

EXPRESSION OF ALKALINE PHOSPHATASE (ALP) FROM OSTEOBLAST CELL SEDED IN COLLAGEN-CHITOSAN- CARBONATE APATITE SCAFFOLD

ABSTRACT

Background: Tooth that have been extracted will leave a defect in the alveolar bone. Generally, the bone will not completely return to its initial state and the defect in the alveolar bone will also cause resorption in the alveolar. The role of tissue engineering is needed to help regenerate damaged structures and tissues as an alternative to the bone graft. The component used in this tissue engineering is scaffolds. Some biomaterials are used to make scaffold in an effort to develop the ability of scaffold to regenerate tissue. The combination of chitosan-collagen-carbonate apatite in the form of scaffold is expected to increase the expression of Alkaline phosphatase (ALP) and accelerate bone regeneration. **Purpose:** To observe the expression of Alkaline phosphatase (ALP) in chitosan-collagen-carbonate apatite scaffold which has been implanted osteoblasts. **Method:** ALP expression on chitosan-collagen-carbonate apatite scaffold which has been implanted with ostoblast cell culture 2×10^6 was seen using immunohistochemistry methods. Incubation was carried out on the scaffold which had been implanted with osteoblasts with 37°C autoclave for 3, 5 and 7 days, then paraffin blocks were made. **Results:** There were significant differences in the expression of alkaline phosphatase (ALP) between the control group and the treatment group and also between the treatment groups on the 3rd and 5th day and 3rd and 7th day. **Conclusion:** Chitosan-collagen-carbonate apatite scaffold planted by osteoblast cells can increase the expression of Alkaline phosphatase (ALP).

Keywords: Scaffold, Chitosan, Collagen, Carbonate Apatite, Chitosan-Collagen-Carbonate Apatite Scaffold, Alkaline phosphatase (ALP), Osteoblast

EKSPRESI ALKALINE PHOSPHATASE (ALP) DARI SEL OSTEOBLAS YANG DITANAM PADA *SCAFFOLD COLLAGEN-CHITOSAN- CARBONATE APATITE*

ABSTRAK

Latar Belakang: Gigi yang telah dilakukan ekstraksi akan meninggalkan defek pada tulang alveolar, pada umumnya tulang tidak akan secara sempurna kembali ke keadaan awal dan defek pada tulang alveolar juga akan menyebabkan resorpsi pada alveolar. Peran rekayasa jaringan dibutuhkan untuk membantu regenerasi struktur dan jaringan yang rusak sebagai alternatif dari *bone graft*. Komponen yang digunakan pada rekayasa jaringan ini adalah *scaffolds*. Beberapa biomaterial digunakan untuk pembuatan *scaffold* dalam upaya mengembangkan kemampuan *scaffold* untuk meregenerasi jaringan. Penggabungan *collagen-chitosan-carbonate apatite* dalam bentuk *scaffold* diharapkan dapat meningkatkan ekspresi *Alkaline phosphatase* (ALP) dan mempercepat proses regenerasi tulang. **Tujuan:** Untuk mengetahui ekspresi *Alkaline phosphatase* (ALP) pada *scaffold collagen-chitosan-carbonate apatite* yang telah ditanamkan sel osteoblas. **Metode:** Ekspresi ALP pada *scaffold collagen-chitosan-carbonate apatite* yang telah ditanamkan kultur sel osteoblas 2×10^6 dilihat menggunakan metode imunohistokimia. Inkubasi dilakukan pada *scaffold* yang telah ditanamkan sel osteoblas dengan autoklaf 37°C selama 3, 5, dan 7 hari, lalu dibuatkan blok paraffin. **Hasil:** Terdapat perbedaan signifikan ekspresi *alkaline phosphatase* (ALP) antar kelompok kontrol dan kelompok perlakuan dan juga antara kelompok perlakuan hari ke-3 dan ke-5 dan hari ke-3 dan ke-7. **Kesimpulan:** *Scaffold collagen-chitosan-carbonate apatite* yang ditanami sel osteoblas dapat meningkatkan ekspresi *Alkaline phosphatase* (ALP).

Kata kunci: *Scaffold, Chitosan, Collagen, Carbonate Apatite, scaffold Collagen-Chitosan-Carbonate Apatite, Alkaline phosphatase (ALP), Sel Osteoblas*