

Hollowfiber Poly Lactid Co-Glycolic Acid (PLGA)-Collagen Coated by Chitosan as a Candidate of Small Diameter Vascular Graft

Authors : Dita Mayasari, Zahrina Mardina, Riki Siswanto, Agresta Ifada, Ova Oktavina, Prihartini Widiyanti

Abstract : Heart failure is a serious major health problem with high number of mortality per year. Bypass is one of the solutions that has often been taken. Natural vascular graft (xenograft) as the substitute in bypass is inconvenient due to ethic problems and the risk of infection transmission caused by the usage of another species transgenic vascular. Nowadays, synthetic materials have been fabricated from polymers. The aim of this research is to make a synthetic vascular graft with great physical strength, high biocompatibility, and good affordability. The method of this research was mixing PLGA and collagen by magnetic stirrer. This composite were shaped by spinneret with water as coagulant. Then it was coated by chitosan with 3 variations of weight (1 gram, 2 grams, and 3 grams) to increase hemo and cytocompatibility, proliferation, and cell attachment in order for the vascular graft candidates to be more biocompatible. Mechanical strength for each variation was 5,306 MPa (chitosan 1 gram), 3,433 MPa (chitosan 2 grams) and 3,745 MPa (chitosan 3 grams). All the tensile values were higher than human vascular tensile strength. Toxicity test showed that the living cells in all variations were more than 60% in number, thus the vascular graft is not toxic.

Keywords : chitosan, collagen, PLGA, spinneret

Conference Title : ICABB 2014 : International Conference on Applied Biomaterials and Biomechanics

Conference Location : Bangkok, Thailand

Conference Dates : December 24-25, 2014