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Two fimbrieein-binding protein genes detected in viridans streptococcal bacteria isolates.

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Oral streptococcal species are increasingly isolated from cases of bacteremia, in particular in cancer patients, and are also implicated in infectious endocarditis. A mechanism whereby these normally commensal bacteria might disseminate from an orally colonised site may be via adherence to extracellular matrix (ECM) proteins, such as fibronectin (fn), exposed during chemotherapeutic treatment. The Ca++ polyependylic Streptococcus species (S. gordonii and S. mitis) are frequently isolated from infected teeth and oral streptococcal species (McNab et al., 1999) J Bacteriol 181:3087-3095. We have detected homologues of fn and Streptococcus pyogenes fn-binding protein gene, fnBP5, in laboratory strains of S. pneumoniae, S. faecalis and S. mitis. To investigate whether these proteins are involved in pathogenesis, it first needs to be shown that the caa and fnBP5 gene homologues are consistently present in clinical isolates. Thirty three blood isolates from cancer patients undergoing chemotherapy were obtained and were identified to the species level by use of biochemical and biological tests and typed byribotyping. The majority (>80%) of the isolates were identified as either S. mitis or S. oralis. Using the Polymerase Chain Reaction (PCRamplification of S. gordobin probes, fnBP5 and caa gene homologues were identified in all S. oralis and S. mitis clinical isolates. The genes were also detected in untyped isolates. In conclusion, we have confirmed the presence of homologue two genes encoding putative fimbrieein-binding proteins in viridans streptococcal bacteria isolates.

This work was supported by the University of Otago.

Ultra-micro-indentation characterisation of mouthguard materials.

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Mouthguards play an important role in preventing dental trauma. However, the literature on mechanical properties of mouthguard materials is limited. The present study was designed to evaluate elastic plastic properties of the materials. Three materials mouthguard materials (clear and coloured) were selected. An ultra-micro-indentation system (UMIS-2000, CSIRO) to determine the nanoindentation characteristic of each material is compared. The unloading characteristics test was performed by indentation with a spherical indenter (R = 500 μm). The nano-indentation depth was 400 nm and a loading rate of 500 N/min was used. The force-displacement data were recorded. The Young’s modulus of FIB and CB was measured by Wi/Wi where Wi is the area under the loading force displacement and Wa is the area between the loading and unloading curves. The higher the ratio, the greater energy absorption capacity of the system. The F values were calculated. For both Wi/Wi and Wa/Wi are summarised in Table 1. All materials failed at the same load. Applying the force to the material caused the material to deform and absorb the energy. The C-M is closest to the human dentine material. In conclusion, the mechanical properties of the materials were considered to be suitable for all sports.

Application of the focused ion beam in dental research.

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Focused Ion Beam (FIB) technology has been available for over ten years but until recently its use has been confined to the microelectronics industry. It was developed originally as an important tool in that industry for defect analysis and circuit modification and, more recently, for preparation of specimens for viewing under the transmission electron microscope. The focused ion beam can also be used as a scanning electron microscope and it is possible to prepare samples from a wide range of materials and to allow detailed study of many types of adhesive interface. FIB allows selection of the area of interest and precise milling with minimal sample deformation. This paper presents an application in examining the dental restorative material interface. The example offered involves the characterisation of the interface between the composite resin used to repair a section of porcelain fractured from a crown or a bridge. It is suggested that this instrument offers opportunities to expand research in dental materials to areas not possible before. This work was gratefully supported by ESPE Australi P/L.

Perceptions of dental attractiveness in UK and Malaysia.

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There may be variations in what is considered to be a pleasing dental appearance between dentists, non-dentists and different ethnic groups. Objectives: To determine if there were differences in perceptions of dental attractiveness between subjects of various ethnic groups and in different countries. Methods: Ten standardised photographs of left and right side maxillary and mandibular dentition were taken. Each subject was shown all 20 photographs with the lips retracted, were shown to 275 dental and patient subjects in Manchester, UK (MAN, n=150) and Kuala Lumpur, Malaysia (KL, n=125). Mann-Whitney-U statistic was used for the evaluation of the data and determined if there were any significant differences between MAN and KL and 20% of subjects respectively, for reasons of tooth shade, form, alignment and healthy gingiva. The mean ratings of the photographs were calculated for both localities. The correlation between MAN and KL by 32% and 42%, respectively of subjects for (stated reasons of deep overbite (MAN=81%, KL=54%) and poor crown shape (length/width (KL-36%). For these photographs there was a significant difference in mean ratings by dentists and patients at each of MAN and KL, and also overall (from p=0.00 to p=0.022).

Conclusions: Although there was a generally similar perception of dental attractiveness across these photographs, there were found in rankings between MAN and KL between dentists and non-dentist and between different ethnic cultural groups.

112 Oral health of remote-dwelling W.A. Aborigines. 

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Objective and Background The CDS provides an annual visiting dental service to some remote Aboriginal communities in Western Australia (WA). To ascertain needs, oral health status of Aboriginal adults aged 50 years and older was comprehensively assessed using traditional dental screening methods and typical was hypobius. The findings, recorded on a special form, were transferred to computer for analysis and are compared with the results of the 1998 WA Child Dental Health Survey and X-rays, for the National Oral Health Survey (1987/88).

The communities included were 65.5% S.5 yr olds and 34.5% 6-9 yr olds and among 11–13 yr olds, DMFT was 1.7 (0.8 in WA, 12. yr olds). Mean DMFT in adults was 5.1 which was similar to adults in WA. The mean DMFT in adults 19–29 yr olds was 1.4 and the adults aged 40–99 yr olds had on average 26.6 teeth present (Australian adults 21.1 teeth). Conclusions Aboriginal children have poorer oral health than the state average but Aboriginal adults' caries status is better than the national average. These findings are consistent with a hypothesis that caries risk is lower for Aboriginals than the case when today's adults were children; this is a cohort effect.

113 Effect of disinfectant on dimensional accuracy of alginate impression material.

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Maintaining dimensional accuracy of dental impression materials during disinfection is important. The present study was aimed to investigate the effect of various disinfectant solutions on the dimensional accuracy of an alginate impression material. Two grooves separated by a distance of 50.000 mm were carved on a plastic reference plate from which alginate impressions (Palget Plus, ESPE) were taken. The distance was measured by use of a travelling microscope and compared both before and after the disinfectant was allowed to remain. In the present study, we compared the effect of the disinfectant solutions on the dimensional accuracy of the impression material. Disinfectant solutions were used to determine the dimensional accuracy and dimensional change after exposure to disinfectant solutions. The measurements in air, immediately following the taking of the impression, were used as the reference. Both the dimensional and dimensional change were compared for an alginate impression material. The result was compared for an alginate impression material. The result was compared with the historical standard of dimensional accuracy of alginate impressions.

There is no significant difference between various solutions in 6 and 60 minutes time intervals. All the disinfectant solutions examined, 6 minutes disinfection with Novapharm had demonstrated dimensional change that was not significantly different. The only exception in 6 minutes exposure to Milton solution for 60 minutes had shown the greatest dimensional change (89.9 µm). A maximum would be maintained in the dimensional change after 60 minutes disinfection. This study was supported by the Novapharm Research (Australia) Pty Ltd.

115 Human buccal epithelium and vaginal epithelium: a comparative study.

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Vaginal mucosa, in contrast to buccal mucosa, males and females as the former could be substituted for the latter, it would expedite research involving the buccal mucosa. Both are lined by non-keratinized epithelium, the distribution of their keratin filaments is comparable and their permeability to chemical substances is similar. To further strengthen the concept that vaginal epithelium could replace buccal epithelium in certain situations, comparisons need to be made regarding both the histological and ultrastructural appearance and the presence of intercellular lipid lamellae and the lipid composition of the epidermis. Because these changes play a role in the epithelial barrier they were examined and compared. Thirty-three specimens of vaginal mucosa from postmenopausal women were examined. Wet and dried specimens were compared by light and electron microscopy. The human buccal epithelium was in-situ and the cell layers in sections of each mucosal specimen in the 3 thickest and 3 thinnest regions were counted. Surface keratinization was evaluated on sections stained with the Picro-Mallory method and results described for the two tissues. These tissues were examined electron microscopically after normal and post fixation in RuO4. Following extensive dehydration in acetone and propylene oxide, the specimens were embedded using thin-layer chromatography. No statistically significant differences were found between the wet and microwave dried specimens. A semiquantitative evaluation of surface keratinization, distribution and appearance of the lipid lamellae was similar. Except for the cholesterol esters, triglycerides and glycerolceramides, which did not reach significant levels, the two epithelia were similar. Based on this structural similarity, comparative lipid composition and our earlier findings we conclude that vaginal epithelium can be used as a substitute for buccal epithelium in certain titers and prone to it in some studies. This study was funded by the MRC of South Africa and Thomas and donor.