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Study finds DNA vaccine to inhibit caries formation

Daniel Zimmermann
DTI

HONG KONG/LEIPZIG, Germany: A research group from the Chinese Academy of Sciences in Beijing has reported a vaccine containing genetically modified DNA to be effective in preventing tooth decay in animals. By injecting lab rats with a protein derived from the *Salmonella* bacterium, they found evidence that it promoted the formation of antibody molecules that have the potential to inhibit the colonization of *Streptococcus mutans* and the development of caries lesions.

Being a relatively new concept, nucleic acid vaccines have been under examination for their use in forming antibodies against a number of diseases and systematic conditions including cancer. It's potential to influence the formation of caries lesions was first examined by scientists almost 30 years ago. The new results build on previous research from the Beijing research group with the so-called pGJA/VAX vaccine and are the most convincing so far in having found an effective mucosal adjuvant candidate for intranasal immunization of an anti-caries vaccine, the authors said.



Researchers from China haven taken another step towards development of a caries vaccine. (DTI/Photo Diego Cervo)

The admitted that low immunogenicity which is the ability to provoke an immune response is still relatively low in the vaccine.

"Animal experimentation with this vaccine and route of administration have been reported over

the past several years," explains Dr Daniel Smith, an immunology specialist and member of the Forsyth Institute in the US, to *DTI Asia Pacific*. "The new feature here is the use of flagellin as an adjuvant which seems to give a modest improvement in antibody levels."

Other substances currently in pre-clinical experimentation for use as a caries vaccine are other recombinant proteins and glucan-protein conjugates. According to Smith, human trials however cannot be expected to be realised anytime soon. [D]

Taiwan implants receive recognition

Dental implant maker Hung Chun Bio-S from Southern Taiwan has been given a product award for its Ti-one 101 implants by the Institute for Biotechnology and Medicine Industry at the recent National Innovation Awards in Taipei.

Operating from Taiwan's major port city Kaohsiung, Hung Chun Bio-S has been active in the national and international implant markets since early 2011. Director of Research and Development Lui Ching-Chieh told reporters that his company, which invested US\$10 million in its implant portfolio, has gained a five per cent market share within the last 11 months.

Taiwan's US\$50 million dental implant market is still dominated by companies from Europe, Korea and the US. In 2008, for example, Nobel Biocare entered the market with the acquisition of its Taipei-based distributor Implant Master. National industry sources estimate that the number of implants placed is growing by almost 20 per cent each year.

Besides Hung Chun Bio-S, local competition includes bio-ceramics manufacturer Coho Technology in Tايوان. [D]



US Navy Chief Petty Officer Nick Hall looks at flooded neighborhoods north of Thailand's capital Bangkok, 28 October, 2011. Owing to the catastrophe, French dental manufacturer Acteon cancelled a seminar on bone management. (DTI/Photo DOD, USA)

Human jaw shrinks with age

The size of the human jaw decreases with age, research conducted at the Malmö University Faculty of Dentistry in Sweden has found. According to study, which followed 30 participants over a timespan of 40 years, less room was available for teeth in the jaw of each individual with increasing age. [D]

Fortis buys Singapore unit

India's largest provider of health care clinics and services has agreed to pay more than half a billion US Dollar to buy Singapore-based Fortis Healthcare International PTE from RHC in Mauritius. The record deal is expected to be completed by mid of December depending on regulatory approval. [D]

Better oral health for Vietnam

The Vietnamese government is doing well in its efforts to improve the oral health of school children, Minister of Health Nguyen Thi Kim Tien has said. Speaking at the Sixth Asian Conference on Oral Health Promotion for School Children last month in Hanoi, she revealed that 10 million school children are now receiving regular dental care through the country's national oral health programme.

According to results of the last National Oral Health Survey conducted in 2001, more than 85 per cent of six-year-olds in the country suffer from tooth decay. Tien said that although the programme has achieved good results, still only 30 per cent of hospitals nationwide offer dental services.

Most dental professionals are also based in cities, making it difficult for people living in rural areas to get any dental treatment at all, she said. [D]



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Disagreement brews over use of botox in Australian dentistry

From news reports

MELBOURNE, Australia: The use of botulinum toxin (botox) in dentistry is causing debate amongst the dental community in Australia. The discussion came to a head recently after the Australian Academy of Dento-Facial Aesthetics (AADFA) issued a letter to the Dental Board of Australia (DBA), the governmental agency that oversees standards, registration and training in dentistry, requesting the retraction of an interim policy that allows only dentists trained in the treatment of TMJ disorders to administer the toxic protein.

Put in place originally in November 2010, this policy also announced the review of the use of botox in dentistry but has not introduced any changes thus far. In a public letter, the DBA's chairperson John Lockwood, however, said that the Board is currently working on establishing a panel of national experts who will review several policies, including those on the possession, administration, supply and prescription of restricted drugs such as dermal fillers or botox.

Dr Myles Holt, head of the AADFA, a private organisation of dentists that promotes facial injectable treatments throughout Australasia, said that the current guidelines are causing confusion amongst dentists and should therefore be retracted in order to make way for a better regulatory framework. He blamed the DBA for having set up its policy with-



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out the proper research or scientific consultation.

Based in Melbourne, the AADFA claims to have trained more than 150 dentists in Australia and New Zealand in facial aesthetic treatment since 2009.

On its website, the Australian Dental Association confirmed that it has received some enquiries by dentists requesting clarity on the issue and advises its members to comply with the current DBA guidelines.

Cosmetic dentistry procedures like tooth whitening, veneers or invisible braces have

become a thriving business in Australia, with clinics specialised in aesthetic procedures reporting an increase in patients of up to 60 per cent in recent years. According to the latest figures from the Cosmetic Physicians Society of Australasia, Aussies are also currently spending more than AUS\$300 million (US\$291 million) on non-invasive cosmetic procedures, with botox being the most requested in 91 per cent of clinics.

The use of botox and dermal fillers by dentists is currently allowed in some countries in Asia, as well as the USA and Europe. [\[1\]](#)

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Dental students in New Zealand borrow most, pay back early

Daniel Zimmermann
DTI

HONG KONG/LEIPZIG, Germany:
Students of Medicine and Den-

tistry are not the ones to blame for the hundreds of millions of loans overdue under the Student Loan Scheme, New Zealand's Tertiary Education Minister Steven Joyce said on Monday. In its 2011 report, released in October, the Ministry of Education found that there are over 2,600 students with piling debts of more than NZ\$100,000 (US\$81,300) each, with pilots and serial students being the worst payers.

Although in the group with the highest loans, medical and dental graduates are usually the ones who are able to pay back their loans quickly, Joyce commented. He said that almost one million students have received money from the government since the implementation of the scheme in 1992. The total amount of debt currently exceeds NZ\$600 million (US\$488 million), almost 0.5 per cent of

the country's gross domestic product.

Joyce announced initiatives to amend the scheme in order to reduce the amount of debt of groups who owe the ministry the most, especially those living overseas. The loan amount of borrowers there has increased by 27 per cent within the last 12 months. Legal action will be also taken against some borrowers living in Australia and

the UK who have not made any effort to pay back their dues, he said.

With NZ\$80,000 (US\$65,000), dentistry tops the list of occupations with the highest average starting salaries, according to latest figures from Careers New Zealand, a government agency based in Wellington. This amount can almost double within five years of practice to NZ\$150,000 (US\$121,900). [DTI](#)

Singapore pushes dentistry

From news reports

SINGAPORE: Singapore's new Minister for Health Gan Kim Yong has announced further investment into the city-state's dental infrastructure. Speaking at this year's Dentist's Pledge Affirmation Ceremony of the Singapore Dental Council, he said that his ministry will look into the possibility of enhancing its capacity to better support dental research and training. As a first step, the annual intake of students at the National University of Singapore's Faculty of Dentistry will be raised from 48 to 80 by the year 2020.



Gan Kim Yong (DTI/Photo courtesy of Ministry of Health, Singapore)

During his speech, Yong pointed to the Primary Care Partnership Scheme, which was recently expanded and now subsidises tertiary dental procedures like crowns and root-canal treatment in private practices for an estimated additional 700,000 Singaporeans. He said that a working group has also been established to strategise the development and implementation of a new specialty, including geriatric and special needs dentistry, a field of care that according to him needs development owing to the city-state's rapidly ageing population.

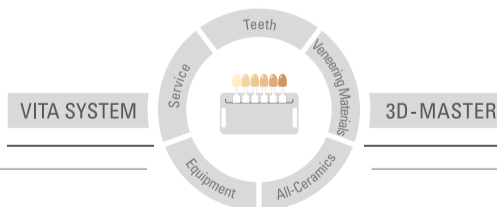
Earlier this month, the ministry announced an initiative to encourage private practices to publish their average fees for several kinds of dental treatment, a practice the ministry has followed for fees charged by public institutions for years.

Yong, who is a member of the governing People's Action Party, took over office after the general elections from long-term Minister for Health Khaw Boon Wan, who is currently serving as the country's Minister for National Development. After he was sworn in, Yong launched a campaign for reviewing the physical capacities of the ministry, amongst other issues. [DTI](#)

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Daniel Zimmermann
DTI

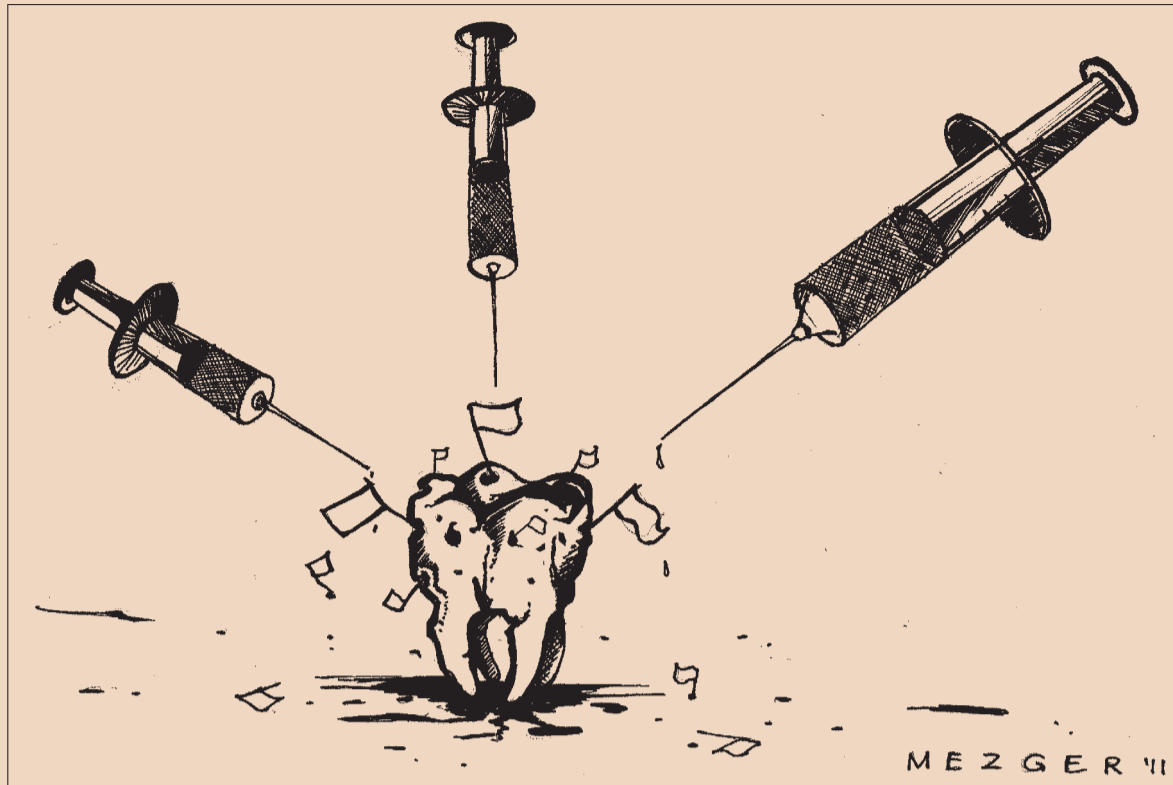
Last year on these pages I already talked much about Asia's prospects in dentistry. Looking back at the last 12 months, nothing could be more relevant today. With debts soaring and markets plunging in almost all developed markets, established systems of social and health care are getting under increasing financial stress. This development will have an effect not only on many people but also on the industry, which is already looking at the Far East for profits.

With the majority being only at the beginning of their development cycle, however, Asian countries should carefully watch the crisis that is currently unfolding in the West in order to avoid repeating the same mistakes. There is no doubt that growth is important for the survival of every society but it also has become quite clear that uncontrolled distribution of resources and welfare only leads to turmoil. Asians should be aware that all our future will depend much on how seriously they are willing to take these principles.

With this in mind, the Asia Pacific editorial team wishes you a happy and successful year 2012! **DT**

Yours sincerely,

Daniel Zimmermann
Group Editor
Dental Tribune International



Use of botox is a medical procedure



Prof. Laurence J. Walsh
Australia

The use of botox for treating TMJ dysfunction and spasms in the muscles of mastication is a well-accepted part of clinical practice, particularly for oral and maxillo-facial surgeons, with a growing evidence base supporting safety and efficacy. Severe bruxism or jaw-closing dystonia unresponsive to other treatments can be treated by injecting Botox-A into the masseter muscles.

The Dental Board of Australia's interim policy on the use of botox permits the use of botulinum toxin by registered dentists with the necessary education, training and competence

for the treatment of TMJ disorder or dysfunction. A general dentist is not sufficiently conversant with the indications for using Botox-A to treat wrinkles as opposed to other skin treatments such as laser resurfacing, dermabrasion or Retin-A therapy.

The arguments against allowing use of botox for wrinkle reduction and other cosmetic treatments are threefold. Firstly, the principles of pharmacology that underpin the use of botox are covered in dentistry programmes at a very basic level, which is not a sufficient foundation for clinical use because of the lack of detailed pharmacology and therapeutics (dosages, side-effects, etc.). Secondly, the detailed anatomy of the mid-face, orbit, upper face and neck is not covered in dental training at a level sufficient for the safe

use of botox. The fact that we as dentists are experienced at administering injections of local anaesthetic solutions into the oral and peri-oral regions does not mean it is appropriate for dentists to inject botox across the neck and face. Finally, the use of botox for cosmetic purposes is part of cosmetic medicine (or beauty therapy) and does not form part of the practice of dentistry. Its use for cosmetic purposes should be confined to appropriately trained medical practitioners, and should be considered a medical procedure. **DT**

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Myth or reality?



Dr KM Shivkumar
India

Dental caries is one of the most common infectious and non-life-threatening diseases known to affect us. It also appears to be a major public health problem, which if left untreated can cause considerable pain and discomfort, as well as require huge amounts of money and time to treat. The WHO has estimated that more than five billion people have suffered from tooth decay.

There are various preventive measures for dental caries, of which immunisation is one. The vaccination can be given subcutaneously, orally, or intranasally by activating gut or nasal lymphoid tissues.

Over the last four decades, many successful animal experiments have been conducted on mice, rats and monkeys for effective immunisation against antigenic components of *S. mutans* or *S. sobrinus* in dental plaque. Despite the scientific evidence, no dental caries vaccine for humans exists today, primarily because paediatric vaccine approval boards are reluctant to add such a vaccine for a normally non-life-threatening disease to their catalogues. Another reason is strong economic interests that hinder the development of such a vaccine for release onto the market. **DT**

Contact Info

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New study targets dental drills for hearing loss

Daniel Zimmermann
DTI

NEW YORK CITY, USA/LEIPZIG, Germany: An audiology student who is investigating the effects of noise from dental drills on dentists has won a National Hearing Conservation Association 2011/2012 research award. In her study, Krisztina Busci Johnson from the East Tennessee State University in Johnson City seeks to determine whether rotating instruments used in dentistry take their toll on dentists' hearing function.

Johnson is not the first scientist to look into a possible connection between dental drills and hearing loss in dental professionals. Research on this topic dates back to the early 1980s, when a study published by the "American Journal of Public Health" found a cause and effect relationship between hearing loss and the use of the high-speed dental handpieces.

Results, however, remain inconclusive, as a recent study conducted by the Institute for Evaluation in Cologne in Germany found that noise from rotating instruments did not go beyond 85 to 90 decibels, the limit commonly asso-

ciated with permanent inner ear damage. This level of noise is typically created by subway trains driving at high speeds or heavy traffic.

Being a dental assistant for eight years herself, Johnson intends to measure and compare data on the hearing threshold of dentists drilling without hearing protection over a period of a working day. She is currently seeking participants in the Johnston City area, who will

also receive a free clinical hearing evaluation during the process. If successful, she hopes to be able to persuade dentists to use better hearing protection and to widen the study by including dental assistants or hygienists.

"Another possibility is that the data could persuade dental drill manufacturers to produce drills that are safer for the human ear," she said.

Manufacturers of modern dental drills usually do not recommend using ear protection during operations, saying that the technology has become quieter over the years and their running time has significantly decreased. According to the NHCA, a second research award went to a University of Florida research assistant who is investigating hearing threshold changes induced by digital audio players.



(DTI/Photo botasolli)

The annual trophy comes with prize money of \$5,000. [DTI](#)

AD

2012 WDF to be held in Hong Kong

From news reports

BELLEVUE, Wash., USA: Modern Dental Laboratories has announced that registration for its second World Dental Forum in Hong Kong in 2012 is now open to dentists in the United States. The event will be held in conjunction with the centennial anniversary of the University of Hong Kong and feature educational offerings in English ranging from subjects like dental restorations to endodontics, implant dentistry or sleep medicine.

With its Shenzhen dental lab north of Hong Kong, Modern Dental Laboratory says to be one of the largest global providers of ISO 15485:2005 certified dental work. It also maintains one of the largest dental technology school worldwide with a staff of 3,000.

The company's first congress was held in fall 2009 and saw more than 200 dentists from Europe, North America and Asia learning and discussing new trends in the global dental industry. Next year's event has confirmed presentations from US dental researchers Drs John Burgess and Jack Ferracane and will be held at the Grand Hyatt hotel from 31 May to 3 June.

Participants will be also able to earn up to 16 AGD approved CE credit hours, the company said. [DTI](#)

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A durian a day keeps caries away, research from Asia suggests

From news reports

LAS VEGAS, Nev., USA: A sugary gel covering the thorn-covered husks of the durian fruit is currently being investigated by researchers for its potential as a mouth disinfectant. Students from the Faculty of Dentistry at the Chulalongkorn University in

Bangkok, Thailand, recently presented their initial findings at the Annual Meeting of the American Dental Association in Las Vegas, the website *drbiscus.com* has reported.

They found that the substance made of polysaccharides was able to reduce the number of

Streptococcus mutans bacteria in lab rats hours after use, which would make it as effective as 0.2 % chlorhexidine, a common formula used in mouth rinses. Studies on human subjects also showed a reduction of hydrogen sulphide, methylmercaptan, and dimethyl sulphide, compounds responsible for halitosis or bad

breath. No evidence of treatment-related gross toxicity or deaths caused by exposure to mouth rinsing with durian polysaccharide gel was observed, the researchers stated.

Durian is popular in many Southeast Asian countries, including Thailand and Malaysia, which are the world's largest importers of the fruit. Its roots and leaves are often used in traditional medicine.

Earlier research conducted on durian polysaccharide gel confirmed the antibacterial properties of the gel. [D](#)

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Caries investigated by nanotech

From news reports

BASEL/VILLIGEN, Switzerland: Researchers at the University of Basel and the Paul Scherrer Institute, the largest research centre for natural and engineering sciences within Switzerland, have successfully demonstrated how caries affects human teeth at a nano-level. Their study offers new possibilities for the treatment of tooth damage.

Dentine consists mainly of inorganic elements but a fifth is composed of organic material. It was previously hypothesised that these organic components—especially certain endogenous structural proteins (collagen)—were unaffected by damage to the dentine and that their structure could offer a basis for remineralisation. To test this hypothesis, the research team, led by Prof. Bert Müller at the Biomaterials Science Center at the University of Basel, used X-ray scattering to compare the density of collagen in healthy and carious tooth spots.

The researchers cut both healthy and carious teeth into thin slices of 0.2 to 0.5 mm and examined them using small-angle X-ray scattering, a technique used for the structural characterisation of solid and fluid materials in the nanometre range.

They observed that carious bacteria initially destroy the ceramic components of the outer enamel and the subjacent dentine. In contrast, in the early to mid-carious state, a significant part of the dentinal collagen network, remains practically unaffected.

Hence, the researchers suggest that in the future their method will allow the development of biometric dental fillings and cavity treatments that are based on an undamaged dentinal collagen network, and allow the remineralisation of damaged dentine, for example, with nanoparticles. [D](#)

Forsyth starts commercialization of blue light gum treatment technology

From news reports

BOSTON, Mass., USA: The Forsyth Institute in Boston has signed an exclusive licencing agreement with a US-based start-up for the commercialisation of a recently patented blue-light based technology for use in dentistry. Under the terms of the contract, Lexing-

ton-based PhotOral will be allowed to support the development and marketing of an intraoral cleaning system working against bacteria that cause gingivitis.

The promising technology was developed and first documented by Forsyth researchers Nikos Soukos and Max Goodson.

They found that light with a particular wavelength, typically used in teeth whitening procedures, did also eradicate so-called "black-pigmented bacteria" that are responsible for the inflammation of gum tissue. In addition, their study showed that the proportion of other healthy bacteria increased.

"This suggests that it might one day be feasible to use light to restore a healthy bacterial balance in the mouth," Soukos told the university paper *Harvard Gazette* in 2005.

According to PhotOral CEO Stamatis Astra, a Boston University business graduate and radio

talk show host, a prototype of the device is expected to be available within the next 12 to 18 months. He said that it will be targeted at the consumer market and be priced at US\$90 dollars. His company would now be in the process of raising a sum of US\$10 million for financing first clinical trials, production and marketing.

Astra told the New England technology journal *Mass High Tech* that the technology could also be used in the future to disinfecting wounds. [D](#)

AD

Birth after oral cancer treatment

Lisa Townshend
DTUK

LEAMINGTON SPA, UK: A British mother has made medical history after successfully giving birth having had chemotherapy cancer treatment during her pregnancy. Thirty-year-old mum-to-be Sarah Best from Leamington Spa was diagnosed with mouth cancer when she was four months pregnant and was told that if she did not opt to have radiotherapy the cancer was sure to spread.

As Best underwent radiotherapy and chemotherapy treatment to treat the mouth cancer, two five-cm thick lead shields were used to protect baby Jake from the radio waves. Best unexpectedly gave birth to a healthy baby boy just hours after receiving her last course of radiotherapy.

"I was devastated when I was told I had cancer," Best, who had an operation to remove a tumour from her tongue, was quoted saying in *The Telegraph*. "The surgeons managed to remove most of it but they said they saw specks of cancer cells on my lymph nodes. I thought pregnancy was supposed to be the happiest time. You are supposed to feel wonderful. I was really worried about the effect the radiotherapy could have on the baby but the doctors said the lead shield would protect him."

Best said she was expecting to have Jake at least a month after her treatment ended but suddenly went into labour on the last day of her treatment.

Meanwhile, she has been given the all clear from cancer. Consultant oncologist Lydia Fresco, who helped design and build the lead guard for Sarah, said in *The Telegraph*: "Sarah's case was extremely rare. As far as published cases go she was the only woman with mouth cancer in the world to have this combination of chemotherapy and radiotherapy while pregnant." [D](#)



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The 2011 FDI Annual World Dental Congress in figures



With entry free-of-charge, just under 5,300 square metres of exhibition space, some 27,000 visitors, 200 exhibitors and nearly 1,000 exhibition staff, 2011 proved to be the largest FDI World Dental Exhibition in recent years. Jointly organized by FDI and the Mexican Dental Industry (AMIC), it was held alongside the 2011 FDI Annual World Dental Congress at the Centro


Banamex Convention Centre, Mexico City, from 14–17 September 2011.

Over 5,000 individuals, principally dental practitioners, but also hygienists and students, participated in the sessions and meetings scheduled in and around the event. The four-day Scientific Programme, held under the theme 'New horizons in oral health care', featured

112 scientific sessions facilitated by more than 128 speakers from 29 different countries.

Sessions covered a wide range of issues, from oral health and noncommunicable diseases to caries management, from patient safety to salivary diagnostics and from oral and maxillofacial surgery to orthodontics—in fact full coverage of the today's key areas of interest and discussion in dental art, science and practice.

In addition, 121 scientific posters were on display and 59 free communications were presented. The three winners of the 2011 FDI Poster Award Competition were announced during the VIP reception on 14 September. They are Assoc. Prof. Josimeri Hebling from Brazil, Assoc. Prof. Aziza Eldar-rat from the United Arab Emirates and Prof. Hyun-Duck Kim from South Korea.

In all, 98 nationalities were represented at the 2011 FDI Annual World Dental Congress. 

FDI Hong Kong 2012 briefing


FDI recently held a site visit and briefing in Hong Kong for an audience comprising members of the dental industry, representatives from the Hong Kong Dental Association, and key providers. The aim was to detail the numerous opportunities at the 2012 Annual World Dental Congress as well as respond to questions.

Those present included sponsors from 19 companies, of which 8 are current FDI corporate partners—in all some 60 industry representative, mainly from China but also from Australia, France and Singapore. The briefing, which took place on 17 October, also allowed all parties to familiarize themselves with the venue.

"We outlined our plans for new sessions and products envisaged for the 2012 Congress and feedback was very positive," said FDI Executive Director Jean-Luc Eiselé. "I really picked up on an interest and willingness to invest in the event."

"Success, as they say, is measured by attention to detail and understanding needs and expectations," added Dr. Eiselé. "And

that is exactly the approach FDI plans to adopt for the AWDC 2012."

Meanwhile, the Congress website will soon be open, with a preliminary programme online by the end of November. 



FDI President: high-level meetings on India visit

On his first official visit—at the invitation of one of FDI's members and valued partner in 'Leading the world to optimal oral health, the Indian Dental Association (IDA)—FDI President Orlando Monteiro da Silva addressed local events, consolidated links with regional branches of IDA and held high-level meetings with government officials.

The trip took in three of the country's major cities. His first stop, 25 September, was in Chennai, where he addressed a vast audience of dentists and dental students at the opening ceremony of a 'Dental-medical interaction Symposium', organized by IDA's Greater Chennai Branch and the Sri Ramachandra University.

IDA President Dr. George Thomas was present as guest of honour. Other dignitaries present included Dr Gunaseelan Rajan and Dr S. Murugesan, respectively President and Hon. Secretary of the IDA-Greater Chennai



Branch, and Dr R. Suresh, Dean of the Dental Faculty Sri Ramachandra University. The visit included a view of the University's medical, pharmaceutical and nurse training facilities.

The following day, Dr da Silva was in Kolkata, where he briefed

a highly receptive audience, among them Mr Sudip Bandhyopadhyay, Minister of State (Health), on FDI advocacy and activities in the field of noncommunicable diseases. As well as IDA representatives, the audience comprised government officials from all over India, mem-

bers of the Indian Dental Council, notably IDC President Dr Dibyendu Mazumber and Vice-president Dr Mahesh Verma, and faculty from a number of universities.

Mumbai, 25 September, was Dr da Silva's last port of call.

There he once again had the opportunity of carrying out a presentation of FDI and outlining its vision and activities to members of the local chapter of IDA, officials from the regional government, and deans from local universities.

During the course of Dr da Silva's visit, IDA officials expressed their keen support for FDI to launch a Continuing Education Accreditation System and outlined their intention of presenting a specific proposal.

Commented Dr da Silva on his return: "I was genuinely moved by the warm reception I received everywhere I travelled and by the enthusiasm of IDA, local politicians and academia on FDI's work and what it is trying to achieve."

"More specifically, I received very clear signals from a major FDI contributor: we really need to move forward on continuing education." 