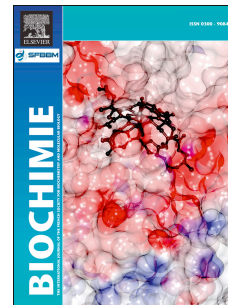


Accepted Manuscript

HAMSCs/HBMSCs coculture system ameliorates osteogenesis and angiogenesis against glucolipototoxicity

Chunli Zhang, Yifei Du, Hua Yuan, Fei Jiang, Ming Shen, Yuli Wang, Ruixia Wang



PII: S0300-9084(18)30195-0

DOI: [10.1016/j.biochi.2018.06.028](https://doi.org/10.1016/j.biochi.2018.06.028)

Reference: BIOCHI 5463

To appear in: *Biochimie*

Received Date: 28 May 2018

Accepted Date: 30 June 2018

Please cite this article as: C. Zhang, Y. Du, H. Yuan, F. Jiang, M. Shen, Y. Wang, R. Wang, HAMSCs/HBMSCs coculture system ameliorates osteogenesis and angiogenesis against glucolipototoxicity, *Biochimie* (2018), doi: 10.1016/j.biochi.2018.06.028.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Osteoporosis and vascular lesions induced by glucolipotoxicity are common complications of diabetes mellitus (DM). In order to deal with these complications, we designed a new therapeutic strategy, i.e. coculture system containing human amnion-derived mesenchymal stem cells (HAMSCs) and human bone marrow mesenchymal stem cells (HBMSCs). Two *in vitro* coculture models, transwell and mixed cocultures, were proposed for 7 days with variable HAMSCs: HBMSCs ratios. Then, supernatant from each coculture was used to reverse the deficiency of HBMSCs and human umbilical vein endothelial cells (HUVECs) impaired by high glucose and palmitic acid (GP). We found that glucolipotoxicity caused by GP remarkably inhibited cell proliferation, osteogenic differentiation and superoxide dismutase (SOD) activity, as well as induced the reactive oxygen species (ROS) level in HBMSCs. Meanwhile, glucolipotoxicity suppressed cell proliferation, tube formation capacity and angiogenic potential of HUVECs. Though, HAMSCs/HBMSCs coculture system reduced HBMSCs dysfunction by antioxidant properties and promoted angiogenesis in HUVECs. The mixed HAMSCs/HBMSCs coculture at the optimal ratio of 3/1 showed significantly greater cell proliferation, antioxidant properties, osteogenic and angiogenic differentiation than HBMSCs or HUVECs alone. In conclusion, the current coculture system of HAMSCs/HBMSCs can be a potential therapeutic material for advancing bone and vascular regeneration against DM-induced glucolipotoxicity.

Download English Version:

<https://daneshyari.com/en/article/8304116>

Download Persian Version:

<https://daneshyari.com/article/8304116>

[Daneshyari.com](https://daneshyari.com)