Cetylpyridinium Chloride, An innovative molecule

The use of chemical and physical components for oral hygiene dates back to approximately 3000 years before Christ. Throughout history, man has developed tools to take care of teeth and prevent bad odour. Later, with the emergence of microbiology, it was found that those responsible for bad breath and the most common oral diseases were bacteria, and removing them with antibiotics was proposed.

Until now, a series of compounds with the ability to eliminate microorganisms have been tested; however, it has been demonstrated that not all of them can be used in the oral cavity, because they can potentially damage soft tissues, mucosa or teeth; or cause them to have an unpleasant taste or smell. These difficulties still exist today and should be resolved in order to come up with effective oral hygiene tools.

A series of compounds that are capable of combating dental plaque exist, and have been classified as follows:

- **Antiseptic agents** that prevent proliferation and/or eliminate microorganisms that form plaque.
- **Antibiotics** capable of inhibiting or killing specific bacterial groups.
- **Enzymes** or enzyme combinations that can break up or disperse the extracellular matrix of the biofilm or act upon the community physiology.
- **Non-enzymatic** dispersing, denaturalising or modifying agents that can alter plaque structure or the metabolic activity of plaque.

Agents that can interfere with the adsorption of the acquired pellicle:

- Currently, a great number of toothpastes and mouthwashes are available on the market that are presented as products that are efficient in maintaining optimal oral health. Different antigingivitis and antiplaque products are formulated with active ingredients such as triclosan (toothpastes), stannous fluoride (toothpastes), chlorhexidine (CHX) (mouthwashes and toothpastes) and cetylpyridinium chloride (CPC) (mouthwashes and toothpastes).

**Pros and Cons of CHX, alcohol and CPC**

Several different studies have found that alcohol can present some adverse effects, such as oral or oesophageal cancer and the deterioration of synthetic dental reconstruction materials and is contraindicated in patients with mucositis, immunocompromised patients, patients undergoing head and neck irradiation for head and neck cancer or those who suffer from periodontitis or gingivitis.

Currently, the majority of mouthwashes use CHX, alcohol and CPC as their active ingredients or mixtures of these. However, different studies have found that alcohol can present some adverse effects, such as oral or oesophageal cancer and the deterioration of synthetic dental reconstruction materials and is contraindicated in patients with mucositis, immunocompromised patients, patients undergoing head and neck irradiation for head and neck cancer or those who suffer from periodontitis or gingivitis.

Dr. Rubén León
Director of R&D at Dentaid. B. Sc. in Biology and PhD in Genetics.

**What research has Dentaid carried out on the CPC molecule?**

At Dentaid, a number of studies have been performed using this molecule, that have led to the confection of diverse formulations that currently aid in human oral hygiene. Also, among these, we have studies on antimicrobial activity, stability studies of the formulations for replacing sodium in mouthwashes and improving CPC’s bioavailability.

We have also carried out different clinical studies with national and foreign universities that have shown that products containing this molecule are among the most effective in the market.

**Having proven the properties of this molecule, how is Dentaid applying it in its products?**

Dentaid has developed a line of products that contain CPC among its active ingredients, products that are meant for care and treatment of periodontial pathologies such as gingivitis, gingiva inflamed or damaged in patients that have been treated for periodontitis or gingivitis. It does this at a much lower degree than CHX.

Thus, it has been proven that CPC can be used as a treatment for certain oral pathologies, such as, for instance, mucositis, especially in patients that have undergone irradiation for head and neck cancer or those who suffer from periodontitis or gingivitis.

Cetylpyridinium Chloride (CPC)