

Academy of Dental Materials Meeting

Annual meeting

The Drake Hotel, Chicago, IL, USA



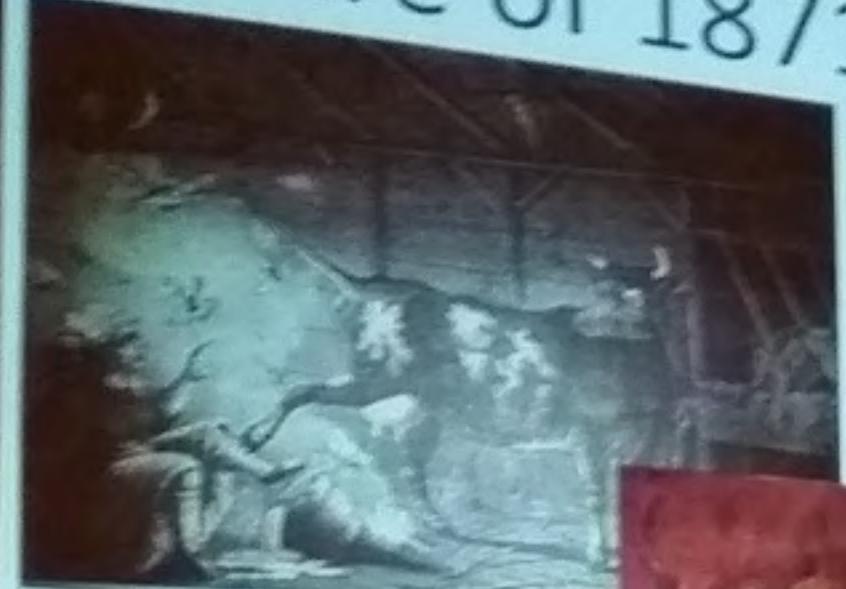
ADM 2016 OCT
12-15

ACADEMY OF DENTAL MATERIALS

Annual Meeting



Fire of 1871



CHICAGO

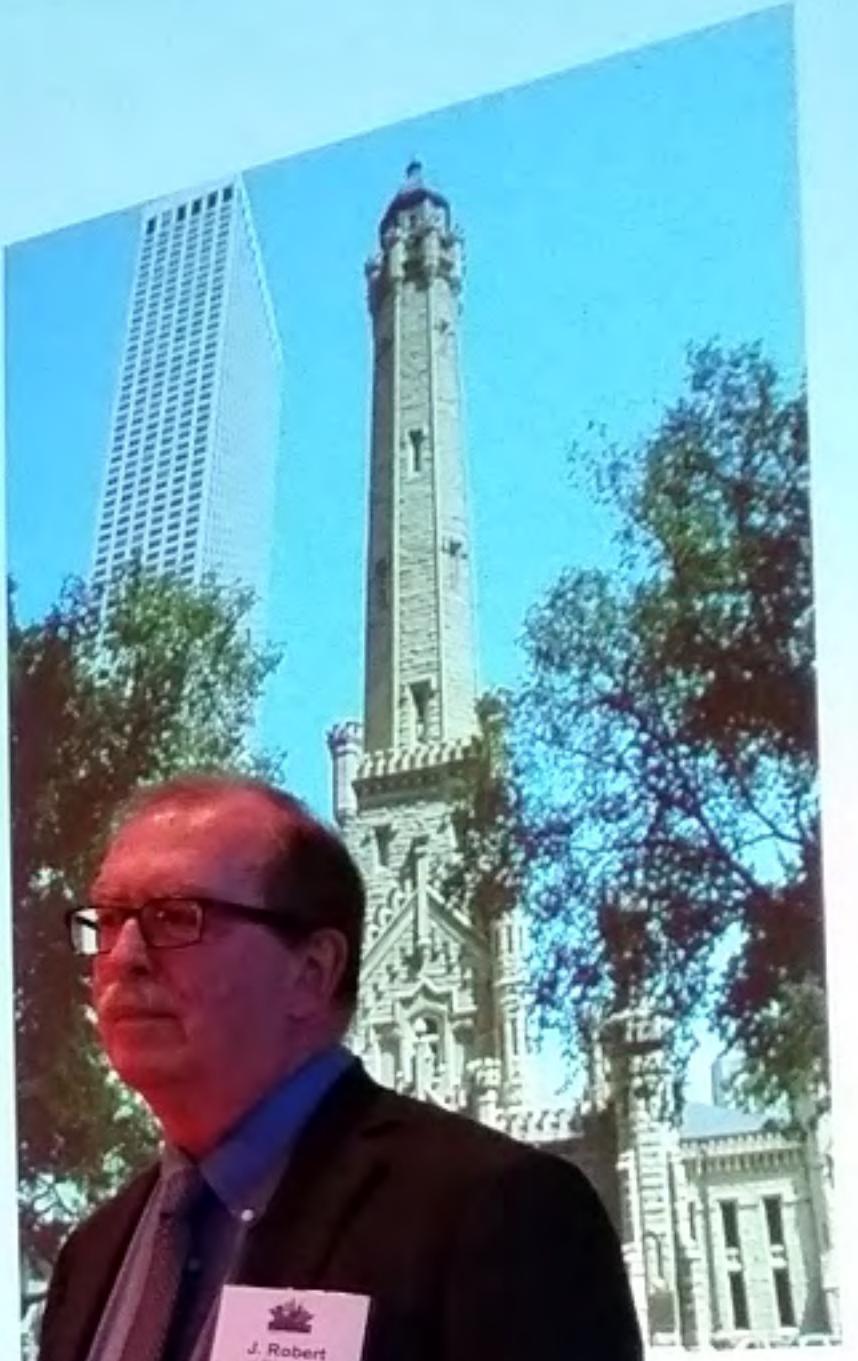


A Proud Story of Rebuilding

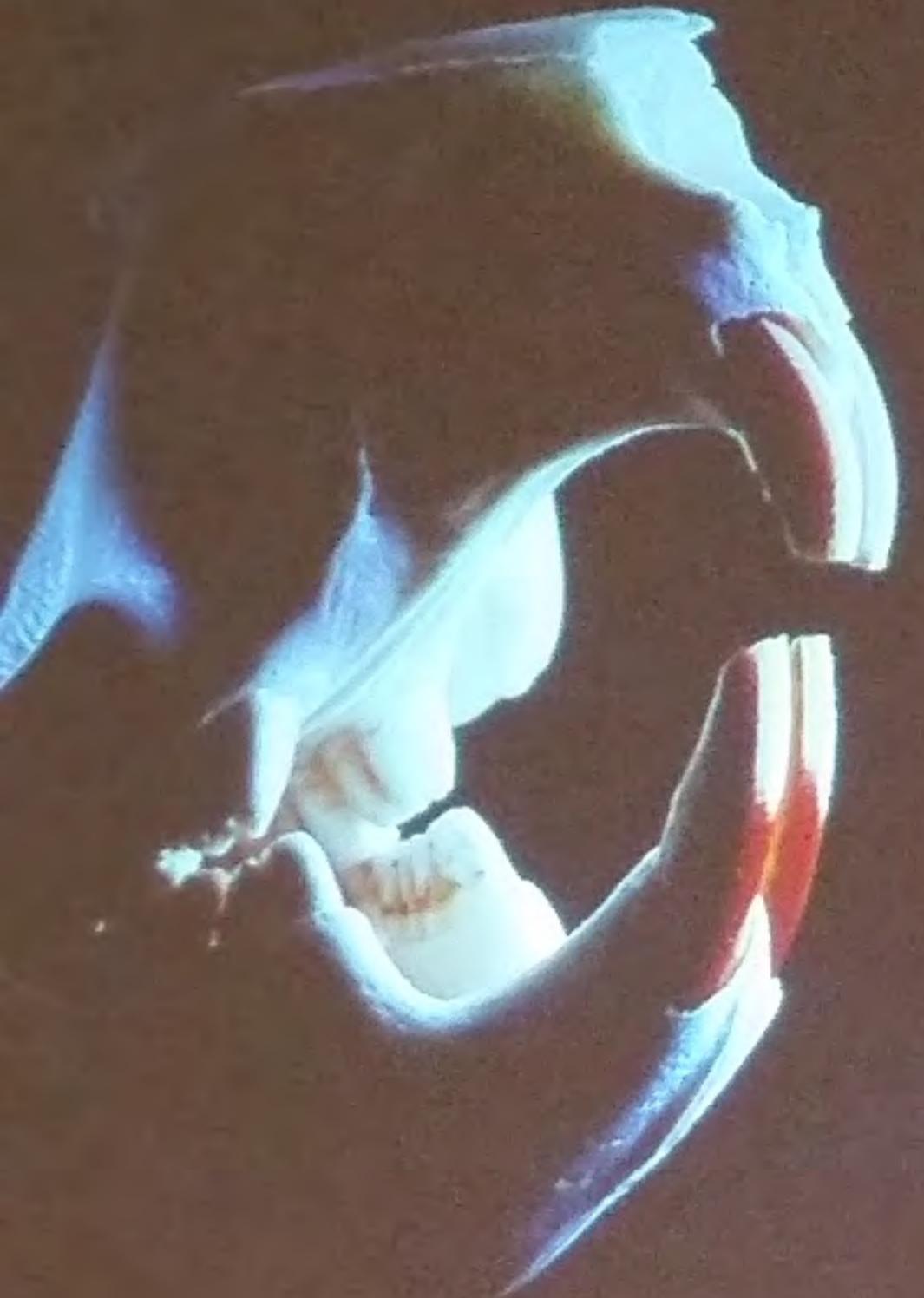


CHICAGO

Fire of



of Rebu



Interfaces and Interphases in Tooth Biominerals

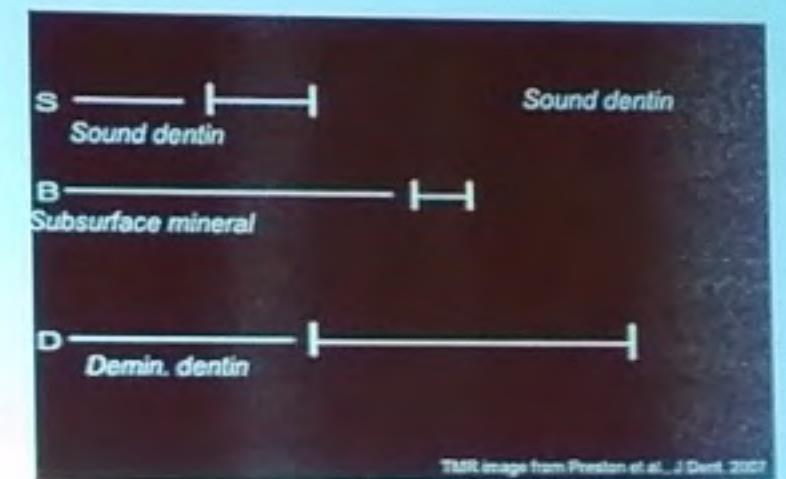
Derk Joester

Materials Science and Engineering
Northwestern University

Chicago Academy of Dental Materials
Oct 13, 2016



Dentin: A Close-up and Fresh Look



PDL-Entheses: Regenerating Zones in the Context of Function

Sunita P. Ho, Ph.D.

Division of Biomaterials and Bioengineering, Department
of Preventive and Restorative Dental Sciences, School of
Dentistry, UCSF, San Francisco, CA

Students: Arvin Pal, 2nd yr DDS; Kurylo M, DDS;
Hurng J, DDS; Jang A DDS, PhD; Jeremy L, DDS, PhD

Scholars: Ling Chen, PhD; Misun Kang, PhD; Feifei Yang, PhD





M 2016 OCT
15

Y OF DENTAL MAT

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Biocompatibility of Biomaterials

- Why care?
 - Systemic effects



Hg - BPA



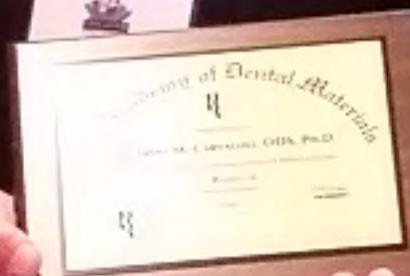


ADM 2016 OCT
12-15

ACADEMY OF DENTAL MATERIALS

Annual Meeting

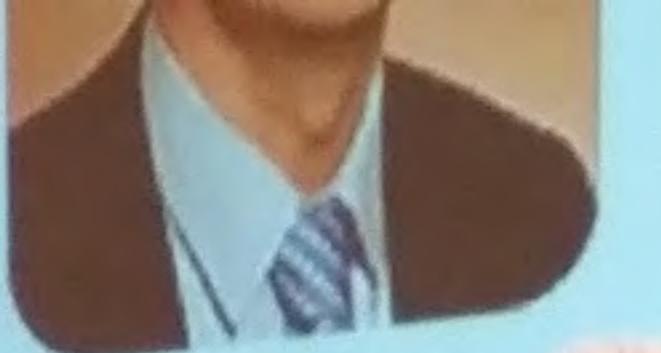




Sharukh Khajuria – ADM Fellow 2016



Nominees:
Mutlu Ozcan and Alvaro Dena

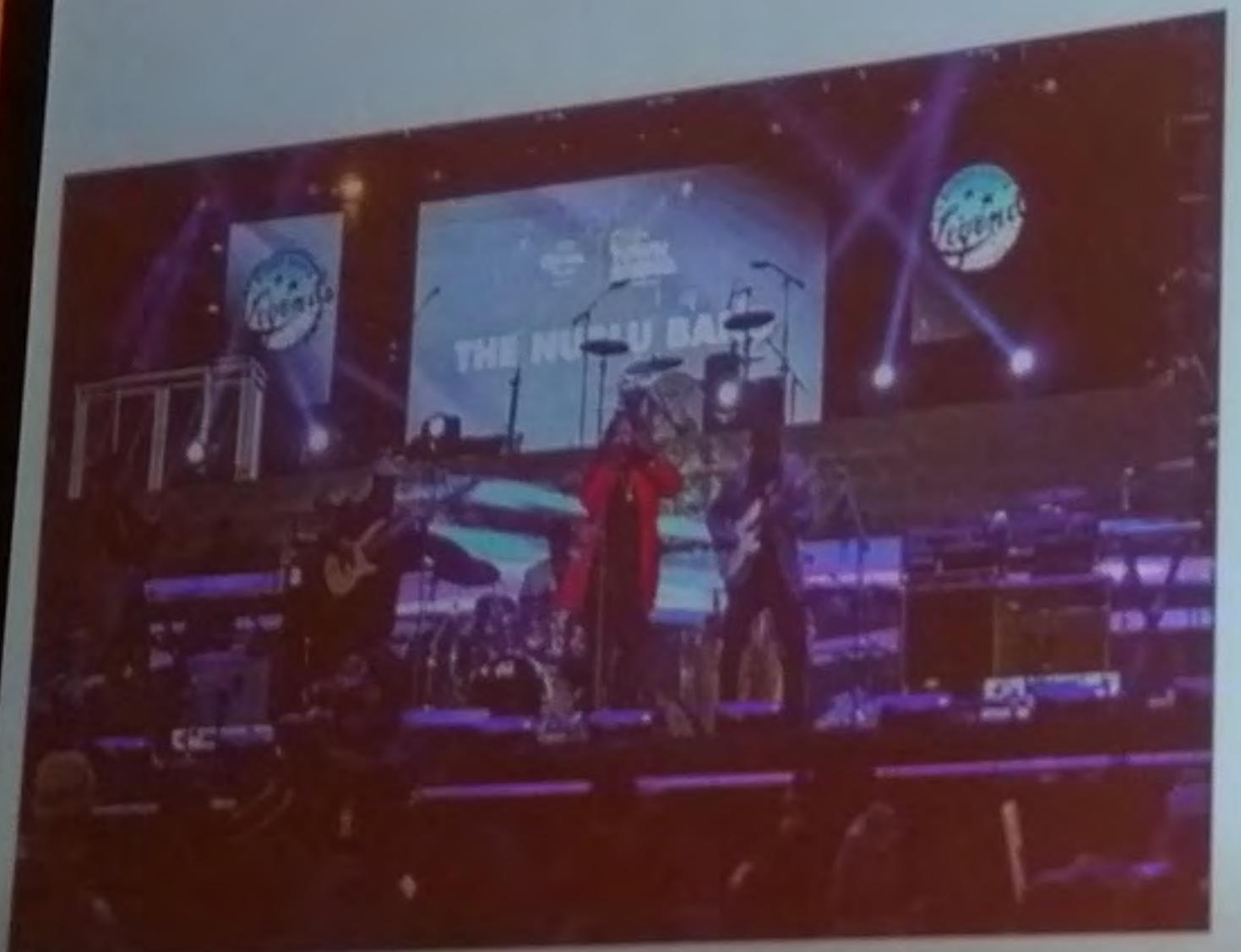


Pekka Mäkinen - ADP Fellow 2015



"A Taste of Chicago" Gala Dinner
Date: Friday, October 14th, 2016;
Time: 7-10pm

TICKETS FOR SALE UNTIL THURSDAY



THE
NUBLU
BAND

A woman in a red and black plaid jacket stands next to the man at the podium, looking towards the audience.

A man in a dark suit and glasses stands behind a clear acrylic podium, speaking into a microphone. He is gesturing with his hands as he speaks.

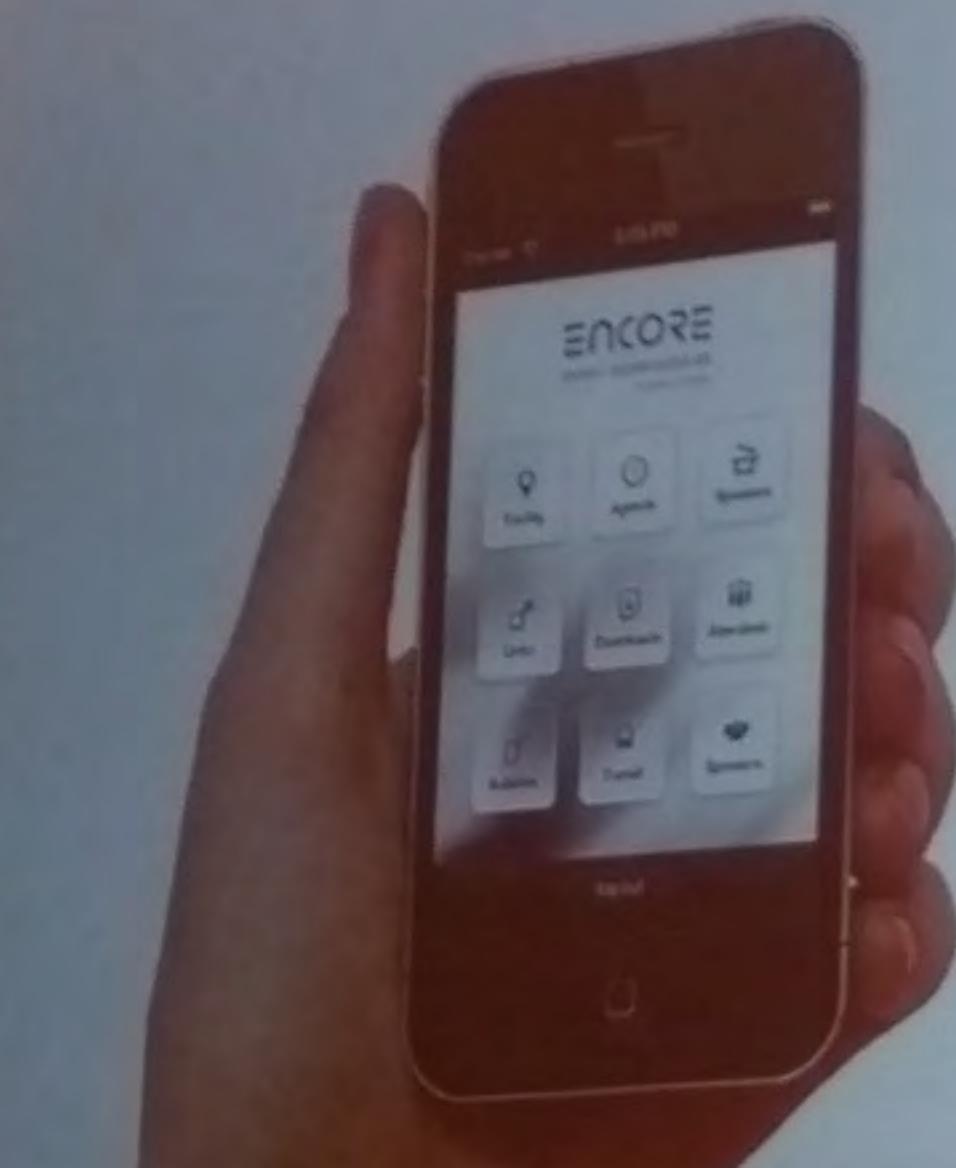
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Event ID: 13867

Encore Event Technologies provides solutions for all aspects of event planning and production, including audiovisual, stage management, and high-speed Internet needs, and handles various types of events around the world.



A woman in a red and black plaid shirt stands next to a podium, smiling. She has a name tag pinned to her shirt that reads "Ana Karina".

A man in a dark suit and glasses stands behind a clear acrylic podium, speaking into a microphone. He is gesturing with his hands as he speaks.

rs

ion – Mastication





ACADEMY OF DENTAL MATERIALS

2016 Annual Meeting Chicago

Paffenbarger Award

Third place winner

RANJANI GALI

"Mica glass ceramic composite with yttria stabilized zirconia for dental restorations."

CHICAGO, October 15,

This certificate



is presented to
Ranjani Gali
for her paper titled
"Mica glass ceramic composite with yttria stabilized zirconia for dental restorations."





ACADEMY OF DENTAL MATERIALS
2016 Annual Meeting Chicago

Paffenbarger Award

Second place winner

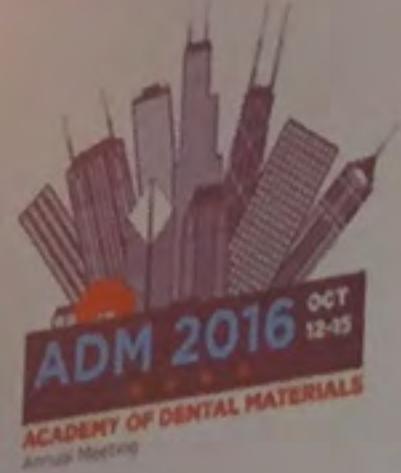
ANALYSE ARATA

"Y-TZP Low temperature degradation: a sigmoidal or a linear behavior?"

Presented at the 2016 Annual Meeting in CHICAGO, October 15, 2016.

This certificate





ACADEMY OF DENTAL MATERIALS 2016 Annual Meeting Chicago

Paffenbarger Award

First place winner

SLOBODAN SIROVICA

"Microspacial variability of monomer conversion in filled dental resin-based composites."

Presented in CHICAGO on October 15, 2016

This certificate entitles the winner of the \$500 and \$500 cash prizes at the 2013 DDM meeting

A photograph showing a group of people in formal attire, including a man in a suit and tie, standing together at an event.



ADM Executive Committee



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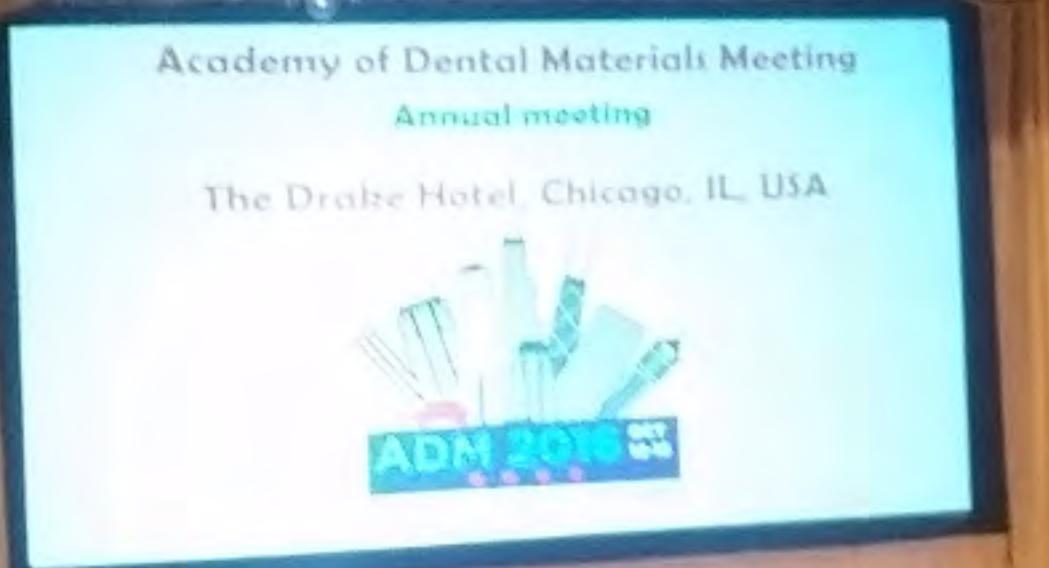
Slate of candidates











ADM 2018

ADM 2018



Academy of Dental Material Meeting
ADM 2016

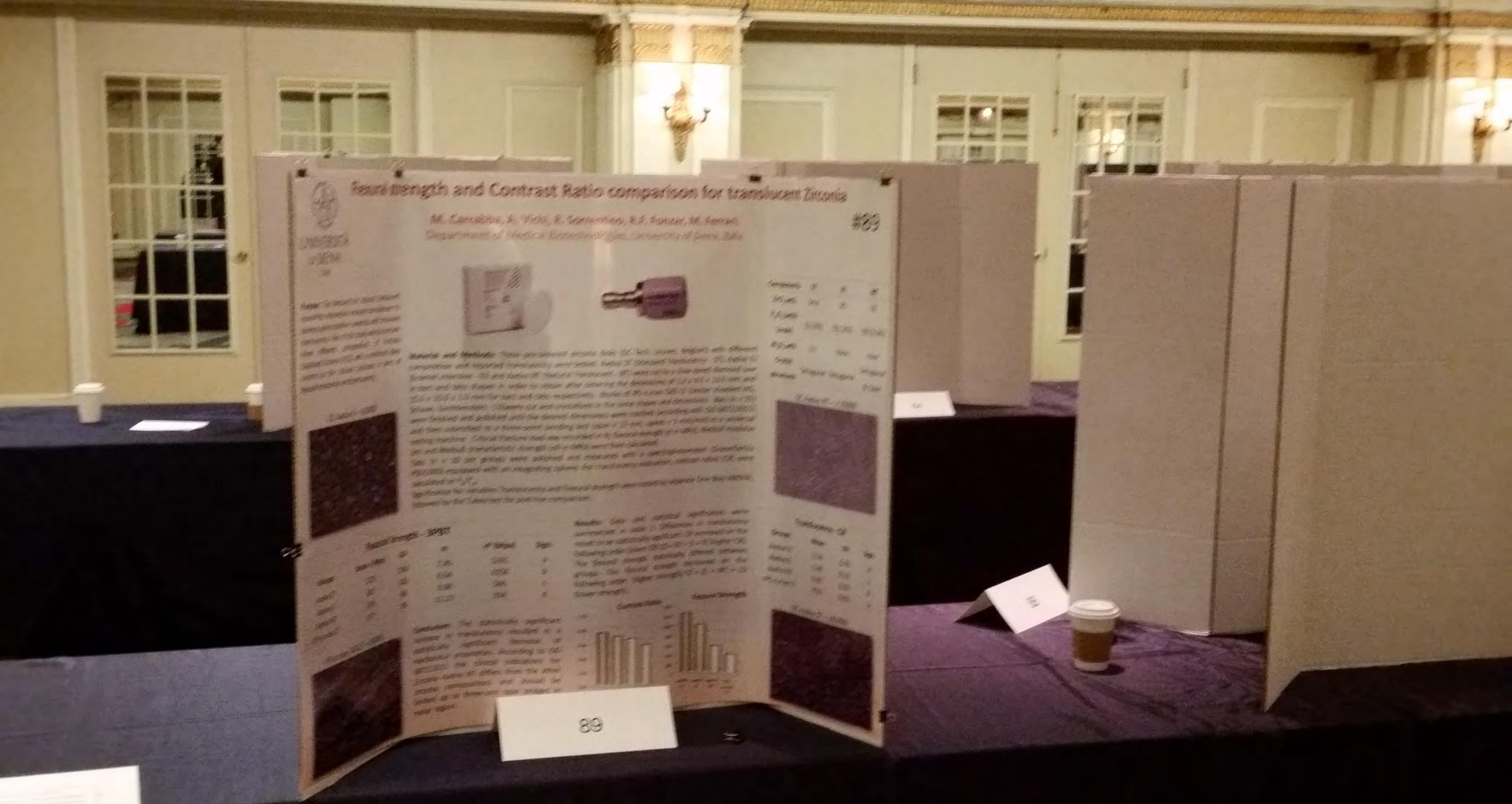
ADM 2016



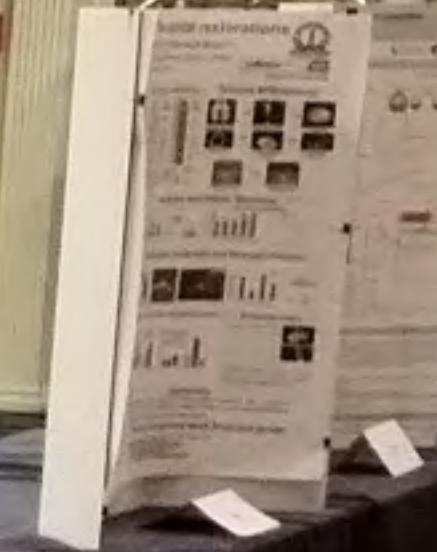
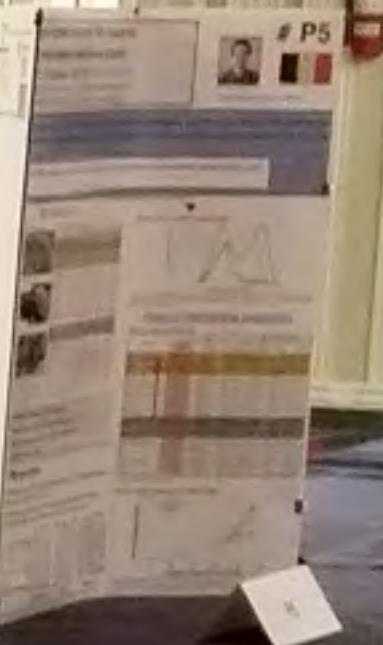
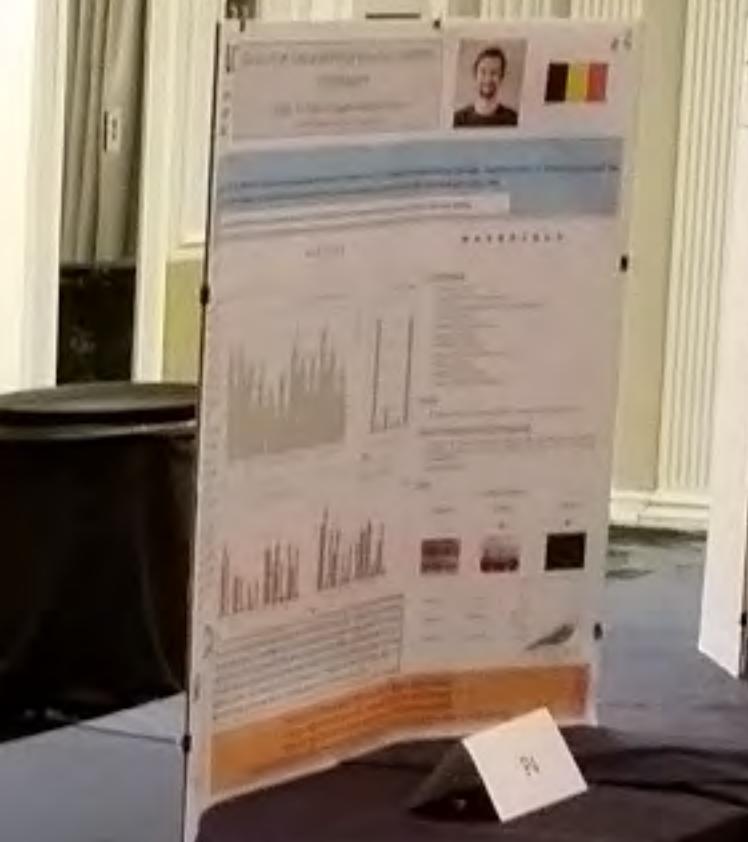
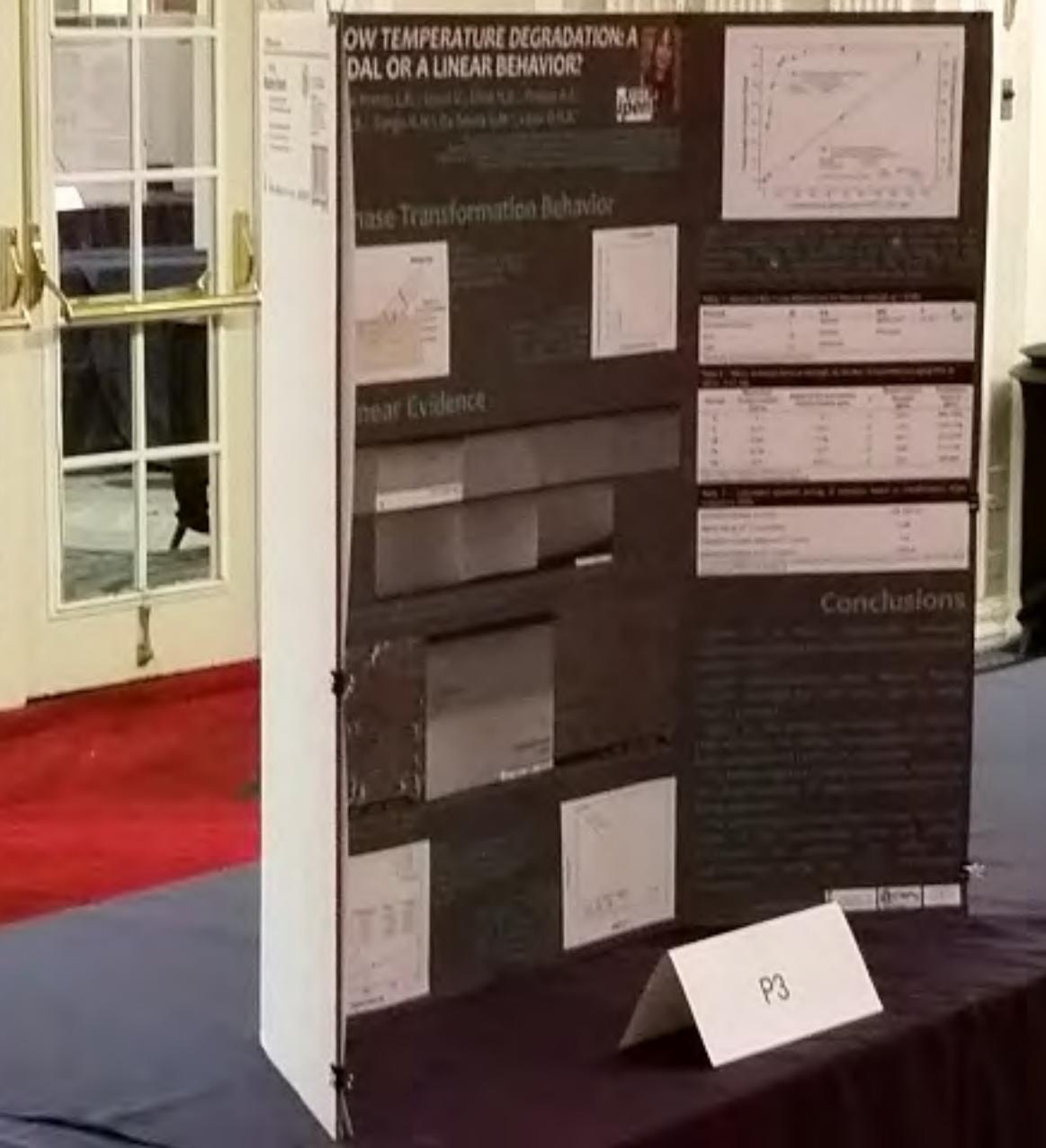
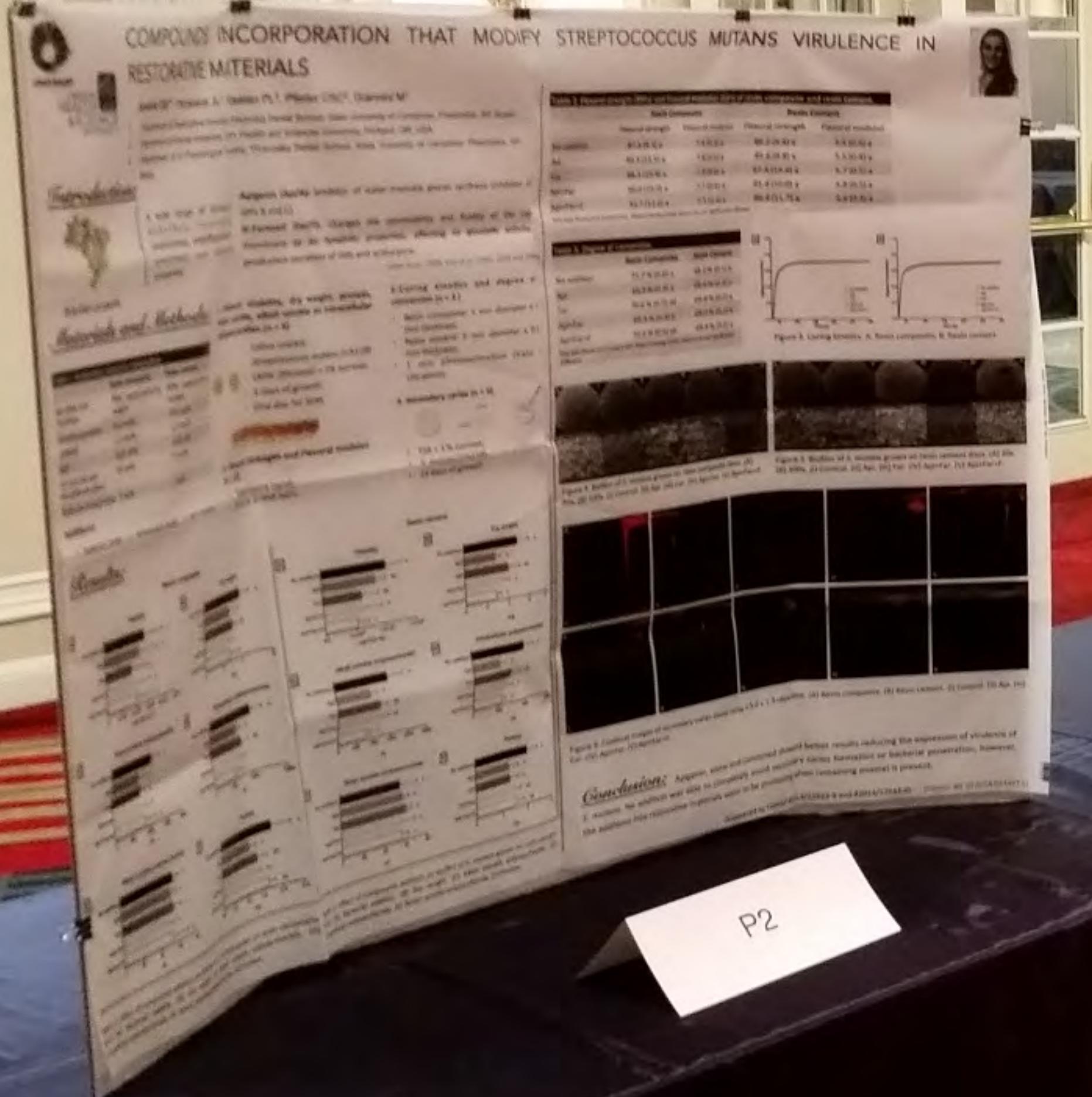
















Repaired anterior composite restorations: up to 15 years clinical survival

R. V. Elias¹, M. S. Cianci¹, E. H. van de Sande², R. R. Marques¹

¹Postgraduate in Dentistry, Federal University of Paraná, Brazil - School of Dentistry, ²MDA Department, Hospital das Clínicas, São Paulo, Brazil

Purpose

This retrospective clinical study investigated the influence of repair on the survival of composite restorations in anterior teeth with follow-up times up to 15 years.

Methods

The database was extracted from records of patients regularly attending a private dental office in Southern Brazil. The study was approved by the local Ethics Committee protocol 022/2008.

- Participants:** Patients having anterior composite restorations with minimum 4 years follow-up time, antagonist teeth, and regular appointments to the same dentist between 1994 and 2009.
- Repair procedures:** Restorations and repairs were carried out by the same operator using rubber dam. Repair was restricted to the defective portion of tooth or composite. The repaired surface was treated with alumina air abrasion.
- Sample:** In total, 626 anterior restorations using hybrid, microhybrid, or microfill composites were included.
- Classification:** Restorations were classified as (1) sound w/o intervention, (2) repaired and sound, (3) repaired then replaced, or (4) replaced restorations that were never repaired.
- Outcomes:** The primary outcome of the study was survival of the restorations, considering main other restoration success or failure.
- Data analysis:** Fisher's exact test was used to analyse the differences in failures within each category. Cox-25 Kaplan-Meier method was used to generate survival curves. A multivariate Cox regression analysis investigated the influence of variables (gender, tooth type and position, cavity type, material on restorative quality) ($p < 0.05$ for significance).

Results

In total, 198 repairs were performed: 55 Class III and IV, 143 veneer restorations.

Distribution of restorations (N=626)	N	%
Patient gender		
Female	476	75.8
Male	152	24.2
Teeth		
Central incisor	263	41.9
Lateral incisor	214	24.1
Canine	151	24.0
Dental arch		
Upper	498	79.3
Lower	130	20.7
Composite type		
Microhybrid	231	36.8
Microfill	321	51.1
Hybrid	76	12.1
Restoration type		
Veneer	399	63.5
Class III	163	26.0
Class IV	66	10.5

Results for the Adjusted Cox regression analysis (log-hazard ratio)

Repair as failure - Class III/IV	N	95% confidence interval	P-value
Dental arch			
Upper	.344	.147	.807
Lower			.014
Repair as failure - Class III/IV			
Tooth			
Central incisor	.567	.301	.853
Lateral incisor			.009
Canine	.527	.322	.863
Dental arch			.011
Upper	.554	.321	.956
Lower			.034
Repair as failure - veneers			
Tooth			
Central incisor	1.034	.721	1.484
Lateral incisor			.855
Canine	.478	.263	.866
Dental arch			.015
Upper	.560	.324	.969
Lower			.038
Composite			
Microhybrid	.468	.304	.720
Microfill			.001
Repair as failure - veneers			
Tooth			
Central incisor	.647	.486	.863
Lateral incisor			.003
Canine	.410	.270	.620
Dental arch			<.001
Upper	.423	.280	.437
Lower			<.001

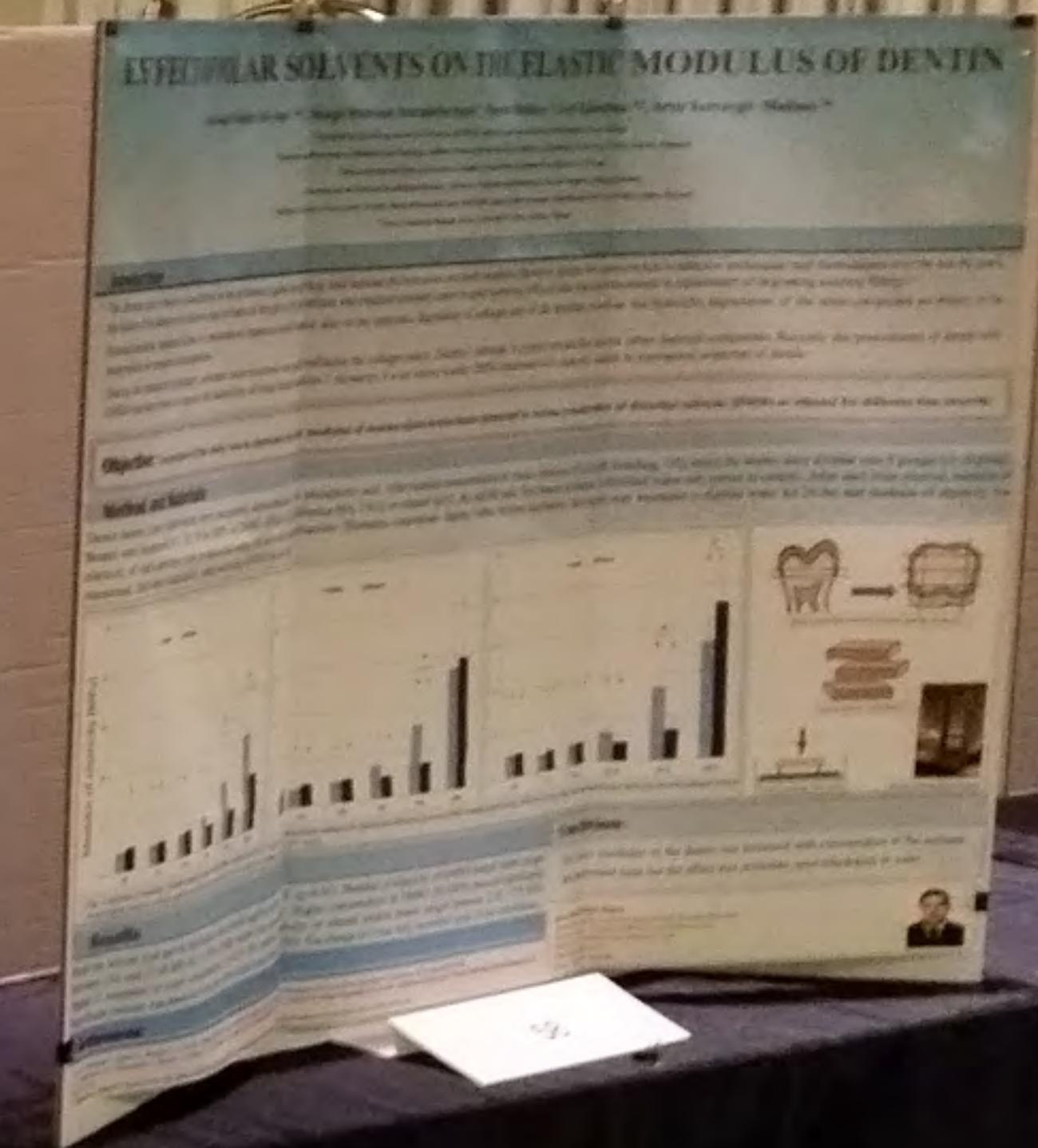
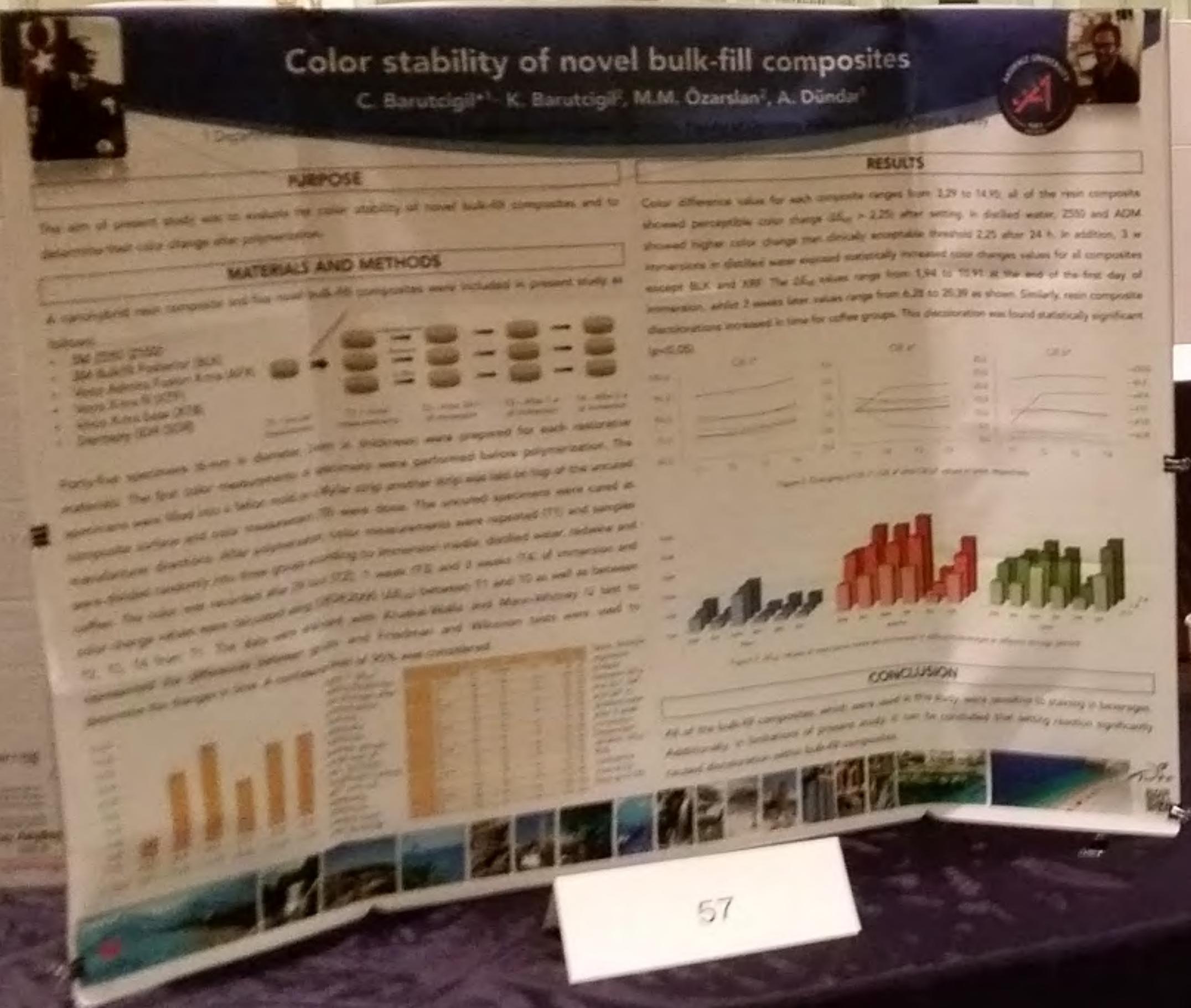
Overall findings:

- 65.4% Class III/IV restorations remained sound during follow up.
- 63.8% veneers remained sound during follow up.
- Repair as success: survival rates increased between ~10% (Class III and IV) and ~20% (veneers).
- Higher survival rates for mandibular restorations.
- Lower survival rates for restorations in central incisors compared with canines.
- Composite type influenced survival only when the repair was considered success (microhybrids with lower survival than microfills).

Kaplan-Meier survival curves (% cumulative survival vs. years) for veneer restorations as a function of composite type, dental arch, and tooth type. In these curves, repair was considered success.

Conclusion

Repair in anterior composite restorations may significantly increase the survival rates of restorations. Composite repair seems to be a viable alternative for treating failures in anterior restorations.







Influence of Er:YAG Laser Cavity Preparation on Micromorphology and Adhesion

L. T. Trevelin*, B. Togoro, C.S. Azevedo, P.F. Cesar, P. Freitas , A. B. Matos

Department of Operative Dentistry – School of Dentistry - University of São Paulo, Brazil

Department of Biomaterials and Oral Biology Department – School of Dentistry - University of São Paulo, Brazil



liva.trevelin@usp.br

INTRODUCTION

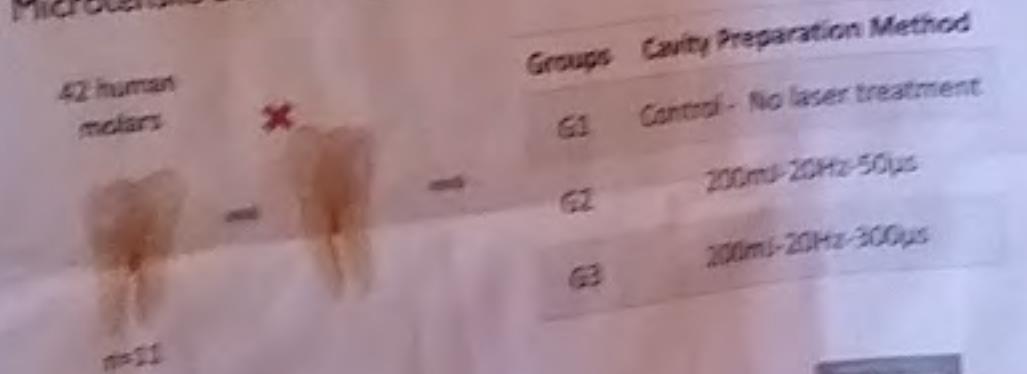
Er:YAG laser with variable pulse duration can prepare cavities by means of cold ablation. Analyzing the micromorphological features of irradiated dentin tissue is key to predict bond strength to composites.

OBJECTIVE

This study evaluated the influence of different pulse duration on adhesive interface morphology and microtensile bond strength (μ TBS) of a composite resin, when cavity preparation is performed by Er:YAG laser.

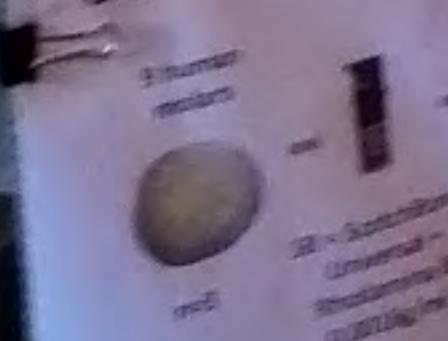
METHODOLOGY

Microtensile Bond Strength



✓ 40% of SDM6W = 20μJ/min
✓ Transistor motor = 2.8 mm
✓ Preload distance = 7mm

Confocal and Second Harmonic Generation



3 human molars
n=3
SB = Scanning
Universal

Confocal -
800nm

SGH -
380nm

RESULTS

Confocal and Second Harmonic Generation (SGH)

G1



Adhesive interface created by the one step Universal self-etching adhesive system on dentin surface. A thick and uniform hybrid layer was observed (A-C). Resin tags without funnel-shaped morphology and with poor resin infiltration were observed (asterisk). Organic matrix was intact (OM). AL=adhesive layer; HL=hybrid layer; RT=resin tag; d=dentin. Arrow= laser pulse dose.

G2



Adhesive interface created by one step Universal self-etching adhesive system on dentin surface irradiated by Er:YAG laser with 200μs/20Hz/50μs. A non-uniform hybrid layer was observed (A-B). Resin tags were observed (C) with poor resin infiltration (asterisk). Also, they did not exhibit the funnel-shaped appearance. Alteration of organic matrix below the irradiated surface (OM) was detected. AL=adhesive layer; HL=hybrid layer; RT=resin tag; d=dentin; Co= composite. Arrow= laser pulse dose.

G3



Adhesive interface created by Universal one step self-etching adhesive system on dentin surface irradiated by Er:YAG laser with 200μs/20Hz/300μs. An non-uniform hybrid layer was observed. (A-C). Resin tag without funnel-shaped morphology and with poor resin infiltration were observed (asterisk). AL=adhesive layer; HL=hybrid layer; RT=resin tag; d=dentin; Co= composite. Arrow= laser pulse dose.

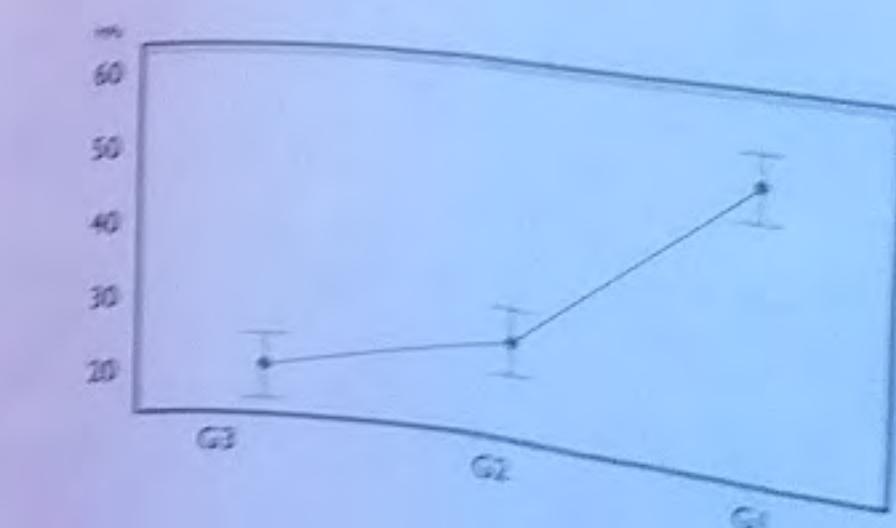
Microtensile Bond Strength μ TBS

Groups	Average MPa	Stand. Dev	CI 95%
G1	51.14a	7.16	44.22 - 55.07
G2	29.17b	7.09	25.25- 33.10
G3	23.53b	4.5	19.60-27.45

Statistical test: ANOVA and Tukey's post-hoc test ($\alpha=0.05$)

✓ G1 showed higher microtensile bond strength values ($p=0.00$) when compared to G2 and G3 (irradiated groups).

✓ No statistical difference was detected when laser groups G2 and G3 ($p>0.05$) were compared.



CONCLUSION

Even though hybrid layer and resin tags were formed in all experimental groups, organic matrix alterations were observed in both laser irradiated specimens. The strength observed in Er:YAG laser groups

SUPPORT FAPESP
15/12651-1 and 15/13671-1



Effect of Er:YAG Laser pulse width on interface micromorphology and bond strength to dentin

A. B. Matos*, L. T. Trevelin, B. Togoro, C.S. Azevedo, P.F. Cesar, P. Freitas

Department of Operative Dentistry – School of Dentistry - University of São Paulo, Brazil

Department of Biomaterials and Oral Biology Department – School of Dentistry - University of São Paulo, Brazil



bona@usp.br

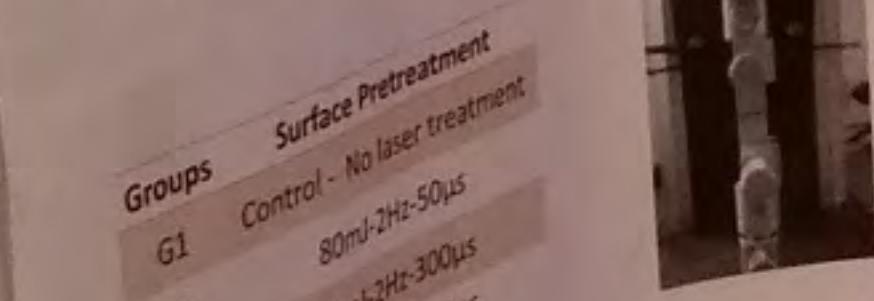
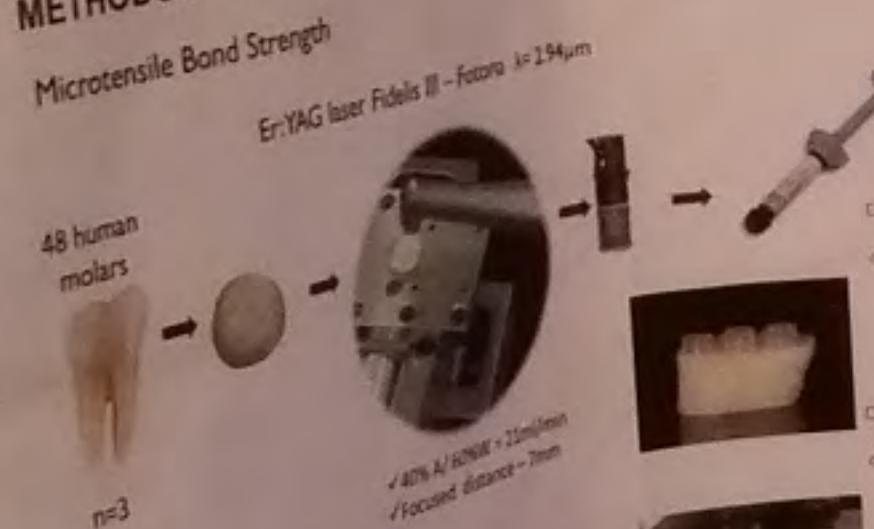
INTRODUCTION

Er:YAG laser with controlled pulse duration can interact with dentin by means of cold ablation. Analyzing the micromorphological features of irradiated dentin is key to predict bond strength to composites.

OBJECTIVE

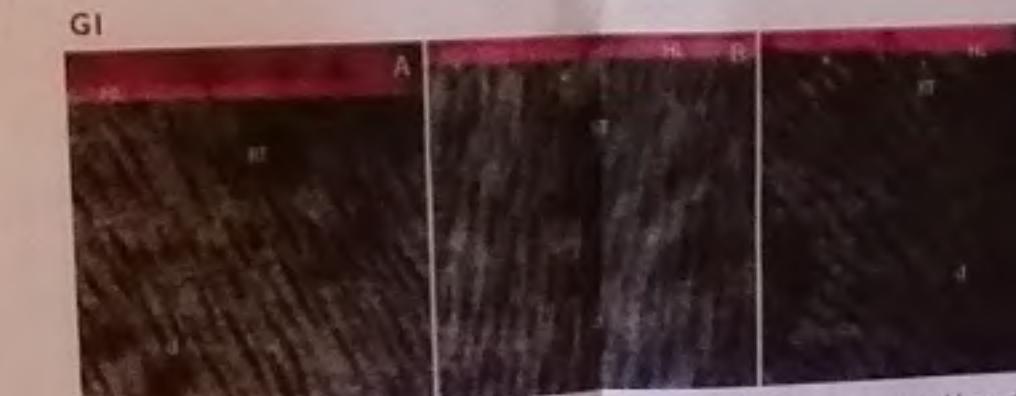
This study investigated the effect of Er:YAG laser pulse width on collagen micromorphology and on bond strength of a composite resin.

METHODOLOGY



RESULTS

Confocal and Second Harmonic Generation (SGH)



Adhesive interface created by universal one step self-etching adhesive system U on dentin surface. A thick and uniform hybrid layer was observed (A-C). Resin tags without funnel-shaped morphology and with poor resin infiltration around were observed (asterisk, C). Organic matrix was intact (OM). AL- adhesive layer; HL- hybrid layer; RT- resin tag; d- dentin.



Adhesive interface created by universal one step self-etching adhesive system on dentin surface irradiated by Er:YAG laser with 200mJ/20Hz/50μs. A non-uniform hybrid layer was observed (A-C). Long resin tags were observed in all regions with poor resin infiltration (asterisk, B-C) although they did not exhibit the funnel-shaped appearance. Alteration of organic matrix below the irradiated surface (OM). AL- adhesive layer; HL- hybrid layer; RT- resin tag; d- dentin; Co- composite; Arrow- laser pulse shape.



Adhesive interface created by universal one step self-etching adhesive system on dentin surface irradiated by Er:YAG laser with 200mJ/20Hz/300μs. A thin and non-uniform hybrid layer was observed (A-C). Scarce resin tags were seen without funnel-shaped morphology and with poor resin infiltration (asterisk, A-C). Alteration of organic matrix below the irradiated surface (OM) (B-C). AL- adhesive layer; HL- hybrid layer; RT- resin tag; d- dentin; Co- composite; Arrow- laser pulse shape.



Adhesive interface created by universal one step self-etching adhesive system on dentin observed (A-C). Resin tags without funnel-shaped were observed with poor resin infiltration (asterisk, C) into peritubular dentin. Alteration of organic matrix below the irradiated surface laser pulse shape.

Microtensile Bond Strength μSBs

Groups	Average MPa	Stand. Dev	CI 95%
G1	26,17a	3,78	24,44 - 27,89
G2	22,142b	2,86	20,41 - 23,86
G3	21,24b	3,03	19,52 - 23,86
G4	20,61b	1,85	18,89 - 22,34

Statistical test: ANOVA and Tukey's post-hoc test ($\alpha=0.05$)

✓ G1 showed higher microshear bond strength values ($p=0.00$) when compared to G2, G3 and G4 (irradiated groups).

✓ No statistical difference was detected when laser groups G2, G3 and G4 ($p>0.05$) were compared.

CONCLUSION

Er:YAG laser pretreatment decreased shear bond strength, although hybrid layer and resin tags were formed in all experimental groups. Collagen fibers disruption and organic matrix alteration were only observed in irradiated groups.

SUPPORT
15/12651-1 and 15/13571-1
FAPESP

Ammonium-Based Methacrylate into Dental Adhesive for Bonding Metal Brackets.



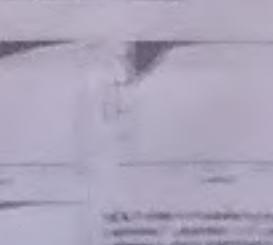
#13

Abstract

Ammonium-based methacrylate was used as a dental adhesive for bonding metal orthodontic brackets. The adhesive was applied to the bracket and dried. The bracket was then bonded to the tooth. The adhesive was found to be effective in bonding metal brackets to teeth.



→



13

Structural and Color-Phase Transformation Properties of Cellulose-Based Composites



#13

Abstract

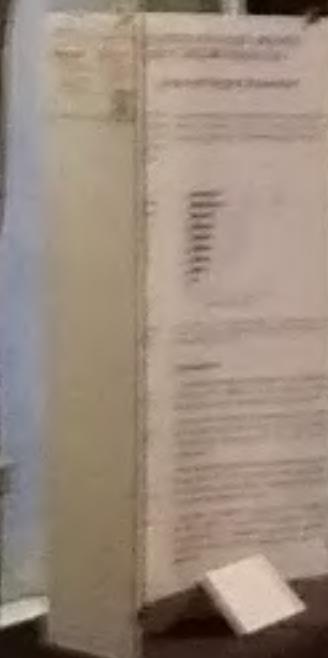
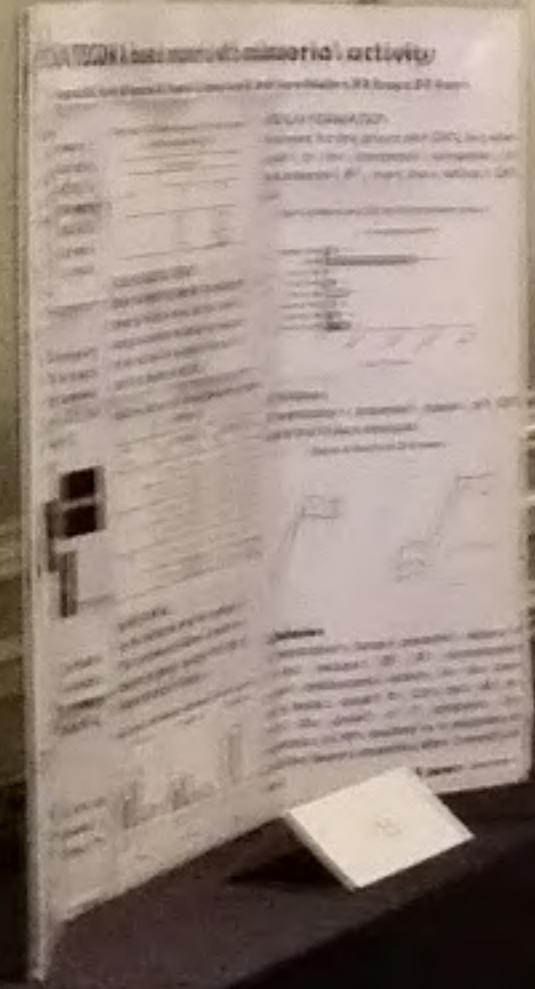
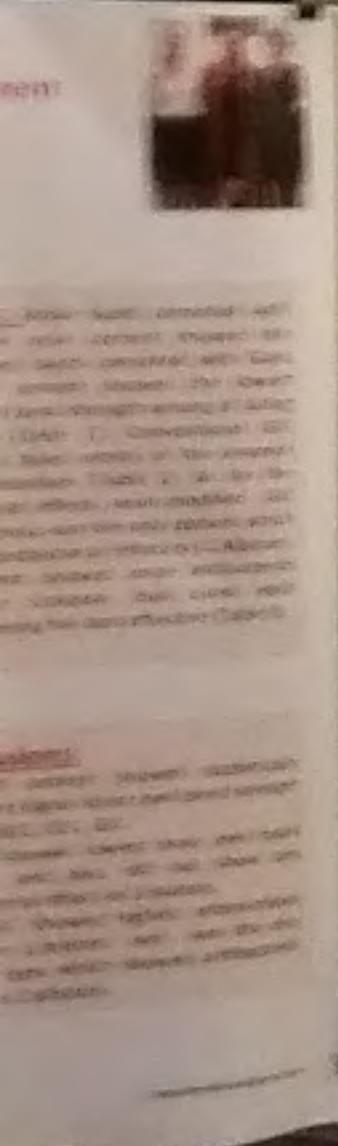
Cellulose-based composites were prepared using cellulose and various other materials. The composites were found to have good mechanical properties and good color stability.

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MECHANICAL PROPERTIES AND ION RELEASE OF POLY(METHYL METHACRYLATE) COMPOSITES CONTAINING CALCIUM PHOSPHATE



I.Mech.E.

2015

CONFERENCE

#25



MECHANICAL PROPERTIES AND ION RELEASE OF COMPOSITES CONTAINING CALCIUM PHOSPHATE

MDS CHIARI, MC RODRIGUES, Y ALANIA, LC NATALE, RR BRAGA *

Department of Biomaterials and Oral Biology, University of São Paulo, São Paulo, Brazil



mdschiari@uol.com.br

Background

The incorporation of calcium orthophosphate particles in resin-based materials has been investigated as a way to provide these materials with remineralizing capabilities. However, the development of ion-releasing restorative composites mechanically suitable for use in stress bearing areas is a challenging endeavor, due to the lack of a chemical bond between the calcium phosphate particles and the resin phase. In order to increase the chemical interaction of CaP nanoparticles and the composite matrix, dicalcium phosphate dihydrate (DCPD) nanoparticles functionalized with triethylene glycol dimethacrylate (TEGDMA) were recently synthesized (Rodrigues et al., 2014).

Objectives

The purpose of this study was to evaluate the effect of replacing glass filler particles with dicalcium phosphate dihydrate nanoparticles (DCPD), either non-functionalized or functionalized with different TEGDMA contents, on the biaxial flexure strength (BFS), elastic modulus (E) and ion release of experimental composites.

Materials and Methods

Four composites were prepared, all containing the same organic phase (1 BisGMA : 1 TEGDMA, in mols) with EDMAB and camphorquinone (0.5wt each) as photoinitiators. The total filler content was 60 vol, including 50 vol of barium glass (2 μm) and 10% of DCPD nano-particle agglomerates ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$, 15-20 μm). Of the DCPD nano-particle content (by weight) on the particles were 0% (non-functionalized, NF), 4% (F4) or 30% (F30). As controls, an experimental composite with 60 vol of granulated glass, as well as Charisma and Durafill (Heraeus Kulzer) were tested. BFS and E were evaluated using disc-shaped specimens (25x2 mm²) kept in distilled water (24 hours or 28 days at 37°C) prior to fracture in a "piston-on-three-balls" device (0.5mm/min). For ion release, specimens (5x3mm, n=5) were individually immersed in 5 ml of NaCl solution (133 mmol/L) buffered to pH 7.2 with 50 mmol/L of HEPES solution, replaced weekly. Ca^{2+} and HPO_4^{2-} release were measured after 7, 14, 21 and 28 days using spectrophotometric methods. BFS and E data were analyzed by two-way ANOVA/Tukey test (0.05 S.E.).

Results



Transmission electron microscopy (TEM) of the synthesized nanoparticles. A and B: non-functionalized particles; C: F4; and D: F30.



Scanning electron microscopy (SEM) of Charisma composite cross-section.

Table 1 - Means and standard deviations for mean biaxial flexural strength (MPa) and flexural modulus (GPa). Similar letters indicate lack of statistically significant difference. Asterisks indicate statistically significant reduction between 24 hours and 28 days of immersion: (a) DCPD particles functionalized with 4%; (b) TEGDMA; (c) DCPD particles functionalized with 30%. TEGDMA, NF: non-functionalized DCPD particles.

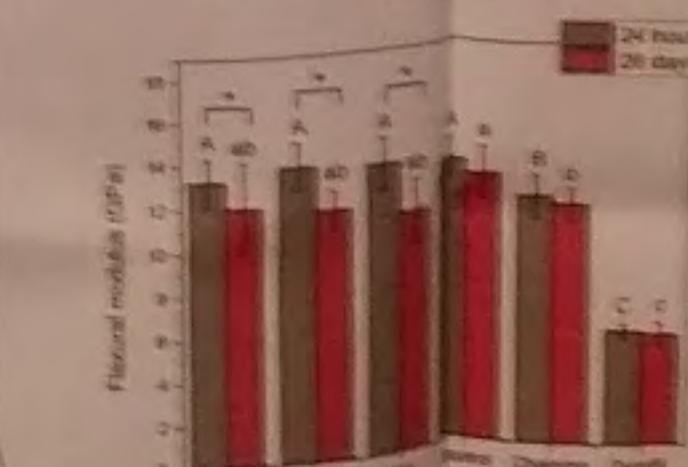


Table 2 - Ion release (mmol/L) after 24 and 28 days of immersion. Asterisks indicate reduction.

Time (days)	NF	F4	F30
7	++	++	++
14	+++	++	++
21	++++	++	++
28	+++++	++	++

Time (days)	NF	F4	F30
7	++	++	++
14	+++	++	++
21	++++	++	++
28	+++++	++	++

Conclusions

Experimental composites containing 4 wt DCPD and 30 vol of reinforcing glass presented initial flexure strength similar to that of a commercial microhybrid composite. DCPD functionalization with 30% TEGDMA had a positive effect on biaxial mechanical strength in comparison to the use of non-functionalized particles without reducing ion release. However, the presence of TEGDMA increased the degradation of the composite after 28 days of immersion, leading to significant reductions in the BFS and modulus.

Financial support:



EXIT

unesp

LIGHT EFFECTS OVER THE COLOR OF ORMOCER X METHACRYLATE COMPOSITES

C.R.G. Torres*, D.C.B. Dantas, J.F. Mathias, T.M.F. Canepepele, A.B. Borges

São Paulo State University - UNESP, São José dos Campos School of Dentistry, São José dos Campos - São Paulo, Brazil

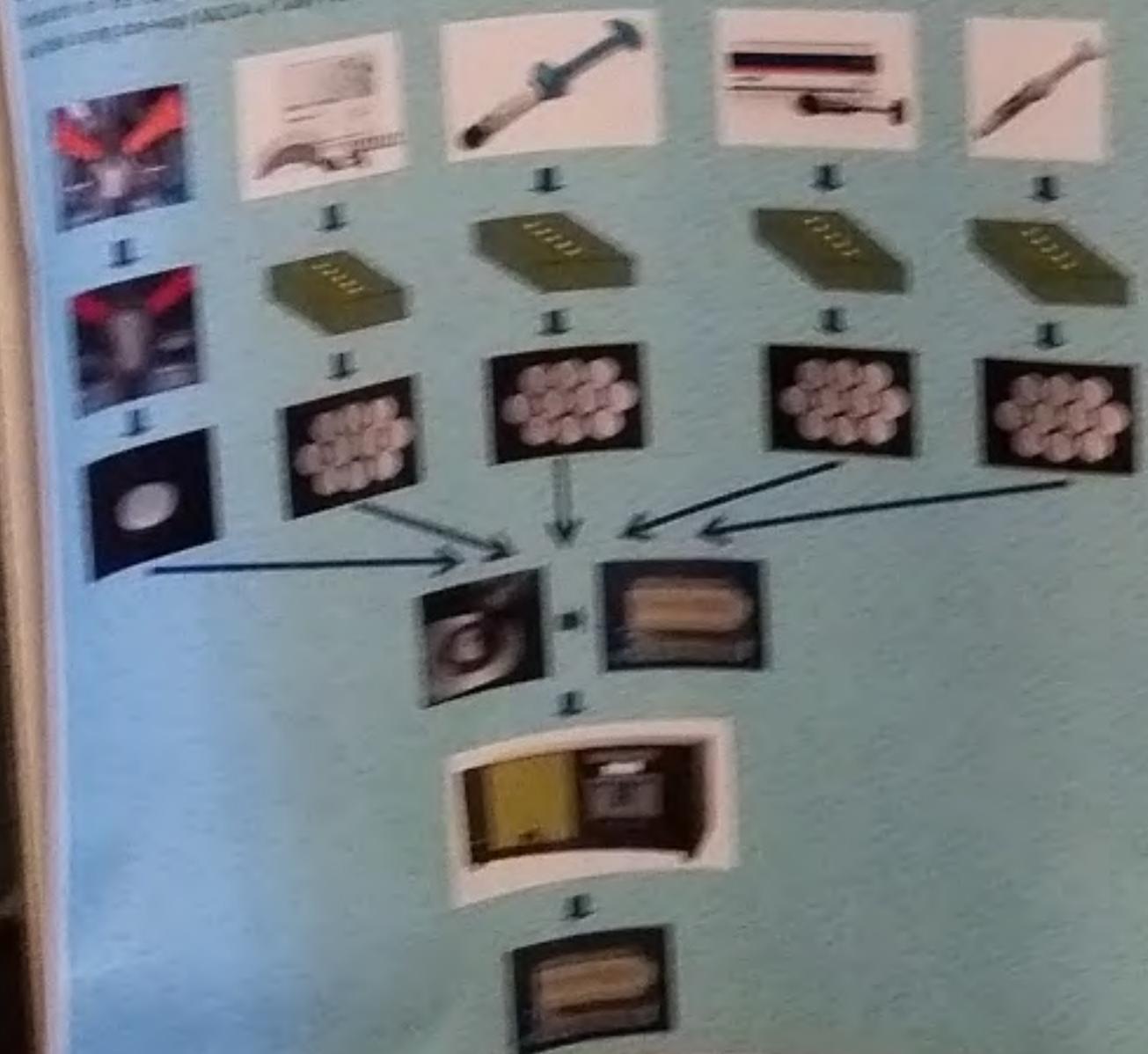


PURPOSE

The aim of this study was to evaluate the effects of light-curing aging over the color of different unidirectional composite

METHODS AND MATERIALS

For this study, five commercial composite resin systems were used: one glass ionomer composite (GIC) (Enamel Bond® - Vivadent), two ormocer (Admira Fusion® - Vivadent, Grandios® - GC America) and one unidirectional composite (Z350® - Vivadent). The samples were prepared in rectangular blocks (10 mm x 10 mm x 2 mm) and cured under laboratory conditions (20 °C) for 20 s per side during each light-curing cycle. After curing, the samples were polished with 120 grit diamond abrasive, with the samples positioned over a stainless steel background. The samples were submitted to light-curing aging at 10 °C under seven cycles (20 s/20 s/20 s/20 s/20 s/20 s/20 s) with an interval of 15 min between cycles. The temperature was set in 10 °C, with an interval of 15 °C between the samples. The samples were placed in a dark chamber (Vivadent) and illuminated by a halogen lamp (Vivadent) for 10 min.



RESULTS

ANOVA showed significant differences among the groups ($p < 0.05$). The results are presented in Table 1 and Figure 1.

Table 1— Means and standard deviation for all groups and modes of light-curing.

GROUPS	Mean	SD	Significance
ENAMEL	3.70	1.38	
ADMIRAFUSION	5.26	0.65	
IPS	5.89	1.30	
GRANDIOSO	6.21	0.82	
Z350	14.08	1.25	

GRANDEZAS DA MÉDIA E DA DESVIAÇÃO PESSOAL PARA OS DIFERENTES SISTEMAS DE COMPOSTOS.



Figure 1— Color difference (Delta E*) for all groups.

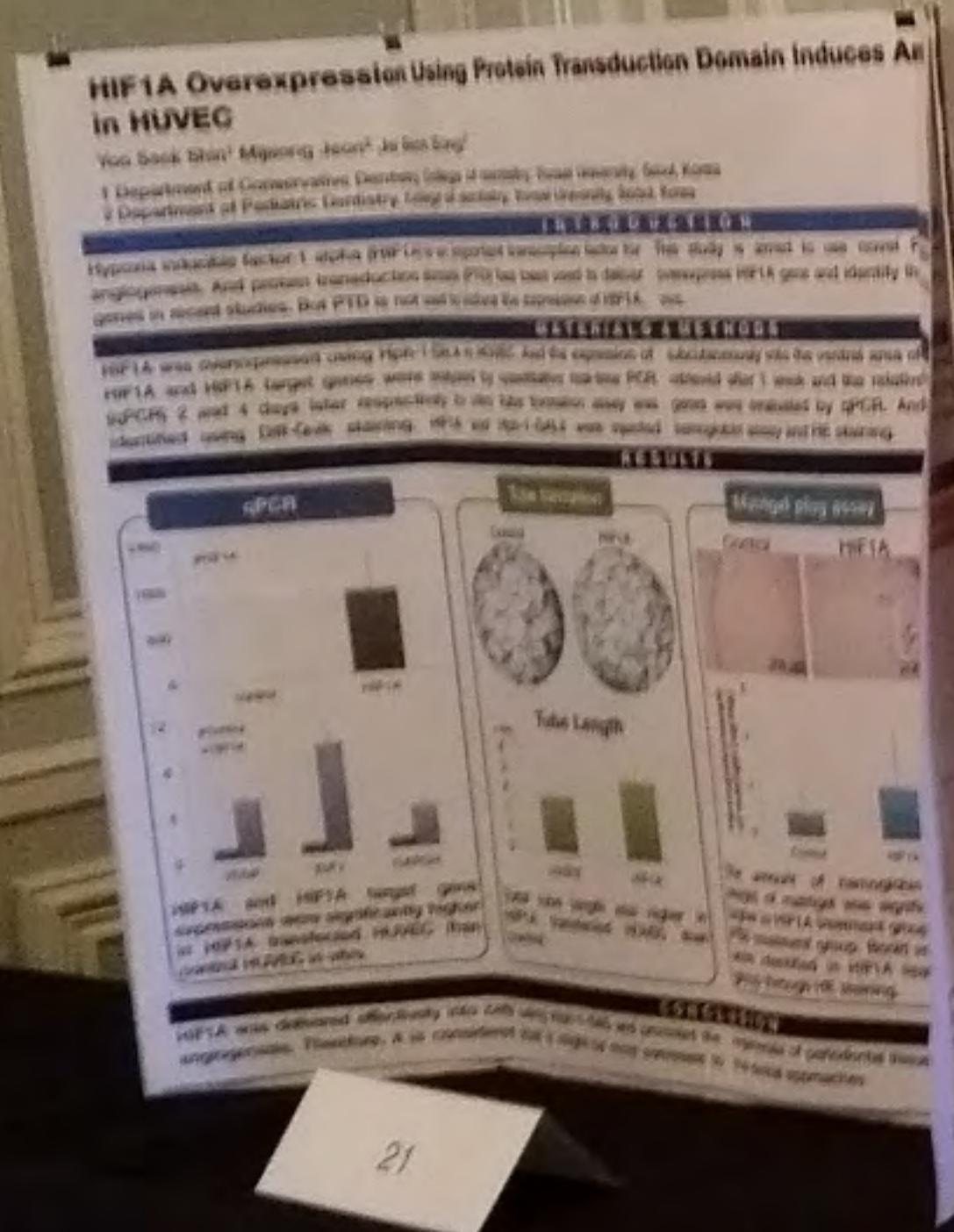
CONCLUSIONS

Anova showed significant differences among the groups ($p < 0.05$). The results are presented in Table 1 and Figure 1.

EXIT



822



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Immediate and long-term dentin-composite bond-strength: In-vivo and in-vitro conditions

César R. Pucci¹, Heleine M. C. Rego¹, Thais da Silva Alves¹, Eduardo Bresciani¹, Li-na Niu² Franklin R. Tay³

¹ - ICT UNESP, Univ. Estadual Paulista, Brazil; ² - State Key Laboratory of Military Stomatology, the Fourth Military Medical University, Xi'an, P. R. China; ³ - Georgia Regents University, Augusta, GA, USA

Objective

To evaluate dentin microtensile bond strength (MTBs) of class I resin composite restorations performed *in vivo* (time) and under *in vitro* conditions (simulated pulpal pressure - SPP, aging protocols and storage time).

Methods

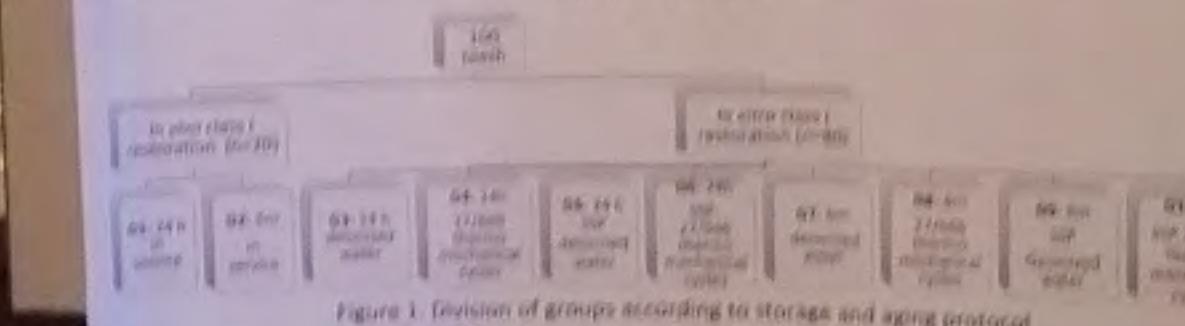


Figure 1: Division of groups according to storage and aging protocol



Figure 2: A) Class I preparation; B) Acid etching (37% Phosphoric Acid - Vigadent, Brazil) on enamel; C) Acid etching on enamel and dentin; D) Adhesive system Single Bond 2 (3M ESPE, USA) applied to cavity; E) Adhesive lightcuring; F) insertion of resin composite Grandio (Vivadent Germany); G) final restoration



Figure 3: Pulp Pressure Simulator device

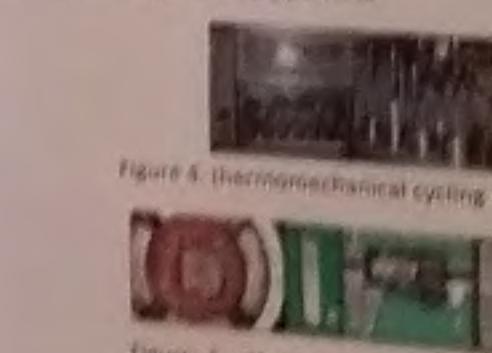


Figure 4: Thermomechanical cycling machine

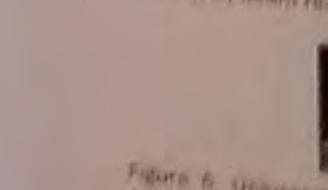


Figure 5: A) Sectioned beam by cutting machine; B) Individual beam after sectioning; C) beam measurement (average 3mm); D) beam ready to microtensile test

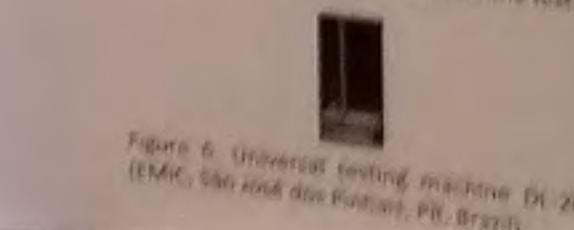


Figure 6: Universal testing machine DI-2000AP (EMIC, São José dos Campos, SP, Brazil)

Results

Bond strength data (Means \pm standard deviations, in MPa) are presented in Table 1. MTB decreased after 6 months under clinical conditions. *In vitro* tests indicated that MTB was significantly affected by all variables examined. MTB decreased with the use of SPP in presence of water and after 6-month aging. For *in vitro* and *in vivo* comparison, the 24 hours results revealed lower MTB for SPP. No differences were detected at 6 months.

Table 1: Mean and standard deviation of tensile bond strength (in MPa)
Conditions

Evaluated Period	<i>In vivo</i>		<i>In vitro</i>		MTB
	Simulated Pulpal Pressure	Aging	Without SPP	With SPP	
G1: 24 hours	23.21 \pm 3.91	G1: Water	24.96 \pm 3.09	23.16 \pm 3.77	24.96 \pm 3.09
		G1: Cycling	24.96 \pm 3.77	23.65 \pm 3.77	
G2: 6 months	14.17 \pm 4.78	G2: Water	19.49 \pm 4.92	16.66 \pm 4.22	19.49 \pm 4.92
		G2: Cycling	19.49 \pm 4.22	18.17 \pm 2.71	
		Without SPP	16.66 \pm 4.22	14.33 \pm 4.64	14.33 \pm 4.64
		With SPP	18.17 \pm 2.71	17.89 \pm 1.39	

Conclusion

The use of SPP adversely affected *in vitro* bonding at 24 h, while results from all *in vitro* testing protocols were similar to *in vivo* conditions at 6 months.

Funding: FAPESP Processo 04/05454-0

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Miguel Angel
Miguel Angel Maturana
Universidad de los Andes

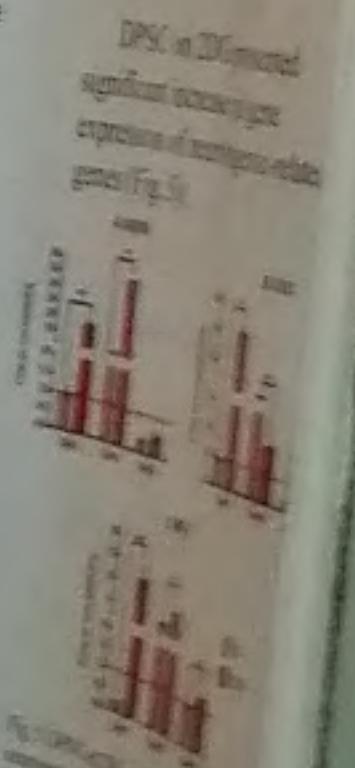


Alessandro
Alessandro Gómez
Universidad de los Andes



a substrate to enhance neurogenic
differentiation of dental pulp stem cells

Madanagopal¹, N. Dubey², JC Viana Gomes²
¹National University Health System, Singapore, ²School for Advanced 2D Materials and Graphene Research Centre



Graphene significantly increases the expression of neurogenic genes (Fig. 5).

Graphene significantly increases the expression of neurogenic genes (Fig. 5).

**Graphene as a substrate to enhance neurogenesis
differentiation of dental pulp stem cells**

Author: T. Alzogib, M. Elshay, C. Vanherle
Institution: Center of Advanced Prosthetic and Regenerative Research Lab

Objective

To evaluate the potential of graphene in neurogenesis differentiation of dental pulp stem cells (DPSC).

Methods

Graphene (2D nanomaterial) was synthesized by chemical vapor deposition (CVD) method and isolated via ultrasonic treatment. Graphene solution (1 mg/ml) was added to the culture media of DPSCs at different concentrations (0, 10, 20, 40, 80, 160, 320, 640, 1280 µg/ml).

Results

The proliferation rate of CNTs was higher than control at 160 µg/ml. At 320 µg/ml, the proliferation rate was decreased (Fig. 1). All concentrations of CNTs increased the proliferation rate (Fig. 2) compared to control.

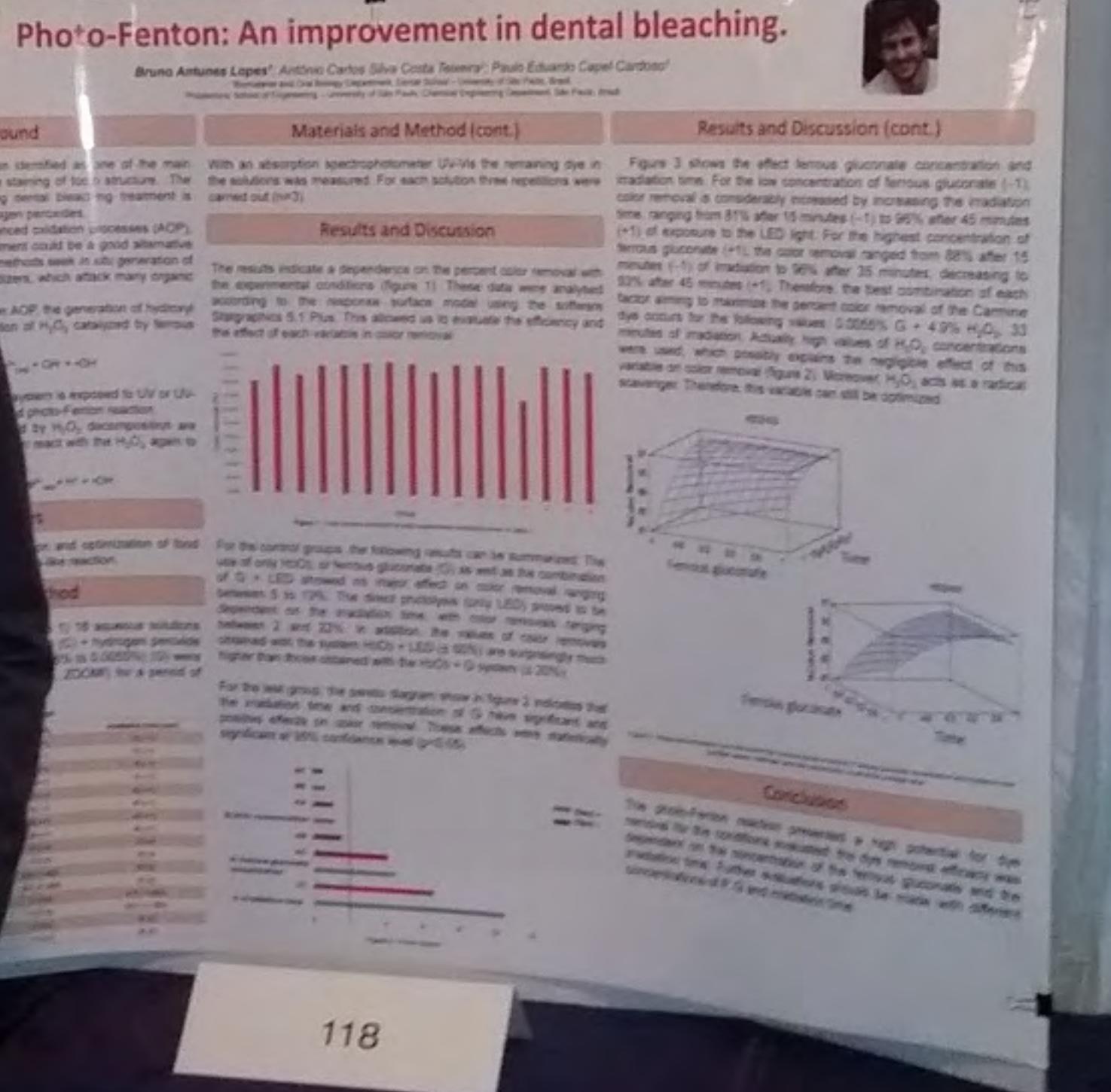
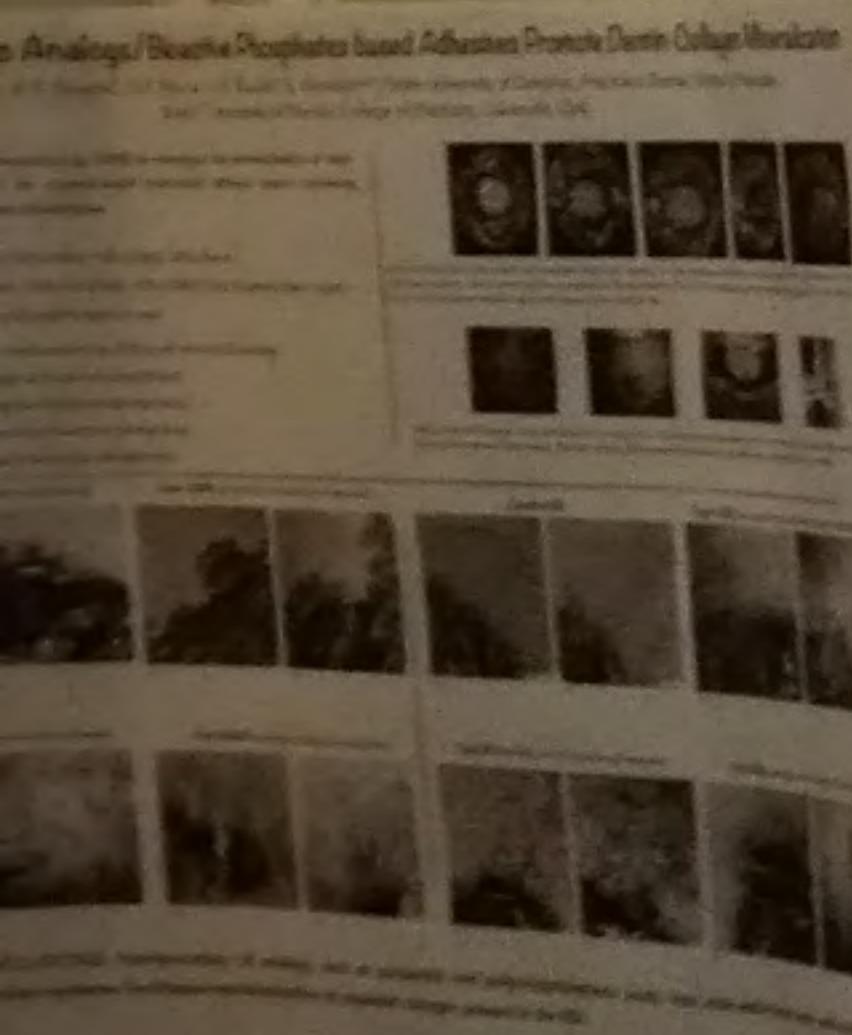
The proliferation rate of CNTs was higher than control at 160 µg/ml. At 320 µg/ml, the proliferation rate was decreased (Fig. 3). All concentrations of CNTs increased the proliferation rate (Fig. 4) compared to control.







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Photo

Background

Colored food and drinks have been identified as sources of pigments that cause the staining of tooth oxidation of these pigments during dental bleaching achieved mainly by the use of hydrogen peroxides. Virtually unknown in dentistry, advanced oxidation processes widely studied for wastewater treatment could be a good to improve teeth whitening. These methods seek *in situ* hydroxyl radicals ($\cdot\text{OH}$), strong oxidizers, which attack compounds, such as food dyes.

In the Fenton process, a well-known AOP the generation of radicals occurs by the decomposition of H_2O_2 catalyzed by Fe^{2+} .



This reaction can be enhanced if the system is exposed via radiation, according to the so-called photo-Fenton reaction. In this case, ferric ions (Fe^{3+}) formed by H_2O_2 decomposition react with the Fe^{2+} , and can react with the H_2O_2 generate additional hydroxyl radicals.

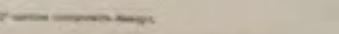


Objectives

The aim of this study is the quantification and optimization of dyes bleaching by using the photo-Fenton reaction.

Materials and Method

Following the experimental planning (table 1) 16 aqueous containing cochineal carmine dye (0.17g/L) (C) + hydrogen (5% to 30%) (P) + ferrous gluconate (0.0005% to 0.0055%) irradiated by the LED lamp Zoom! (Philips ZOOM!) for a time between 5 and 55 minutes.



Dose	P% Ferrous gluconate	P% H ₂ O ₂
1	0.0005%	5%
2	0.0005%	10%
3	0.0005%	20%
4	0.0005%	30%
5	0.0005%	5%
6	0.0005%	10%
7	0.0005%	20%
8	0.0005%	30%
9	0.0055%	5%
10	0.0055%	10%
11	0.0055%	20%
12	0.0055%	30%
13	0.0055%	5%
14	0.0055%	10%
15	0.0055%	20%
16	0.0055%	30%

Abfraction versus Erosion: Impact of Type I erosion 1-Year Restorative Performance

M.A.S. Athari*, A.F. Soares, E.C. Consalvino, O. Bim Júnior, R.F. Rodrigues, S.A. L.

H.M. Honório, J. Ishikiriana, L. Wang

Bauru School of Dentistry, University of São Paulo, Bauru, Brazil

Introduction
Abstract

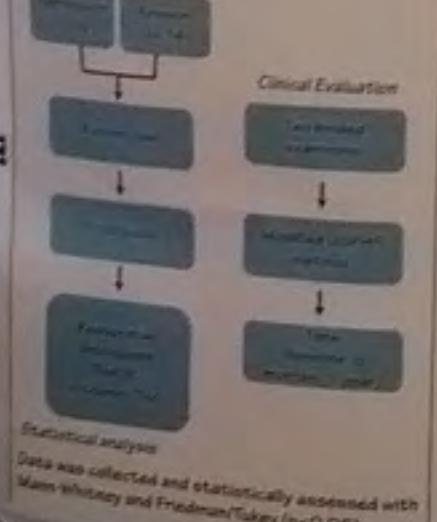
Purpose

Resin-modified glass-ionomer cement (RMGIC) is recommended for the treatment of non-carious cervical lesions (NCCL) irrespective to their etiological factor. However, as these factors frequently persist even after restorative treatment, this study aimed to evaluate the restorative performance predominantly caused by abfraction or erosion.

Material and Methods

One commercial cement (Vivadent, Z22864013.6.0000.5417)

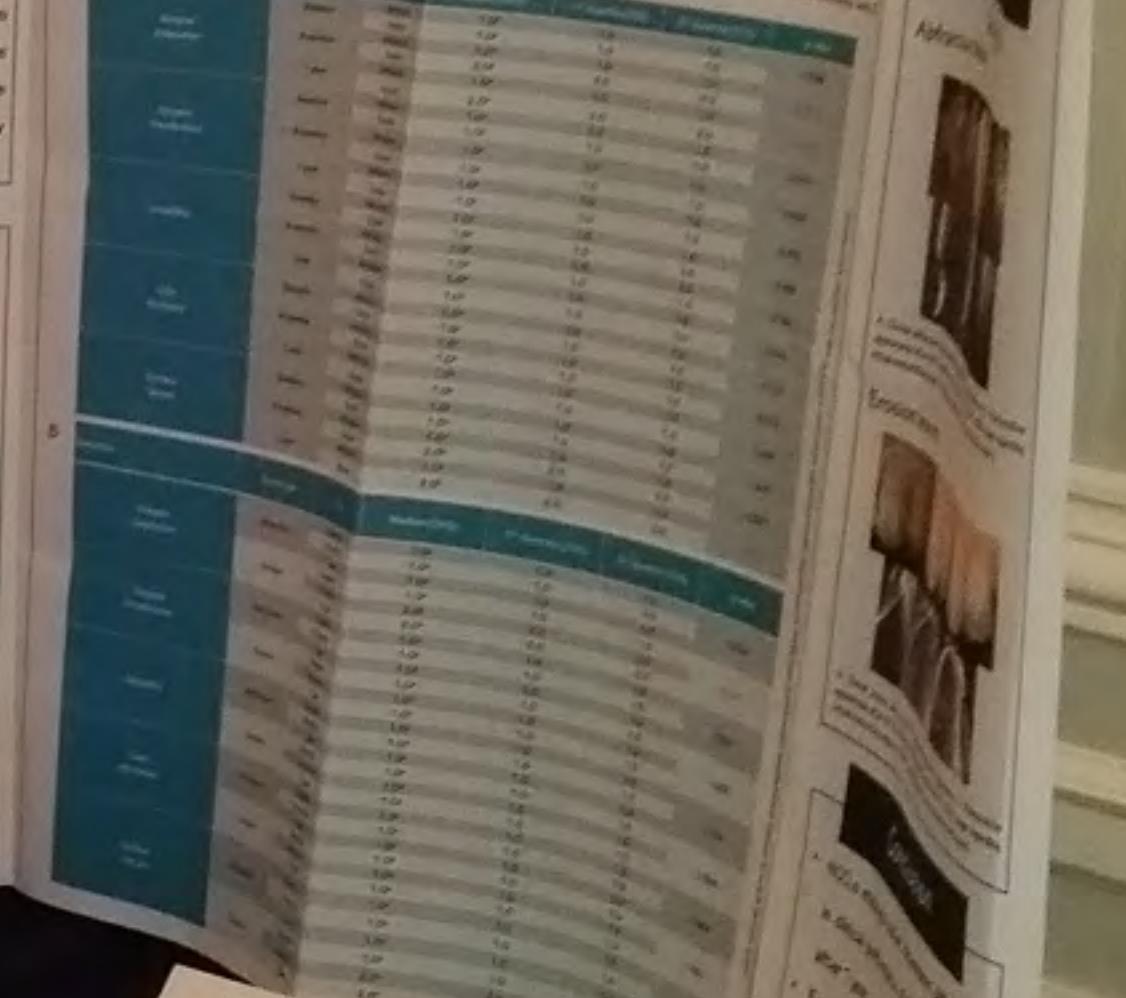
Clinical Procedures



Statistical analysis
Data was collected and statistically assessed with Mann-Whitney and Friedman/Tukey ($p < 0.05$)

Results

Median, 1st quartile, 3rd quartile and range for different cervical restorative, 6 months and 1 year from type (abfraction and erosion) to evaluate cervical margin discoloration, marginal discoloration, proximal sensitivity, color alteration and surface texture.



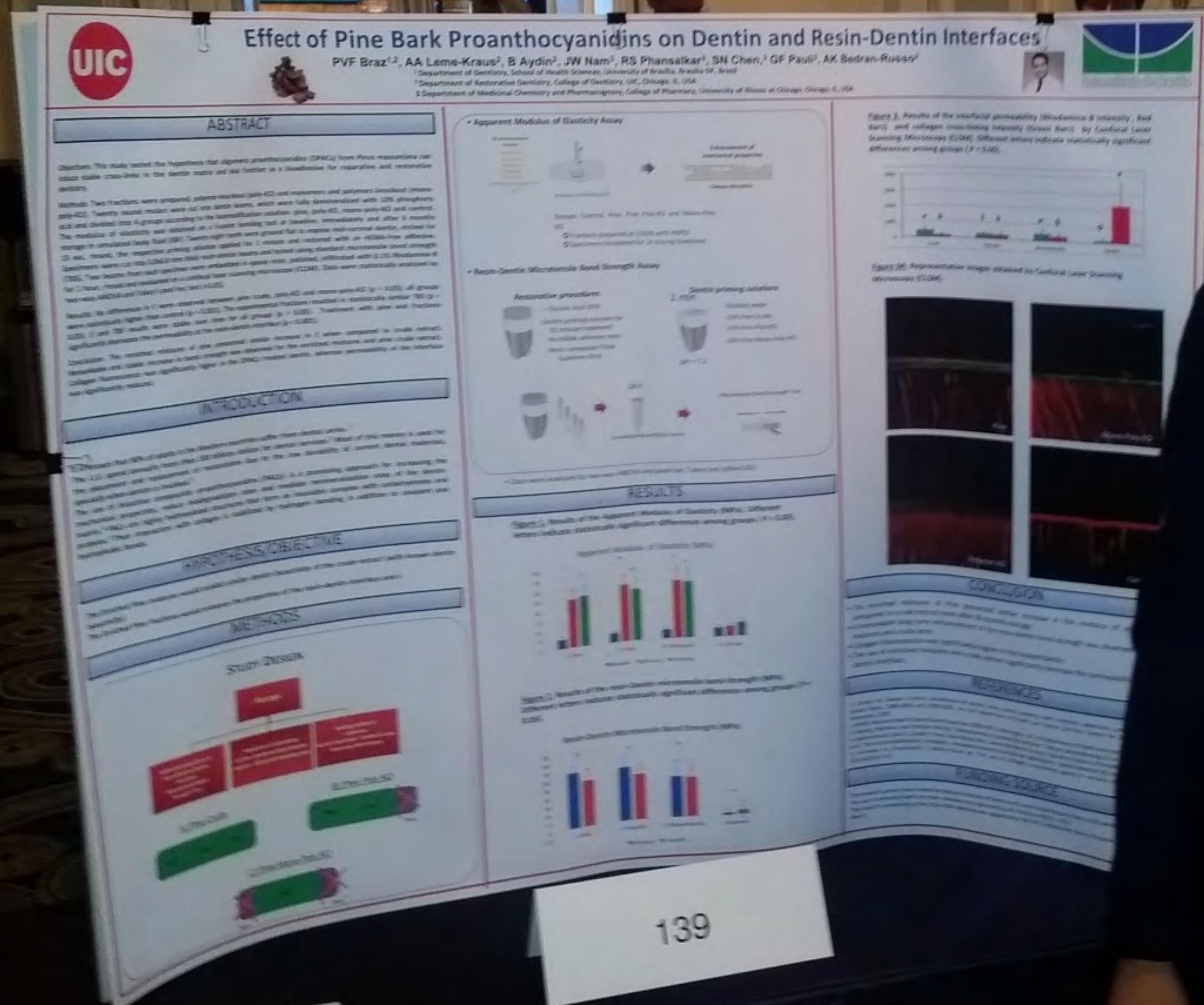
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Amanda
David





Paulo
Phansalkar



Biomimetic Hydrogels and Dental Materials

COLLEGE

Development of 3D hydrogel materials
and biomimetic dental materials affected
some factors containing metallophilic and
chelating organic components of living cells
are very important.

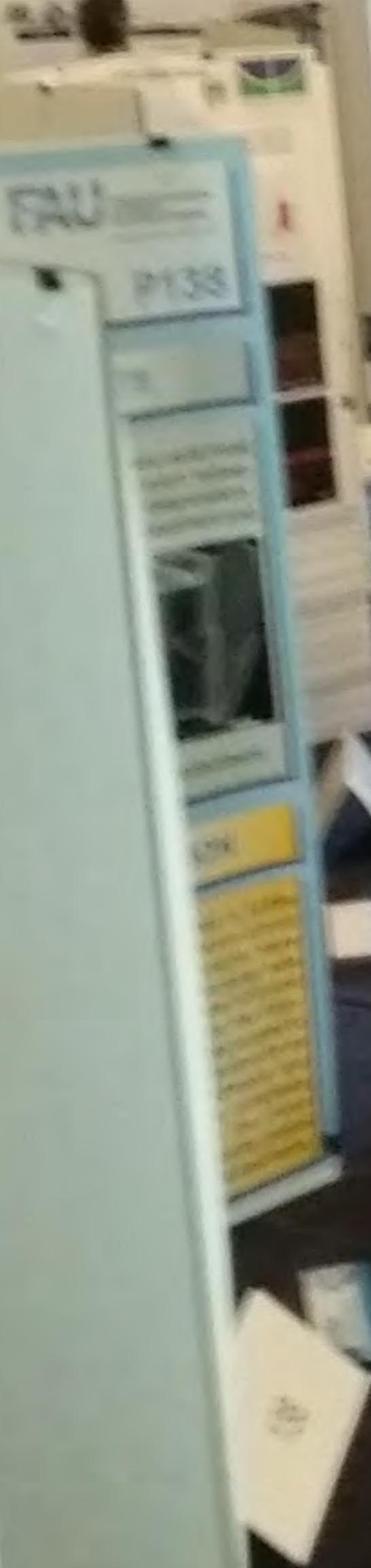
MATERIALS AND METHODS

PREPARATION OF SPECIMENS

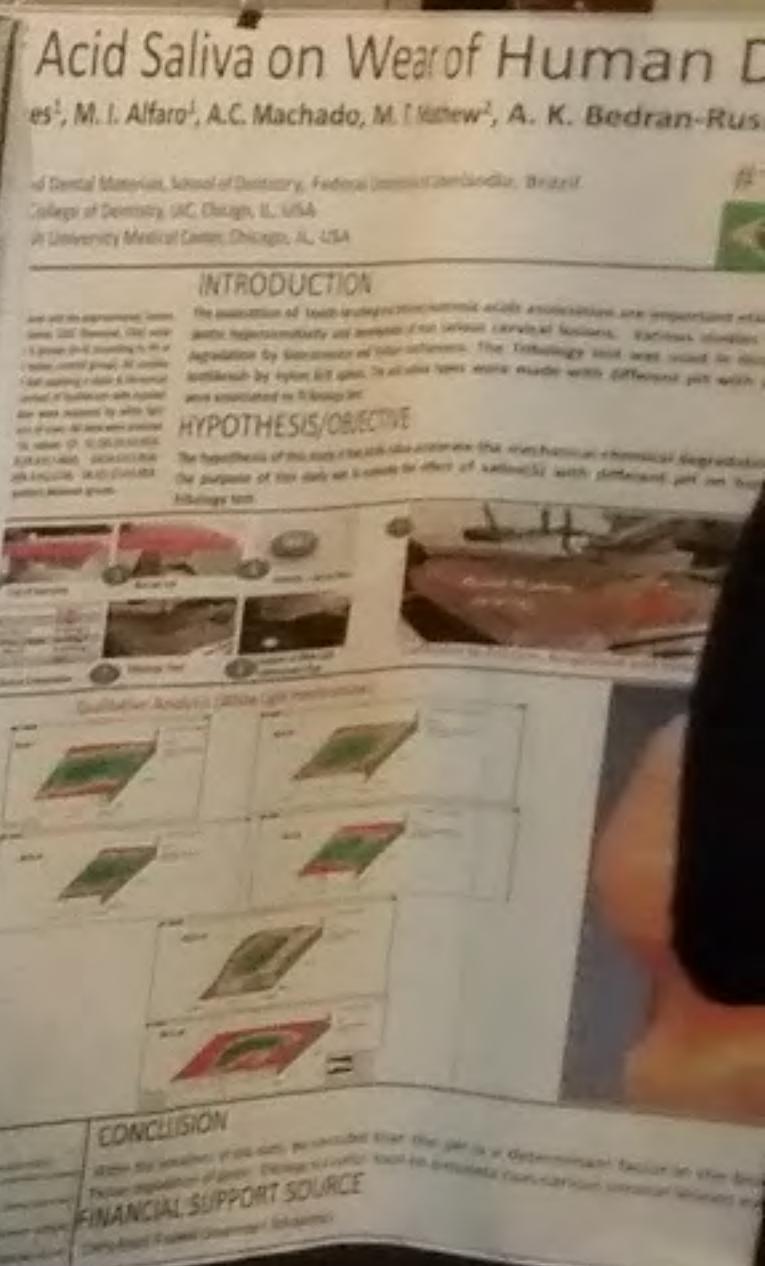


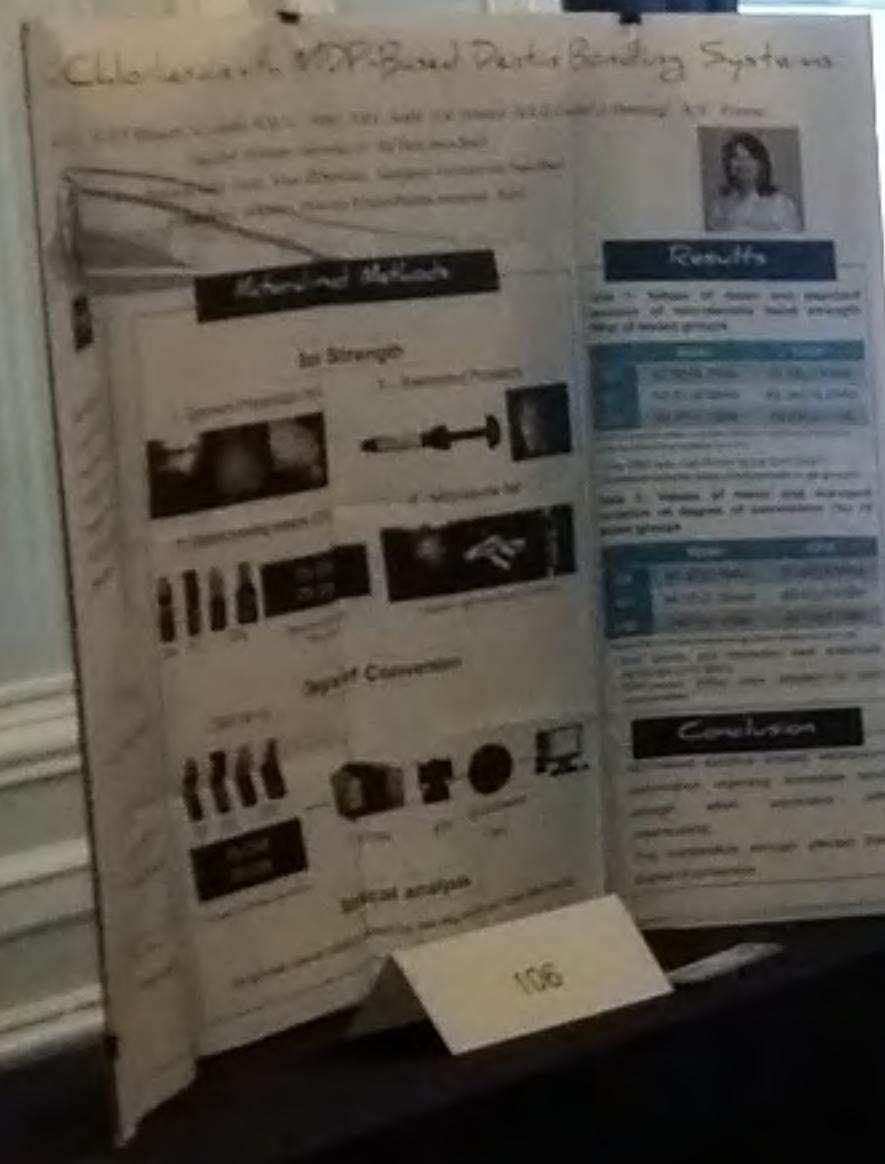
Preparation of 3D hydrogel materials – University of Campinas











Fatigue limit of monolithic zircônia FDP: damage and glass infiltration

M Amaral^{*1}, R Rocha², RM Melo², GK Pereira³, T Campos⁴, Y Zhang⁵, LF Valandro³, MA Bottino²
(¹University of Taubaté, ²Univ. Estadual Paulista, ³University of Santa Maria, ⁴Aeronautic Technilogie Institute/BR, ⁵New York University/USA)

OBJECTIVE

The aim of this study was to evaluate the effect of damage with diamond and glass infiltration by two different methods on the fatigue limit of fixed dental prosthesis (FDP) in monolithic zirconia.

METHODS

Specimens were milled from monolithic zirconia blocks (Vivadent, V2) and submitted to three different treatments: Control (no treatment), abrasion by extra-fine diamond bur on the gingival area of the connectors, and Y2 infiltrated by glass - sol-gel method. Y2 infiltrated by glass - slurry method

RESULTS

Table 1: Load-to-fracture and stair-case parameters for testing.

Load-to-fracture(N)	Initial load for stair-case	Load increment (N)
C1	1907.46	1335.36
A1B	2069.37	1448.56
S1G	2619.17	1833.42
G2G	3235.5	2264.85

Table 2: Fatigue limit (SD) and decrease of fatigue limit from load-to-fracture values.

Groups	Flexural Fatigue limit(N)	Standard Deviation (N)	Confidence intervals (95%) ^a	Decrease of fatigue limit values (%)
C1	1607.24	91.4	1542.9 - 1671.5	15.8
A1B	1598.22	65.6	1535.6 - 1616.8	23.3
S1G	1824.25	69.7	1759.5 - 1889.1	0.5
G2G	2032.07	295.2	1854.7 - 2209.4	10.3

CONCLUSION

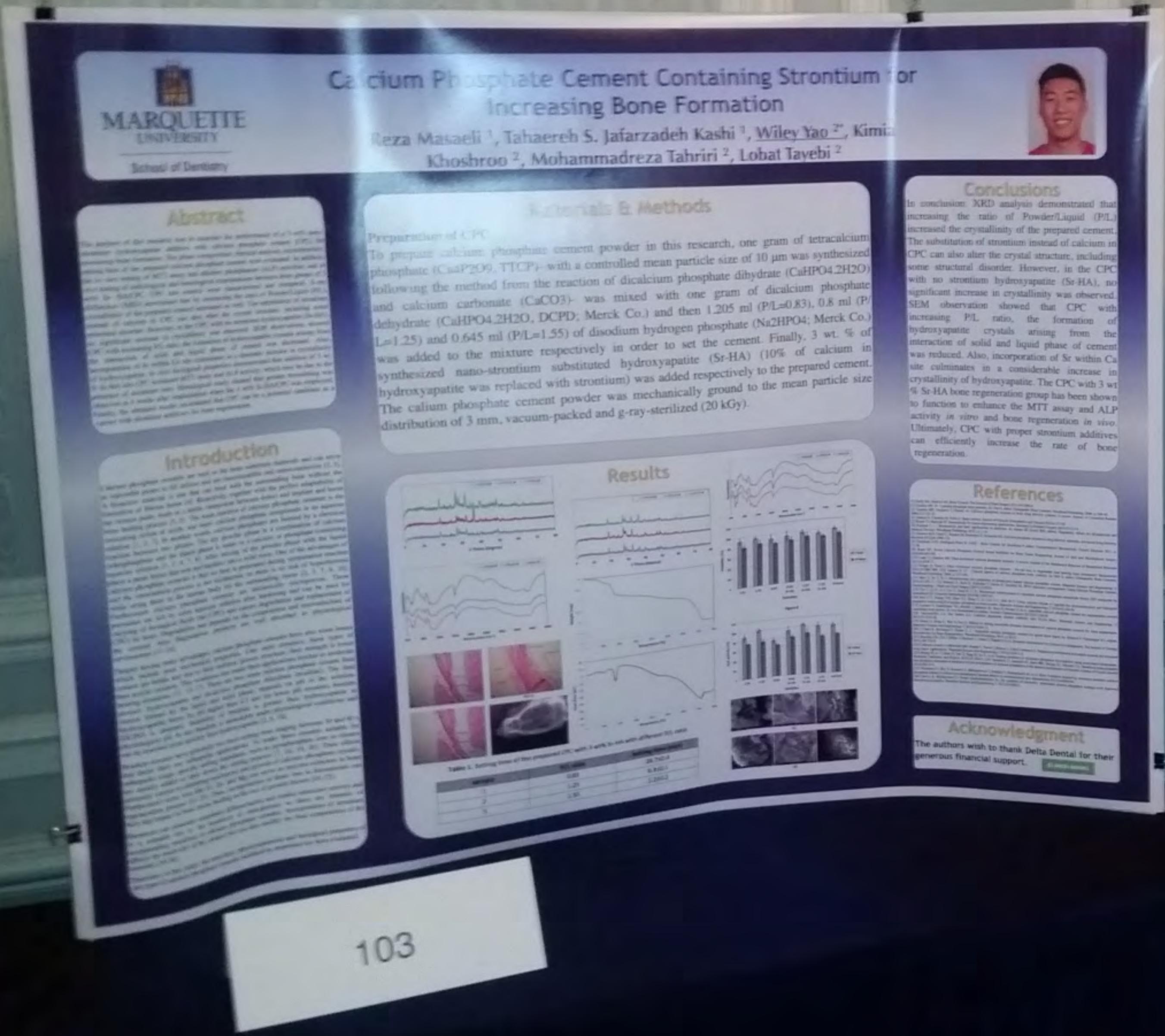
Fatigue limit of FDP in monolithic zirconia was not affected by abrasion with diamond bur and were enhanced by glass infiltration.

^a"Callies" method.

CNPq # 130379/2015-0

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Brasília Dental Science





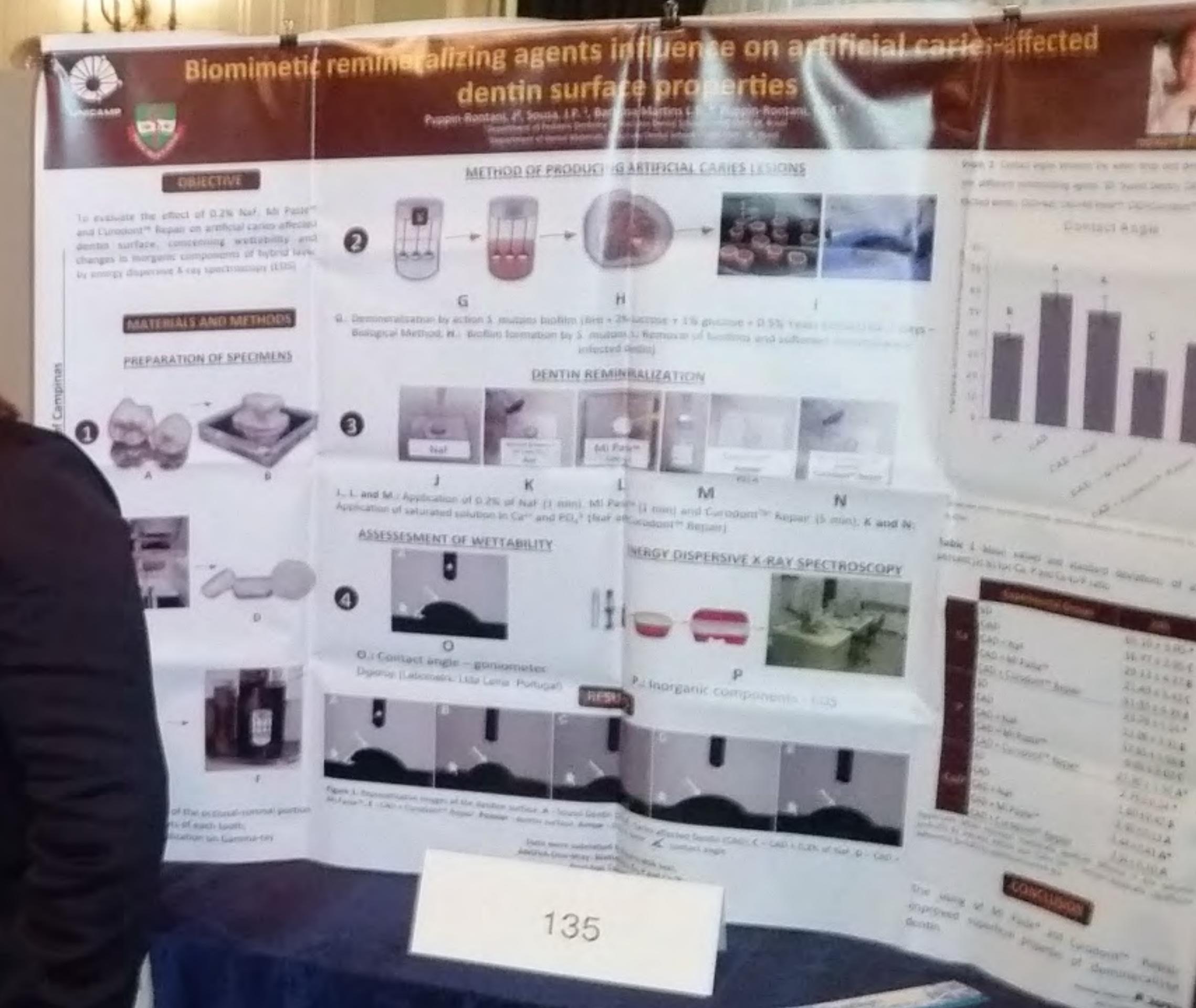
EXIT

Roberta

Roberta

Paulo Henrique

Paulo Henrique





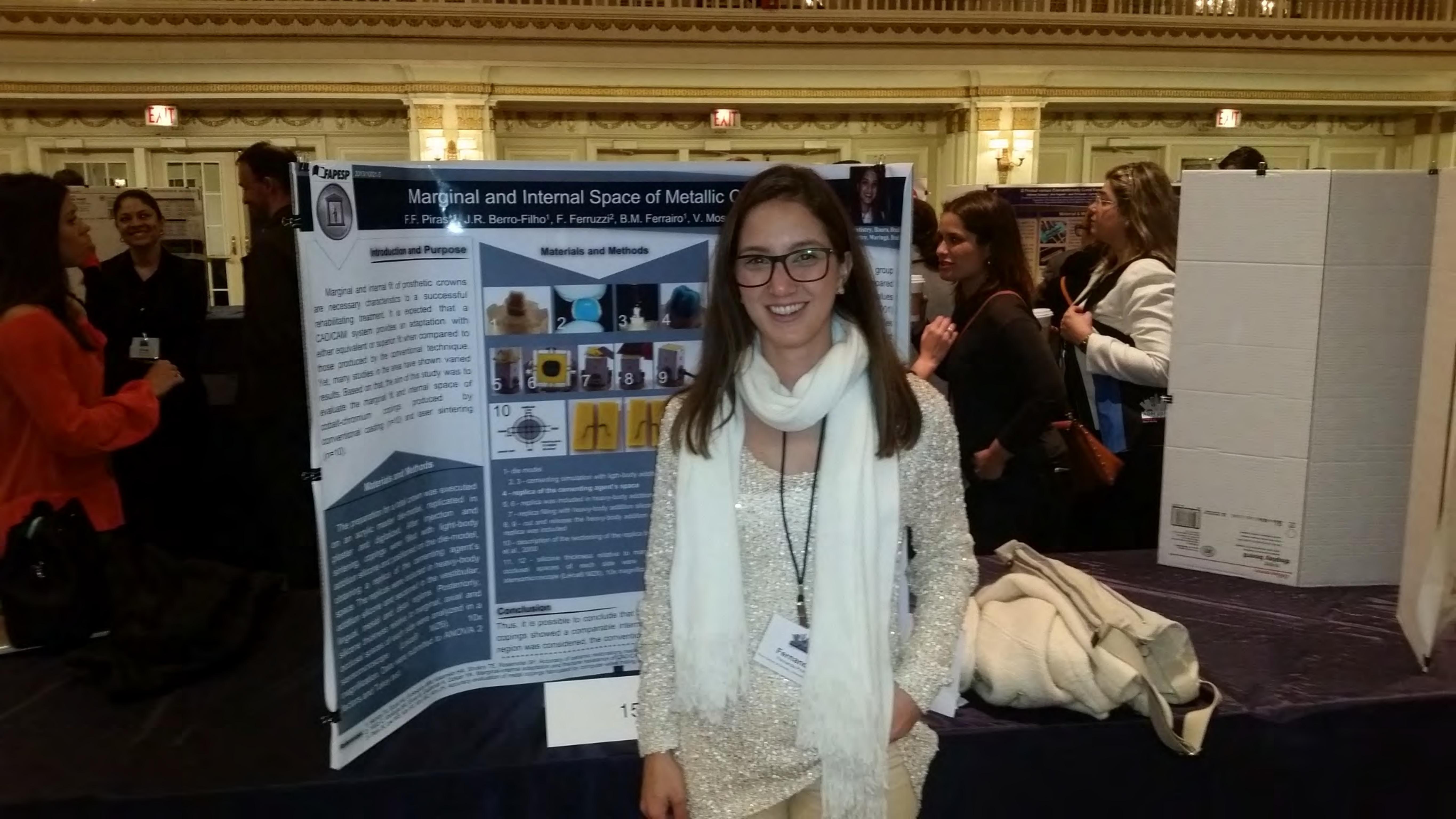
Luis

Luiz
Luis Fernando

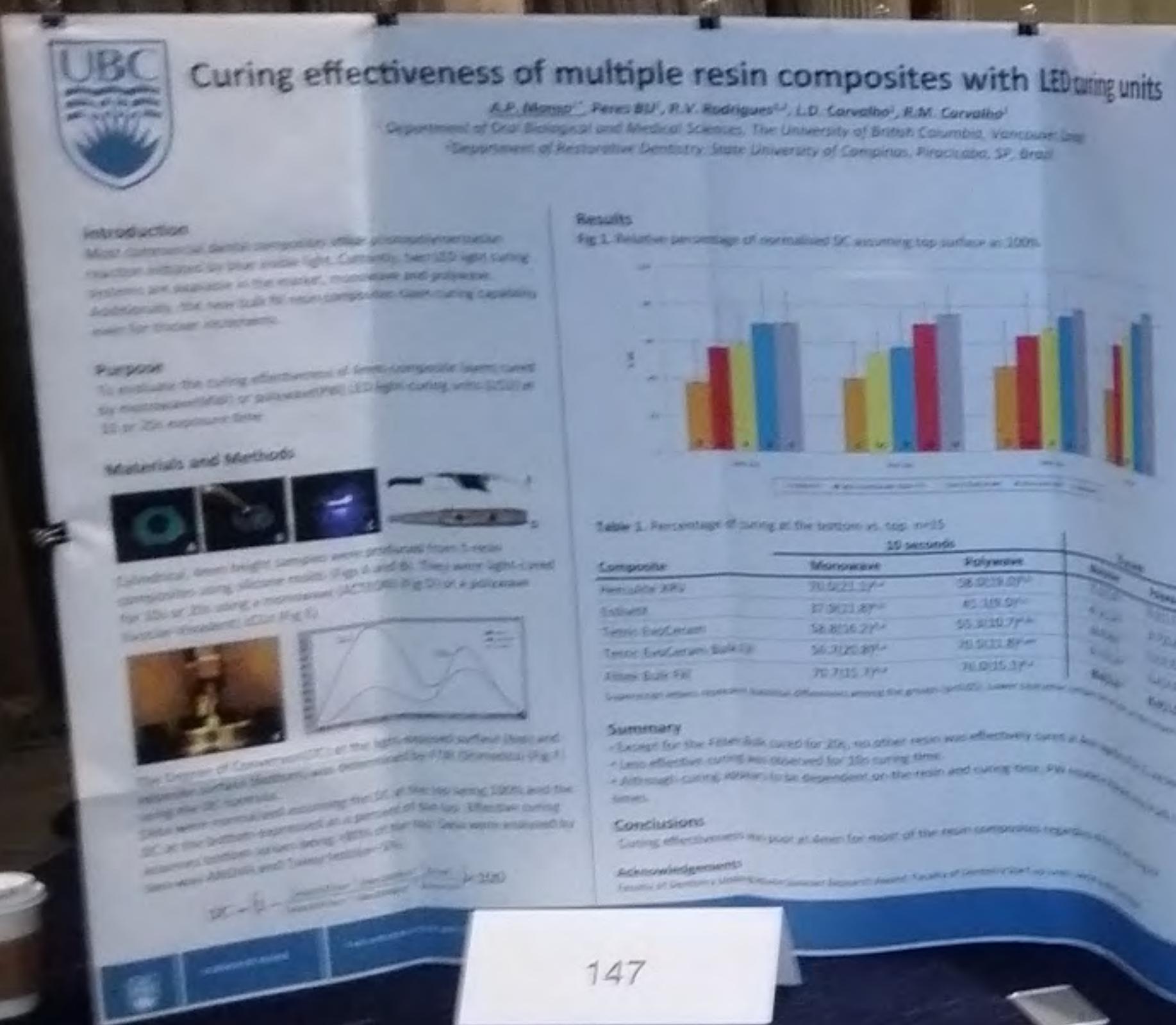
Andre

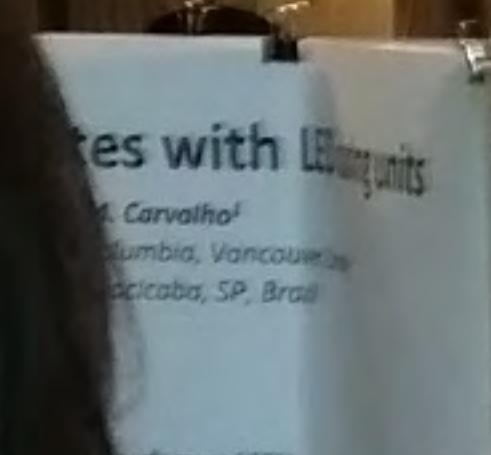
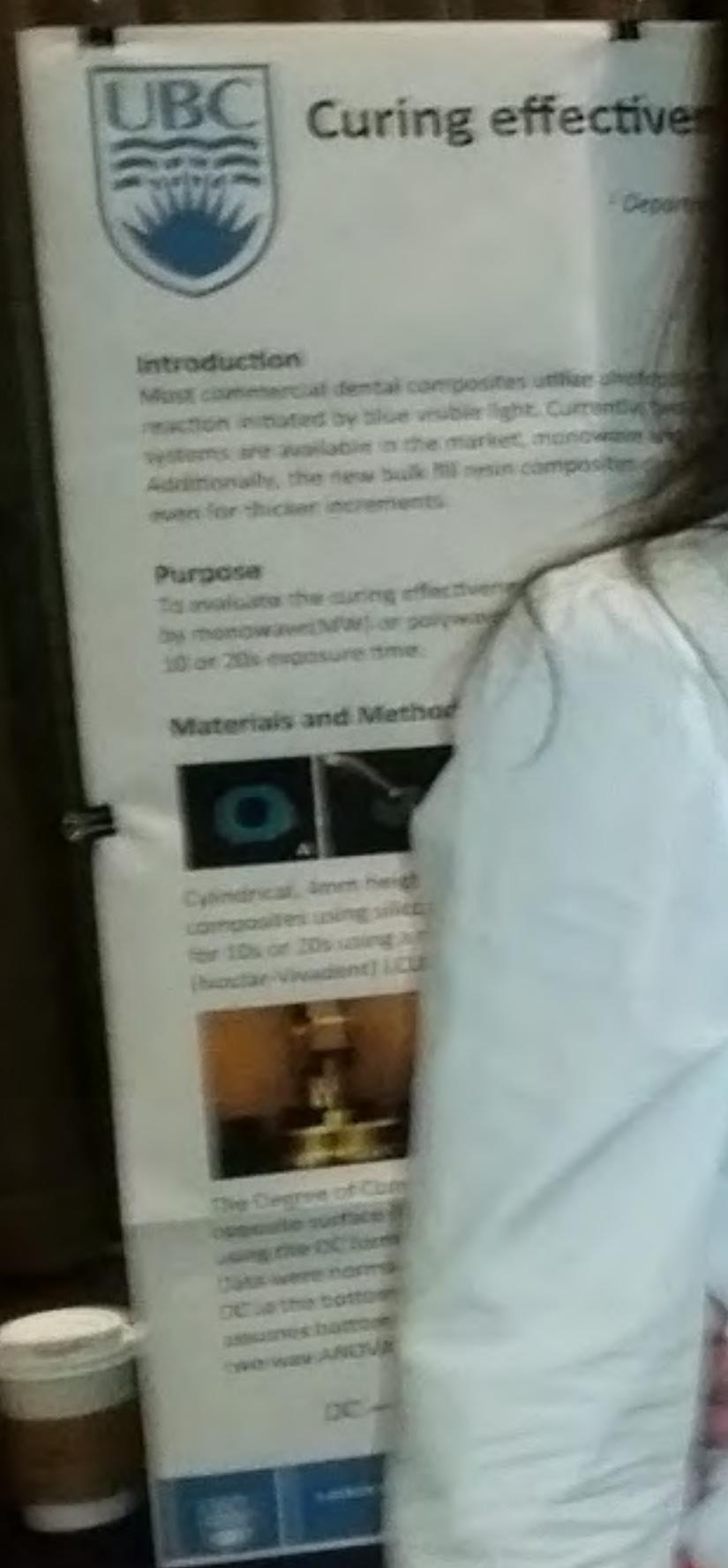
Andre
Andre Faria











EFFECT OF DOXYCYCLINE INCORPORATED WITHIN DENTAL ADHESIVES ON TOOTH-RESTORATION INTERFACE

R.H. FREITAS^{1,2}, M. GIANINI¹, S. CONSA¹, S. DENIS¹, RODRIGO FRANCA²

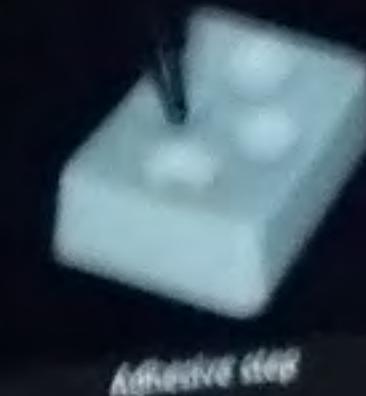
rodrigo@uol.com

¹ College of Dentistry, University of Minas Gerais, Belo Horizonte, Brazil

² Dental School of Campinas, State University of Campinas, Brazil, São Paulo, Brazil

MATERIAL AND METHODS

Single Bond 2 - Control
EXP1 - Doxycycline 0,05%
EXP2 - Doxycycline 0,1%
EXP3 - Doxycycline 0,5%
EXP4 - Doxycycline 1%



Adhesive disk



Restorative disk



Dentin-dentin-disk embedded in epoxy resin



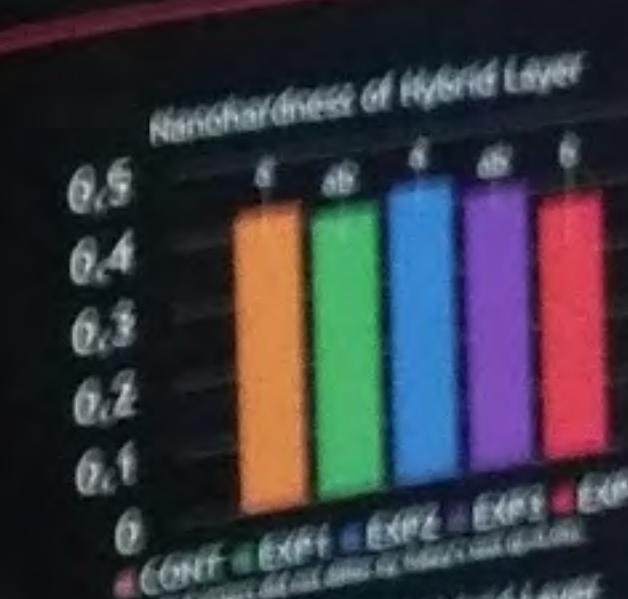
Load of 1000 gf and a standard displacement rate function 0.5%.



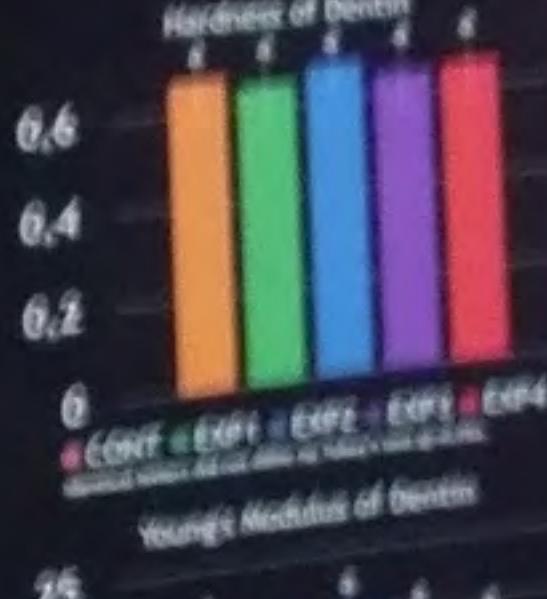
Indentation for the dentin, hybrid layer and adhesive

RESULTS

Nanohardness of Adhesive Layer



Hardness of Hybrid Layer



Young's Modulus of Hybrid Layer



CONCLUSIONS

Control group showed higher values for adhesive layer; the experimental groups showed no statistical difference between them. There were no difference between groups for Young's Modulus values.

EXP4 showed lower value compared to Control group and EXP2 for the Hybrid Layer's nanohardness values. However, Control group did not show difference among EXP1, EXP2 and EXP3. Control group showed the lower value among all the groups for Young's Modulus of Hybrid Layer. EXP2 showed higher value among Control group and EXP4. However, EXP2 did not show difference among EXP1 and EXP3.

Hardness and Young's Modulus of dentin did not show difference between the groups. Therefore, confirm that the substrate differences and mineralization levels did not change the properties of the hybrid layer in a particular group.



Polymerization Stress, Gap Formation and Bacterial Infiltration in Bulk-Fill Restorations

B. M. Frontzeck¹, C. B. Andre¹, R. R. Brogo², J. L. Ferreira², P. L. Rosalen², M. Gannini¹

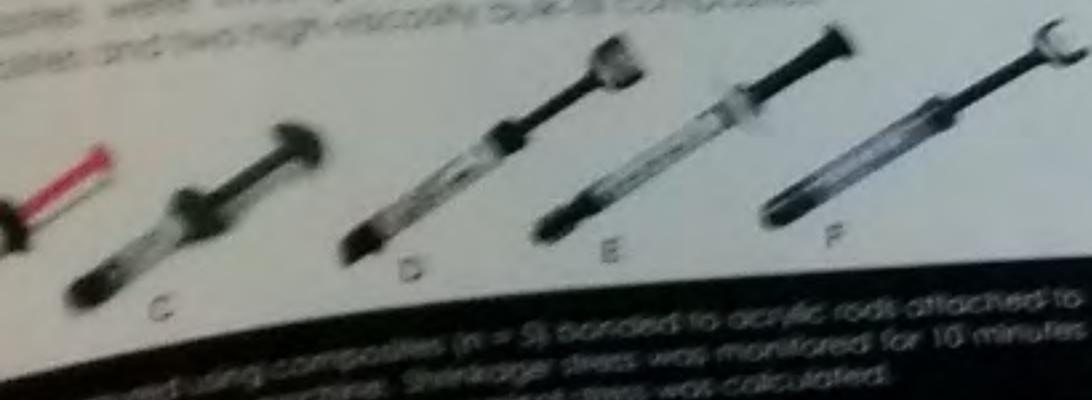
¹Saint Louis University of Campinas; ²University of São Paulo - Oregon Institute of Health and Science, USA

Abstract

One of the main reasons for clinical failure of resin composite restorations is the presence of numerous regions around restorations may be related to subsequent degradation of the exposed surfaces involved following further bacterial infiltration. The objective of the study was to evaluate polymerization stress, internal gap formation, bacterial infiltration and secondary caries development in bulk-fill composites restorations.

Methods

Two conventional materials, two low viscosity bulk-fill composites and two high viscosity bulk-fill composites were investigated.



Conventional composites (n = 5) bonded to acrylic rods attached to a universal testing machine. Shrinkage stress was monitored for 10 minutes after activation and maximum nominal stress was calculated.

Hybrid dentin was made in decontaminated molars. For restorative procedures dentin bonding agent (Single Bond Universal for 3M composites, and Pro-Bond II for Shofu products).

Conventional composites were applied in two oblique increments and bulk-fill composites were applied in one single increment.

Specimens were sterilized using UV light and left in *Streptococcus mutans* culture for 14 days.

Specimens were analyzed through epoxy resin replicas using scanning electron microscopy. Bacterial infiltration and secondary caries development was observed under lower confocal microscopy.

Results

Polymerization stress and gap formation data were one-way ANOVA and Tukey post-hoc tests ($\alpha = 0.05$). Bacterial infiltration and secondary caries development were compared qualitatively.

Material	Polymerization Stress
A Filtek Supreme Ultra	3.29 (0.28) c
B Filtek Bulk Fill Flowable	3.52 (0.19) dc
C Filtek Bulk Fill Restorative	3.25 (0.21) c
D Beaufill II	3.70 (0.27) ds
E Beaufill Bulk Flowable	4.08 (0.18) ds
F Beaufill Bulk Restorative	3.08

Table 1. Mean (standard deviation) of polymerization stress (MPa). Within a column, means followed by the same letter are not significantly different according to Tukey test.

Gaps were mostly located at the hybrid dentin layer. Conventional composites presented more gaps than bulk fill composites.

Conventional composites showed higher values for hardness and Young's Modulus of dentin than bulk fill composites.

Hardness and Young's Modulus of dentin did not show difference between the groups. Therefore, dentin mineral levels did not change the properties of the dentin layer in a particular group.

Conclusion

Internal gap formation was independent of restorative materials. Gaps were present, but no significant difference was observed between materials.

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EFFECT OF DOXYCYCLINE INCORPORATED WITHIN DENTAL ADHESIVES ON TOOTH-RESTORATION INTERFACE

AN REPORT IN DENTAL CERAMIC AND RESTORATIVE

DISCUSSION

Department of Ceramics and Materials Engineering

Department of Dentistry, University of São Paulo

Department of Oral Rehabilitation, University of São Paulo

Department of Oral and Maxillofacial Surgery, University of São Paulo

Department of Endodontics, University of São Paulo

Department of Prosthetic Dentistry, University of São Paulo

Department of Orthodontics, University of São Paulo

Department of Preventive Dentistry, University of São Paulo

Department of Removable Prosthetics, University of São Paulo

Department of Restorative Dentistry, University of São Paulo

Department of Special Dentistry, University of São Paulo

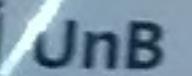
Department of Traumatology, University of São Paulo

Department of Urology, University of São Paulo

Department of Vascular Surgery, University of São Paulo

Department of Visceral Surgery, University of São Paulo

Role of proteoglycans on dentin biochemical and bio



UnB

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Introduction

Proteoglycans (PGs) are glycosylated biomacromolecules formed by a core protein with one or more covalently attached glycosaminoglycan (GAG) chains, present in many collagen-based tissue, including dentin. They represent a small fractions of the dentin extracellular matrix (ECM) while sustaining pivotal roles in the formation, arrangement and mineralization of the tissue. GAGs are linear disaccharide chains that contain acidic sugar residues and/or sulfate groups that are negatively charged and can attract cations and/or water molecules. In dentin, main members of the small leucine rich proteoglycans (SLRPs) include chondroitin sulfate (CS)-rich decorin and biglycan and keratan-sulfate (KS)-rich fibromodulin and lumican.

PGs attract water molecules into the interfibrillar spaces of the dentin matrix creating a hydraulic mechanical support system to the type I collagen network. The intricate interaction between GAG chains from different PG molecules possibly rely on a protein core binding to four or more collagen microfibrils via hydrogen bonds assuming a helical configuration. The GAG chain forms interfibrillar bridges by connecting adjacent collagen fibrils at specific intervals when wrapping around them in an anti-parallel position (Figure 1).



Figure 1: Schematic sketch of PGs attached to the collagen fibrils (not to scale). (1) collagen fibril, (2)decorin protein core, (3) chondroitin sulfate GAG.

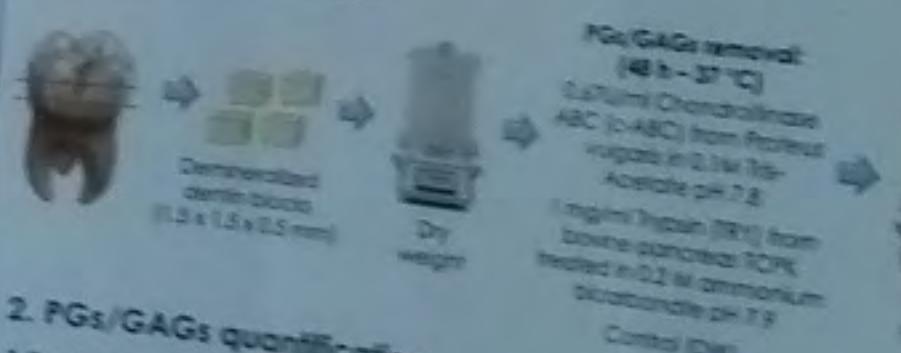
Correlations between an imbalance of PGs synthesis or concentration with tissue strength and biodegradability are reported in cartilage and bone, while it is unclear if PGs have any role in this aspect in dentin. Moreover, there is a lack of knowledge in the specific mechanisms involved in the participation of these biomacromolecules on bulk tissue mechanical behavior and matrix biostability.

Objective

To determine the roles of PGs/GAGs on the biomechanical properties and biochemical stability of bulk demineralized dentin matrices by selectively removing these biomacromolecules.

Material and Methods

1. PGs/GAGs removal



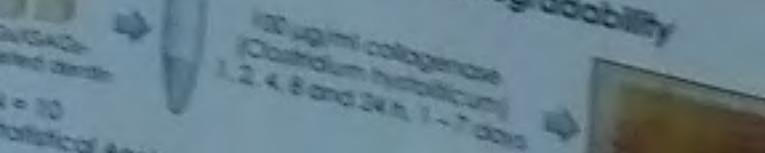
2. PGs/GAGs quantification

- N = 13
- Absorbance reading at 656 nm
- 50 µg/ml/mg dentin
- Statistical Analysis: One-way ANOVA and Scheffe post-hoc tests ($\alpha = 0.05$)



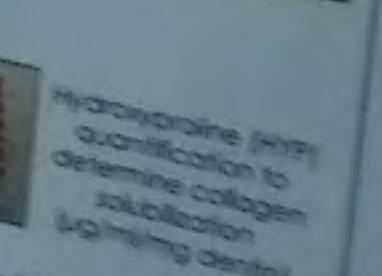
Results

3. PGs/GAGs-depleted ECM biodegradability

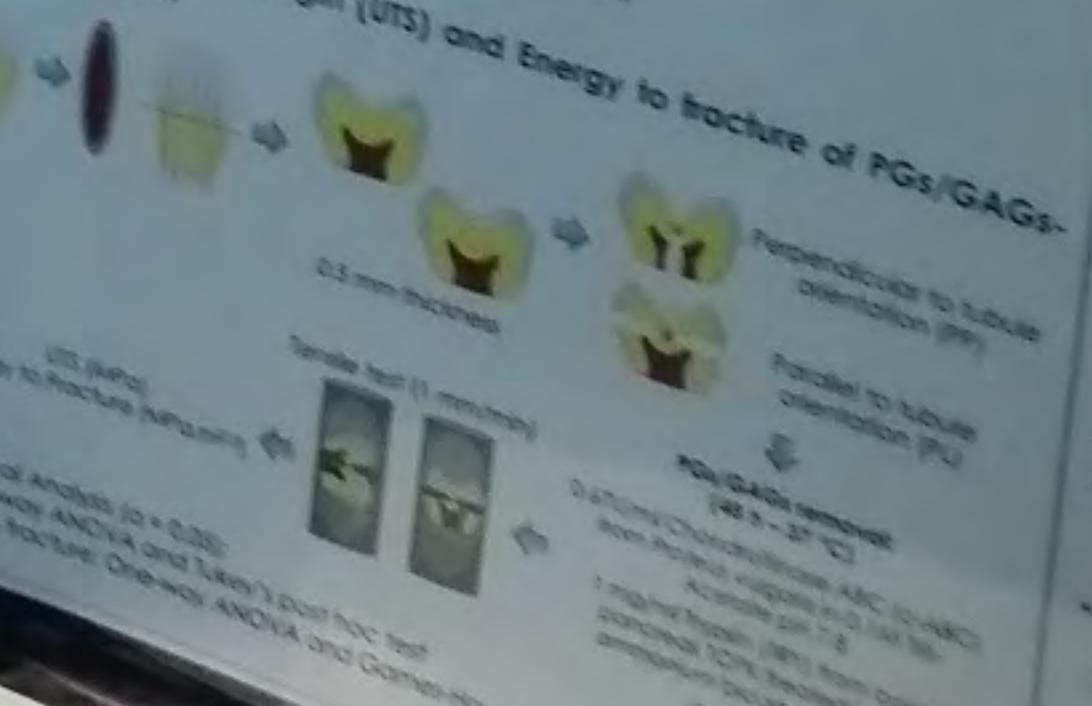


4. PGs/GAGs removal by TEM

- N = 5
- Cupromeronic blue (CB) staining (Bedran-Russo et al. 2009)



5. Ultimate tensile strength (UTS) and Energy to fracture of PGs/GAGs-depleted dentin



Conclusion

- PGs/GAGs regulate growth/proliferation
- PGs/GAGs increase proteoglycan production
- PGs core protein profile





The Effect of Hydrofluoric Acid Concentration on Bonding Strength to EMX Luted to Glass Ceramic

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UNICAMP

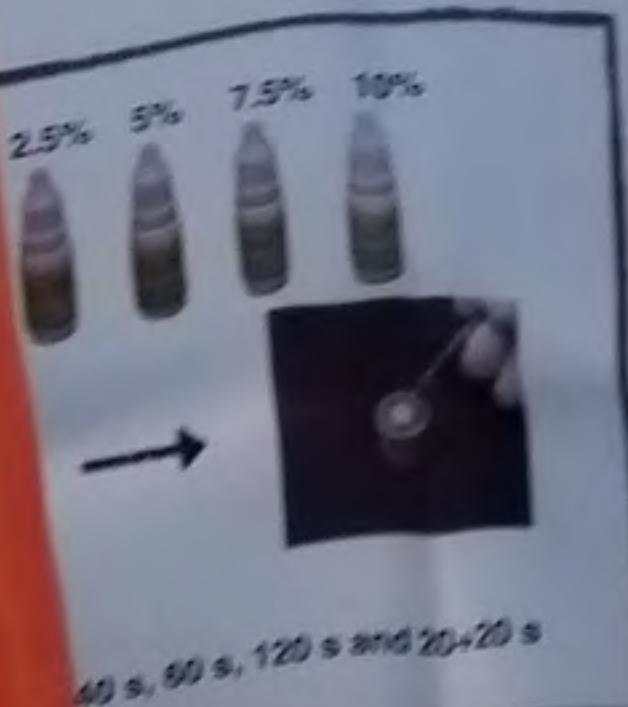
Propose

Evaluate the effect of different hydrofluoric acid concentrations associated with varied etching times on the microshear bond strength (μ SBS) and surface morphology (SEM analysis) of EMX luted to a resin cement.

Materials and Methods

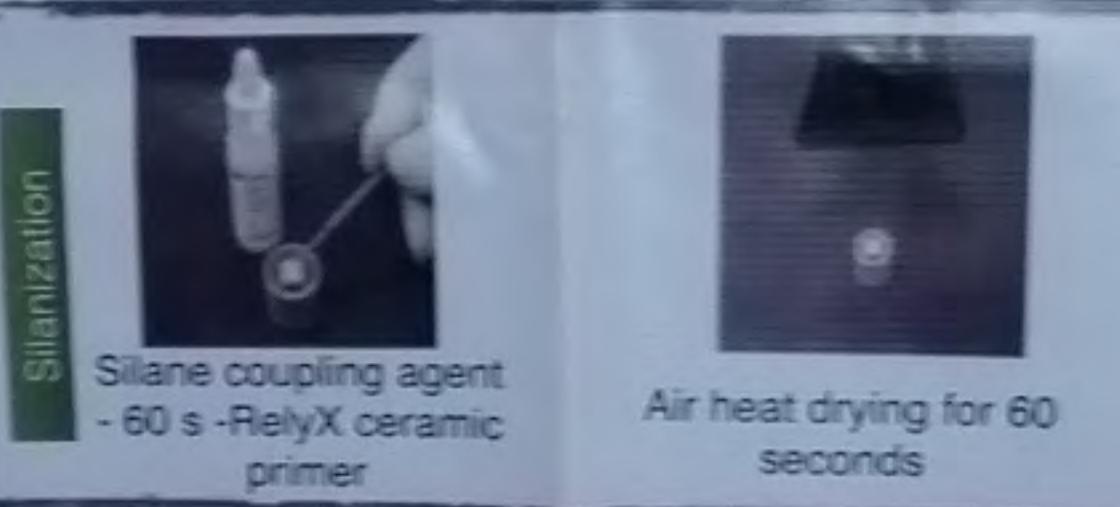


N=250
n=10
Polishing - #600, #1200, #2000



HF - 2.5%, 5%, 7.5% and 10%
60 s, 60 s, 120 s and 20+20 s

Etch spray, air dried for 60s



μSBS testing procedures



Resin cement Variolink II
250 g/120 s

μSBS Test

SEM analysis

HF - 1%, 2.5%, 5%, 7.5% and 10%

Statistical analysis

Data were submitted to two-way ANOVA and Tukey tests ($p < 5\%$).
 $n=1$ → Etching time - 20 s, 40 s, 60 s, 120 s and 20+20 s

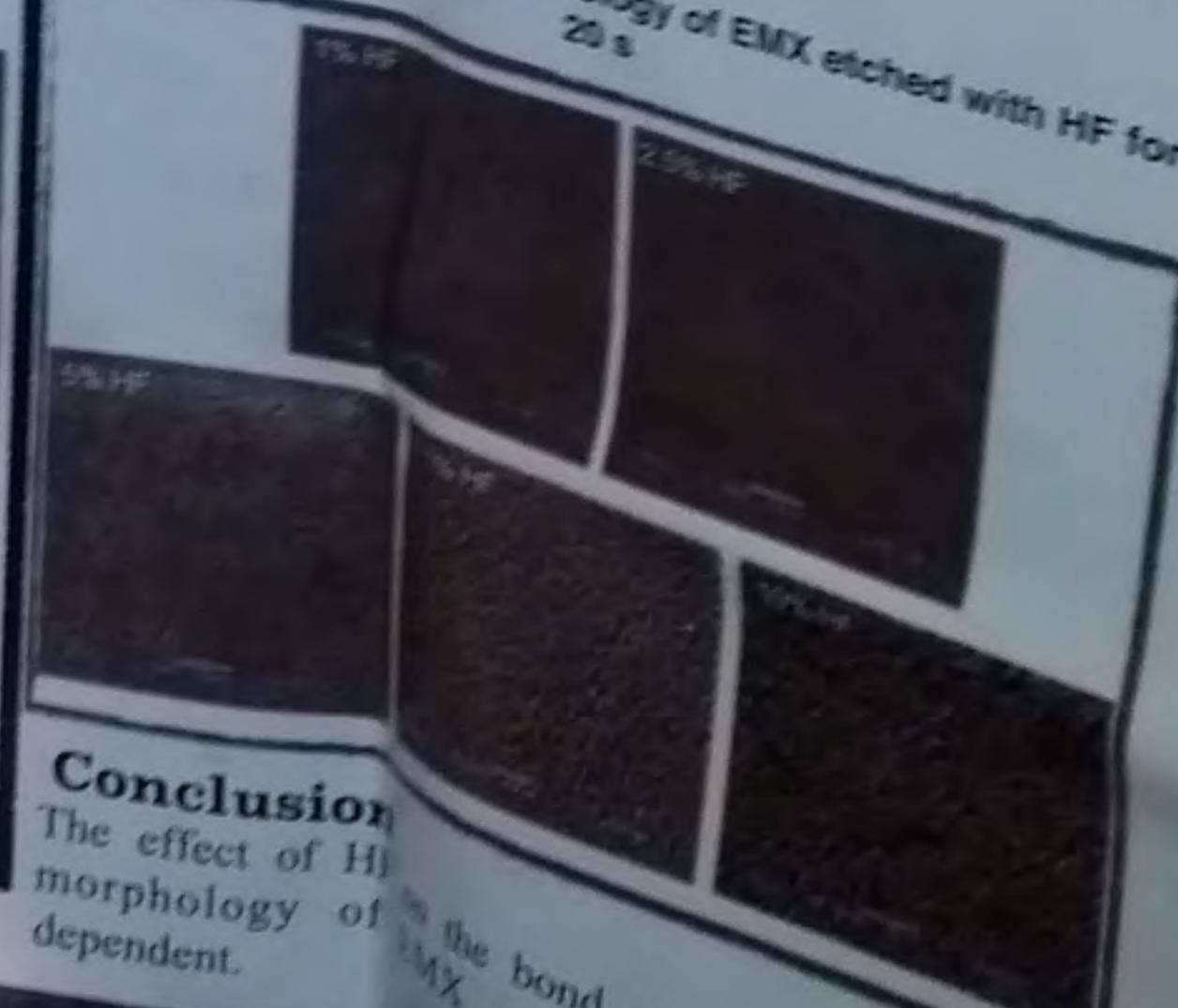
Results

Means of μ SBS (MPa) (Standard Deviations) for all groups

HF (%)	Etching time				
	20 s	40 s	60 s	120 s	20 + 20 s
1%	11.2 (2.1) cC	16.2 (1.1) cB	14.1 (1.9) cBC	22.0 (1.1) bA	16.3 (1.2) cB
2.5%	16.8 (2.6) bB	21.8 (2.9) bA	24.2 (1.2) bA	25.9 (1.3) bA	22.0 (1.8) bA
5%	27.8 (1.8) aA	28.4 (1.2) aA	30.1 (2.2) aA	30.9 (1.4) aA	28.9 (1.7) aA
7.5%	28.1 (1.6) aB	29.9 (1.3) aB	32.3 (1.8) aAB	33.0 (1.6) aA	30.2 (2.2) aAB
10%	31.7 (1.7) aA	31.0 (1.4) aA	32.9 (1.4) aAB	33.8 (1.5) aA	30.7 (1.3) aA

Means followed by different lowercase letters in each column and upper capital letters in each line differ statistically by Tukey's test
 $p < 0.05$.

SEM images of surface morphology of EMX etched with HF for 20 s

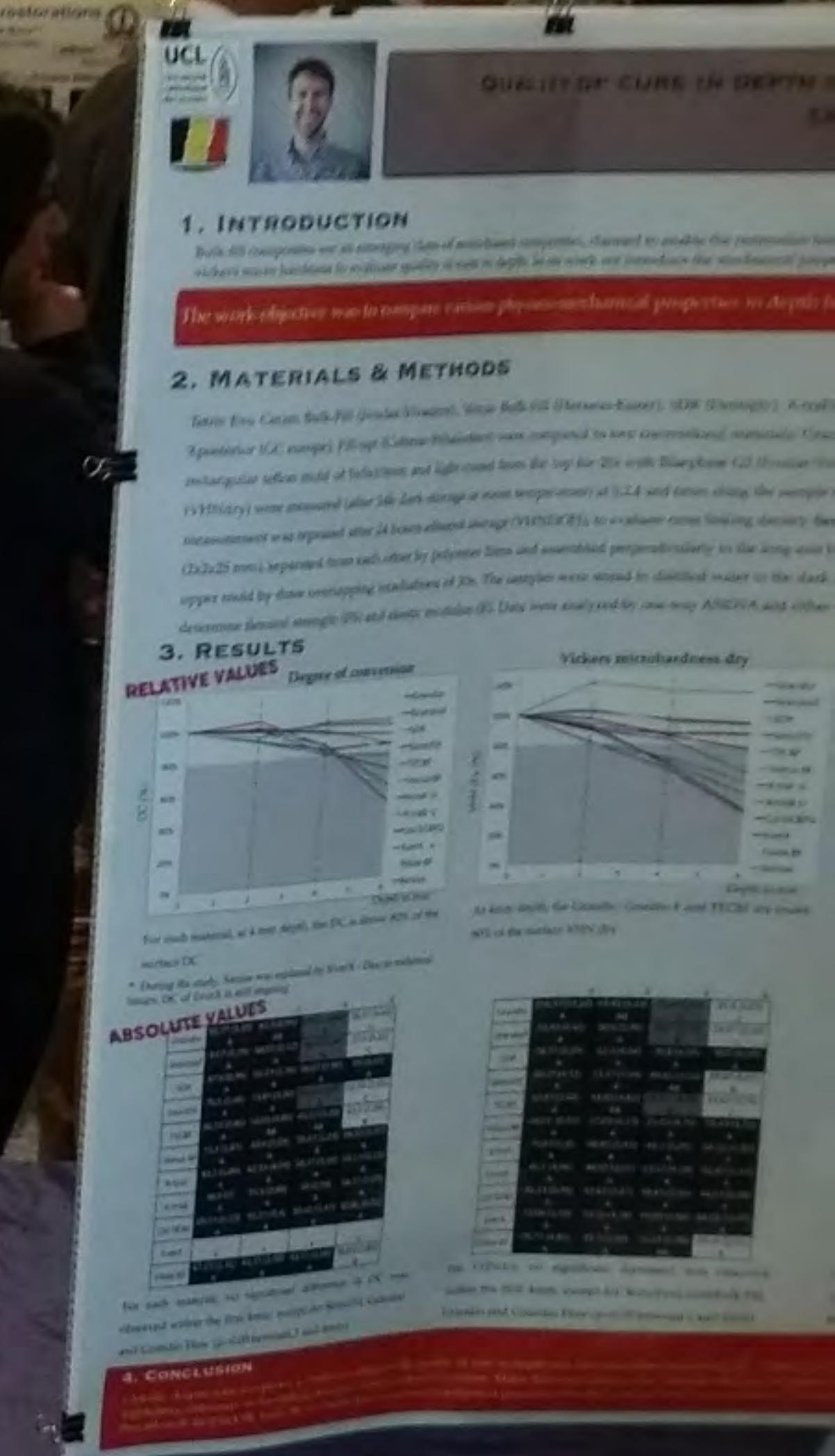
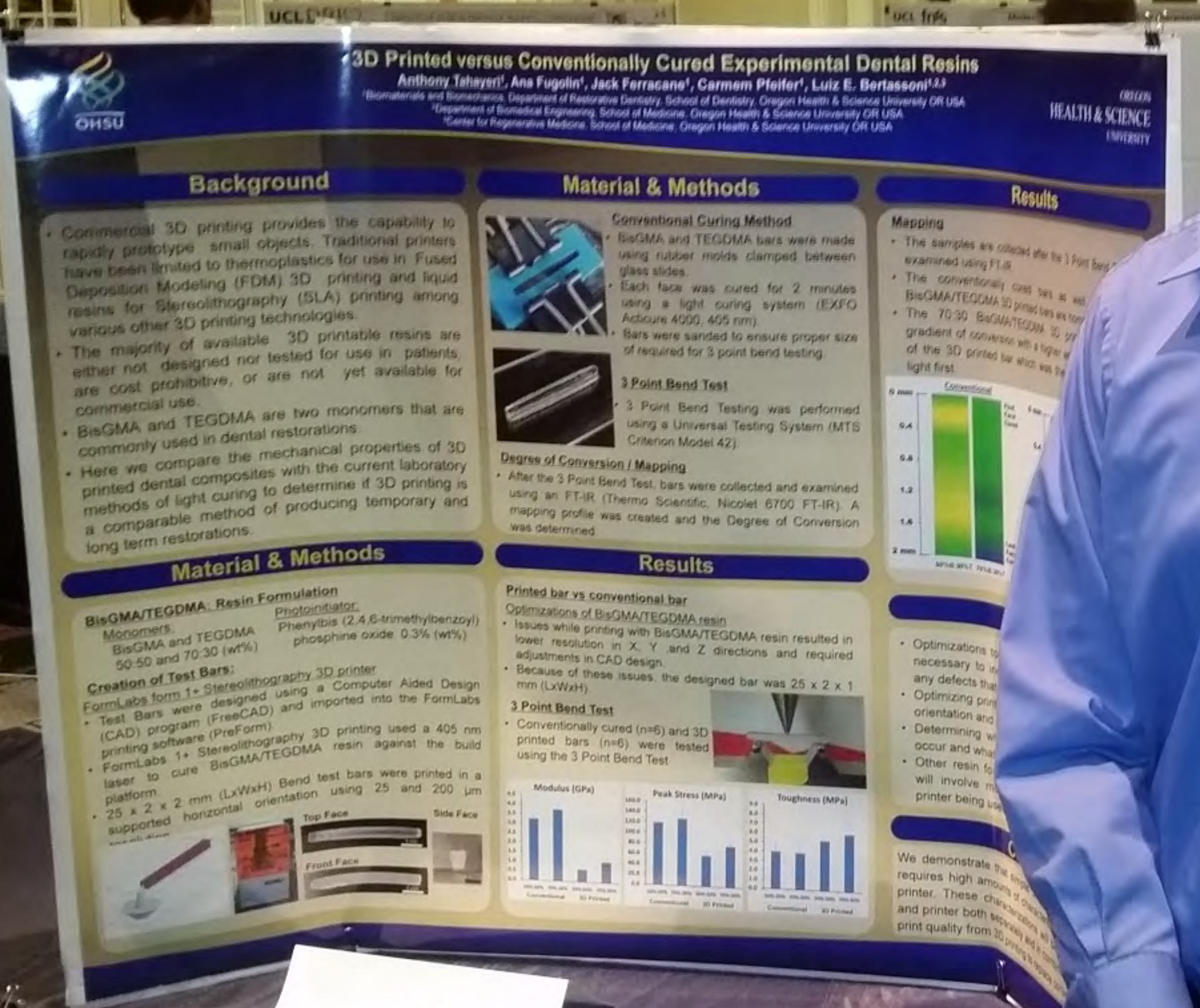
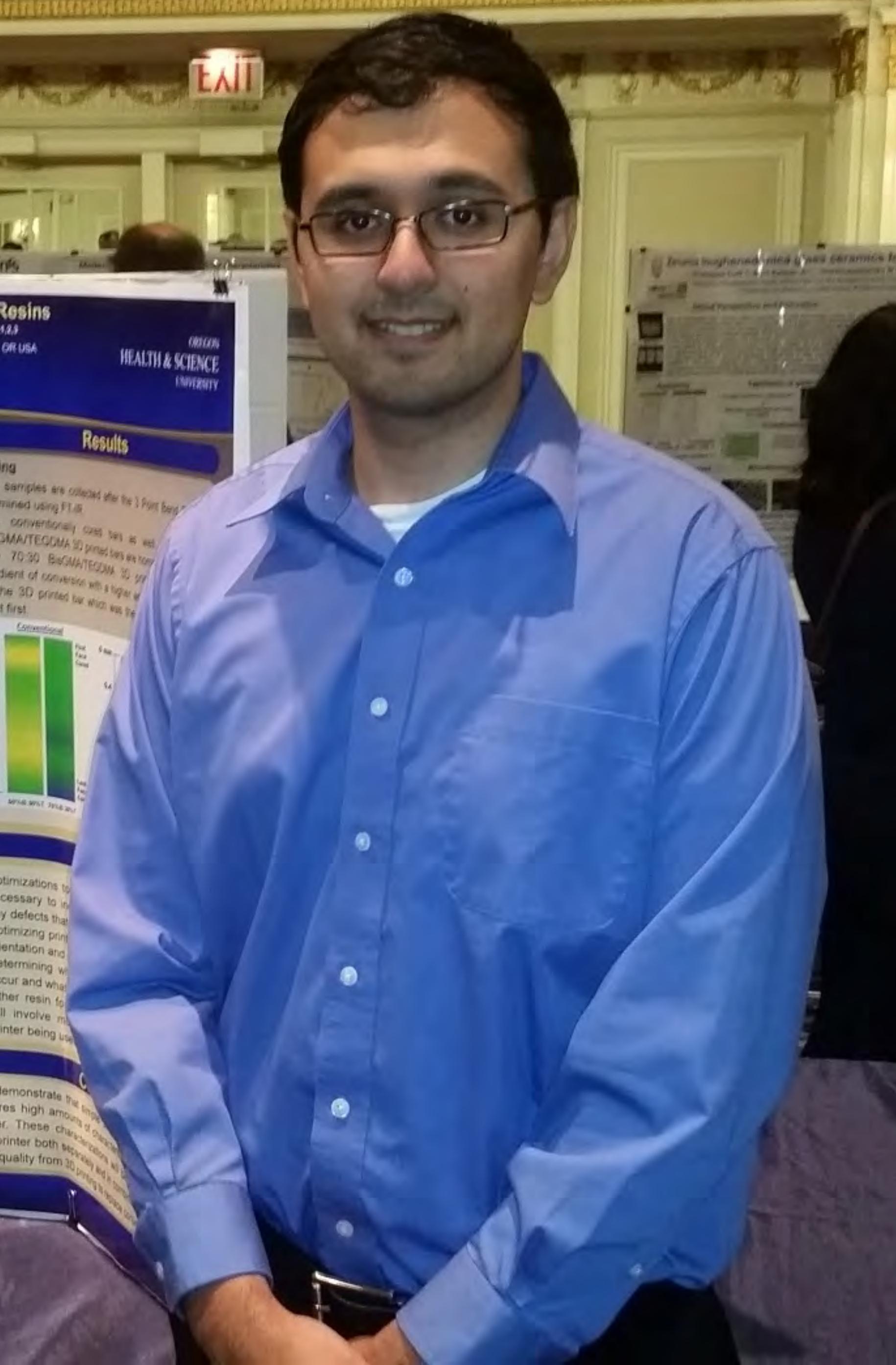


Conclusion

The effect of HF concentration on the bond strength was dependent on the etching time.









RAFFI A.P., RABIER-PERROT E., SENECHAL C., GARNIER-BAILLY M., PERRIN M.
BRUSHLESS AND GLOSS OF LITHIUM-BASED GLASS CERAMICS AFTER POLISHING

Université de Lorraine

Dr. Ingrid Raffi
Université de Lorraine
Institut des Matériaux Jean-Pierre Botta
Lyon, France

In order to evaluate the influence of the polishing process on the surface quality of the glass-ceramic samples, the samples were polished with different polishing systems. The samples were polished with a 20 µm CAU wedge (Series A) and a 200 µm CAU wedge (Series B). The samples were polished with a 20 µm CAU wedge (Series A) and a 200 µm CAU wedge (Series B). The samples were polished with a 20 µm CAU wedge (Series A) and a 200 µm CAU wedge (Series B).

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185 Effect of Pulp-Capping and Filling Techniques on Chamber Heating and Deformation

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Introduction

On deep cavities, the use of capping is used to prevent postoperative sensitivity. The more recently used capping materials had monomers in their composition that require light activation, which may result in shrinkage stress, temperature raise and their clinical consequences. Pulp temperature and deformation is critical and should not exceed the normal values supported by the pulp tissues and by the dentin/composite resin interface. Few studies have reported the effects of temperature rise and dentin deformation within the pulp chamber due to the curing reaction of the capping material.

Objectives

To analyze the effect of pulp-capping materials and composite resin light activation on strain and temperature development into the pulp and at the interface integrity at the pulpal floor/pulp-capping materials in large molar class II cavities.

Experimental design

Methods

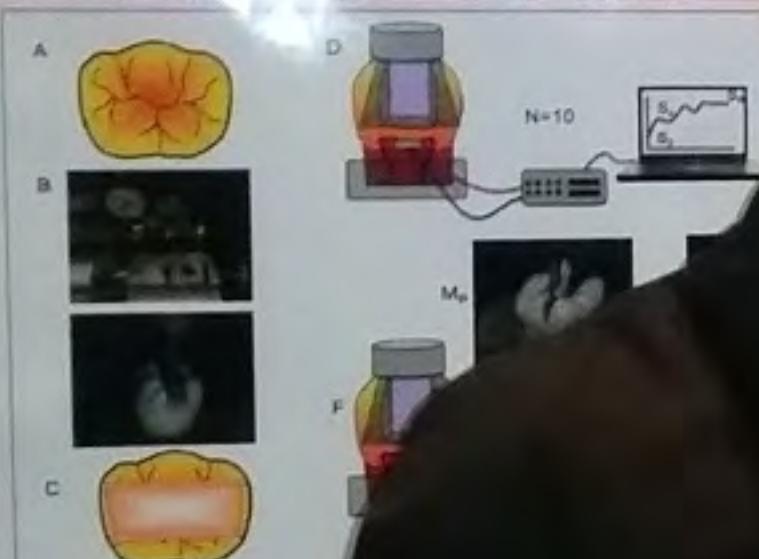


Figure 1. Schematic diagram of the experimental setup:
A. Intact molar;
B. Cavity preparation machine;
C. MOD deep cavity preparation;
D. Measurement of deformation (moment at final restoration);
E. Strain-gauge bonded to the pulpal floor;
F. Measurement of pulpal temperature at final restoration;
G. Thermocouple inserted.

Conclusion

Within the limitations:
1) The light curing of the pulpal temperature;
2) Shrinkage of the composite resin;
3) The self-etching agent used in the chamber;
4) The Biocal had low viscosity.

Clinical Significance

Light curing of pulpal temperature, pulpal temperature and glass ionomer in deep cavity preparation, temperature and deformation.



Piperonylic METHACRYLATE : NEW COINITIATOR copolymerizable with biocompatibility

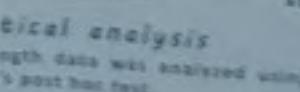
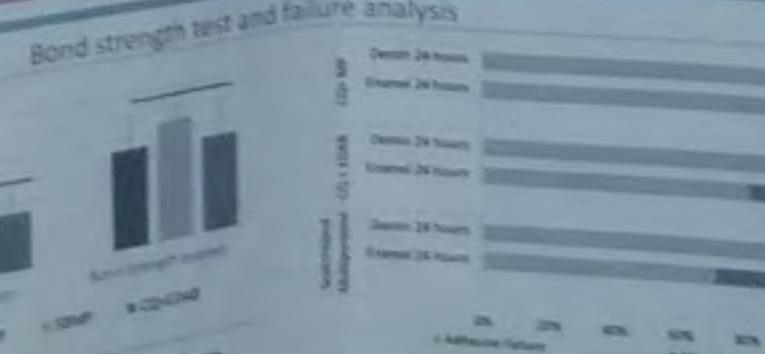
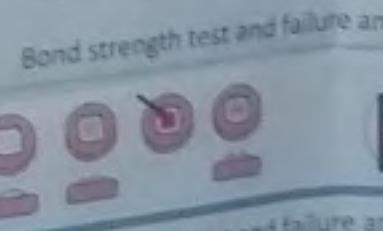
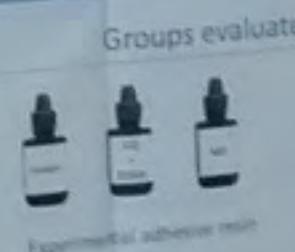
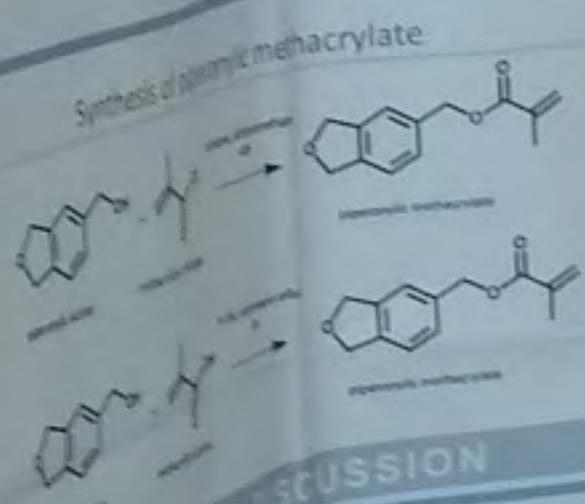
G. Lima * 1, AG Moreira 1, G. Lowe 1, AO Ogliari 1, FA Ogliari 1, E. Piva 1
1-Faculty of Dentistry, Federal University of Pelotas Pelotas - Brazil



OBJECTIVE

The aim of this study was to synthesize a new molecule piperonylic methacrylate and to evaluate its performance as a copolymerizable alternative coinitiator in photopolymerizable dental bonding agents.

MATERIALS AND METHODS

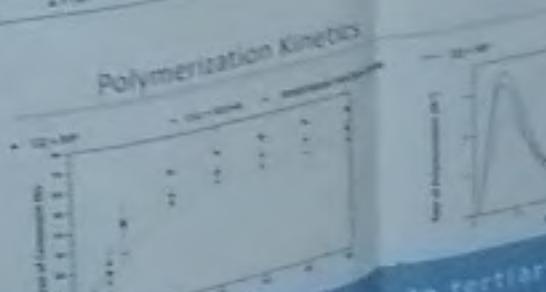


CONCLUSION

RESULTS AND DISCUSSION

Synthesis of piperonylmethacrylate

	Bond
H	6.40 $\text{CH}_2 = \text{CH}$
C	2.1 $\text{CH}_2 = \text{CH}$
C	123.7 $\text{CH}_2 = \text{CH}$
C	17.9 CH_2



The polymerization kinetics showed a similar or superior performance to tertiary amine, with the advantage of their potential alternative reagent photopolymerizable compositions.

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Role of dentin TBS and MMPs activity

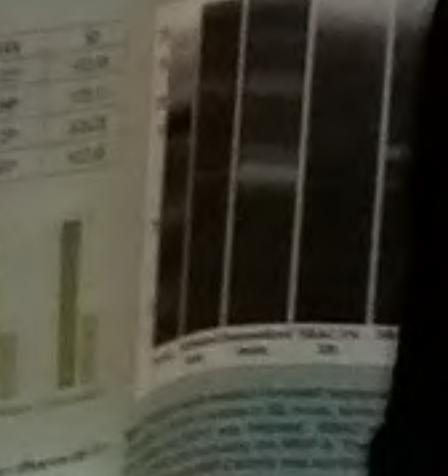
A. Marovic T¹, Oretti V¹, Camara M², Breschi L¹
& Bologna, Italy. ¹University of Bologna, Trieste Italy

Purpose

To evaluate the dentin bonding strength and the mineral loss of a multi-mode universal adhesive system with a bis-GMA (BIS-GMA) resin, universal resin (ESPR) in self-etching mode (SEM) under a dynamic dentin TBS and MMPs activity.

Materials and Methods

30 dentin samples were exposed to the following groups: 10 SEM with 30% phosphoric acid (BIS-GMA) and 20% water. 10 adhesive system (ESPR) in self-etching mode (SEM) with 30% phosphoric acid (BIS-GMA) and 20% water. Bond strength was measured by a BondCheck and Tensile mode at 37 °C. UTM data were recorded after each group.



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ia toughened mica glass ceramics for

Calí*, Ravi Kumar, K**, Sreenivasamurthy, B V*

of Dental Sciences, M S Ramaiah University of Applied

Indian Institute of Science, Bangalore,

Bas g

is a direct and amplifying

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Longitudinal Clinical Study: 3 In office Bleaching Protocols; One Year Follow up

Paulo Eduardo Capel Cardoso¹, Bruno Antunes Lopes, Helena Burlamaqui Porcoli, Flávio Umeda Gentil

¹Biochemical and Oral Biology Department, Dental School - University of São Paulo, Brazil

Background

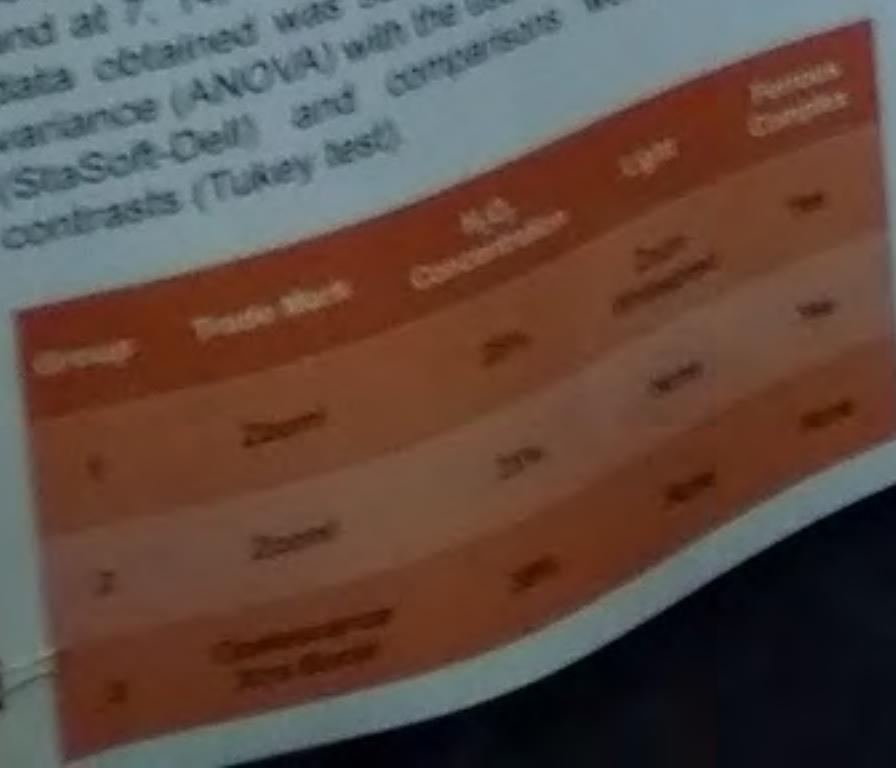
Longitudinal clinical studies, which follow patient over a long period of time are not very common in the dental literature, especially when associated with large samples.

Objectives

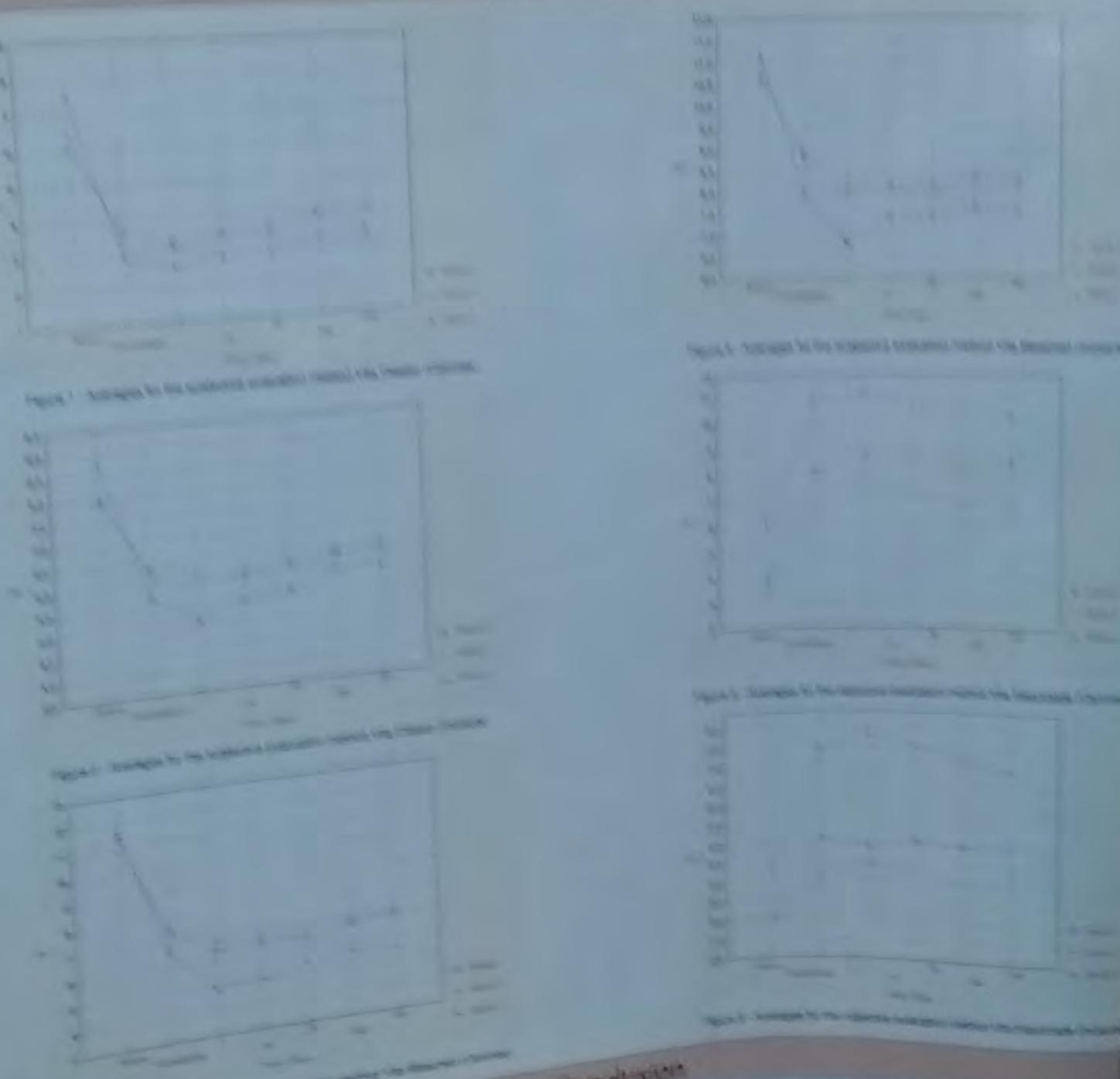
This study evaluated the efficacy and color stability of three in-office bleaching systems over a period of time of 365 days.

Materials and Method

A randomized clinical trial was conducted with 90 volunteers divided into 3 groups (table 1) ($n=30$). Subjects for Groups 1 and 3 underwent a bleaching treatment session according to manufacturer's instructions while an authors variation of the technique was used for Group 2. Color changes were measured using a spectrophotometer (Vita-Esashade) and the shade guides Vita-Classical and Vita-Bleachedguide 3D-Master. Color assessments were made on superior central incisors and canines before, immediately after and at 7, 14, 30, 180 and 365 days post treatment. The data obtained was submitted to statistical analyses of variance (ANOVA) with the use of software Statistica 6.0 (StatSoft-Dell) and comparisons were made using contrasts (Tukey test).



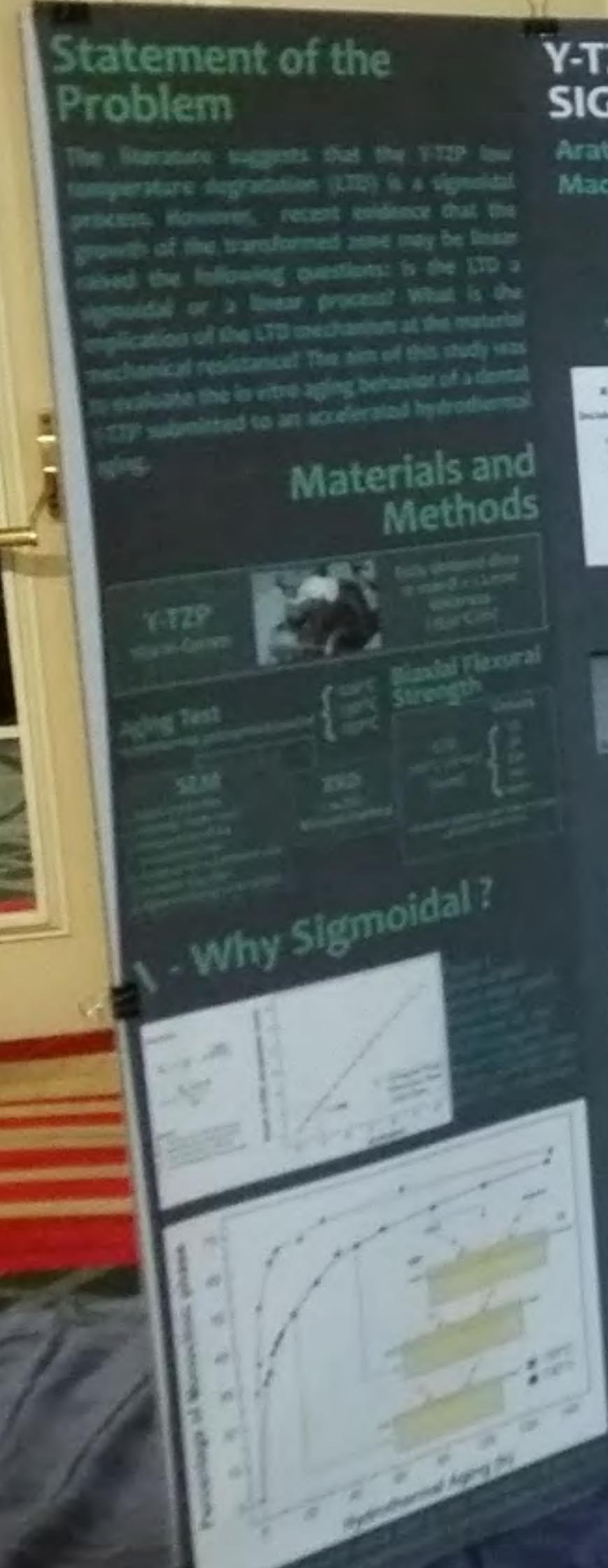
Results and Discussion



Conclusion

Group 1 presented the highest bleaching results and color stability was registered for all the 365-day. In addition it was observed that the visual analyses have less capacity to detect bleaching shade difference than instrumental analysis.





Y-TZP LOW TEMPERATURE DEGRADATION: A SIGMOIDAL OR A LINEAR BEHAVIOR?

Arata A.^{1*}, De Pretto L.R.¹, Ussui V.¹, Lima N.B.¹, Freitas A.Z.¹,
 Machado J.P.B.², Tango R.N.¹, De Souza G.M.¹, Lazar D.R.R.¹

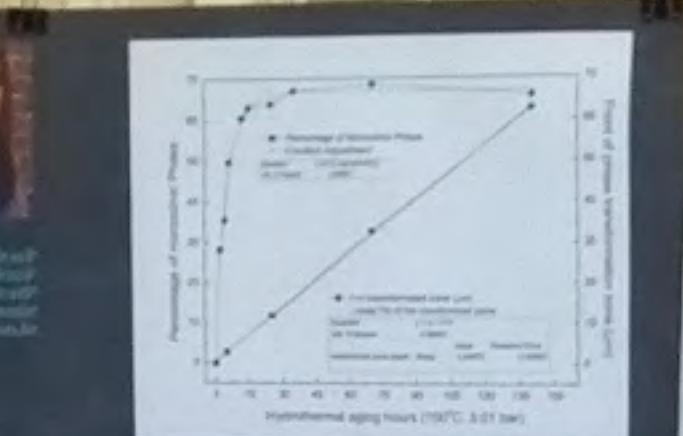
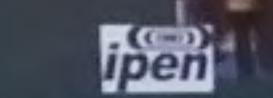


Figure 8: Comparison of the XRD and SEM data of the two phase transformation. The XRD curve (●) shows that the phase was stabilized at 25 hours aging and the linear curve (■) demonstrates that the transformation phase transformation in about 20 hours becomes half.

Table 1: Values of the 1-way ANOVA test for Residual strength ($p < 0.05$).

Source	df	BS	MS	F	p
Hydrothermal aging	4	200002	500002	18.75	<0.001
Error	40	200002	500002		
Total	44				

Table 2: Mean of flexural residual strength as function of hydrothermal aging time at 150°C, 5.01 bar.

Source	Mean Hydrothermal aging time (h)	Depth of the front phase transformation (μm)	Residual Pressure (MPa)	Strength (MPa)	Coef. Variation (%)
1	7	2.25	10	1002	10
2	49.75	2.25	10	1002	10
3	103.50	10.25	10	960	10
4	156.25	10.25	10	960	10
5	210.00	10.25	10	959	10

Table 3: Calculated activation energy of activation based on transition analysis by SEM.

Activation Energy (kcal)
Aging time 27.10 (years)
Flexural Residual Strength = 100 MPa
Flexural Residual Strength = 50 MPa
Flexural Residual Strength = 10 MPa

*A 10% error is used to calculate the activation energy of the transformation.

Table 4: Activation energy of activation based on transition analysis by SEM.

Activation Energy (kcal)

Aging time 27.10 (years)

Flexural Residual Strength = 100 MPa

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Activation Energy (kcal)

Aging time 27.10 (years)

Flexural Residual Strength = 100 MPa





Improving Mechanical Properties of GICs by adding Hydroxyapatite Fluorapatite Nanoparticles

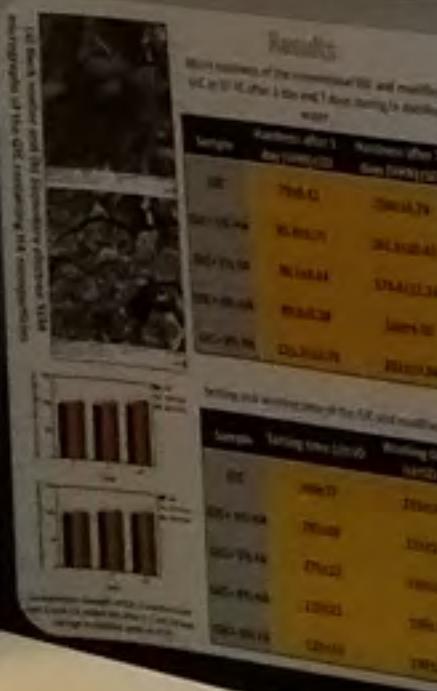
T. Barzegar, M. Khosroo Rad, A. Hosseini, K. Khoshroo, M. Taheri, L. Tayibi
Marquette University School of Dentistry, Milwaukee, WI 53233, USA

Abstract
The objective of this study was to evaluate the addition of synthesized hydroxyapatite (HA) and fluorapatite (FA) nanoparticles to a glass-ionomer cement (GIC) (Fuji II, GC gold label, GC International, Tokyo, Japan) on the mechanical properties, while preserving their unique clinical properties.

Introduction

GICs are water-based materials that set by an acid-base reaction between a polyacidic acid and a basic aluminum glass (1). GICs could be employed in an extensive range of clinical applications because of their ability to have their physical characteristics by changing the powder/liquid (P/L) ratio or chemical formulation (2). Moreover, by addition of a fluorine ion, they display an antimicrobial potential, and they have moderate biocompatibility and hemispherical adhesion to mineralized tissue (3). Nevertheless, GICs are brittle and have poor mechanical characteristics, including low fracture strength, fracture toughness and wear resistance. These properties are their main disadvantages, which limit their wide range of use in dentistry as a fixing material in stress-bearing applications (4).

Hence, the aim of this research was the addition of synthesized HA and FA nanoparticles to the powder of the glass-ionomer cement to assess the effect of these nano components on the mechanical characteristics of the GIC.



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Sneha
Sneha Kelkar
Dentist Student



School of Dentistry

Preparation, mechanical properties of PLGA/layered double hydroxide (LDH) composites microspheres for bone tissue

Kimia Khoshroo¹, Tahereh Soltani¹, Mohammadreza

Abstract

The purpose of this study was to fabricate and evaluate novel three dimensional scaffolds made of poly(lactic-co-glycolic acid) (PLGA)/layered double hydroxide (LDH) composite microspheres for potential bone substitute applications.

Introduction

LDH is a biodegradable polymer that has been developed since the 1960s. It has been used as an organic component of scaffold structures because of its biocompatibility. PLGA has been used with various ceramics to investigate, but to date, LDH has been used as a candidate for a scaffold with PLGA. LDH can be used as a highly porous scaffold. It is currently being evaluated for use in bone and liver system applications to develop a LDH hybrid scaffold to support the bone.

Conclusions

PLGA/LDH composite structure implications as a bone regenerator such as alveolar bone mechanical properties based on PLGA/LDH modulus and of the C for 2 h on the her assay end of



Leticia
Leticia Brancetti
Baylor School of Dentistry



SALES AND CATERING



OLD COAST ROOM



























