<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>The relationship between the acid and alkaline phosphatase activity and the adherence of <em>Candida parapsilosis</em> to human buccal epithelial cells</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>Samaranayake, LP; Fernando, PHP; Panagoda, GJ</td>
</tr>
<tr>
<td><strong>Citation</strong></td>
<td>The 47th Annual Meeting of the Japanese Association for Dental Research, Kobe, Japan, 27-28 November 1999. In <em>Journal of Dental Research</em>, 2000, v. 79 n. 5, p. 1254, abstract no. 155</td>
</tr>
<tr>
<td><strong>Issued Date</strong></td>
<td>2000</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10722/53927">http://hdl.handle.net/10722/53927</a></td>
</tr>
<tr>
<td><strong>Rights</strong></td>
<td>This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.</td>
</tr>
</tbody>
</table>
153 Expression of the Cell-Surface Heparan Sulfate Proteoglycan mRNA in Monkey Submandibular Gland. E. YAMAGATA, A. KAMADA and T. SAKAKI (Osaka Dental University, Osaka, Japan)

Cell-surface heparan sulfate proteoglycans belong primarily to two families of molecules, syndecans and glypicans, that differ significantly in core protein domain structure. They have been shown to participate in both matrix recognition and growth factor binding and thereby may participate in cell regulation. Microarray analysis of the cell-surface heparan sulfate proteoglycans in adult female monkey (Macaca fascicularis) submandibular gland using the RT-PCR technique. Agarose gel electrophoresis of the PCR product of the mRNA preparation from the gland is carried out to demonstrate the expression of mRNA in syndecan-1, syndecan-2, and glypican-2. Although in order to compare the mRNA expression level among the cell-surface heparan sulfate proteoglycans, we measured changes in the relative intensity of PCR products with increasing thermal cycle number. The results demonstrated that the expression levels were syndecan-4, syndecan-1 and syndecan-2, glypican in descending order. Hence, it was indicated that the control of the expression pattern of the cell-surface proteoglycans may regulate the cellular function and behavior in the submandibular gland. This study was supported in part by the NEDO Projects (09671913) from the Scientific Research Fund of the Japanese Ministry of Education.

154 VAMP-containing Complex at Secretory Granules in Parotid Acinar Cells. J. YOSHIGAKI*, Y. DOHKE, M. HARA-YOKOYAMA, S. FURUYAMA, H. SUGIYAMA and F. YAMASHITA (Dept. Physiol., Nihon Univ. Sch. of Dentistry at Matsudo, Chiba, Japan)

Amylase release from parotid acinar cells is mainly regulated by accumulation of intracellular cAMP. We previously reported that VAMP1, one of the SNARE proteins, is specifically expressed in parotid acinar cells and has an essential role in cAMP-regulated amylase secretion. We also found that VAMP2 makes complex with some unidentified protein(s) at secretory granules in the resting state. In the present study, we investigated whether the VAMP2-containing complex is peripherally associated with resting granules and whether it is released with activated granules. We incubated solubilized granule membranes with activated BNT-B and performed immunoblotting analysis with anti-VAMP2 antibody. As a result, VAMP2 in solubilized granule membrane was efficiently cleaved by BNT-B. This result suggests that the VAMP2-containing complex is not pre-existing SNARE complex. This study was supported in part by a Grant-in-aid for Scientific Research (No. 09771550) from the Ministry of Education, Science and Culture of Japan.

155 The Relationship between the Acid and Alkaline Phosphatase Activity and the Adherence of Candida parapsilosis to Human Buccal Epithelial Cells. L. P. SAMARANAYAKE*, P. H. F. FERNANDO* and G. J. P. ANAGODA* (Faculty of Dentistry, University of Hong Kong, Hong Kong, University of Peradeniya, Sri Lanka)

Candida parapsilosis is an emerging fungal pathogen implicated in many diseases, especially in compromised hosts. Candida parapsilosis adhesion and biofilm formation on their isolated strains and on host surfaces, which in turn depend upon the host and the yeast cell wall components and the related biochemical mechanisms. Therefore, we examined the potential pathogenic traits of 24 C. parapsilosis isolates, from buccal epithelial cells and denture surfaces. The results showed that intracellular phosphatase activity was measured with para-nitrophenyl phosphate (ONishi et al. J. Brol. Med. 1977; 24: 11943-11947). Significant inter-strain differences were seen in both the acid and alkaline phosphatase activity as well as in their adhesion to buccal epithelial cells (p < 0.001). Further, the acid phosphatase activity of the superficial isolates was significantly greater (152%) than the systemic isolates (0.035%). A highly significant positive correlation was also established between the yeast adhesion to buccal epithelial cells and both the acid (r = 0.80, p < 0.001) and alkaline (r = 0.9, p < 0.001) phosphatase activities. These results, described for the first time, imply that the alkaline and acid phosphatases of Candida species may play a substantial role in potentiating their virulence.

Supported by the CRCG of the University of Hong Kong and the RGC grants.

156 Oral infectivity of Candida species in a healthy and immunocompromised animal model. *Y. H. SAMARANAYAKE and L. P. SAMARANAYAKE (Oral Biosci. Faculty of Dentistry, University of Hong Kong, Hong Kong)

Little is known of the pathogenic potential of different Candida species in healthy and compromised animal models. Therefore, we investigated the oral colonization and infectivity of C. albicans and C. krusei in healthy and immunocompromised Sprague-Dawley rats. A total of 15 rats, were allocated into three groups and were inoculated with Candida albicans or C. krusei by the oral route (0.971915) from the CRCG of the University of Hong Kong. Each rat was inoculated with 106 yeast cells. At the end of the experiment, the rat was sacrificed and examined for presence of Candida sp. in various oral sites. Candida albicans was seeded in rats from both families. Oral candidal infection was observed in all the experimental animals. The results showed that the oral colonization and infectivity of the C. albicans group was higher than C. krusei in the healthy animal model. However, the oral colonization and infectivity of the C. krusei group was higher than C. albicans in the animal model with immunodeficiency. These results indicate that the C. krusei, though less common, is able to transform into an invasive pathogen under immunosuppression. Further, the 3D in vitro model is useful for further studies on the oral infectivity of different Candida species.

Supported by the CRCG of the University of Hong Kong (grant nos. 335/2004/005 and 335/2006/005).

S-1 Biochemical Approach to Synovial Fluid Associated with Temporomandibular Joint Disorders. Takanosuke SHIBATA* and Masao NAGAMOTO (Department of Dentistry and Oral Surgery, School of Medicine, Yamagata University,) Second Department of Oral & Maxillofacial Surgery, School of Dentistry, Shoba University, Japan)

Recent improvements in techniques for detecting trace amounts of biologic molecules in small volume of synovial fluid have lead to analysis on various inflammatory and cartilage degeneration markers in the diseases temporomandibular joint (TMJ). The first international symposium of TMJ synovial fluid markers, which was named "Biochemical Changes in Synovial Fluid Associated With Pathology of the Temporomandibular Joint" was held with general practitioners of TMJ. We have studied on three markers: matrix metalloproteinase-1 and 3, tissue inhibitor matrix metalloproteinase-1 and 3, and As inflammatory markers, and Chondroitin sulfate, Hyaluronic acid, Keratan sulfate, procollagen II. The purpose of this study is to report the current state of knowledge regarding the biochemical changes in the synovial fluid associated with TMJ disorders, to discuss their role to the joint pathology, to provide data regarding the presence of markers to assess the advance of research in this field during the last two years, and to accelerate the advance of research in this field.

S-2 Clinical Assessment for Joint Effusion of the TMJ. KOKAYASHI* (Department of Oral Radiology, Tsurumi University School of Dental Medicine, Yokohama, Japan)

The purpose of this presentation was to find out a possible correlation between the MR image of the temporomandibular joint (TMJ) suffering from joint effusion and the existing symptomatic joint pain and internal derangement. In 1992, Westesson and Brooks suggested that the joint effusion was closely associated with joint pain. However, joint effusion is considered to correlate other some factors, too. For129 TMJ's with clinical symptoms of the TMJ disorders, sagittal and coronal T2* and T2 weighting images were examined. The clinical symptoms of the subjects were evaluated by the board of the clinical research and the MRI images were correlated with disc position, disc configuration and pain. The cases were classified into three groups by the extent of anterior disc displacement. The TMJ's with anterior disc displacement showed a higher frequency of joint effusion (47%) than the normal TMJ and the TMJ's with disc normally positioned (p<0.05). Among the joints with the anterior disc displacement without reduction, the biconcave group showed a higher frequency of joint effusion (75%) than the normal TMJ and the TMJ's with disc normally positioned (p<0.05). In conclusion, the MR image evidences for joint effusion in the TMJ was associated with the presence of disc displacement, disc configuration and joint pain, it was for unspecific findings.

S-3 Analysis of proinflammatory mediators in synovial fluids of the TMJ. T. TAKAHASHI* (Division of Dentistry and Oral Surgery, Aki University School of Medicine, Aki, Japan)

Various inflammatory mediators including arachidonic acid metabolites, cytokines, glucocorticoid components, prostaglandins, and free radicals are found in SF patients with TMD. In this study, to investigate these mediators are involved in the pathology of synovitis and cartilage degeneration in the clinical spectrum, such as pain, a proinflammatory cytokine, IL-1β and a gaseous free radical, nitric oxide (NO), were analyzed using synovial tawge fluid samples (SF) and compared with clinical signs and symptoms as well as arthroscopic findings. The levels of nitrite (NO2-) and nitrate (NO3-) were measured by the luminescence assay and expressed as NO2- and NO3- respectively. The measurable levels of IL-1β were found in SF patients, not in SF from healthy asymptomatic controls. IL-1β was detected from TMDs with severe synovitis and/or cartilage degeneration. Furthermore, significantly higher levels of NO was seen in the patients with TMD. In addition, the levels of NO were higher in painful joints than in non-painful joints. The levels of NO were significantly lower in the patients with severe cartilage degeneration. There was also a positive correlation between the levels of NO and IL-1β. These findings indicate that increased levels of IL-1β and NO are involved in the pathogenesis of cartilaginous changes of the TMJ. These findings also suggest that many proinflammatory mediators seems to be involved in TMJ pathosis in a quite complex manner. The analysis of these proinflammatory mediators may shed a light into the clinical management of the TMJ disease.

S-4 Assay of catalase metabolite in synovial fluid of TMJ. Kenji KAKUDO* (Second Department of Oral and Maxillofacial Surgery, Osaka Dental University, Japan)

To clarify the mechanisms of cartilage degeneration of temporomandibular joint (TMJ), we investigated the molecular profile of hyaluronic acid (HA) and its activity of degradation enzyme, N-acetyl-D-glucosaminidase (NAG), examined in the synovial fluid (SF) collected from patients with internal derangement of TMJ (ID group) or osteoarthritis of TMJ (OA group) diagnosed by MRI and X-ray examination and normal subjects using by indirect aspiration technique. Secondly, the joint effusion was diagnosed by MRI and matrix metalloproteinase(MMPs) level were assayed by ELISA and its activities were determined by enzymography and Western blot analysis of SF samples obtained by direct aspiration technique Shibata.T. et al (1995). The molecular size of HA differed among the three groups. It was greatest for the normal group, followed by the ID group and the OA group, in that order, reflecting the degree of progression of temporomandibular disorders (TMJ). The specific activity of NAG was lowest in the normal group, was greatest in the ID group and greatest in the OA group, showing a negative correlation between NAG activity and the molecular size of HA. MMP-3 was detected in all SF samples obtained by direct aspiration technique and its level in ID group was greater than in OA group. In conclusion, the assay of catalase metabolite in SF of TMJ was useful for diagnosis of TMD.