



Targeted Remineralization Treatment Using Mineral Loaded Starch Nanoparticles

Clinical Need

Dental caries, caused by the demineralization of enamel, is the most common chronic disease worldwide. While caries is often treated surgically, recent treatment methods include the non-invasive approach of mineral ions and fluoride delivery using professionally applied fluoride varnishes, prescription and over-the-counter fluoride toothpastes, and calcium phosphate-based remineralization agents. However, these treatments are unable to regenerate enamel within the depth of subsurface carious lesions.

Solution

GreenMark Biomedical Inc. has developed targeted biodegradable nanoparticles capable of delivering minerals and fluoride specifically to enamel, for in-office treatment of non-cavitated carious lesions ("pre-cavities"). The same technology platform is also being used in the development of a diagnostic product which illuminates carious lesions using a standard dental curing lamp to allow earlier detection of pre-cavities. The nanoparticles consist of starch, readily degraded by natural amylase enzymes in saliva, and their specific adhesion defines the interior lesion sub-surface morphology. While traditional fluoride treatments impact the surface of enamel lesions, this targeted delivery of minerals and fluoride to the dominant subsurface lesion is expected to enable a superior non-surgical dental treatment.

Competitive Advantage

High localized concentration of these minerals and fluoride is expected to facilitate tooth structure regeneration through nucleation and targeted formation of hydroxyapatite-like crystals to improve efficacy, lower the required therapeutic dose, and minimize reliance on patient compliance, yielding superior remineralization of lesions compared to other available treatments.



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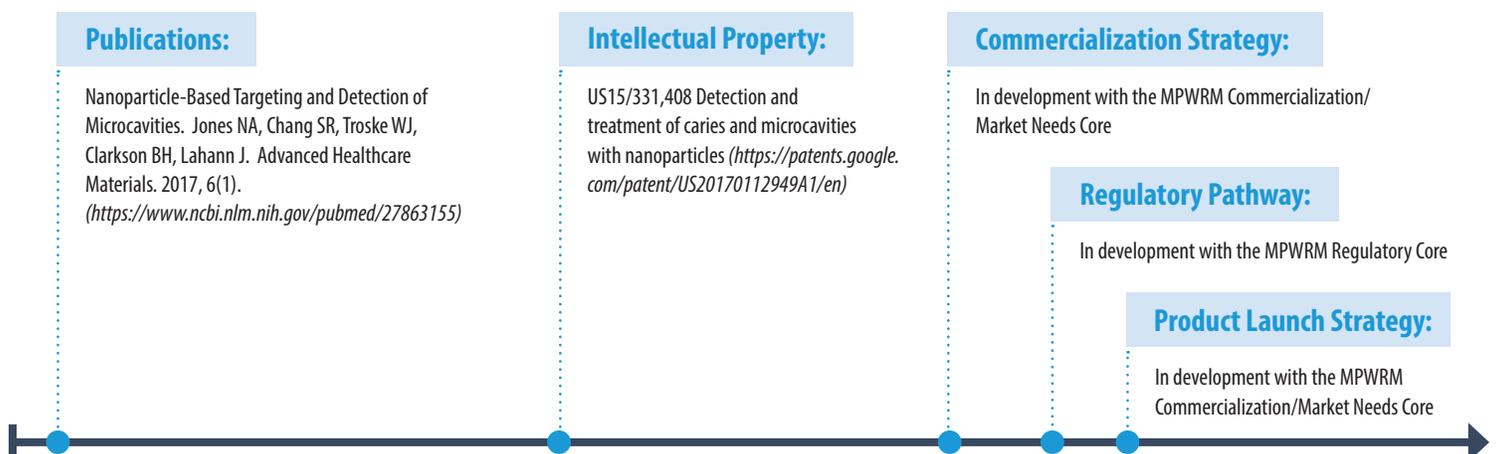
"Targeted nanoparticle based regeneration of enamel will allow for more natural repair of dental caries using painless and non-invasive treatment, reducing discomfort during dental procedures, preserving dental tissue and improving long term oral health of patients."

<http://greenmark.bio/>

How the ITP Program Supports this Project

The support from the ITP program is expected to advance the technology with continued technical validation and development of regulatory and marketing strategies.

Clinical Translation Pathway



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