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IP International Journal of Periodontology and Implantology

Journal homepage: https://www.ijpi.in/

Editorial

Role of SPARC a glycoprotiene in periodontitis

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ARTICLE INFO

Article history:
Received 05-11-2024
Accepted 21-11-2024
Available online 14-12-2024

Osteonectin (ON), a glycoprotein with a molecular weight of about 40 kD, is often referred to as secreted phosphoprotein acidic and rich in cysteine (SPARC). It is a cysteine-rich, acidic protein made up of a single polypeptide chain that is separated into four different domains: Near a glutamic acid-rich area at the amino terminus, Domain I has calcium-binding sites; Domain II has a lot of cysteine; Domain III has a hydrophilic region; and Domain IV has an EF hand motif at the carboxy terminus. Its function in the organizing and mineralization of the bone matrix is facilitated by this structure.[1]

Numerous cells, including osteoblasts, fibroblasts from the skin, tendons, sclera, and periodontal ligaments, generate osteonectin (ON), also referred to as SPARC (Secreted Phosphoprotein Acidic and Rich in Cysteine). Nonetheless, platelets are the source of the majority of ON in the blood. It is highly expressed in tissues going through morphogenesis, remodeling, and repair and secreted by proliferating cells in vitro. ON is broadly distributed throughout many tissues and is particularly expressed in non-ossifying tissues and during early development, despite being plentiful in bone. Osteonectin, which is produced by fibroblasts, especially periodontal fibroblasts, aids in the healing of wounds. At wound sites, macrophages manufacture it, and platelets release it. Osteonectin functions as an anti-adhesive and inhibits cell spreading and focal adhesion, especially in fibroblasts, in contrast to some matrix proteins that promote cell attachment. It has also been shown to reduce DNA synthesis in cultured bone cells and controls cell proliferation, particularly affecting endothelial cells, possibly through interactions with growth factors and cytokines.[2]

Because it affects a number of physiological functions, osteonectin (ON), also known as SPARC, is essential for general health. Through its interactions with collagen and hydroxyapatite, it promotes bone health by assisting in the mineralization of bone tissue. Osteonectin has a role in tissue remodeling and repair during wound healing, which helps injured tissues heal. It affects cell adhesion and behavior via controlling matrix interactions and cell proliferation. Furthermore, angiogenesis—the creation of new blood vessels—is facilitated by osteonectin and is necessary for tissue regeneration and repair. All things considered, osteonectin is essential for preserving strong bones, encouraging efficient wound healing, and sustaining vascular and cellular processes.

By binding to collagen and hydroxyapatite, it promotes bone growth and mineralization in periodontal tissues, supporting the structural integrity of the alveolar bone that supports teeth. Additionally, osteonectin helps the periodontal ligament restructure so that teeth may properly adhere to the bone and adjust to mechanical forces. It also aids cementoblasts in the formation of cementum, the mineralized tissue that envelops tooth roots and adds solidity to teeth. Osteonectin plays a crucial function in periodontal health and recovery by promoting wound

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https://doi.org/10.18231/j.ijpi.2024.035

healing after tissue injury or illness by aiding tissue repair and regeneration.[3]

Conflict of Interest

None.

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Cite this article: Mutthineni RB. Role of SPARC a glycoprotiene in periodontitis. *IP Int J Periodontol Implantol* 2024;9(4):171-172.