

AN INNOVATIVE APPROACH TO ENAMEL REGENERATION

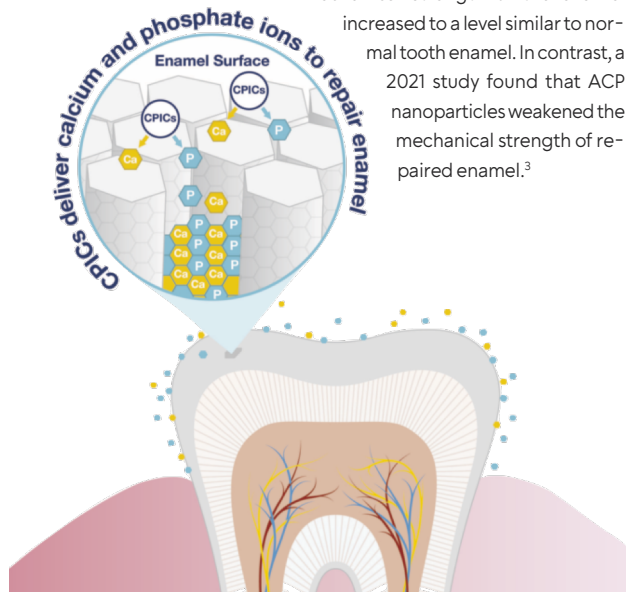
Pac-Dent's ProMin™ offers revolutionary remineralization ability backed by nanotechnology.

Dental caries is the most common chronic disease in children and adults, despite being preventable. To address the high prevalence of tooth decay, many products have been created to aid in the prevention of further enamel deterioration, but what about the regeneration of enamel that has already been lost? Products for the regrowth of enamel exist, however, the effectiveness of the current formulations on the market can vary as the structure and mechanical properties of human enamel are not easily replicated.

Human enamel is characterized by its extreme hardness and resilience and its intricate structure of interwoven rods of hydroxyapatite crystals that create a “fish scale” pattern. A 2019 study compared the ability of calcium phosphate ion clusters (CPICs) to regenerate human tooth enamel with amorphous calcium phosphate (ACP) nanoparticles.¹ Within 48 hours, the intricate structure of enamel was precisely replicated using CPIC material, confirmed by scanning electron microscopy as the enamel regenerated by CPICs was indistinguishable from native enamel. This demonstrated the precise reconstruction of human enamel from the nanoscale to macroscale level. ACP nanoparticles were not able to achieve this same characterized structure.

In another study, published in 2022, a similar experiment was conducted in which the mechanical strength of enamel was tested before and after being treated with a CPIC solution.² After the CPIC solution was applied, the mechanical strength of the enamel

increased to a level similar to normal tooth enamel. In contrast, a 2021 study found that ACP nanoparticles weakened the mechanical strength of repaired enamel.³



CPICs are the inspiration for Pac-Dent's newest innovation: ProMin and ProMin F. ProMin is a revolutionary remineralizing and desensitizing tooth creme that uses the nanotechnology of CPICs in combination with potassium nitrate and xylitol. CPICs are engineered to mimic the body's natural mineralization processes and deliver a concentrated source of calcium and phosphate ions directly to enamel to initiate the formation of hydroxyapatite crystals that merge directly with native enamel. Potassium nitrate is a natural desensitizing agent, while xylitol helps prevent dental caries by inhibiting the growth of caries-causing bacteria.

ProMin F is the fluoride version of ProMin. The added fluoride works synergistically with CPICs to accelerate the uptake of calcium and phosphate ions into the tooth structure. This results in quicker and more efficient enamel repair and to the formation of fluorapatite, a more acid-resistant form of hydroxyapatite, which further strengthens enamel and enhances its resistance to acid attacks from plaque and dietary sources.

ProMin and ProMin F are safe for use by children and adults and can be used not only for remineralizing, but for the prevention and control of hypersensitivity after prophylaxis, scaling and root planing, and tooth whitening. Both products are easily applied using a toothbrush, fingertip, or custom dental tray, making them convenient for both professional and home use. Regular application enhances and maintains enamel strength and health, providing a simple yet effective method for long-term dental care. ■



REFERENCES

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