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## Freeze-dried platelet as a natural source of essential growth factors for periodontium regeneration

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**P**eriodontitis is a common disease that starts with gingival inflammation and may end with the formation of periodontal pocket with loss of attachment and destruction of the supporting structures. This eventually leads to functional and esthetic problems. Several limitations in the current treatment modalities restrict the reach for full periodontium regeneration. The utilization of the science of tissue engineering and regenerative medicine offers the opportunity to overcome these limitations. Platelet concentrates have been used to deliver a high dose of growth factors that can aid in the healing and regeneration of wound defects. However, fresh prepared platelet concentrate has a shelf life of only 4-5 days and frozen platelet concentrate loses a lot of its benefits. In addition, delivered growth factors have a short half-life in vivo (within hours) due to rapid clearance which makes it difficult to maintain a therapeutic dose at the defect site throughout the healing period. Therefore, it was hypothesized that incorporating freeze-dried platelets in high amounts with their load of many growth factors in a hydrogel carrier can control their delivery and provide a sustained therapeutic dose for a longer period. In addition, an antimicrobial easy-applicable hydrogel scaffold was used for better regeneration.

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