New chip accelerates

Detection of periodontal bacteria

[PICTURE: ©BOTAZSOLTI]

Of the estimated 700 bacterial species found in the oral cavity, only 11 are known to cause periodontitis. The detection of the relevant pathogens, however, has been very time-consuming to date. Now scientists from Germany hope that a newly developed diagnostic device will allow dentists and medical labs to conduct bacterial analysis in less than half an hour.

Conventionally, bacterial analyses are carried out in external contract laboratories using microbial cultures. This method bears the risk of bacteria being killed as soon as they come into contact with oxygen and the analysis can take up to four to six hours. Therefore, ParoChip, an initial lab-on-a-chip device, was designed by researchers at the Fraunhofer Institute for Cell Therapy and Immunology (IZI) to speed up the time needed for identification.

The new mobile diagnostic unit consists of a disk-shaped microfluidic card that is about 6 cm in diameter. The card has eleven reaction chambers, each containing the dried reagent for one of the eleven periodontal pathogens.

Using ParoChip, many manual steps involved in bacterial analysis can be avoided, Kuhlmeier said. In addition, the synthetic disks can be produced cheaply and are disposable, just like a single-use glove, he added.

To date, there is only a prototype of the device, which will be tested in clinical laboratories first. However, the researchers believe that it could also be used by dentists to carry out in-house analyses of patient samples in their practice in the future.

Oral Health Care

"Healthy Mouths, Healthy Lives"

[PICTURE: ©MICHAELJUNG]

Councilman Dan Halloran, Philips, and Dr Bernard Fialkoff DDS presented the Partnership for Healthy Mouths, Healthy Lives and the Ad Council's "Healthy Mouths, Healthy Lives" campaign at a free oral health care event for 20 elementary aged Queens children at the Colonial Church's after-school program in Bayside, NY, this past week.

Dr Fialkoff, founder of the Fialkoff Dental Study Club, a dental educational group in Queens, learned about the Partnership for Healthy Mouths, Healthy Lives' campaign earlier this year which the Ad Council recently released to Capitol Hill and American dentists.

Dr Fialkoff encouraged all dentist members to do likewise at the group's October meeting. Mike Calia of Philips Oral Healthcare donated 20 "Sonicare for Kids" electronic toothbrushes.

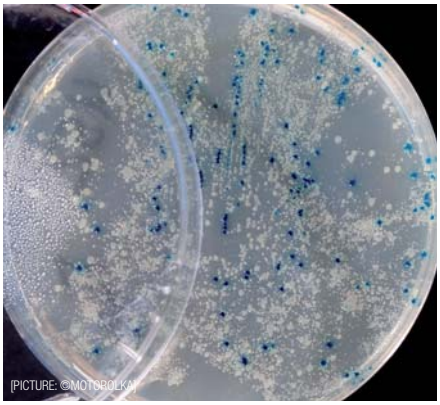
Victor Mimoni, staff representative of Councilman Dan Halloran, instructed the children on proper dental health.

Gingivitis bacteria

Manipulate immune system

New research from the US provides evidence that Porphyromonas gingivalis, the main agent of the chronic inflammatory disease periodontitis, also manipulates the human immune system. In a number of laboratory tests, scientists observed that the pathogen inhibits the body's defense processes that would normally destroy it.

In order to determine the manner in which *P. gingivalis* influences the immune system, the researchers treated cells from mice with an inhibiting antibody against Interleukin-10 (IL-10), an anti-inflammatory protein, while leaving a different portion of the same cells untreated. Afterwards, they tested whether the cells produced interferon-gamma (IFN-γ), a protein that has an immunostimulatory and antiviral effect.


[PICTURE: ©MOTOROLKIN]

According to the study, *P. gingivalis* stimulated the production of IL-10, which in turn inhibited the activity of T-cells and macrophages, and repressed the immune response. The researchers observed increased production of IFN-γ in the treated cells, while no such growth was seen in the untreated cells.

The study highlighted the mechanism by which the pathogen establishes a chronic infection. "These bacteria go beyond merely evading our body's defense and actually manipulate our immune system for their own survival," the researchers said. The findings suggested that the damage done by the bacterium occurs when the immune cells of the host are first exposed to the pathogen. With regard to successful treatment, the results demonstrated the importance of a very early intervention.

Eco-Dentistry Association to hold

First Green Dentistry Conference

[PICTURES: ©RADOMA, ©VECTOMART]

The Eco-Dentistry Association, an international association of dental professionals that promotes earth-friendly dentistry, has announced that it will be holding the first conference devoted to high-tech, environmentally sound dental practices. The event will take place on 3 and 4 May at the Redford Conference Center in Provo, Utah.

The conference will showcase the information and products needed to create and maintain state-of-the-art green practices. In this regard, it will feature a number of lectures about branding and marketing a green dental practice, as well as a presentation about how dental technologies can reduce waste and save energy. Participants may earn continuing education credits, the EDA announced. During the meeting, panel discussions will be held on various topics, from building and financing to creating a successful green hygiene program. Participants will have the opportunity to attend small-group hands-on courses for dental technology such as laser and CAD/CAM systems.

In order to promote the overall health and well-being of the attendees, optional morning yoga and meditation courses will be held, in addition to presentations focusing on the importance of work-life balance. After the conference, participants can join a hiking tour in the 6,000 acres of pristine wilderness adjacent to the Sundance Resort on May 5.

Anyone interested can register for the event on the EDA's website, www.ecodentistry.org/conference. However, attendance is limited to the first 100 registrants, the association said.

The EDA was founded by Dr Fred Pockrass and his wife Ina Pockrass, who created the model for eco-friendly dentistry, which includes methods such as reducing waste and pollution, as well as saving energy, water and money. Their practice in Berkeley, CA, was the first in the country to be certified as a green business.

Blackberries: possible treatment for

Oral bacterial diseases

[PICTURE: ©AFRICA STUDIO]

New research has provided evidence that blackberry extract could be used to control the growth of oral pathogens on dental and mucosal surfaces. In a number of tests, the researchers found that it inhibited the metabolic activity of the causative agents of periodontal disease and dental caries in particular. In the study, researchers from the University of Kentucky tested the antimicrobial effects of blackberry extract on ten different oral bacteria. Among others, they observed that the extract significantly reduced the metabolic activity of *Porphyromonas gingivalis* and *Fusobacterium nucleatum*, two pathogens known to cause periodontal diseases, by about 40 per cent, and that it inhibited *Streptococcus mutans*, the primary agent of dental caries, by approximately 30 per cent. In addition, they found that at higher concentrations the extract had the ability to kill oral bacteria.

To date, mouth rinse containing chlorhexidine, a chemical antiseptic, has been one of the most effective antimicrobial agents against the colonization of oral bacteria responsible for gingivitis and periodontitis. However, its side effects, such as staining and abrasion, limit its prolonged use as antimicrobial agent by the general population. Thus, blackberry extract might be a promising adjunct for prevention and treatment of periodontal infections, the scientists concluded.

Although the mechanisms underlying the antimicrobial effects are not fully understood, the researchers suggested that berry-derived polyphenols, which can be found in red wine, citrus and black tea too, could be involved the process. The study will be published in the February issue of the Journal of Periodontal Research.

Complete tooth loss after

Extensive consume of soft drinks

According to recent news reports, Australian dentists have had to remove all the teeth from the mouth of a 25-year-old owing to overindulgence in soft drinks. The man had apparently drunk up to eight litres of soft drink each day for the last three years. As reported by online newspaper adelaidenow, William Kennewell is highly addicted to sugary drinks and ignored dentists' repeated warnings about the possible danger to his oral health. He said he drank six to eight litres a day. His addiction had not only led to severe tooth decay, leaving him with only 13 teeth, but also caused blood poisoning, which improved after his teeth were removed and replaced with dentures, the newspaper reported. Only recently, a study among 16,500 Australian children revealed that more than half of the children in the country consume at least one soft drink per day. Health experts have consequently called for tooth-decay warnings on sugar-sweetened beverages.

[PICTURE: ©BOULE]