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Cellular Derivatives and Efficacy in Wound and Scar Management

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ABSTRACT

Biologicals have been used for decades in biopharmaceutical topical preparations. Because cellular therapies are routinely used in the clinic they have gained significant attention. Different derivatives are possible from different cell and tissue sources, making the selection of cell types and establishment of consistent cell banks crucial steps in the initial whole-cell bioprocessing. Various cell and tissue types have been used in treatment of skin wounds including autologous and allogenic skin cells, platelets, placenta and amniotic extracts from either human or animal sources. Experience with progenitor cells show that they may provide an interesting cell choice due to facility of out-scaling and known properties for wound healing without scar. Using defined animal cell lines to develop cell-free derivatives may provide initial starting material for pharmaceutical formulations that help in overall stability. Cell lines derived from ovine tissue (skin, muscle, connective tissue) can be developed in short periods of time and consistency of these cell lines was monitored by cellular life-span, protein concentrations, stability and activity. Each cell line had long culture periods up to 37 - 41 passages and protein measures for each cell line at passages 2 - 15 had only 1.4-fold maximal difference. Growth stimulation activity towards two target skin cell lines (GM01717 and CRL-1221; 40 year old human males) at concentrations ranging up to 6mg/ml showed 2-3-fold (single extracts) and 3-7-fold (co-cultured extracts) increase. Proteins from co-culture remained stable up to 1 year in pharmaceutical preparations shown by separation on SDS-PAGE gels. Pharmaceutical cell-free preparations were used for veterinary and human wounds and burns. Cell lines and cell-free extracts can show remarkable consistency and stability for preparation of biopharmaceutical creams, moreover when cells are co-cultured, and have positive effects for tissue repair.

KEYWORDS

Biological; Wound Healing; Scars; Cell-Free Derivatives

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