Title:	BIO-SCAVENGING: A PROMISING THERAPEUTIC APPROACH TO ADDRESS CARTILAGE ASSOCIATED DISEASES.
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Abstract:	According to the Global Burden Diseases (GBD) report of 2022, ~500 million people suffer from degenerative and inflammatory musculoskeletal joint disorders alone. The musculoskeletal joint disorders are the primary cause of life-time disability in many cases. In such individuals, inflammation and severe pain is manifested in the joints like knees, hands, feet, hips and spine. The degeneration of cartilage and the underlying bone leads to chronic inflammatory diseases of joints such as osteoarthritis (OA) and rheumatic arthritis (RA). Articular cartilage (AC) is a specialized type of connective tissue that covers the ends of bones in joints, providing a smooth, lubricated surface that allows for frictionless movement of the joint. AC possesses limited ability for natural healing and regeneration due to its lack of blood vessels. Consequently, safeguarding and maintaining the health of AC is crucial for the overall well-being of the joints. Protecting AC from further damage is a significant challenge for patients, surgeons and physical therapists. Joint injuries or its overuse can accelerate the breakdown of cartilage leading to OA, a degenerative inflammatory joint disease. OA is characterized by an increase in pro-inflammatory markers such as Nitric oxide (NO), IL-1β and TNF-α. Typically, in acute inflammatory conditions, a series of cellular and molecular events work together to minimize the damage or infection. However, when acute inflammation is not properly controlled, it can transit into a chronic state, which manifests as chronic inflammatory diseases. This chronic inflammation can damage the joints contributing to OA progression. Elevated levels of inflammatory markers lead to an increase in matrix metalloproteases (MMPs), which in turn causes cartilage degeneration. This degeneration subsequently leads to subchondral bone (SB) damage and subsequently to joint instability. The existing pharmaceutical approaches to treat OA includes drugs that mitigate pain and inflammation. However, there is no approved drug that can prevent/modify the damage to the articular cartilage. Understanding the current scenario, we proposed to develop therapeutic approaches that prevent the progression of cartilage degeneration.
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