

Effects of collagen-derived bioactive peptides and natural antioxidant compounds on proliferation and matrix protein synthesis by cultured normal human dermal fibroblasts

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Nutraceuticals containing collagen peptides, vitamins, minerals and antioxidants are innovative functional food supplements that have been clinically shown to have positive effects on skin hydration and elasticity in vivo. In this in vitro study, we investigated the interactions between collagen peptides (0.3-8 kDa) and other constituents present in liquid collagen-based nutraceuticals on normal primary dermal fibroblast function in a novel, physiologically relevant, cell culture model crowded with macromolecular dextran sulphate.

Collagen peptides significantly increased fibroblast elastin synthesis, while significantly inhibiting release of MMP-1 and MMP-3 and elastin degradation. The positive effects of the collagen peptides on these responses and on fibroblast proliferation were enhanced in the presence of the antioxidant constituents of the products.

These data provide a scientific, cell-based, rationale for the positive effects of these collagen-derived peptides and other nutraceutical compounds on skin properties, suggesting that enhanced formation of stable dermal fibroblast-derived extracellular matrices may follow their oral consumption.