

## ABSTRACT

Skin anti-aging is a primary focus in derma cosmetics, targeting the reactive oxidative species (ROS) pathway for developing anti-aging therapies due to its role in the degradation of dermal extracellular matrix (EDM). Collagen type 1 is targeted to combat skin aging due to its role in preventing wrinkles formation and re-epithelization of human keratinocytes (HaCaT). Cell-free treatments have emerged as a promising approach for developing anti-aging products. Specifically, the use of mesenchymal stem cells (MSCs) conditioned medium (or secretome) and MSCs lysate have shown promise in regenerative medicine as cell-free anti-aging approaches. The human umbilical cord is an effective source of isolatable MSCs that release soluble factors into the culture medium. This study investigates and compares the anti-aging activity of umbilical cord-derived MSCs (UC-MSCs) secretome and lysate by observing their impact on collagen type 1 expression. UC-MSC was isolated from umbilical cord tissue and validated using the CD73, CD90, and CD45 surface markers. Secretome and lysate were prepared from the isolated UC-MSCs and total protein concentration was quantified. To mimic the aging process, HaCaT cells were exposed to hydrogen peroxide, generating ROS, which was later treated with UC-MSC secretome and lysate. The results showed that both secretome and lysate increased the collagen type 1 expression of HaCaT cells under oxidative stress, yet, a direct comparison between the two treatments remains inclusive due to differences in protein concentration between samples. Nevertheless, ELISA results indicated the potential of both secretome and lysate as anti-aging treatments given their ability in stimulating collagen production.

**Keywords:** *anti-aging, secretome, umbilical cord mesenchymal stem cells, ROS, lysate, collagen*