Novel Preventative Anti-caries and Periodontal Diseases Treatment

A novel method for treating and preventing dental diseases.

Problem Solved by this Technology
The challenges to developing effective anti-biofilm therapies include targeting and delivery of therapeutic agents to the appropriate surface, the short duration that the agents remain in contact with the surface, release at the appropriate time, and clearance of the agents. These challenges are especially relevant in the dental field since therapeutic agents are not retained for sufficient duration due to rapid clearance.

Applications
This novel technology entails the use of pH-responsive nanoparticle drug carriers (NPC) that bind avidly to both the pellicle and exopolysaccharide-rich matrix (EPS) that builds up on teeth. This approach allows for:

1. Strong tooth surface binding characteristics maximizing exposure to therapeutic agents in comparison to other known dental anti-biofilm treatments.
2. Enhanced localized controlled sustained release of therapeutic agents only in situ where active biofilm assembly occurs.
3. Therapeutic agents released under acidic conditions that promote cariogenic biofilm build up and acid dissolution of tooth enamel.
4. Potential broader treatment methods in other biofilm related conditions.

Intellectual Property Status
Patent applications pending in the United States, Australia, Canada, China, Europe, and Japan.