conferenceseries.com
2nd International Conference on
Clinical Trials and Therapeutic Drug Monitoring
August 22-24, 2016 Philadelphia, USA

C C Chu et al., J Clin Trials 2016, 6:4(Suppl)
http://dx.doi.org/10.4172/2167-0870.C1.010

Wound healing characteristics treated by two newly developed amino acid-based biodegradable polymers in burn and incision porcine wound models

C C Chu[1], **L Sigurdson**[2], **R Hard**[2], **W L Hicks**[2] and **S McDonough**[1]
[1]Cornell University, USA
[2]State University of New York, USA

A mast cell stabilizer (Ketotifen, KF) doped new biodegradable nano-fibrous membrane fabricated from a new synthetic amino acid-based poly (ester amides) (AA-PEA) and absorbable polycaprolactone (PCl) and hybrid hydrogels from Arg-PEA/chitosan derivatives were evaluated for wound healing characteristics of a 2nd degree burn as well as full-thickness excision injury of a porcine model at 7, 14, and 21 days post-injury. The characteristics of the wound treated with the new biomaterials were evaluated in terms of tissue inflammatory responses and scar tissue formation. Wound tissues harvested were histologically evaluated for collagen content, type, mast cell and macrophage. Macrophages in tissue sections were labeled with ionized calcium binding adaptor molecule 1 (IBA1) and DAB as the chromagen. The proportion of type I vs. type III collagen was determined from photomicrographs of Pico Sirius Red stained slides illuminated with circularly polarized light, the ratio of yellow/red pixels to green pixels was determined using Fiji. Assay data were analyzed using ANOVA and appropriate post hoc tests for potential differences in time and/or treatment effects on wound HP content. Treatment of burns with the mast cell stabilizer-doped nano-fibrous membrane resulted in a lower wound hydroxyproline content than undoped membrane- or Silvadene-treated wounds, suggesting that the membranes themselves did not invoke a significant inflammatory reaction. Both IBA-1 and positive pixel count data of macrophage confirm that the KF-doped nanofibrous membranes showed lower numbers of macrophage (i.e., inflammation) than both the non-doped and Silvadent-treated burn wounds. There were no statistically significant differences in HP content between excision-wounded untreated and wounded hydrogel-treated groups, suggesting that the Arg-PEA hybrid gels did not induce significant inflammation.

Biography

C C Chu, the Rebecca Q Morgan endowed Chair Professor, is a Biomaterial Scientist/Engineer at Cornell University since 1978. He is the recipient of the State University of New York Chancellor's Award for Excellence in Scholarship and Creative Activities in May, 2009. He was very recently inducted into the College of Fellow of the American Institute of Medical and Biological Engineering on March 24, 2014. He also served on the Biology/Medicine Panel of the Hong Kong Research Grant Council from 2010-2013. He has 200 research papers/book chapters, 3 books and 68 US/international patents with 7,665 citations and H-index 50.

cc62@cornell.edu

Notes: