

## **R-17. The effect of chitosan and collagen membrane coated with PLGA on bone regeneration in Rat Calvarial Defect**

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Resorbable membranes are being evaluated as potential candidates for periodontal and bone regenerative therapy. The objective of this study was to evaluate the effect of chitosan and collagen membrane coated with PLGA on bone regeneration in Rat Calvarial Defect.

A standardized, circular, transosseous defect, 8 mm in diameter, was created on the cranium with the use of a saline cooled trephine drill. After removal of the trephined calvarial disk, each PLGA coated collagen and chitosan membrane was applied to the defects. The animals were divided into 9 groups of 5 animals each and allowed to heal for 2 (5 rats) or 8 (5 rats) weeks. Each animal received one of three experimental conditions: PLGA 0.5%, PLGA 1%, PLGA 3%. The animals were sacrificed 8 weeks after surgery and comparative histometric analysis was done.

Surgical implantation of chitosan and collagen membranes resulted in enhanced local bone formation at both 2 and 8 weeks. Within PLGA coating examined, chitosan membrane did not exhibit an appreciable dose dependent response. Defect closure and new bone area were not significantly different in chitosan and collagen membranes group at 2 weeks. However, the defect closure and new bone in collagen area were significantly greater than those of the chitosan group at 8 weeks ( $P < 0.01$ ). The defect closures of the collagen membrane group were significantly greater than those of the chitosan group at 8 weeks ( $P < 0.01$ ).

In conclusion, collagen membrane coated with PLGA after 8weeks has a significant potential to induce bone formation in the rat calvarial defect model. Within the selected PLGA dose range and observation interval, there appeared to be no meaningful differences in bone formation.

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\* **key words** : collagen membrane, chitosan membrane, dose response, PLGA coating, rat calvarial defect model

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