

D-RIBOSE ENHANCES BASAL AND MITOCHONDRIAL RESPIRATORY RATES IN HUMAN DERMAL FIBROBLASTS

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Dermal integrity and function encompasses a perpetual daily regenerative supply of mature fibroblastic cells and a constant surveillance with removal of an aging cellular population to maintain a proper architecture. ATP is necessary to maintain cellular integrity and function, including dermal fibroblasts. D-ribose, a 5 carbon sugar, has demonstrated beneficial effects in replenishing ATP. As a nutritive agent, D-ribose was added to human fibroblastic cell cultures to assess: cellular cytotoxicity (MTT assay), oxygen consumption (respiration rates), and cellular ATP production. Cells were suspended in culture wells for 24 hours at 37⁰ C. All cell cultures were subjected to oxygenated and hypoxic states. D-ribose at 0.05% demonstrated a significant stimulate effect in basal cellular and mitochondrial oxygen consumption, respiration rates (37% and 31%, respectively, p<0.01) with a positive non-significant basal rate trend at 0.1%. The absence of hypoxia did not show a significant increase in ATP levels at 0.1%, 0.05%, and 0.01% concentrations. However, 0.1% and 0.05% concentrations of D-ribose revealed a positive ATP trend, i.e. 19% improvement @ 0.05%, during hypoxia. Supplementation of D-ribose appears to aid in basal and mitochondrial respiration, two important components necessary for healthy fibroblastic activity, needed for dermal integrity and function.

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