



# Conference Programme and Abstracts

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IN PARTNERSHIP WITH

**Colgate**

tissues were homogenized and ALP activity was determined spectrophotometrically (SpectraMAX Plus, Molecular Devices, Sunnyvale, CA) and the results expressed as milliunits/ per milligram protein (mU/ mg protein). The differences between the groups analyzed statistically using Mann-Whitney U test at the 95% confidential level.

**Results:** The recorded ALP activity levels were between (1909,5 ± 245,37 and 1110 ± 296,1). ALP activity in reversible and irreversible pulpitis increased when compared to control group. The differences between reversible pulpitis and control group were statistically significant (p < 0.05).

**Conclusions:** These results suggest that ALP may have a specific role in the initial pulp response to injury.

#### 0242 (111706)

**Signalling Mineralisation in Dental Pulp Derived Cells. R.B. CARTWRIGHT<sup>1</sup>, P. COOPER<sup>1</sup>, M. EDWARDS<sup>2</sup>, C.R. PARKINSON<sup>2</sup>, and A.J. SMITH<sup>1</sup>, <sup>1</sup>University of Birmingham, United Kingdom, <sup>2</sup>GlaxoSmithKline, Weybridge, United Kingdom**

**Objectives:** Signalling of mineralisation in the mature tooth is a key event associated with both peritubular dentinogenesis and regenerative processes after injury in the dentine-pulp complex. We investigate whether solubilised dentine matrix proteins can stimulate mineralisation in dental pulp derived cells.

**Methods:** Dentine matrix proteins (DMPs) were isolated by extraction of dissected and powdered sound human dentine with 10% (w/v) EDTA, pH 7.2, containing protease inhibitors for 7 days at 4°C followed by dialysis and lyophilisation. Odontoblast-like (MDPC-23) and pulp-derived (OD-21) cell lines, kindly provided by Dr J Nor (University of Michigan), and the 3T3 fibroblast-like cell line were cultured in DMEM medium with 10% FCS for 3, 7, 11, 14 and 18 days in the presence of various mineralisation supplements including a)  $\beta$ -glycerophosphate (BGP) and ascorbic acid (AA) [basal mineralisation supplement], b) BGP + AA + DMPs (1 $\mu$ g/ml) [experimental mineralisation supplement], c) BGP + AA + dexamethasone (DEX) [control mineralisation supplement]. Viable cell numbers were assessed by trypan blue staining and mineralisation was quantified by image analysis of von Kossa stained cultures. Mineralisation was expressed as % per cell by dividing the area of mineralisation by viable cell count.

**Results:** Basal levels of mineralisation were observed in the MDPC-23 and OD-21 cells and to a much lesser extent within the 3T3 cell line in the cultures with basal mineralisation supplement. A significant increase in mineralisation was seen with both the addition of DMPs and the control mineralisation supplement.

**Conclusion:** This work demonstrates that solubilised dentin matrix proteins can stimulate mineralization in dental pulp derived cells.

#### 0243 (111258)

**Effect of perinatal exposure to bisphenol-A on pubertal rats. A. POIMENOVA, C. RAHIOTIS, and E. KITRAKI, University of Athens (EKPA), Goudi, Greece**

**Objective:** To examine in juvenile rats the effect of perinatal exposure to a low dose of bisphenol A (BPA) on spatial memory and on the basal and stress-induced secretion of corticosterone in plasma.

**Methods:** Female Wistar rats were exposed to BPA (40 microg/kg provided through corn flakes) from gestational day 1 to the end of lactation. At postnatal day 42, their offspring were randomly divided into two groups per sex. The one group was sacrificed under basal conditions and the other group was tested in the Y maze task and sacrificed immediately afterwards. Trunk blood was collected for corticosterone determinations by radioimmunoassay.

**Results:** BPA-treated animals of both sexes exhibited a reduced exploration attitude during the Y maze test vs. same sex controls. BPA exposure impaired spatial memory and novel arm discrimination, as BPA-treated animals of both sexes showed no significant preference for visiting the novel arm during the Y maze test, compared to the same sex controls. Exposure to BPA significantly increased basal corticosterone levels of females vs. non-treated females (Table 1). Following Y-maze, the BPA-treated, but not the non-treated males, exhibited significantly elevated corticosterone levels. Pubertal females, irrespective of perinatal treatment, showed elevated corticosterone levels following the test. However, this increase was significantly higher in BPA-treated females, as compared to the non-treated animals.

Table 1: Corticosterone levels in control and BPA animals. Mean  $\pm$  SEM; 2-way ANOVA; \*p < 0.05.

Plasma corticosterone	Male Control	Male BPA	Female Control	Female BPA
Basal (ng/ml)	187 $\pm$ 28	151 $\pm$ 33	141 $\pm$ 29	338 $\pm$ 66*
Post Y maze test	251 $\pm$ 24	410 $\pm$ 58*	336 $\pm$ 31	449 $\pm$ 23*

**Conclusion:** Perinatal exposure of rats to a low dose of BPA can modify spatial memory and plasma corticosterone secretion at the onset of puberty in a sexually dimorphic manner.

#### 0244 (110407)

**In vitro thermal effects of root canal Nd:YAP laser irradiation. S. BAREK, R. UZAN, M.-J. JAVELOT, and J. AZÉRAD, University of Paris 7, France**

**Objectives:** The aim of this in vitro study was to determine the variation of the temperature at the external root surface arising from heat transfer after Nd:Yap laser irradiation delivered into the root canal.

**Methods:** Teeth (n=5) were placed into a 37°C thermostatic water container. Shaped (taper .04) root canal were irradiated using Nd:YAP 1.34 $\mu$ m pulsed laser (Lokki, France) at [0.9W/5Hz], [1.4W/5Hz], [1.8W/5Hz], [2W/10Hz], [3W/10Hz] and [4W/10Hz] without water cooling. One to five sequences of laser irradiation were delivered thru a 200 $\mu$ m glass fibre tip at the apical and medial third of the root canal. Temperature changes were recorded at the external surface of the root using a thermal camera (Thermacam B4, Flir, USA).

**Results:** Temperature maxima did not exceed 41°C after laser irradiation using recommended endodontics values (0.9W/5Hz, 1.4W/5Hz, 1.8W/5Hz). Whatever the power settings the temperature maxima did not exceed 41°C after a single sequence of irradiation. Whatever the power settings, the

temperature increase was higher and faster in the apical third. The return of temperature to pre-irradiation values was reached after 60 s maximum.

**Conclusions:** The observed thermal effects of Nd:YAP root canal laser irradiation exhibit low potential damage to the periradicular tissues and can be considered as a safe procedure for clinical endodontic applications when used in the recommended power/frequency range.

#### 0245 (110646)

**Root canal anatomy of third molars. J. COSIC<sup>1</sup>, N. GALIC<sup>2</sup>, V. NJEMIROVSKIJ<sup>2</sup>, and M. VODANOVIC<sup>1</sup>, <sup>1</sup>Private Dental Practice, Zagreb, Croatia, <sup>2</sup>University of Zagreb, School of Dental Medicine, Croatia**

Morphology of third molars has been described as unpredictable. However restorative, prosthodontic and orthodontic considerations often requires endodontic treatment of third molars in order for them to be retained as functional components of the dental arch.

**Objectives:** The purpose of this study was to investigate and characterize the anatomy of maxillary and mandibular third molars.

**Methods:** A total of 106 human extracted third molars (56 maxillary, 50 mandibular) were included in this in vitro study. With the aid of a carbundum disc in a straight headpiece, each specimen was prepared according to the standard techniques. The anatomy of the root canal system was then recorded. The following observations were made: number of roots, number of canals per root, root-canal configuration, frequency of root canal configuration, number of lateral canals, the average length of the root-canals.

**Results:** Most of the maxillary third molars (83.9%) had three roots, 8.9% had one root, 5.4% had two roots, and 1.8% had four roots. 56% of mandibular molars had one root, and 44% had two roots. 75% of the maxillary third molars had 3 canals, 10.7% had 4 canals, 7.1% had one canal, and 7.1% had two canals. 90% of the mandibular molars had 3 canals, and 4% had 1 canal. The frequency of deviation of the maxillary root-canals was 76.8%, and of the mandibular root-canals was 84%. 12% of the maxillary and two percent of the mandibular third molars contained lateral canals. The average length of the maxillary third molars was approximately 17.98, and of the mandibular third molars was approximately 18.9 mm.

**Conclusion:** Third molars show great anatomic variability. Maxillary third molars may have one to four roots, while mandibular may have one or two roots. Maxillary third molars may have up to 4 root canals, while mandibular have up to 3 canals.

#### 0246 (111396)

**Endogenous Carbon Monoxide Participates in Basal Perfusion Maintenance of Gingiva. B. KEREMI<sup>1</sup>, P. KOMORA<sup>1</sup>, D. ABRAHAM<sup>1</sup>, B. BEKE<sup>1</sup>, S. DUHAJ<sup>1</sup>, A. SZEKELY<sup>1</sup>, A. FAZEKAS<sup>1</sup>, G. VARGA<sup>2</sup>, and Z. LOHINALI<sup>1</sup>, <sup>1</sup>Semmelweis University of Medicine, Budapest, Hungary, <sup>2</sup>Semmelweis University, Budapest, Hungary, Hungary, <sup>3</sup>Semmelweis University, Budapest, Hungary**

Carbon monoxide (CO) is commonly recognized as an environmental toxin that arises from an incomplete combustion of fossil fuels. However, it is also generated endogenously in the body from heme via heme oxygenase (HO) isoenzymes (inducible HO-1 also termed as heat shock protein-32 or constitutive HO-2) and involved in both physiological and pathological processes as a gaseous mediator.

**Objectives:** The aim of our study was to investigate the effect of CO produced by HO on the gingival resting microcirculation.

**Methods:** The gingival blood flow was measured by laser Doppler fluxmetry in the upper central papilla before (bsl) and after the application of an HO inhibitor (zinc deuteroporphylin 2,4-bis glycolate, ip. 45 micromol/kg) for 45 min in anaesthetized rats. The same study was repeated after the blockade of nitric oxide (NO) synthase activity (1mg/ml L-NAME in tap water ad libitum for 1 week). At the end of the experiments the HO isoenzymes were localized by immunohistochemistry in the gingival vessels.

**Results:** HO inhibition significantly decreased gingival blood flow (GBF, bsl vs. 45. min: 570 $\pm$ 94 vs. 326 $\pm$ 85 BPU, p<0.05) and increased gingival vascular resistance (GVR, bsl vs. 45. min: 0.23 $\pm$ 0.04 vs. 0.39 $\pm$ 0.06 mmHg/BPU, p<0.05) without altering the mean arterial blood pressure (MBP). NO deficiency significantly increased the start-up MBP (control vs. L-NAME pretreatment: 108 $\pm$ 3 vs. 145 $\pm$ 4 mmHg, p<0.05) and GVR (control vs. L-NAME pretreatment: 0.23 $\pm$ 0.04 vs. 0.35 $\pm$ 0.04 mmHg/BPU, p<0.05) and prevented the vasoconstrictor effect of HO blockade in the gingiva. There was a weak HO-1 immunostaining within the vascular wall and the perivascular nerves elicited HO-2 reactivity.

**Conclusions:** Our data indicate that endogenous CO is involved in the adequate maintenance of basal gingival perfusion. The vasodilatory effects of endogenous CO are NO dependent. Supports: OTKA T042584 and T049708.

#### 0247 (110796)

**Folic acid and the cleft palate of Tgf- $\beta$ 3 null mice. A. DEL RÍO<sup>1</sup>, M.C. BARRIO<sup>1</sup>, J. MURILLO<sup>1</sup>, E. MALDONADO<sup>1</sup>, Y. LÓPEZ<sup>1</sup>, J. PÉREZ-MIGUELSANZ<sup>1</sup>, C. MAESTRO<sup>1</sup>, E. MARTÍNEZ-SANZ<sup>1</sup>, C. MARTÍN<sup>2</sup>, and C. MARTÍNEZ-ÁLVAREZ<sup>1</sup>, <sup>1</sup>UNIVERSIDAD COMPLUTENSE DE MADRID, Madrid, Spain, <sup>2</sup>Faculty of Odontology, Universidad Complutense de Madrid, Spain**

Tgf- $\beta$ 3 null mutant mice (Tgf- $\beta$ 3<sup>-/-</sup>) have cleft palate (CP). This CP is mainly due to lack of bilateral medial edge epithelia (MEE) adhesion and disappearance, although a decrease of palatal mesenchymal cell proliferation may also cooperate. A low intake of dietary Folic Acid (FA) has been correlated with CP appearance, whilst supplements of FA have been seen to reduce the risk of this congenital malformation. Objective: Our aim has been to determine whether a supplement of FA added either to Tgf- $\beta$ 3<sup>+/-</sup> dams or Tgf- $\beta$ 3<sup>-/-</sup> palatal shelf cultures benefits the CP presented by the Tgf- $\beta$ 3<sup>-/-</sup> mice.

**Methods:** The diet of Tgf- $\beta$ 3<sup>+/-</sup> females was 2 mg FA/kg diet (control) or supplemented with 40 mg FA/kg diet (20 fold the standard levels) for 2 to 16 weeks. Pregnant females were sacrificed at