HYPOXIA CONDITION ENHANCED STEMNESS MARKER EXPRESSION OF MESENCHYMAL STEM-CELLS

Zenitalia[1]
[1]Universitas Udayana
Email: nitapasongka@gmail.com

ABSTRAK

Penelitian ini mendiagnosis ekspresi penanda batang MSC, kami menyelidiki penanda batang tersebut pada kondisi hipoksia dan normoksia. Sel stroma/stem mesenkim (MSC) adalah sel multipoten yang berada di banyak jaringan yang mampu memperbaharui diri dan berdiferensiasi menjadi berbagai jenis sel. Sifat-sifat ini menjadikannya kandidat yang menjanjikan untuk terapi regeneratif.
Kata Kunci: Sel Punca Mesenkim, Hipoksia, Oct4, Sox2, Nanog.

ABSTRACT

This study was diagnosed about the expression of MSCs stemness marker, we investigated the stemness marker under hypoxia and normoxia conditions. Mesenchymal stromal/stem cells (MSCs) are multipotent cells that reside in multiple tissues are capable of self-renewal and differentiation into various cell types. These properties make them promising candidates for regenerative therapies.
Keywords: *Mesenchymal Stem Cell, Hypoxia, Oct4, Sox2, Nanog.*

INTRODUCTION

Mesenchymal stem cells (MSCs) are attractive candidates for clinical repair or regeneration of damaged tissues 1-3. Oct4, Sox2, and Nanog which are essential transcription factors for pluripotency and self-renewal, are naturally expressed in MSCs at low levels in early passages, and their levels gradually decrease as the passage number increases 4. Low oxygen levels have shown to promote self-renewal in many stem cells 5,6. Therefore, to increase the expression of MSCs stemness marker, we investigated the stemness marker under hypoxia and normoxia conditions.

RESEARCH METHOD

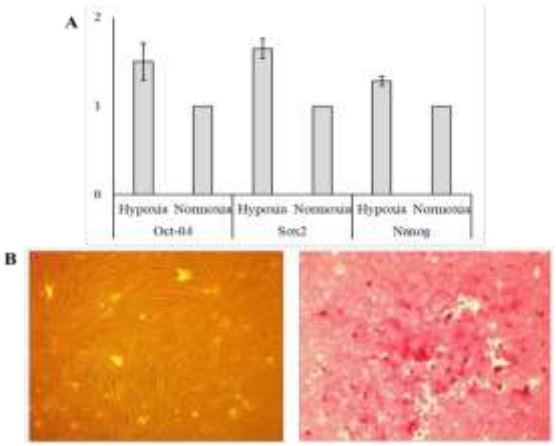
MSCs reached 70% confluents were placed in a hypoxic chamber for 24 h. Paracrine factors secreted-MSCs was analysed under qRT-PCR.

RESULTS AND DISCUSSION

Increased levels of Oct4, Sox2, and Nanog under hypoxic condition indicating acceleration in the MSCs prolferation. Furthermore, stemness marker overexpression showed higher differentiation abilities for osteoblasts than normoxia.

CONCLUSION

The improvement in cell proliferation and differentiation using Oct4, Sox2, and Nanog expression in MSCs may be a useful method for expanding the population and increasing the stemness of MSCs.



(A) Levels of stemness marker in MSCs.
(B) The morphology and differentiation of MSCs.

Umbilical cord MSC-like from in vitro culture showing fibroblast-like and polygonal cells (white arrow) Osteogenic differentiation, Alizarin Red staining appearing in MSC population (black arrow) (magnification x10, scale bar 200 µm)

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