

# Bone and Lyophilized PRF as Novel Material for Bone Regeneration

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Reconstruction of bone defects is a principal problem in orthopedic, oral, and maxillofacial surgery [1]. Over the years, different strategies leading to the replacement of missing bone have been employed. Autologous bone grafts remain the most commonly used procedure for bone defect treatment. Tissue engineering and regenerative medicine thus emerged as an option to overcome the limitation of conventional tissue grafting. In the field of bone regenerative therapies, various strategies using bioactive membranes, growth factors and/or stem cells have been intensively proposed [1]. In this context, the fibrin network (FN) has become a highly attractive and easily accessible source of bioactive biological tissue containing many different of growth factors such as PDGF, VEGF, FGF, TGF $\beta$ , et. [2]. Fibrin network is prepared from peripheral blood with different techniques. FN has been used in therapy as a useful biological tool in medicine, especially in bone and skin regeneration. Many studies have shown that FN produced in different forms are suitable for tissue engineering applications especially in the field of bone regeneration [3]. First, it has been demonstrated that FN has the ability to be osteodifferentiated in toto, thereby suggesting promising results using this membrane in its entirety for bone regeneration. Some studies thus suggested its potential as a biological alternative to membrane commonly used for guided bone regeneration [4]. The combination of FN with bone allografts can increase the process of osteogenesis and accelerate repair of the speed of bone regeneration in the maxillofacial area.

Recently, lyophilized platelet-rich fibrin (PRF) is expanding, which can be used as an effective agent in the reconstruction and repair of hard and soft tissues. The FN obtained from PRF can be used as a new generation of products in bone tissue repair [5,6].

There are many studies in the clinical field for the use of PRF in the restoration of bone in maxillofacial and face. It has been reported that this product in combination with demineralized bone matrix [DBM] can accelerate the process of maxillofacial bone

formation [4]. It can be used as a new and effective product in combination with bone allografts in bone restoration by achieving the appropriate technique of separation and preparation of the FN as well as its lyophilization.

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