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**A NOVEL CHEMICALLY DEFINED PRE-CONDITION FOR HUMAN MENSTRUAL BLOOD-DERIVED STEM CELLS**

Rongrong Wu, Xinyang Hu, Zhi Jiang, Wenxia Wang, Yinchuang Xu, Huiqiang Chen, Jian'an Wang *Department of Cardiology, Cardiovascular Key Lab of Zhejiang Province, Zhejiang, China*

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The successful establishment of stem cell-based therapies to repair damaged myocardium after myocardial infarction (MI) requires multipotent stem cells, and most importantly, well-optimal culture conditions for large-scale expansion of such cell populations. In this study, we developed a novel chemically defined medium N2B27 combined with a different group of growth factors for short-term cultivation of human menstrual blood-derived stem cells (hMBSCs). After cultivated during four to five days, MBSCs maintained their original fibroblastic morphology, and showed great proliferative potential but no considerable change in the expression of CD29, CD34, CD45, CD105, CD117, CD166 and SSEA-4. Furthermore, in vitro migration assay using Transwell filters demonstrated that hMBSCs had an increasing migration potential after cultivation in N2B27 medium plus IGF and bFGF. When transplanted into animal models with MI, hMBSCs pretreated in N2B27 showed great migration potential into various tissues including spleen, lung and heart of peri-infarcted zones. This increase of migration potential in hMBSCs may be due to the up-regulation of MMP-2, MMP-9, MMP-14 and SDF-1 $\alpha$ -CXCR7 axis.