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FRIOS® Algipore® – natural bone remodeling

Algipore has successfully been used as a bone grafting material since 1988 and with almost 25 years of clinical experience, it has been demonstrated to enhance new bone formation both in, pre-clinical *in vitro* [1–3], *in vivo* [4, 5] as well as clinical [6–9] situations. Furthermore, Algipore has shown good resorbable properties over time when used both in humans [10, 11] as well as in animals [4] where resorbed particles are being replaced by newly formed bone. Its ease of use and appliance has made it used as a bone augmentation material worldwide.

Algipore is a natural occurring hydroxyapatite derived from calcifying maritime algae with moderate chrystallinity [12]. It is prepared by the hydrothermal conversion of the original calcium carbonate of the algae in the presence of ammonium phosphate at about 700°C [12] and this process preserves the porosity of the algae. It is available as granulate with particle sizes of 0.3–2.0 mm and pores in the range of 5–10 µm [12]. Due to its columnar porous structure [13], Algipore has a large surface area available for protein binding which evidently makes it highly suitable as a protein carrier for e.g. bone growth promoting factors [14–18] or stem cells [19]. Immunological *in vitro* testing of human peripheral blood cells cultivated in the presence of Algipore showed no signs of an activated immune response, thus supporting Algipore as a highly biocompataible substance [20].

The pre-clinical *in vivo* performance of Algipore has been documented in various experimental models with different focuses [4, 5, 14, 16, 21]. In a study performed in a rabbit tibia bone defect model, the high osseoconductive and resorbable properties of Algipore were confirmed [4].

Many clinical investigations report on the usage of Algipore as a bone substitute material suitable for many different indications [6–10, 19, 22–32]. One of the most frequently reported indication for Algipore is bone augmentation in the atrophic maxilla [6, 7, 9–11, 24–26, 31, 32]. In a long-term, retrospective study, with a follow-up of up to 14 years, implant survival rate was 95.6% following sinus grafting with Algipore [6]. Additionally, Algipore has been successfully used as bone filling material for patients suffering from periimplantitis lesions [28–30], for which sustainable results with up to 3 years follow-up was achieved [28]. Another clinical situation is alveolar ridge deformation following tooth extraction, where Algipore in combination with another graft material, was shown to favor the preservation of the alveolar ridge and thus preventing narrowing and loss of height of the residual ridge [27].

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