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Can Locally Administered Nanoparticles Revolutionize the Treatment of the Oral Cavity?

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Historically, dental caries and periodontal diseases have been considered the most important global oral health burden according to WHO. Even though there has been an improvement of the world's oral health, each day many people, both children and elderly, will be diagnosed with dental caries.

In addition, during the last years, oral mucosal infections, such as bacterial, viral or fungal infections, have been more and more common due to the increasing population with a reduced immune response such as HIV positive patients, AIDS patients and patients that has been through transplantations.

However, there are a number of challenges to overcome when aiming for drug delivery for local treatment of the oral cavity. First of all the residence time of the formulation at the site of action is low. This is mainly caused by swallowing and the secretion of saliva. This great challenge could potentially be solved by giving the drug delivery system bioadhesive properties.

Different advanced drug delivery systems such as *in situ* gelling systems for local treatment of the oral cavity have been developed lately. Also the treatment of periodontitis has been improved by the use of new drug delivery systems such as inserts, fibers and microspheres. This improvement is probably due to the ease of getting access to the periodontal pockets in combination with bioadhesive properties of the formulation.

Using nanoparticles in the treatment of the oral cavity is still in its early infancy but nanoparticles seem to have a great potential according to their great versatility in the context of encapsulating different types of drugs but also for the ease of giving nanoparticles bioadhesive and stimuli responsive properties. Also their small size can increase the patience compliance since these particles are not being noticed by the patient.