Expressions

Newsletter of the HKU Faculty of Dentistry
2011, Issue 2

Spotlight on dental discovery
Close-up on Faculty research themes

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Spotlight on dental discovery

By Lakshman Samaranayake, Dean

As part of a research-led university, the HKU Faculty of Dentistry organised its research areas in 2004 to complement HKU’s University Strategic Research Themes.

Our interdisciplinary research programmes cover the following three areas:
- Biomedical and Tissue Engineering
- Infection and Immunity
- Public Health and Healthy Ageing

The programmes are ably overseen by group convenors (see pages 11-13), as well as Associate and Assistant Deans of Research, Innovation, and Enterprise—currently Prof Li-jian Jin and Dr Chun-hung Chu, respectively.

The Faculty’s vibrant spirit of collaboration and innovation is proving a winning combination. Our researchers publish in the world’s top peer-reviewed journals and regularly receive awards from professional and academic communities, locally and internationally. Many Faculty members are Chief Editors and Editorial Board members of international research journals. Recently, students and staff made their mark at the 89th General Session & Exhibition of the International Association for Dental Research, in San Diego, California, USA (see page 9).

At undergraduate level, HKU is encouraging research within the curriculum as part of its 2012 curriculum reform. Although our BDS curriculum has long had a compulsory research component in the form of BDS IV Community Health Projects (see page 16), we started annual scholarships in 2009 for undergraduate laboratory/clinical research (see page 16). And we recently introduced research journals-based learning to instil evidence-based principles and develop research/information literacy skills. These skills form a firm foundation for life-long learning and preparation for our research and taught postgraduate programmes.

Indeed, we are delighted when BDS graduates return to the Faculty to pursue advanced studies and, in turn, add to knowledge creation and discovery by publishing their postgraduate research. Eventually, some alumni enter a career of dental research and education at the Faculty, thereby enabling a virtuous cycle of creating knowledge to advance science and help the community, while nurturing the next generation of researchers and innovators (see page 17). Throughout this issue, we highlight some of the products of our recent research efforts.

Happy reading!
Will your salivary research take you to Rio de Janeiro, Brazil?

2012 Salivary Research Award

Develop a salivary research abstract & WIN a trip to Rio de Janeiro, Brazil to attend the 2012 International Association for Dental Research General Session & Exhibition!

Submission Deadline:
February 2012

For more details, please visit www.iadr.org/SRGResearchAward
Prof Jin was selected by an HKU advisory committee as the recipient of the Endowed Professorship in recognition of his 25 years of contribution to the field of periodontology (the study of the tissues surrounding and supporting teeth).

The benefactor of the endowment is Modern Dental Laboratory Co Ltd. “We are honoured to support The University of Hong Kong with this Endowed Professorship,” says Mr Godfrey SK Ngai, Director and CEO of Modern Dental Laboratory (pictured to the right of Prof Jin). “It is our shared vision that the Endowed Professorship will enrich the resources available at the Faculty of Dentistry and help uphold its high standard of scholarship, research, and education.”

“I’m truly honoured to receive this professorship, and I’m very grateful to Modern Dental Laboratory for making this a reality,” says Prof Jin, who joined HKU in 1994, having obtained doctoral degrees from Peking University and the Karolinska Institutet in Sweden. “Severe gum disease is a major cause of tooth loss in adults worldwide and recent evidence has shown that gum disease affects not only oral health but also general health such as heart disease or diabetes; so, periodontal care benefits both oral health and general well-being.”

Prof Jin and his current research team have received numerous international awards, most recently for identifying a series of immunity molecules naturally present in the body that are related to gum health. “I hope our findings will contribute to the development of new vaccines for the prevention of gum disease,” says Prof Jin.

Prof Lakshman Samaranayake, HKU Dean of Dentistry and Tam Wah-Ching Professor in Dental Science, says: “Prof Jin has researched the interactions between bacteria that cause gum disease and the human immune system, and his discoveries are very important for the prevention of gum disease in future generations. This prestigious professorship is a tribute to his academic and research excellence.”

The Modern Dental Laboratory Professorship in Clinical Dental Science is the University’s second endowed professorship in dentistry, but the first one in clinical dentistry and the first to be donated by a dental company. An Endowed Professorship is one of the most significant awards bestowed on eminent academics at HKU. Each generous donation of HK$10 million or more is matched by the University and becomes a perpetual endowment in the designated disciplines. For more information about HKU’s Endowed Professorships, visit <www3.hku.hk/ephku>.
To continue encouraging academic exchange with institutions outside Hong Kong, the HKU Faculty of Dentistry recently hosted visits by delegates from three universities. During the visits, the partners discussed opportunities for deep collaboration and signed formal cooperative agreements.

Common areas mentioned in the reciprocal pledges included formal student and staff exchanges, joint research projects, and joint academic meetings and seminars.

On 30 March 2011, Acting Faculty Dean, Prof Tak-wah Chow (Associate Dean for External Relations), signed a 5-year Agreement for Academic Collaboration with Dr Yuan-zhong Chen, President of Fujian Medical University, Fujian, China (1st photo, R and L). This is the seventh partnership agreement between the Faculty and universities in mainland China (already including Beijing, Shanghai, Chengdu, Xi’an, Wuhan, and Guangzhou).

On 2 June 2011, Dean Lakshman Samaranayake renewed a 5-year Memorandum of Understanding with Assoc Prof Wacharaporn Tasachan, Dean of the Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand (2nd photo, L and R). This agreement is one of six that the Faculty currently has with Thailand.

And on 9 June 2011, Dean Lakshman Samaranayake signed a 5-year Memorandum of Understanding with Dr Ho-keun Kwon, Dean of the College of Dentistry, Yonsei University, Seoul, South Korea (3rd photo, R and L). This Memorandum of Understanding represents the first official exchange agreement between the Faculty and a dental school in South Korea.

“We were delighted to renew or initiate these strategic collaborative agreements,” says Dean Samaranayake. “Today’s universities must actively pursue ways of promoting internationalisation, and like-minded institutions need to seek and cement partnerships. With each side having something unique to offer and share, we can ensure significant mutual benefit and synergy.”

**Collaboration counts:** The Faculty’s other current international agreements are listed on the webpage: <http://facdent.hku.hk/engagement/collaborations/index.html>.
Faculty launces virtual "Centre for Innovation in Dental Education"

The HKU Faculty of Dentistry has established the Centre for Innovation in Dental Education (CIDE) as its new virtual hub for curriculum innovation and research.

The official Launch Ceremony of CIDE took place on 28 February 2011 at the Prince Philip Dental Hospital and was attended by 50 guests, including (pictured, from right to left) Prof Lakshman Samaranayake, HKU Dean of Dentistry; Guest-of-Honour Prof Amy BM Tsui, HKU Pro-Vice-Chancellor and Vice-President (Teaching and Learning); Dr Cynthia KY Yiu, CIDE Co-Director and the Faculty’s Associate Dean for Undergraduate Education; and Dr Susan Bridges, CIDE Co-Director and the Faculty’s Assistant Dean for Curriculum Development.

“The Faculty of Dentistry has a strong reputation for its commitment to high-quality teaching and learning. Its response to the 3-3-4 curriculum reform and active engagement in curriculum and pedagogical renewal have been exemplary,” said Prof Tsui. “The setting up of the CIDE hub by the Faculty is strategic and timely. Not only will it take teaching and learning within the Faculty to new heights, it will also provide a platform for cross-fertilisation of innovative ideas and practices—something that is much needed in an era of higher education reform.”

**Look in CIDE:** The CIDE website, which contains information on the Faculty’s undergraduate curriculum development and educational consultancies, news, publications, awards, and upcoming events, is accessible at <http://facdent.hku.hk/learning/cide_index.html>.

Dental Library turns 30

The HKU Dental Library marked its 30th anniversary this spring with a special exhibition that coincided with celebrations of the HKU Centenary and HKU Library Centenary.

The month-long exhibition, held in the Dental Library at the Prince Philip Dental Hospital from 14 March to 16 April 2011, traced significant historic events of the Dental Library from 1978 to present.

Coverage included the background behind the establishment of the HKU Faculty of Dentistry, the beginnings of the Dental Library as part of HKU’s Main Library, and the official opening of the Dental Library in the current premises in 1981. Souvenir bookmarks were given to all exhibition visitors.

Mr Sam Lee, who joined the HKU Library staff in 1992 and has been Librarian at the Dental Library since 2003, told Expressions, "Over the past 30 years, the library has experienced tremendous changes in terms of services, collections, and facilities. In particular, we’ve constantly moved with the advancing technology, from providing microfiche records to now online services and laptop loans, and to the future self-checking in and out of books with RFID [radio-frequency identification]."

**Many happy returns:** Visit the exhibition online at <http://lib.hku.hk/hkul100/Dental_Exhibition.pdf>. For more about the other HKU Library Centenary exhibitions, visit <http://lib.hku.hk/hkul100/lhe.html>. 
**Prune power**

A traditional Chinese medicine that comes from a dried plum can kill bacteria that are linked to tooth and gum disease, a research team from the HKU Faculty of Dentistry has discovered.

Of 20 plant products used as traditional medicines, a dried plum extract—called *wu mei* or *Fructus armeniaca mume* and taken to treat coughs—was the most effective in laboratory tests at killing four kinds of mouth bacteria (*Streptococcus mutans*, *Porphyromonas gingivalis*, *S mitis*, and *S sanguis*). The prune sample killed bacteria grown on a gel even when the extract was very dilute: a concentration of 0.0003 g/mL was enough to kill *P gingivalis* and 0.08-0.16 g/mL was enough to kill the other three bacteria.

The authors conclude that the prune extract was “very effective against all four bacteria” and, after the active chemicals have been identified, “clinical studies should be carried out to optimize the clinical use of *Fructus armeniaca mume* in mouth rinses, toothpaste, chewing gum and other oral products.”

[Link to Medline abstract]

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**Fungal death watch**

A laboratory study conducted by HKU and the Chinese University of Hong Kong has shown how an anti-migraine drug can kill a fungus that is increasingly causing disease but is resistant to many conventional antifungal agents.

Led by Dr Paul WK Tsang from the HKU Faculty of Dentistry, the researchers observed how Candida krusei reacted to metergoline (a serotonin receptor antagonist). Cell behaviour—elevation of reactive oxygen species, mitochondrial and cell membrane changes, and DNA breakdown—indicated “a concentration- and time-dependent cell death process”. Twelve hours of exposure to low doses of drug triggered apoptosis (a type of programmed cell death, or ‘cell suicide’) as well as necrosis (bursting), whereas high doses killed cells mainly by necrosis. The findings “provide important insight” into the molecular mechanisms of cell death in Candida fungi, the authors write.

[Link to Medline abstract]

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**Mouths of migrants**

In China, the oral health of children in families who have relocated from the country to the city tends to be poor and needs closer attention, according to a study conducted by HKU and Sun Yat-sen University.

The researchers, including Dr Xiao-li Gao and Prof Colman McGrath from the HKU Faculty of Dentistry, assessed the oral health of 5-year-olds attending a typical school for migrants in Guangzhou, where rural-to-urban migrants currently make up a third of the local population. Among the 138 children (81 boys and 57 girls) studied, about 86% showed signs of tooth decay and each had about 5 affected teeth. Nearly all of the children had poor oral hygiene. Parental reports revealed that about 35% of the children regularly ate sweets/candy at bedtime, 27% had never brushed their teeth, and 89% had never had a dental check-up; for 60% of the children, life quality had been reduced by their oral health. These findings indicate “an urgent need” for strengthened community- and school-based oral health programmes for migrants, as well as “migrant-sensitive” clinical practice, the researchers conclude.


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**Enlightened therapy**

Using special laser therapies after professional cleaning may be beneficial “on a short-term basis” to treat chronic periodontitis (a form of advanced gum disease), HKU Faculty of Dentistry researchers have reported.

Two diseased teeth were studied in each of 24 non-smoking adults before and after cleaning (scaling and root debridement). For one of the teeth, a low-level diode laser was shone to promote gum healing; 1 day later, a disinfectant was applied and activated by laser (known as ‘photodynamic therapy’), and, 3 days later, the first laser step was repeated. Compared with cleaning alone, adding the laser treatments led to greater improvements in gum health after 1 month, but this advantage disappeared by 3 months.

The researchers note that “further studies are required to assess the long-term effectiveness of the combination of photodynamic therapy with low-level laser therapy as an adjunct in nonsurgical treatment of periodontitis”.

Research prize winners honoured at Dean’s Reception

Five Faculty representatives who won International Association for Dental Research (IADR) prizes this year gave presentations of their winning projects to the Faculty at a Dean’s Reception on 27 April 2011.

Held in the Lounge of the Prince Philip Dental Hospital, the buffet lunch reception provided an opportunity for the Dean and Faculty academic staff and postgraduates to congratulate the awardees and learn more about their award-winning research.

Dr Xiao-li Gao, Postdoctoral Fellow in Dental Public Health and recipient of the 2011 William J Gies Award for Clinical Research, explained how different screening methods could predict the risk of tooth decay among children (see below).

Two winners of 2011 IADR/Colgate “Research in Prevention” Travel Awards, Dr Nihal Bandara (PhD student in Oral Biosciences and Periodontology) and Ms Thanuja Herath (PhD student in Periodontology) outlined recent projects evaluating the effects of various toxins (lipopolysaccharide) from important mouth bacteria on, respectively, fungus cells that commonly cause human disease (Candida albicans) and human gum cells.

Dr Otto Lam (PhD student in Oral Rehabilitation), who won a 2011 IADR/Lion Dental Research Award for Junior Investigators, described different oral hygiene therapies for patients recovering from stroke (see page 17).

Mr Jack C Ji (BDS IV student), who won a 2010 IADR/Unilever Hatton Divisional Award for the IADR South East Asia Division, spoke about the molecular effects of non-surgical treatment of gum disease (see page 16).

“Our Faculty was the only dental school to reap so many IADR research awards in different discipline sub-categories this year,” says Dean Samaranayake. “The lunch reception was our collective celebration of this landmark achievement and the presentations were a further inspiration to fellow researchers. Well-deserved congratulations to our winners!”

Prof Li-jian Jin, Associate Dean for Research, Innovation, and Enterprise, likewise applauded the five prize-winners, saying: “We are fortunate to have so many keen and able Faculty ambassadors of world-class dental research and discovery. The successes are testament to the high-quality work being done by our researchers.”

Predicting children’s caries risk

Results of a questionnaire, a mouth examination, and biological tests can be used to estimate a child’s risk of developing dental caries (tooth decay and cavities), according to the winners of the 2011 William J Gies Award for Clinical Research.*

Dr Xiao-li Gao (pictured) from the HKU Faculty of Dentistry and colleagues from the National University of Singapore tested if the three investigations, in various combinations, could be developed as assessment tools to predict the likelihood of caries development in 1 year among kindergarten children. Five assessment tools gave acceptable results and met different screening requirements in the community or clinic.

One of the assessment methods, consisting of just a questionnaire of six questions, was simple but accurate and practical enough for use outside the clinic to identify children with the highest caries risk. This “Community-screening” tool could be useful for early detection and treatment of caries among kindergarten children, “especially in communities where regular dental screening for preschoolers is uncommon and/or costly”, the study authors conclude.


Faculty felicitations [from L to R]: Dr Nihal Bandara, Dr Otto Lam, Dean Samaranayake, Dr Xiao-li Gao, Ms Thanuja Herath, Prof Li-jian Jin, Mr Jack C Ji.
How has Dentistry changed the world?

To mark the HKU Centenary and the 30th anniversary of the HKU Faculty of Dentistry, the Faculty newsletter Expressions invites (1) Hong Kong secondary school students and (2) HKU Faculty of Dentistry students / staff / alumni to write an original essay on the most significant development in dentistry in the past 100 years. The winner will receive an Apple iPad2 and the winning essay will be printed in Expressions in 2012.

Log onto <http://facdent.hku.hk> for entry details.

HKU Information Days for Undergraduate Admission 2011

HKU Faculty of Dentistry

29 (am & pm) & 30 (am) October 2011
Prince Philip Dental Hospital

For more information, please visit: <http://www.infoday.hku.hk>

“How has Dentistry changed the world?”

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Biomedical and Tissue Engineering

By Lim K Cheung

The Biomedical and Tissue Engineering Research Group of the HKU Faculty of Dentistry aims to bridge the gap between basic science research and its clinical application in the field of bone induction (stimulation of bone formation) and dental biomaterials.

The principal research focuses of the Biomedical and Tissue Engineering Research Group are as follows:

• Growth factors regulating osteogenesis (bone formation)
• Bone tissue engineering with stem cells (unspecialised cells with the potential to develop into specific cell types)
• Bone induction using traditional Chinese medicines
• Jaw reconstruction with microvascular prefabricated flaps (sections of own tissue containing fine blood vessels)
• Enamel- and dentine-bonding agents (non-metal tooth-filling materials)
• Biodegradation of the resin-dentine bond (longevity of plastic tooth-filling materials)
• Distraction osteogenesis of the cranio-maxillofacial region (controlled step-wise movement and healing of surgically created fractures in bones of the skull, jaw, and face)
• Dental biomaterials, as well as tissue-engineered scaffolds (artificial nets that hold and support cells)
• 3-dimensional facial imaging, as well as cephalometry (measurements of face and head features)
• Healing of dental implants with nano-coating (a very thin layer of very small molecules)
• Oral cancer
• 3-dimensional head and neck imaging with magnetic resonance imaging (MRI) and computed tomography (scanning using magnets and X-rays, respectively)
• Brain function mapping using functional MRI (scanning using magnets to track changes in blood flow)

Recent research findings

- By collecting and analysing 3-dimensional X-ray and photographic images of 50 men and 50 women from Hong Kong, these researchers created the first database of typical 3-D features of faces and skulls of Chinese adults. The 3-D reference database will be useful in assessing facial deformities and treatment results.

- This systematic review of past studies revealed that among 828 patients who had received radiotherapy for head and neck cancer, 7% had unhealed bone in tooth sockets after tooth extraction, indicating bone cell death (osteoradionecrosis). The risk was highest for radiotherapy doses exceeding 60 Gy, and there was “weak evidence” of prevention by using a pressurised (hyperbaric) oxygen chamber.

- Cells from the pulp of human teeth were inserted into a protein-based gel and, after chemical treatment and transplantation into mice, developed into mineralised tissue pieces that made proteins normally found in bone.

- In laboratory tests of bonding between pre-treated zirconia to resin-composite cement (two materials used in tooth restorations), each of five experimental silane coupling agents led to stabler bonding (greater shear bond strengths) than a commercially available ready-to-use product.

- Laboratory studies on Enterococcus faecalis, a bacterium that can survive in treated root canals, showed that 3.8% silver diamine fluoride had a similar antibacterial effect to 5.25% sodium hypochlorite.

- According to 12 dental postgraduates who were asked to identify one of the mouth’s nerves (mandibular nerve) in 11 patients, the nerve was more readily visible with magnetic resonance imaging than with cone-beam computed tomography.

Prof Lim K Cheung, <lkcheung@hkucc.hku.hk>, is the convenor of the Biomedical and Tissue Engineering Research Group at the HKU Faculty of Dentistry. A list of the group’s members can be found at: <http://facdent.hku.hk/discovery/group_biomedical.html>.
I infection and Immunity

By Rory Watt

Microbes are involved in many common oral diseases in humans, such as caries (tooth decay), periodontal (gum) diseases, and fungal infections. Recent studies have increasingly shown that these oral infections may be implicated in some diseases or disorders affecting the rest of the body. The Infection and Immunity Research Group of the HKU Faculty of Dentistry aims to study such topics in a comprehensive manner by using biomedical, clinical, and translational approaches.

The principal research focuses of the Infection and Immunity Research Group are as follows:

- Oral microbiology of healthy as well as medically compromised individuals (those with health/developmental conditions that alter normal activities), including patients with HIV infection, those with diabetes, and those undergoing irradiation for cancer
- Molecular pathogenesis (disease mechanisms at a molecular or chemical level) and epidemiology (features of disease in human populations) of mouth infections caused by the fungus Candida
- Mechanisms by which fungi become resistant to antifungal drugs, and the characterisation and development of novel antifungal agents
- In vitro (artificial, laboratory) studies into the formation and structure of microbial biofilms—complex multicellular communities of microbes that commonly grow on biological and environmental surfaces
- Development of new technologies for microbial genome engineering (modification of a micro-organism’s genetic information)
- Risk factors and biological and genetic markers of periodontal (gum) diseases
- Basic and clinical studies in periodontal medicine, and the development of appropriate therapeutic modalities (methods or forms of treatment) to control and prevent periodontal diseases
- Basic and applied research into the operation of the gum’s innate immune (non-specific, first-line defence) system, and the microbiological profiles and molecular mechanisms of bacteria-host interactions in periodontal health and disease
- The application of traditional Chinese medicines in oral health care

Recent research findings

- These clinical studies showed for the first time (1) the association between increased levels of circulating endothelial progenitor cells and periodontitis; (2) the effect of periodontal (gum) treatment on the level of circulating endothelial progenitor cells; and (3) the production of C-reactive protein in the human gum. The findings provide insight into molecular mechanisms that may account for the link between gum infections and heart and blood vessel diseases.

- This clinical study identified novel genetic variations associated with the occurrence of chronic periodontitis within human populations.

- These researchers discovered a novel mechanism that allows fungal biofilms to show very high levels of resistance against clinically used antifungal drugs. The findings will pave the way to develop new strategies against fungal infections, which are killing many hospitalised patients in Hong Kong and other parts of the world.

- This study characterised the functions of two proteins that help the virus-like SXT particle establish itself within cells of the bacterium that causes cholera.

- This review identified key factors in the process by which the cancer-causing Epstein-Barr virus is released into the saliva of infected people.

Dr Rory Watt, <rmwatt@hku.hk>, is the convenor of the Infection and Immunity Research Group at the HKU Faculty of Dentistry. A list of the group’s members can be found at: <http://facdent.hku.hk/discovery/group_infection.html>.
Public Health and Healthy Ageing

By Colman McGrath

The Public Health and Healthy Ageing Research Group of the HKU Faculty of Dentistry is committed to protecting and improving oral health for all people by performing and synthesising clinical, community-level, and educational research, and by applying public health sciences.

The principal research focuses of the Public Health and Healthy Ageing Research Group are as follows:

- Clinical epidemiology (population-level features) of oral diseases and conditions
- Clinical trials on innovative methods of preventing and treating oral diseases and conditions (including the use of traditional Chinese medicine)
- Dental education, clinical communication, and oral health literacy
- Oral health–related quality of life and subjective assessments of oral health
- Oral health care services, including issues related to human resources and utilisation of services
- Special care dentistry (dentistry for special-needs groups)

Recent research findings

- Two Cochrane Reviews concluded that (1) the use of toothpastes with a fluoride concentration of 1000 ppm or higher has a significant benefit over use of a placebo in preventing tooth decay in children and adolescents; and (2) the evidence that starting the use of fluoridated toothpastes at ages younger than 1 year may be linked to an increased risk of fluorosis is “weak” and “unreliable”. The authors recommend that dentists help caregivers weigh the benefit of preventing tooth decay against the risk of developing mild fluorosis when selecting fluoridated toothpastes for use in children younger than 6 years.

- In this clinical trial, researchers studied the prevention of new cases of root decay in institutionalised elders after they received individualised oral hygiene instructions. The effectiveness of this approach was increased by adding one of three treatments over 3 years—namely, applications of (1) 1% chlorhexidine varnish every 3 months; (2) 5% sodium fluoride varnish every 3 months; and (3) 38% silver diamine fluoride solution annually.

Leung WK, Chu CH, Mok MY, Yeung KW, Ng SK. J Periodontol 2011;82:1140-5.
- Compared with age- and sex-matched healthy dental patients, 36 patients with systemic sclerosis (an autoimmune disease affecting connective tissue) had greater amounts of gum inflammation. Mouth X-ray images also showed wider periodontal ligament spaces (where ligaments attach roots of teeth to bone) for these patients.

- Several newly developed assessment methods were shown to be useful in estimating the likelihood of tooth decay in kindergarten children and might be valuable in prevention or treatment planning. One method could be particularly useful and cost-effective in non-clinic settings (see page 9).

- Repeated dental assessments of 221 Hong Kong students at ages 12 years (late childhood), 15 years (adolescence), and 18 years (early adulthood) revealed that oral health gradually worsened with age. Oral health status and use of dental services in childhood predicted those in adulthood, and reduced use of dental services was associated with reduced monthly household income.

- In this first human study on bone healing around inserted metal dental implants, rough-surfaced titanium cylinders (2.8 mm wide and 4 mm long) were screwed into jawbones of volunteers and then removed after different periods. About half of the 49 implants had been chemically pretreated so the surface was hydrophilic (water-attracting), while the other half remained hydrophobic (water-repelling). The hydrophilic implants initially showed faster coverage by new bone, up to day 28, but both implant types were covered by the same amount of new bone by day 42.

- The integration of interactive (touch-screen) whiteboards into small-group problem-based learning tutorials involving face-to-face contact between dental undergraduates and a facilitator led to enhanced engagement and knowledge construction within the group.

Prof Colman McGrath, <mcgrathc@hku.hk>, is the convenor of the Public Health and Healthy Ageing Research Group at the HKU Faculty of Dentistry. A list of the group’s members can be found at: <http://www.dental.hku.hk/discovery/group_publichealth.html>.
Faculty tutor receives Long Service Award

Ms Jenney LK Leung, Tutor in Dental Surgery Assisting at the HKU Faculty of Dentistry, has been presented with an HKU Long Service Award in recognition of 25 years of service to the University.

Ms Leung (pictured, first in front row) was one of 19 staff honoured by HKU Vice-Chancellor Prof Lap-chee Tsui at this year’s Long Service Awards Presentation Ceremony on 2 June 2011. She told Expressions: “It doesn’t seem like 25 years since I first joined the HKU Faculty of Dentistry. I very much enjoy training dental surgery assistants and seeing them grow as both people and health care professionals. I think of my work as both a profession and vocation, and I, too, have learnt something new every day here at HKU.”

Dental surgery assistants are key members of the dental team. They assist the dentist at the chairside with the care of patients before, during, and after treatment. For more information on dental surgery assisting and the programme jointly organised by the Faculty and the Prince Philip Dental Hospital, please visit <http://ppdh.org.hk/en/assistant.htm>.

Productive visit for Research Fellow

During 2011, Dr Andy Choi, a post-doctoral researcher from Australia, has been an Honorary Assistant Professor in Dental Materials Science at the Faculty, courtesy of an Endeavour Australia Cheung Kong Research Fellowship. His brief visit has been time very well spent.

Firstly, Dr Choi and Dr Lukka Matinlinna (Associate Professor in Dental Materials Science) [pictured, R and L] have already had a joint research paper accepted by the journal Acta Odontologica Scandinavica, and a second one is in the pipeline.

In the accepted paper, the two researchers compared stress differences between dental implants made of either titanium-aluminium-vanadium or partially stabilised zirconia (ZrO2) during simulated jaw clenching. The findings have implications for the clinical performance of zirconia in oral implantology.

Secondly, Drs Choi and Matinlinna, with Prof Besim Ben-Nissan (University of Technology, Sydney), won third prize for their poster presentation titled “Titanium dental implant versus zirconia dental implant: a three-dimensional finite element study” at the 2nd Hong Kong International Dental Expo and Symposium (HKIDEAS) on 3 June 2011.

“Competing for and then winning an Endeavour Australia Cheung Kong Research Fellowship has definitely opened a few doors for me in terms of collaborating with one of the top dental schools in Asia,” says Dr Choi. “I am very grateful to Dr Matinlinna and Faculty staff members, who have given me their friendship and full support during my visiting fellowship.”

Staff moves

The Faculty bids a warm welcome to:
• Dr Wen-yang Chen, Postdoctoral Fellow in Infection and Immunity
• Dr Xiao-li Gao, Research Assistant Professor in Public Health and Healthy Ageing
• Dr Xiao Li, Postdoctoral Fellow in Infection and Immunity
• Miss Molly MY Kam, Secretary II
• Mr Chi-wai Man, Office Attendant

…And congratulations to the following (re-) appointed Assistant Deans:
• Dr Michael Botelho, Undergraduate Education
• Dr Susan Bridges, Curriculum Development
• Prof Coleman McGrath, Postgraduate & Continuing Education
• Dr Katherine CM Leung, Postgraduate & Continuing Education
• Dr Chun-hung Chu, Research, Innovation & Enterprise
• Dr Jeffery WW Chang, International Affairs
• Dr Li-wu Zheng, Greater China Affairs
• Dr Gary SP Cheung, External Relations

…And a fond farewell to:
• Prof Urban Hägg, Chair Professor of Orthodontics
• Dr Peng Lin, Postdoctoral Fellow in Biomedical and Tissue Engineering
• Dr Peng Xin, Clinical Associate Professor in Oral & Maxillofacial Surgery
• Dr Wen-you Zhou, Postdoctoral Fellow in Biomedical and Tissue Engineering
• Mr Ronny PK Chan, Senior Technical Officer
• Mr Rupert KY Chan, Faculty Secretary
• Ms Clara MT Choy, Senior Secretary
• Ms Sue SY Cheung, Clerk II
• Ms Alice YM Kan, Secretary II
Spring retreat

Faculty teaching staff gathered at the Aberdeen Marina Club, Aberdeen, on 5 May 2011 for the Annual Faculty Retreat. This year, the theme of the all-day strategic discussion meeting was “Assessments in the BDS curriculum”.

Global digital learning

Dr Susan Bridges (Assistant Dean for Curriculum Development) represented HKU at the American Dental Education Association (ADEA) Scholarship of Teaching and Learning Workshops in San Diego, USA, on 14 March 2011.

Together with Prof Damien Walmsley (University of Birmingham, UK), Dr Bridges assisted Dr Karen Gardner (University of British Columbia, Canada) (pictured, L to R), in organising a 3-hour Faculty Development Workshop titled “Global dental digital learning communities: learning or social networking?”.

The workshop was based on the Universitas 21 project on International Peer Review (IPR) for dental undergraduates, <www.diastemas.net>. Dr Bridges led a session on the conceptualisation of this online learning initiative as a “community of practice” and shared the Faculty’s experience with the project.

The IPR project is supported by an HKU Teaching Development Grant recently awarded to Drs Susan Bridges, Chun-hung Chu, and Jeffrey WW Chang.

Double bonds

Elective students from two overseas dental schools paid a 1-week visit to the Faculty in March 2011.

The seven students were from the Melbourne Dental School at The University of Melbourne, Australia, and the School of Dental Medicine, Tsurumi University, Japan.

On 9 March 2011, the visitors (including Dr Asiri Jayawardena from Tsurumi University) were given a guided tour of the Prince Philip Dental Hospital and held a joint discussion about dental education and dentistry in Hong Kong, with Dean Lakshman Samaranayake and Dr Chun-hung Chu (Assistant Dean for Research, Innovation, and Enterprise, and Tutor for Elective Studies). During their elective week at the Faculty, the students participated in problem-based learning tutorials and clinic observation sessions.

Information on arranging incoming overseas electives to the HKU Faculty of Dentistry can be obtained at <http://facdent.hku.hk/learning/ug_studentship.html>.
Bench marks

By Jack Ji

In a new research initiative at the HKU Faculty of Dentistry in 2009-10, four undergraduates were selected by competition to perform clinical and laboratory research alongside Faculty staff.

I was fortunate to take part in a project supervised by Prof Li-jian Jin and Dr C Jayampath Seneviratne on the non-surgical treatment of periodontal (gum) disease. Staff from the Discipline of Oral Biosciences were very helpful and allowed me to master a range of molecular techniques, while my supervisors provided excellent guidance in organising and interpreting data.

As a BDS undergraduate, I was particularly excited to learn about the mechanisms underlying the clinical success of non-surgical periodontal therapy and to get to know this “good old friend” of dentists in a deep way. By the end of the project, not only did we demonstrate clinical, immunological, and biological effects of non-surgical periodontal treatment, but I also learnt how to design, formulate, and perform a scientific study; how to interpret and analyse results; and how to make research posters and prepare presentations. The whole process improved my way of thinking logically and critically. Winning a regional IADR prize was a great bonus.

The most valuable aspect about this undergraduate research project was the chance to put previously learnt knowledge from textbooks and journals into practice, while having a taste of life as a scientific researcher.

Jack Ji is a BDS IV student and the current International Liaison Officer for the Asia Pacific Dental Students Association.

Helping helpers

By Harry Mak

The HKU Faculty of Dentistry held dental outreach clinics for Indonesian domestic helpers at the Indonesian Consulate General, Causeway Bay, during two weekends in March 2011.

Our outreach clinic was part of BDS Group 4.6’s Community Health Project, supervised by Dr Xiao-li Gao. We divided our clinic into several stations: for consent and questionnaire taking; for oral examination; for basic dental treatment (eg, scaling, topical fluoride application, and atraumatic restorative therapy); and for demonstrating proper oral hygiene and passing on oral health knowledge. The 163 participants moved from station to station in sequence.

We saw many patients whom we would not normally see at the Prince Philip Dental Hospital, and we also collected data as part of our study on understanding the oral health status of these domestic workers. The large number of teeth showing decay was quite stunning. With such a great treatment need, we learnt first-hand that the dental service to this sector of Hong Kong’s community was not sufficient.

The outreach clinic was a great experience. Apart from providing treatment outside the hospital, we had the chance to practise how to manage a real-life clinic with limited resources. The assistance from the professors and local dentists was indispensable for the well-organised setting. Also, as we did not have any dental surgery assistants, we had to help each other chart, suction, prepare treatment materials, and sterilise equipment. We had a new-found appreciation for dental surgery assistants for smooth and successful treatment and realised the need for good planning to maximise efficiency.

In becoming dentists, we aim to help the needy and serve the community. The outreach clinic project gave us a sense of satisfaction, and the attendees showed great appreciation. We thank the Indonesian Consulate General, Prof Edward Lo, Prof Colman McGrath, Dr Anthony Wong, Dr Alex Chau, and Dr Xiao-li Gao for helping to make the programme a successful one.

Harry Mak is a BDS IV student and the BDS Group 4.6 Representative.
Alumni give voice to children’s oral health

Little is known about the dental health of Hong Kong children aged 5 years and younger, so Prof Edward CM Lo (Professor in Dental Public Health), Dr Eva KY Loo (a general dental practitioner in private practice), and Dr Chun-kei Lee (a paediatric dentist in the Hong Kong Department of Health) aimed to obtain up-to-date data for this group. In 2007, they randomly selected 12 kindergartens on Hong Kong Island, from which a total of 1343 children were examined (691 boys and 652 girls, with an average age of 3.9 years).

More than a third (35%) of the children displayed any signs of tooth decay. On average, 1.5 teeth per child were affected, with 90% of cases as untreated decay and the remainder as missing or filled teeth; 12% of the children had more than 4 affected teeth. Statistical tests showed that older ages, lower education levels of mothers, poorer dental knowledge among parents, lower family incomes, use of a nursing bottle during bedtime, and more frequent intake of sugary snacks were predictors of having an increased number of decayed, missing, or filled teeth.

The researchers conclude that the frequency of tooth decay among preschool children “was not high”. However, they note that incomes on Hong Kong Island are relatively high and, since tooth decay seems linked to lower incomes, the decay prevalence found in the study may be an underestimate. They recommend that children who are the most prone to tooth decay be identified and then “appropriate preventive measures be provided”, such as topical fluoride application.

Dr Loo, currently a part-time research postgraduate, says: “I enjoyed working on the study, which, hopefully, will help to raise the dental health status of preschool children in Hong Kong.”

Personal enrichment

In March, Dr Otto LT Lam won a 2011 IADR/Lion Dental Research Award for Junior Investigators for presenting research from his PhD project on oral hygiene in stroke survivors. Expressions asked him about life as a Faculty PhD student.

What made you go back to school?
I’ve always been interested in science and research. After BDS graduation from the Faculty, followed by clinical practice, I felt that I still wanted something more academic. Studying for a PhD seemed like an intuitive next step. Naturally, I chose the HKU Faculty of Dentistry because of its outstanding reputation in research and its high-quality staff.

What has research taught you?
The PhD programme has taught me how to become an independent researcher, how to tackle all sorts of problems, and how to think on my feet.

What’s it like being a student again?
Being with others in the same situation, in a cultivating environment, and in the company of seasoned researchers with a wealth of experience, I’ve been able to gain a better perspective on my life and my future goals. The experience has been life-changing.
Surgical quiz

By Dr Philip KM Lee (BDS 1986, MDS[OMFS] 2000), Specialist in Oral and Maxillofacial Surgery

An 8-year-old girl had an asymptomatic insidious swelling in the right mandible (Fig 1). A lateral oblique radiograph (Fig 2) showed a well-defined radiolucent lesion in the right mandible and an unerupted second molar.

1. How would you investigate the condition and what information is crucial for treatment planning?
2. What are the differential diagnoses?
3. What treatment options are available?

Write expressions

By

Dr Philip KM Lee
(BDS 1986, MDS[OMFS] 2000), Specialist in Oral and Maxillofacial Surgery

If patient A had 20% of teeth showing signs of teeth grinding but patient B had 10%, then:

(1) Patient B had 10% fewer affected teeth than patient A.
(2) Patient A had twice as many affected teeth as patient B.
(3) Bruxism was two times less common for patient B than in patient A.
(4) The prevalence rate of bruxism ranged between 10 to 20%.
(5) The percent of bruxism in patient A was 2-fold higher than patient B.


Follow-up

Correction: Expressions 2011, issue 1, page 6, said that the 2010 Graduation and Awards Ceremony was the 25th for BDS graduands. Although it was the 25th anniversary of the first BDS conferment, the ceremony was the 26th for undergraduates (but the 25th for postgraduates). This has been corrected in the online version.

HKU Centenary - Faculty of Dentistry Pearl Jubilee Essay Contest: Win an Apple ipad2! Rules for the contest, in two categories (local secondary school students and Faculty students/staff/alumni) are now available online at: <http://facdent.hku.hk/docs/Essay2011Rules.pdf>. Deadline extended to 30 October 2011.

Check your answers to this issue’s quizzes at the online Knowledge Exchange Hub of the Faculty’s website at: <http://facdent.hku.hk/engagement/ke>.
Guide to teeth grinding

♦ What causes teeth grinding?
♦ What problems can teeth grinding cause?
♦ How can teeth grinding be treated?

What causes teeth grinding?

Teeth grinding or clenching (bruxism) can happen during the daytime as a habit in response to stress and anxiety, or during deep concentration; it is often done without the person being aware of it. It can also happen during sleep (nocturnal/sleep bruxism). Children may grind their teeth when their first or second set of teeth emerges, or in response to earache.

The exact cause of teeth grinding in adults is unknown. Teeth grinding may be linked to experiencing stressful or frustrating situations; excessive intake of alcohol or tea/coffee; smoking; taking drugs for sleep, depression, or anxiety; taking illegal drugs; having missing or misaligned teeth; having upper and lower teeth that meet abnormally (malocclusion); and certain medical conditions. See your dentist if you notice any of the signs of teeth grinding/clenching shown in the Box.

What problems can teeth grinding cause?

Most cases of teeth grinding are mild and do not show symptoms. However, problems include the following:

- Crowns of teeth become worn down and require restoration, or previous restorations become damaged and need replacement, so as to allow proper chewing
- Cracks in teeth allow microbes to infect the tissues inside the teeth, which may require fillings or root canal treatment
- Worn-down or cracked tooth surfaces lead to tooth sensitivity
- Sleep disruption for the patient and bedroom partner
- Muscle aches, headaches
- Stiffness or pain in the jaw joints (temporomandibular joint disorder)

How can teeth grinding be treated?

There is no cure for teeth grinding. Because people may be unaware they have this condition, regular visits to a dentist are important.

The dentist will notice signs of teeth grinding or its complications; will perform a full examination and ask questions to identify associated lifestyle or medical factors; and may recommend professional help, such as from a medical doctor, sleep specialist, behaviour specialist, or stress counsellor. The dentist may also treat conditions such as inflammation; broken, cracked, or infected teeth; and jaw disorders. Other steps include the following:

- The dentist may custom-make a soft-plastic mouth guard or hard-plastic mouth splint to protect teeth, especially at night
- The dentist may correct misaligned teeth by tooth-straightening (orthodontic) treatment
- Reducing intake of alcohol and tea/coffee, especially at night
- Finding ways of relaxing and managing/preventing stress
- Giving up smoking; Hong Kong Department of Health Smoking Cessation Hotline: 1833 183; HKU Smoking Reduction Hotline: 2819 2697; HKU Female Smoking Cessation Hotline: 2819 2692; Hong Kong Council on Smoking and Health website: http://smokefree.hk (Chinese) or http://smokefree.hk/en/home (English)


Written by Trevor Lane, DPhil; edited by Philip Newsome, MRD RCS Ed, FDS RCS Ed. This Patient Page is for general informational use and is not a substitute for diagnosis; for specific advice, please consult a dentist.
Finally, instant* sensitivity relief patients can take home.

A breakthrough: Pro-Argin™ Technology

**BEFORE**

In Vitro SEM photograph of untreated dentin surface.

The tubules that lead to sensitivity are open

**AFTER**

In Vitro SEM photograph of dentin surface after application.

The tubules are plugged for instant, lasting relief

With Pro-Argin™ Technology, you can finally provide instant* and lasting relief from dentin hypersensitivity using the Colgate® Sensitive Pro-Relief™ Treatment Program:

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Pro-Argin™ Technology works through a natural process of dentin tubule occlusion that attracts arginine and calcium carbonate to the dentin surface to form a protective seal that provides instant relief.²

*Instant relief is achieved with direct application of toothpaste massaged on sensitive tooth for 1 minute.

When applied directly to the sensitive tooth with a fingertip and gently massaged for 1 minute, Colgate® Sensitive Pro-Relief™ Toothpaste provides instant sensitivity relief compared to the positive and negative controls. The relief was maintained after 3 days of twice-daily brushing.

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