NEWS

Silver nanoparticles could help

Fight against oral infections



Yeasts that cause mouth infections can be killed using silver nanoparticles in the laboratory, scientists in Portugal have found. The researchers hope to test silver nanoparticles in mouthwash and dentures as a potential preventative measure against the infections, which are caused by Candida albicans and Candida glabrata and target the young, old and immunocompromised.

The study was conducted by Prof Mariana Henriques and her colleagues from the University of Minho in Largo do Paço, who investigated the antifungal properties of silver nanoparticles of different sizes to determine their effect against *C. albicans* and *C. glabrata*. These two yeasts cause various infections, including oral thrush and dental stomatitis, a painful infection that affects around seven out of ten denture wearers. Infections like these are particularly difficult to treat because the micro-organisms involved form biofilms.

The scientists used artificial biofilms in conditions that mimicked those of saliva as closely as possible. They then added different sizes and concentrations of silver nanoparticles and found that nanoparticles of different sizes were equally effective at killing the yeasts. Owing to the range of sizes of nanoparticles with anti-fungal properties, the researchers hope this will enable the nanoparticles to be used in many different applications.

Some researchers have expressed concerns regarding the safety of nanoparticle use but the Portuguese scientists stressed that this research is at an early stage and extensive safety trials will be carried out before any product reaches the market.

"With the emergence of candida infections, which are frequently resistant to the traditional anti-fungal therapies, there is an increasing need for alternative approaches. So, silver nanoparticles appear to be a new potential strategy to combat these infections," Henriques said. "As the nanoparticles are relatively stable in a liquid medium they could be developed into a mouthwash solution in the near future."

Moving forward, Henriques hopes to integrate silver nanoparticles into dentures, which could prevent infections from taking hold.

The study was published online in the Society for Applied Microbiology's Letters in Applied Microbiology journal.

Nobel Biocare appoints

New Head of Global Operations

Nobel Biocare announced that Frank Mengis will be appointed Senior Vice President Global Operations and member of the Executive Committee, effective 1 July 2012. He will replace Ernst Zaengerle, who will be retiring. Frank Mengis has extensive senior



management experience in operations and manufacturing in the life sciences field including the dental industry. Most recently, he held senior management positions in Project Management and Development, Global Manufacturing, Operations and Quality Management at Straumann Institute. Prior to that, Frank Mengis was Head of Pharma Capital Investment Projects at Karl Steiner, Switzerland, after having held various management positions at F. Hoffmann-La Roche, Switzerland, in areas including galenical engineering and pharmaceutical manufacturing. Frank Mengis obtained a degree in Mechanical Engineering from the University of Karlsruhe, and completed the Advanced Management Program at Harvard Business School. Nobel Biocare would like to thank Ernst Zaengerle for his commitment and contribution to Nobel Biocare, and wishes him all the best for his future.

Increase until 2030

German dental sector to grow considerably

While the dental sector in some countries may be facing hard times, German dental professionals and dental suppliers can look forward to the future. According to a recent study, about 76,000 jobs will be created in dental offices, dental laboratories and through dental retail sales until 2030. This represents an increase of 19 per cent compared with current figures. The study was conducted by the Institute of German Dentists (Institut der Deutschen Zahnärzte—IDZ) and WifOR Darmstadt, an independent economic research institute, upon the instruction of the National Association of Statutory Health Insurance Dentists (Kassenzahnärztliche Bundesvereinigung—KZBV) and the German Dental Association (Bundeszahnärztekammer—BZÄK). "The dental sector must not only be discussed as a cost factor. It's an economic factor and part of the health-care job machinery. Already, 400,000 people are working in the German dental sector," said Dr Jürgen Fedderwitz, Chairman of the BZÄK Board. Prof Christoph Benz, Vice-President of BZÄK, commented: "The job training rate in dental professions is traditionally high. Additionally, demographic developments will probably lead to a further employment stimulus."

Both dental organisations pointed out that the positive forecast for the German dental sector depends on health policy representatives being willing to set stable conditions

References: KZBV/DTI

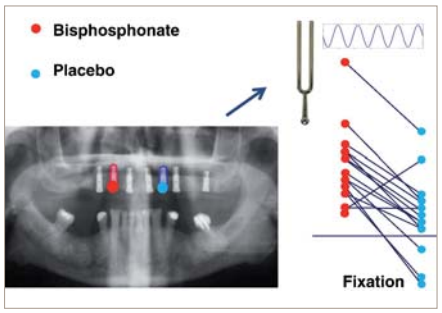
Study shows success

New coating accelerates fixation of dental implants

Researchers from Linköping University in Sweden have successfully tested a new drug coating on humans that allows titanium implants to adhere to the bone better and more rapidly. The findings could benefit patients with difficulty chewing following dental treatment.

Millions of people have bad teeth replaced with dental implants, which are embedded into the jawbone and provide retention for artificial teeth. After the procedure, many patients are unable to chew food. Using the current technology, it may take four to six months before the bone surrounding the implant has healed and is strong enough for the patient to begin to benefit from surgery.

The new coating consists of a nanometre-thin layer of protein that adheres to the metal surface. Attached to the protein is a drug belonging to the class of bisphosphonates, usually used to treat osteoporosis.



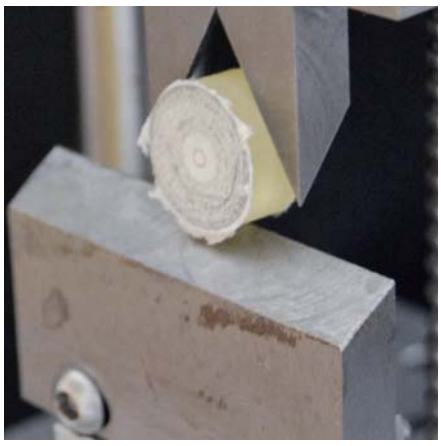
Now, for the first time, this method has been tested on humans. The study involved 16 patients. Each of them received two implants—one ordinary implant and a similar surface-treated implant as described above. Neither the patient nor the dental surgeon knew which was which. After six months, it was noted that for 15 of the 16 patients the surface-treated screw was markedly much better established. Already after two months, X-ray images showed positive changes in the tissue surrounding the surface-treated implants. According to the researchers, no complications occurred.

"It is the first time ever anyone has succeeded in reinforcing the bone around an implant with localised medication," said study leader Per Aspenberg, Professor of Orthopaedics, who devised the method of using bisphosphonates in this way. The study was published online in the Bone journal.

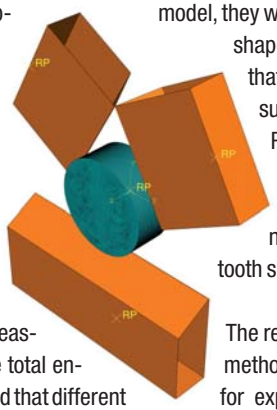
Reference: DTI

Most efficient way explored

Researchers investigate efficiency of bladed tooth shape



Using a combination of guillotine-based experiments and cutting-edge computer modelling, researchers at the University of Bristol have explored the most efficient ways for teeth to cut food. Their results demonstrate how precisely the shape of an animal's teeth is optimised to suit the type of food it eats. There is massive variety in tooth shapes in the natural world, from long, serrated teeth in Tyrannosaurus rex to triangular teeth in sharks and our own complex molars. Teeth can enable animals to crush, chop, grind or even cut food into pieces small enough to swallow. Such cutting instruments, however, are not restricted to toothed animals. Bird beaks, insect mouth parts and even the roughened tongue of snails can also be used to break down food. Nevertheless, how teeth are able to cut and break down food has not been extensively examined. Now, two researchers at the University of Bristol's School of Earth Sciences have investigated this problem. In their study, research fellow Dr Philip Anderson and lecturer Dr Emily Rayfield used a unique double-bladed guillotine and measured the force needed by different tooth shapes to compress food materials. Finite-element analysis, a computational engineering technique, was then used to mimic these experiments and measure different variables, such as the total energy required. The researchers found that different shaped bladed teeth are optimised for different types of food.



"The actual hardness or toughness of the food item has a strong effect on what type of tooth shape is most efficient for cutting it," Anderson said. "We looked specifically at V-shaped bladed edges, which are similar to tooth shapes found in some sharks and the cheek teeth of many carnivorous mammals, and found that the angle of the V could be optimised for different foods." According to Anderson, this sort of analysis is only possible with a computer model, which the researchers created to mimic the physical experiments. With the validated model, they were able to alter aspects of the tooth shape until they found a specific shape that used the least energy. "These results might seem rather obvious," said Rayfield, "because we know tooth shape is adapted to diet. But we were surprised at the preciseness and predictability of the fit of tooth shape to dietary item."

The researchers hope this new integrated methodology will create a new framework for exploring the evolutionary history of dental shape and how it relates to diet. Their study, "Virtual experiments, physical validation: Dental morphology at the intersection of experiment and theory", was published ahead of print on 7 March in the Journal of the Royal Society Interface.

Reference: DTI