

Antibacterial Absorbable Surgical Suture Based on PLGA-Collagen with *Citrus paradisi* extract

Fadila Nashiri Khoirun Nisak^a, Prihartini Widiyanti^{a,b,*}, Dwi Gustiono^c, Jan Setiawan^d

^a Biomedical Engineering Study Program, Faculty of Science and Technology, Universitas Airlangga, Indonesia

^b Institute of Tropical Disease, Universitas Airlangga, Indonesia

^c Pusat Teknologi Material – BPPT, Serpong, Indonesia

^d Pusat Teknologi Bahan Bakar Nuklir- BATAN

* Corresponding author: pwidiyanti@fst.unair.ac.id

Abstract

The healing process of injuries requires surgical sutures to unify the wound. The suture has possibility to be contaminated by the microorganism and to have disturbed healing. The aim of this research is antibacterial absorbable suture synthesis. The suture was made from PLGA – collagen and *Citrus paradisi* extract. The multifilament fibers of suture was made from by using electrospinning method. The results of tensile tests showed that all samples were in the optimal range, 4.62 MPa. The swelling test showed the percentage was less than 20% indicating that no swelling occurred in the wound area. The percentage of the living cells are 90% in all samples. The optimal value of degradation rate is 89% at 60 days of absorption period. The antibacterial test using *S. aureus* are obtained the clear zone in range of 0,225-1,895 mm indicating the bacterial growth inhibition. Based on the characterization, PLGA collagen *Citrus paradisi* extract has potency as antibacterial absorbable surgical-suture.
