice. EC-18 was administered daily for 1, 5 and 15 days to 6 week-aged C57BL/6 mice. Bone marrow cells of EC-18 administrated mice were collected from femurs and tibiae. Cell population was analyzed by FACs. As results, the total number of bone marrow cells was increased in EC-18 administered mice. To identify hematopoietic lineage cell population, we used lineage cocktail antibody kit including anti-mouse CD3, CD11b, CD45R, Gr-1 and TER-119. The lineages negative population contains HSCs which can self-renew and generate into all lineages of the hematopoietic system. The lineage negative cells significantly increased in time dependent manner in the EC-18-daily administrated mice. Cell population between myeloid progenitor (Lin- Sca1- Kit+) and common lymphoid progenitors (Lin- Sca1+ Kit+ IL-7R-α+) were

analyzed using the antibody for Sca-1, c-Kit, IL-7R-α. The data showed that the population of myeloid progenitor cells was markedly increased rather than common lymphoid progenitor cells. In myeloid progenitor cell population, the cell population of megakaryocyte/erythrocyte progenitors (MEP) and granulocyte-monocyte progenitors (GMP) also elevated significantly. Taken together, EC-18 may have a potential role in the HSC differentiation and could be used as a therapeutic agent for anemia and neutropenia.

**Disclosures** No relevant conflicts of interest to declare.

- ↵* Asterisk with author names denotes non-ASH members.



**Related Articles**

Notch1 activation increases hematopoietic stem cell self-renewal in vivo and favors lymphoid over myeloid lineage outcome
Sebastian Stier et al., Blood, 2002

Differential Regulation of Expression of the Anti-Leukemogenic Orphan Nuclear Receptor Nur77 (nr4a1) In HSCs, CLPs, and CMPs
Yusup Shin et al., Blood, 2010

Growth Factor Independence 1 b (Gfi1b) as a New Regulator of Hematopoietic Stem Cell Fate
Cyrus Khandanpour et al., Blood, 2010

The Endothelial Antigen ESAM Marks Hematopoietic Stem Cells throughout Life
Takafumi Yokota et al., Blood, 2008

E47 regulates hematopoietic stem cell proliferation and energetics but not myeloid lineage restriction.
Qi Yang et al., Blood, 2011

Genetically determined variation in the number of phenotypically defined hematopoietic progenitor and stem cells and in their response to early-acting cytokines
Els Henckaerts et al., Blood, 2002

Myeloid-biased hematopoietic stem cells have extensive self-renewal capacity but generate diminished lymphoid progeny with impaired IL-7 responsiveness.
Christa E Muller-Sieburg et al., Blood, 2004

Scl regulates the quiescence and the long-term competence of hematopoietic stem cells.
Julie Lacombe et al., Blood, 2009

LRF Regulates Self-Renewal of Hematopoietic Stem Cells by Blocking Notch1-Mediated T Cell Differentiation
Sung-UK Lee et al., Blood, 2008

p18INK4C Is a Checkpoint For a Noncanonical Differentiation Path Of Hematopoietic Stem Cells Into Lymphoid Lineages
Fang Dong et al., Blood, 2013

Powered by

Back to top

Previous

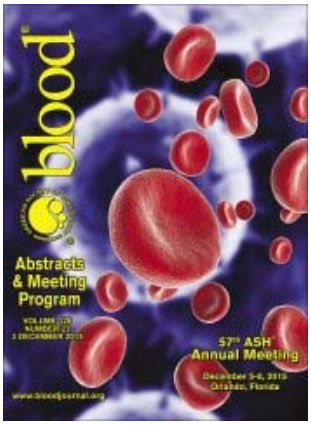


Table of Contents

**Volume:** 126
**Issue:** 23
**Pages:** 4757
**DOI:** https://doi.org/

Email
Alerts
Citation Tools
Cite This
Request Permissions
Share



**Jump to**

- Article
- Info & Metrics
- e-Letters

## Related Articles

*No related articles found.*



Current Issue
First Edition
Collections
All Issues
Abstracts
Video Library
About *Blood*
Subscriptions
Newsroom
Copyright
Public Access
Permissions
Submit to *Blood*
*Blood* App
Alerts
RSS
Contact Us
Order Reprints

**Information for:**

Authors
Subscribers