



Press Release

Nanit[®] active: A natural solution to the problem of sensitive teeth

Small particles with great potential

Sensitive teeth are a worldwide problem. Studies show that about one in two Europeans and one in three North Americans are familiar with the sensation of a stab of sudden pain from their teeth. Henkel and the joint research company SusTech Darmstadt have succeeded in harnessing nanotechnology to develop a completely new active ingredient that effectively reinforces the natural repair mechanism of saliva and thus appreciably reduces the sensitivity of the teeth.

Düsseldorf – Nanoparticles are extremely – for most of us inconceivably – small particles, whose size is measured in billionths of a meter, i.e. in nanometers. Although the diameter of a human hair is 50,000 times larger, these tiny particles pack a powerful punch. The research company SusTech Darmstadt – a joint enterprise established by Henkel, the Technical University of Darmstadt, and five professors – utilizes the practical potential of nanoparticles to tackle the widespread problem of sensitive teeth.

In most cases, the cause of the problem is receding gums and the resulting exposure of the necks of the teeth. Microscopically small channels, known as dentinal tubules, lead from the surface of the tooth neck into its interior, and transmit stimuli such as hot and cold or sweet and sour directly to the dental nerve. That can hurt. Many commercially available products for sensitive teeth contain simple salts to suppress the conduction of the stimuli.

The interdisciplinary teams of researchers from Henkel KGaA and SusTech GmbH & Co. KG have succeeded in producing Nanit[®] active, a nanotechnological active substance. It not only relieves the symptoms but goes straight to the root of the pain. The biocomposite reacts with the calcium and phosphate ions in saliva to form a bioanalogous layer: "In

terms of its composition and structure, the new protective layer consists of toothlike material that is 1-2 micrometers thick and bonds firmly to the natural material of the teeth,” explains Dr. Tilo Weiss, CEO of SusTech Darmstadt. In short, the inclusion of Nanit® active in dental care products enables open dentinal tubules to be sealed simply by brushing the teeth.

In laboratory tests, the scientists in Darmstadt were able to demonstrate that the newly created protective layer is more stable than that produced by comparable methods. Moreover, the nanoparticles act quickly. After just three treatments, about 80 percent of the previously open dentinal tubules were covered, and after 20 applications virtually none of the tubules remained open. The efficacy of dental care products with Nanit® active has also been confirmed by two clinical studies carried out by the Aster-Cephac Institute, Paris.

The step from active material to toothpaste was achieved by specialists at Henkel, Düsseldorf. The key challenge facing the product developers was to come up with a formulation that thoroughly cleans the teeth and yet leaves enough Nanit® active on the tooth surface so that the bioanalogous protective layer can form over the dentinal tubules.

Another milestone on the path from the concept to an effective pain-relieving product was the industrial production of Nanit® active. Specialists from SusTech Darmstadt and Henkel built the new, highly automated production plant for the active ingredient at the Henkel site in Düsseldorf in record time. The successful upscaling from the laboratory to production is another example of excellent interdisciplinary cooperation.

After the highly promising research results, preparations for the market launch of the first Nanit® active toothpaste are in full swing. As of early 2006, Theramed SOS Sensitive will help people to treat sensitive teeth. The researchers are convinced that this is just the beginning for the tiny particles. They see great potential for new, more wide-ranging applications.

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