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Calycosin Ameliorates Osteoarthritis by Regulating the Imbalance Between Chondrocyte Synthesis and Catabolism

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Abstract : Osteoarthritis (OA) is a severe chronic inflammatory disease. As the main active component of Astragalus mongholicus Bunge, a classic traditional ethnic herb, calycosin exhibits anti-inflammatory action and its mechanism of exact targets for OA have yet to be determined. In this study, we established an anterior cruciate ligament transection (ACLT) mouse model. Mice were randomized to sham, OA, and calycosin groups. Cartilage synthesis markers type II collagen (Col-2) and SRY-Box Transcription Factor 9 (Sox-9) increased significantly after calycosin gavage. While cartilage matrix degradation index cyclooxygenase-2 (COX-2), phosphor-epidermal growth factor receptor (p-EGFR), and matrix metalloproteinase-9 (MMP9) expression were decreased. With the help of network pharmacology and molecular docking, these results were confirmed in chondrocyte ATDC5 cells. Our results indicated that the calycosin treatment significantly improved cartilage damage, this was probably attributed to reversing the imbalance between chondrocyte synthesis and catabolism.

Keywords : calycosin, osteoarthritis, network pharmacology, molecular docking, inflammatory, cyclooxygenase 2
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