THE POLYSACCHARIDE OF ANACARDIUM OCCIDENTALE (POLICAJU) AS A BIOMATERIAL TO USE IN WOUND HEALING PROCESSES

Maria das Graças Paiva[1,2], Giuliana Viegas Schirato[2], Flaviane Maria Florêncio Monteiro[2], Flávio Oliveira Silva[2], Camila Souza Porto[2], Ricardo Santos[3], Valder Nogueira Freire[3], Benildo S. Cavada[4], José Luiz de Lima Filho[2,5], Ana Lúcia Figueiredo Porto[2,6], Maria das Graças Carneiro da Cunha[2,5] & Ana Maria dos Anjos Carneiro Leão[2,6]

[1] Departamento de Fisioterapia, UFPE, PE; [2] Laboratório de Imunopatologia Keizo Asami (LIKA), UFPE, PE; [3] Departamento de Física, UFC, CE; [4] Departamento de Bioquímica e Biologia Molecular, UFC, CE; [5] Departamento de Bioquímica, UFPE, PE; [6] Departamento de Morfologia e Fisiologia Animal, UFRPE, PE.

A variety of biodegradable, biocompatible and low toxicity polymers have shown technological interest due to its potential utilization as biomaterials and controlled liberation of drugs systems. Among them, the polysaccharide from cashew tree (*Anacardium occidentale*) gum cause immune system stimulation and can be used as to improve skin wound healing. Besides this, it can be used to develop films on solid surfaces, which can be used as an occlusive dressing or to be loaded with proteases that can act along wound healing process (inflammatory phase and collagen remodelling). The aim of these studies was to evaluate the effect of the topical treatment using different formulations of POLICAJU (emulsion, occlusive matrix and as a controlled liberation system of protease) in skin wound healing. POLICAJU films were produced by polysaccharide dilution in 150mM NaCl or 4% v/v acetic acid, directed dripped on histological glass cover slides or cellulose supports and dried at 55°C for 24 hours, when AFM height images were obtained in two different resolutions, revealing the surface topography formed by a polymeric material complex net similar to oriented fibers. Wound healing was evaluated clinically and histopathologically for 12 days in female albino Swiss mice (n=15/group) which were single topically treated immediately after aseptic surgery using 150 mM NaCl, 75mg.ml^{-1} ascorbic acid, Furacin® (control groups) and POLICAJU/ascorbic acid emulsions (75mg.ml^{-1}, 150mg.ml^{-1} and 214,3 mg.ml^{-1}). When polymeric membranes were used, wounds were also treated using 4% v/v acetic acid; 10% w/v POLICAJU/4% v/v acetic acid and 10% w/v POLICAJU/150 mM NaCl films. Commercial trypsin was enclausured into these membranes and was also tested. Best results were observed using POLICAJU emulsion (150 mg.ml^{-1}), POLICAJU/NaCl occlusive dressing and 1000 µg.ml^{-1} trypsin loaded POLICAJU/NaCl film. One could observe an improved evolution than those of the control groups considering clinical (reduction of inflammatory signals as oedema, hyperemia, crust and bleeding, besides an improving of wound contraction) and microscopic characteristics (higher development of fibrous granulation tissue, faster and complete repithelization). These results suggest that different formulations of POLICAJU can be applied topically on open wounds in order to accelerate the healing process.

Supported by CAPES and CNPq