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Development of Cutaneous Biocurative by Decellularization of Nile Tilapia Skin: A Promising Approach

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The preserved skin of Nile Tilapia (*Oreochromis niloticus*) has been used as a dressing for cutaneous wounds in various species. However, the presence of proteins in the cell membrane can lead to severe inflammatory processes and rejection in the recipient individual [1]. The aim of this study was to develop a biocurative for cutaneous use through the decellularization of tilapia skin. Adult tilapia skins were dissected to remove subcutaneous tissues and washed in a physiological solution. Subsequently, 5x3cm fragments, extracted from three regions of the skin (dorsal, median, and ventral), were subjected to different times (12, 16, 24, and 72 hours) of alkaline treatment in NaOH solution. After treatment, they were submerged in sodium hypochlorite for disinfection, washed in distilled water, dried on paper towels, frozen in liquid nitrogen, and lyophilized for 20 hours. Samples from the control group were washed in distilled water, frozen, and lyophilized without being treated in an alkaline solution. Permanent histological slides of the samples were prepared, stained with hematoxylin-eosin and Gomori trichrome, and evaluated under optical microscopy. Effective decellularization of the dermis was observed at all treatment times, which showed either no fibroblasts or a significant reduction in their quantity. Additionally, it was noted that alkaline treatment removed the amorphous part of the extracellular matrix, further contributing to improved biocompatibility. However, the increase in treatment time was directly proportional to the disorganization and fragmentation of collagen fibers. It was concluded that a 12-hour treatment is sufficient for effective decellularization and removal of the antigenic part of the extracellular matrix with good preservation of collagen fiber structure.

References:

[1] David F. Williams, *Bioactive Materials*, Vol.10, pg 306, 2022