

# Potensi Immunomodulasi Sel Punca Mesenkim Tali Pusat Dibanding Sel Punca Mesenkim Adiposa Pada Kokultur Dengan Sel Mononuklear Darah Tepi Yang Diinduksi Phytohaemagglutinin = Immunomodulatory Potency Of Umbilical Cord-Compred To Adipose-Derived Mesenchymal Stem Cells In Coculture With Phytohaemagglutinin-Induced Peripheral Blood Mononuclear Cells

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## Abstrak

Sel Punca Mesenkim (SPM) dianggap sebagai sel yang sangat menjanjikan untuk terapi penyakit berdasar inflamasi karena potensi proliferasi multilineagenya, imunogenisitas rendah, migrasi spesifik ke jaringan yang cedera, dan efek imunomodulator potensialnya. Diperlukan data pendukung mengenai potensi imunomodulasi SPM dalam menghadapi kondisi proinflamasi sebelum digunakan dalam uji klinis. Dilakukan desain penelitian eksperimental in vitro kultur sel untuk menilai potensi imunomodulasi SPM yang berasal dari tali pusat (SPM-TP) dan asal jaringan adiposa (SPM-AD). Untuk menciptakan kondisi inflamasi, menggunakan kultur PBMC yang distimulasi dengan mitogen PHA, diikuti oleh kokultur dengan dua jenis SPM. Pengujian proliferasi dengan Ki67 dilakukan dengan qRT-PCR, pengujian sitokin proinflamasi IFN- $\hat{I}^3$ , IL-1 $\hat{I}^2$ , dan antiinflamasi IL-10 dilakukan dengan metode Luminex dan pengujian sitokin TGF- $\hat{I}^2$  danIDO dilakukan mnggunakan metode ELISA. Hasil studi menunjukkan adanya perbedaan signifikan antara kelompok dengan perlakuan dan tanpa perlakuan, tetapi tidak terdapat perbedaan signifikan diantara dua kelompok perlakuan (SPM- TP dan SPM-AD). Namun, berdasarkan kemampuan untuk menekan proliferasi PBMC terlihat bahwa SPM-TP menunjukkan kemampuan yang lebih baik dibandingkan SPM-AD.

.....The Mesenchymal Stem Cells (MSCs) are considered highly promising for inflammatory disease therapy due to their multilineage proliferation potential, low immunogenicity, specific migration to injured tissues, and potential immunomodulatory effects. Supporting data on the immunomodulatory potential of MSCs in facing proinflammatory conditions are required before their use in clinical trials. An experimental in vitro cell culture research design was conducted to assess the immunomodulatory potential of MSCs derived from umbilical cord (UC-MSCs) and adipose tissue (AD-MSCs). To induce inflammatory conditions, peripheral blood mononuclear cells (PBMCs) were stimulated with PHA mitogen, followed by co-culture with the two types of MSCs. Proliferation testing using Ki67 was performed with qRT-PCR, proinflammatory cytokine testing (IFN- $\hat{I}^3$ , IL-1 $\hat{I}^2$ ) and anti-inflammatory cytokine (IL-10) were conducted using the Luminex method, and TGF- $\hat{I}^2$  and IDO cytokine testing were performed using the ELISA method. The study results indicated significant differences between the treated and untreated groups, although no significant differences were observed between the two treatment groups (UC-MSCs and AD-MSCs). However, based on the ability to suppress PBMC proliferation, it was evident that UC-MSCs exhibited superior capabilities compared to AD-MSCs.