Formulation of Low-Cost Artificial Skin for Cellular Regeneration and Severe Burns Treatment

Nunes, Sofia (School: Escola Santa Teresinha)

The formulation of artificial grafts for cellular regeneration and burn treatment represents a significant advancement in the field of tissue bioengineering, with an emphasis on developing cost-effective solutions. This project aims to overcome the limitations of currently available regenerative therapies for severe burns, which require rapid tissue repair to prevent infections and loss of function. As a method, the creation of an economically viable artificial skin was proposed, capable of promoting deep tissue regeneration and hydrating the affected area through an optimized biopolymeric matrix. In the development of the biofilm, 5% acetic acid and chitosan were used as the base, complemented by hydrogels, hyaluronic acid, albumin, and buriti oil. These components were selected due to their beneficial properties in the healing process, such as biocompatibility, hydration capacity, and stimulation of cellular regeneration. The final product demonstrated a solid and uniform structure, highlighting the compatibility between the materials and the formation of a cohesive and functional film. Analyses conducted using an electronic magnifier revealed the formation of fibers in the biofilm structure, indicating a morphology similar to that of human skin. These results suggest that the developed formulation has significant potential as a viable and economically accessible alternative for applications in regenerative medicine, particularly in the reconstitution of epithelial tissue in burn cases. Therefore, it is possible to conclude that the biofilm proves to be a promising solution for treating severe skin injuries.

Awards Won: