New Era of *Aloe vera* as Biomaterial for Tissue Regeneration

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Aloe vera has been recognized as a medicinal herb for enhancing skin wound healing. Recently, our group has successfully extracted acemannan, a polysaccharide from *aloe vera* gel. Acemannan contains a unique acetylated D-mannose as a major sugar residue. *In vitro* study, acemannan stimulated proliferation, extracellular matrix synthesis, growth factor secretion, and mineral deposition in primary human gingival fibroblast, pulpal fibroblast, bone marrow stromal cell, and periodontal ligament cell. In animal model, acemannan induced oral wound healing, reparative dentin formation, tooth socket healing , and periodontium regeneration. Clinically, acemannan was effectively in oral aphthous ulcer treatment, reparative dentin formation, and tooth socket healing. The effectiveness of acemannan in reducing ulcer size and pain was superior to that of control, but inferior to that of 0.1% triamcinolone acetonide. Acemannan significantly enhanced new dentin formation to conceal the pulp exposure comparing with $Ca(OH)_2$. Using radiographic evaluation, acemannan accelerated tooth socket healing 3-months after surgical removal of mandibular partial bony impacted third molars. The percentage radiographic density of the socket 3-months post-surgery in the acemannan treated group was significantly higher than that of non-treated control. From our limitation data, acemannan could be natural bioactive material for oral tissue regeneration.