INTISARI

ISOLASI DAN KARAKTERISASI *CANINE PERIODONTAL LIGAMENT STEM CELLS* (cPDLSCs)

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Periodontal Ligament Stem Cells (PDLSCs) adalah sel punca mesenkimal (MSC) yang diisolasi dari ligamen periodontal, sel multipoten yang memiliki karakteristik pembaharuan diri dan diferensiasi menjadi berbagai jenis sel spesifik, khususnya garis keturunan mesodermal. Penelitian ini bertujuan untuk mengisolasi dan mengkarakterisasi PDLSCs anjing. Isolasi periodontal ligamen diperoleh dari sepertiga tengah permukaan akar gigi anjing domestik kemudian dikultur dalam media kultur. Sel Punca Ligamen Periodontal anjing (cPDLSCs) diperiksa morfologinya. Ketika sel-sel yang melekat pada plat kultur mencapai konfluensi 80%, sel dapat dipasase. Kemampuan pembentukan koloni cPDLSCs juga diamati. *Surface marker* sel punca mesenkimal, yakni *Cluster of Differentation* (CD44, CD73, CD90, dan CD105) dan penanda permukaan sel hematopoietik CD45 diperiksa menggunakan RT-qPCR. Pengukuran ekspresi *stemness marker* meliputi reduced expression 1 (REX1), NANOG homeobox (NANOG), dan Octamer-binding transcription factor 4 (OCT4) juga dilakukan menggunakan RT-qPCR. Hasil isolasi dan karakterisasi penelitian ini menunjukkan morfologi mirip fibroblas yang melekat pada plastik/cawan kultur. Uji pembentukan koloni (CFU) menunjukkan kemampuan sel tunggal untuk tumbuh menjadi koloni melalui ekspansi klonal. Hasil RT-qPCR mengonfirmasi cPDLSCs mengekspresikan *surface marker* MSCs CD44 (1,15), CD73 (1,21), CD90 (10,38), dan CD105 (1,12), tetapi tidak mengekspresikan CD45 (0,0001). *Marker stemness* REX1 (10,36), NANOG (8,28), dan OCT4 (2,93) menunjukkan sel masih berada dalam keadaan multipoten. Kesimpulannya, cPDLSCs dianggap sebagai MSCs karena memenuhi persyaratan karakteristik untuk menentukan jenis sel sebagai MSCs, sehingga MSCs dapat diisolasi dari ligamen periodontal anjing.

Kata kunci: anjing, karakterisasi, ligamen periodontal, sel punca mesenkimal, RT-qPCR

ABSTRACT

ISOLATION AND CHARACTERIZATION OF CANINE PERIODONTAL LIGAMENT STEM CELLS (cPDLSCs)

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Periodontal Ligament Stem Cells (PDLSCs) are mesenchymal stem cells (MSCs) that isolated from periodontal ligament, multipotent cells that have characteristics of self-renewal and differentiation into various specific cell types, in particular mesodermal lineages. This research aimed at isolation and characterize canine PDLSCs. Ligament periodontal isolates were obtained from the middle third of the root surface of domestic dog then cultured in culture medium. Canine Periodontal Ligament Stem Cells (cPDLSCs) were examined for their morphology. When the plastic-adherent cells approximately 80% confluent can be passaged. The colony-forming capability of cPDLSCs was also observed. The mesenchymal stem cell-related surface markers Cluster of Differentiation (CD44, CD73, CD90, and CD105) and hematopoietic cell surface marker CD45 were examined using RT-qPCR. Quantification expression of stemness marker (REX1, NANOG, and OCT4) was performed using RT-qPCR. The results of isolation and characterization in this research showed of fibroblast-like morphology which these cells adhered on plastic/culture dish. Colony Forming Unit (CFU) Assay showed the capability of a single cell to grow into a colony through clonal expansion. Result of RT-qPCR confirmed cPDLSCs expressed MSCs surface markers CD44 (1,15), CD73 (1,21), CD90 (10,38), and CD105 (1,12), but not CD45 (0,0001). In addition to the stemness-related markers REX1 (10,36), NANOG (8,28), and OCT4 (2,93) indicate that cells are still in a multipotent state. In conclusion, cPDLSCs are considered MSCs because they fulfill the characteristics requirements to define a cell type as MSCs so MSCs can be isolated from canine periodontal ligament.

Key words: canine, characterize, periodontal ligament, mesenchymal stem cell, RT-qPCR