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Wound healing potential of a biodegradable film from pullulan in rats

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The aim of this study was to develop a biodegradable film from pullulan and investigate its efficacy for wound healing. Many biomaterials like collagen, fibrin, chitosan etc., have been used in the form of films to enhance wound healing. In this study, biocompatible, biodegradable films were prepared from a biopolymer, pullulan, and used to augment wound healing. A 2 cm² full-thickness excision wound was made on the back of rats and the effectiveness of pullulan scaffolds on these wounds was investigated by measuring different biochemical, biophysical and histological analyses. The mechanical properties like tensile strength, elongation at break were found to be increased in the wounds treated with pullulan films when compared to controls. Biochemical parameters like collagen, uronic acid and hexosamine were also observed to be increased in the granulation tissues of pullulan treated rats as compared to controls. Rate of contraction was found to be significantly increased. Epithelialization period was remarkably reduced from 22 days (control) to 11 days (treated). The adhesive property of the film was studied by assessing the rejoining of incision edges (3 cm long, not stitched). It was interesting to observe that the incisions treated with pullulan films healed within 6 days whereas the control wounds took more than 12 days. The tensile strength of the treated wounds was also significantly increased. Thus, our results strongly support that pullulan films could be used as a better wound dressing for both incision and excision wounds.

Biography

Lonchin Suguna has completed her Ph.D. at the age of 27 years from University of Madras. She did her postdoctoral studies at ETH-Zentrum, Zurich, Switzerland. She is working as a Scientist in the Department of Biochemistry, Central Leather Research Institute, and in a Governmental organization in India. She has published more than 48 papers in reputed journals and serving as a reviewer for 12 journals and Editorial board member for 4 journals. She has received Mr. VV Swaminathan Diamond Jubilee Research Endowment award for the outstanding contribution in the scientific evaluation of medicinal properties of plants, by Indian Association of Biomedical Scientists, 2012 (Gold Medal)

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