

ABSTRACT

The present invention discloses an application of Avenanthramide C (Avn C) as an inducer of chondrocyte differentiation in Mesenchymal Stem Cells (MSCs), providing a promising approach for regenerative cartilage therapies. By employing Avn C treatments, MSCs exhibit enhanced chondrocyte differentiation with elevated expression of key specific chondrogenic extracellular matrix (ECM) factors, notably collagen type 2 (COL2A1). Moreover, a synergistic effect is observed when Avn C is used in combination with Chondroitin Sulfate (CS), resulting in the upregulation of the transcriptionally active state of SOX9, a crucial regulator of chondrogenesis. The disclosed invention demonstrates significant improvements in mRNA gene expressions (ACAN, LRP1, SOX9), cellular protein levels (COL2A1, SOX9, LRP1), and functional outcomes, as evidenced by the secretion of extracellular matrix proteins (FSTL-1, BGH3, CO1A1, CO1A2, and CO3A1).

[FIG. 1]