

**ABSTRACT**

**Effect of Glutaraldehyde Additions to Degradation Properties of Gelatin-Chitosan-Diclofenac Sodium Scaffold (with Swelling Ratio and Weight Loss)**

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Glutaraldehyde is a crosslink agent that has high efficiency on the stability of chitosan-gelatin material. The addition of glutaraldehyde can create a stable chemical bond in the structure of chitosan-gelatin scaffold with diclofenac sodium and an effective method to slow down the degradation of scaffold and modify the release of active ingredients. The purpose of this study was to determine the effect of the addition of glutaraldehyde to the degradation of scaffold so that the optimal formula known as scaffold was used to support cartilage regeneration and drug delivery systems. Chitosan-gelatin-sodium diclofenac scaffold was made by adding glutaraldehyde to several different concentrations of 0%; 0.25; 0.50; 0.75; 1.00 and 2.50%. The scaffold was made by using the freeze drying method. Scaffold degradation was examined by swelling ratio and its weight loss using the gravimetric method by immersing the scaffold in Phosphate Buffered Saline pH  $7.4 \pm 0.1$  at  $37^{\circ}\text{C}$  for 42 days. The results showed that the addition of glutaraldehyde could increase the swelling ratio ranging from  $195.79 \pm 7.04\%$  to  $793.49 \pm 6.92\%$  and minimize weight loss up to  $50.98 \pm 0.82\%$ . Based on those two parameters, it showed that with the increasing glutaraldehyde concentration, the degradation of scaffold was decreased. This research showed that the addition of 2.50% glutaraldehyde may be an optimal scaffold formula.

Keywords: scaffold, glutaraldehyde, degradation, swelling ratio, weight loss