COMPARATIVE STUDIES BETWEEN CULTURED FIBROBLASTS/ KERATINOCYTES AND FOETAL/ ADULT HUMAN SKIN

Thesis

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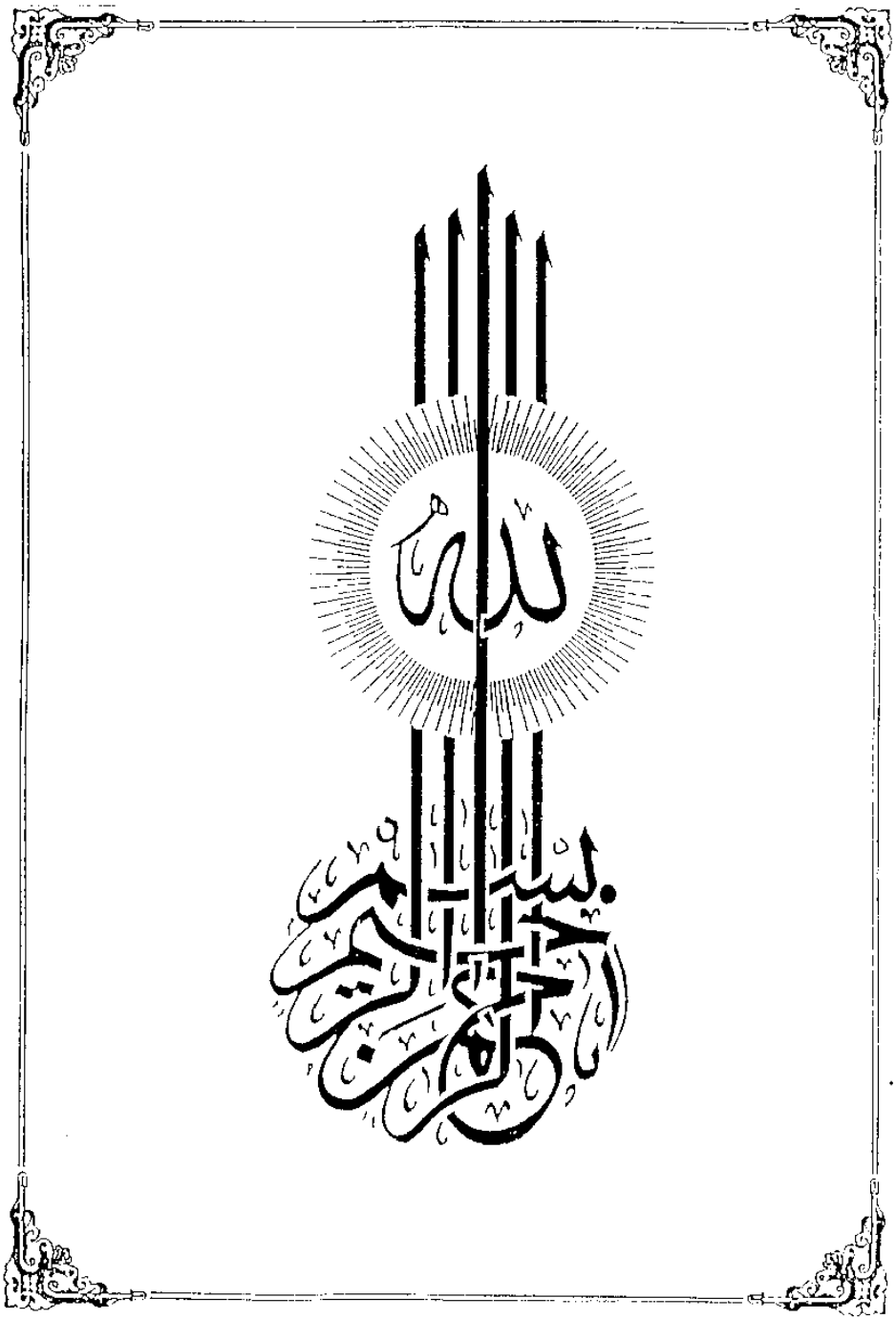

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REVIEW OF LITERATURE

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CULTURE OF THE EPIDERMAL CELLS

(A) CULTURE OF KERATINOCYTES :

Wheeler, Canby and Cawley (1957) tried to establish a line of human epidermal cells in tissue culture which would be stable enough to grow in culture media for prolonged periods, and could be serially transplanted, and could support the growth and multiplication of a number of viruses. They obtained some full thickness and other split thickness specimens of normal human skin and treated them with trypsin to separate epidermal cells from the dermis. The separated epidermal cells were placed in a growth medium and incubated at 37°C. The cells from most of the obtained specimens either did not grow, grew very little or grew to the stage of keratinization. One specimen of skin, however, yielded a line of cells which grew rapidly, was stable and could be transplanted in series. The cells demonstrated variation in size, shape and staining qualities. Many mitotic figures were present and abnormal mitosis was frequent. The initial cultures had frequently contained large numbers of fibroblasts, and after thirty to sixty days of cultivation "malignant" epithelial-like cells had appeared and these had been passed indefinitely in cell culture. This cell line was able to support the growth of herpes simplex and vaccinia viruses and its morphologic features were indistinguishable from cancer cells.

Later on, ***Reaven and Cox (1965)***, succeeded in cultivation of small pieces of postembryonic human skin which explanted under controlled conditions and had resulted in growth and differentiation of epidermal cells leading to the formation of keratohyaline granules and cornification. They found that the production of keratohyaline granules could be influenced by modifying the pH of the growth medium. The authors stated that, although major differences between the *in vivo* and *in vitro* growth of epidermis do exit, there was, nevertheless, in human skin explants, a certain predictable behaviour embodying cell multiplication and epidermal maturation, with the formation of keratohyaline granules and stratum corneum.

Karasek (1966) proved that the cultured human skin epidermal cells were able to form keratin in culture. He found that the primary culture of human skin epithelial cells accumulated an intracellular amorphous material. The isolated material from the culture was studied using histochemical and biochemical methods. The results revealed that the amorphous substance was scleroprotein with properties of native keratin. Electron microscopic studies showed tonofilaments and tonofibrils inside the epithelial cells and they were indistinguishable from those observed in the epithelial cells *in vivo*.

Foetal mouse skin cells were cultivated as a monolayer culture by ***Yuspa, Morgan, Walker and Bates (1970)***. The authors described the behaviour of the primary culture. They found that the early cultures