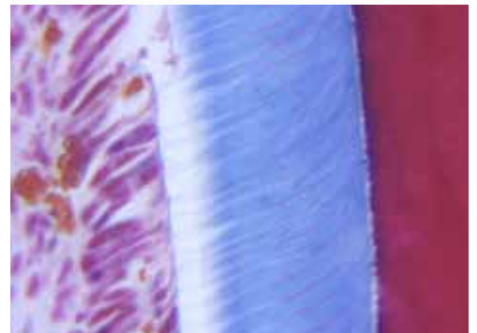


EXPLORER

Journal of USC Student Research



Research Day
February 10, 2010



the **Herman Ostrow**
School of Dentistry
of USC

EXPLORER

Journal of USC Student Research

Publisher	University of Southern California School of Dentistry Student Research Group 925 West 34th Street Los Angeles, CA 90089
Editor in Chief	Heather Stephens
Editorial Board	Weston Carpiaux Nini Hung Bridger Jensen Wilson Jing Issa Kawas Andrew Kiss Nima Mirmoghataei
Faculty Advisor	Dr. Parish Sedghizadeh
Design & Layout	Heather Stephens
Explorer Publication Founder	Dr. Shervin Molayem
Explorer Logo Design	S. Jossein Shahangian DDS

Research Day Planning Committee

Jennifer Bandich	Vanessa Jackson	Kelley Randle
Weston Carpiaux	Bridger Jensen	Dr. Parish Sedghizadeh
Donna Castillo	Meredythe Mann	Brian Steele
Dr. Yang Chai	Jackie Mardirossian	Heather Stephens
Jaime Gonzalez	Tom Nizetich	Dr. Maggie Zeichner-David
	Calen Ouellette	

All views are the authors' and do not necessarily represent those of the student body at the University of Southern California School of Dentistry nor of the editors of the Explorer Journal, unless such statements have been officially adopted by the University. The Explorer Journal editorial board reserves the right to reduce, revise or reject any material submitted for publication. Articles and photos published in the Explorer Journal are the property of the Explorer Journal and may be reproduced or reprinted only after written permission has been granted. The editors and founder reserve the right to accept, reject, discontinue or edit any article, letter, or abstract submitted for publication.

The Explorer Journal is published annually by members of the student body of the University of Southern California School of Dentistry. Any questions may be sent to the Student Research Group at uscsrc@gmail.com

WELCOME TO THE EXPLORER JOURNAL

DEAN AVISHAI SADAN

Dear Colleagues,

The Herman Ostrow School of Dentistry of USC is home to world-renowned research in oral and craniofacial biology, stem cell science, biofilm investigation, clinical inquiry, and more. These diverse research activities present our students with a multitude of opportunities to maximize the depth and breadth of their educational experiences.

As Dean of the Ostrow School of Dentistry, I am extremely proud of our students who take advantage of this rich scientific environment. The ambition and innovation needed for successful scientific inquiry speaks volumes about the talent and dedication of our student researchers, who take their dental education to the laboratory and emerge with a deep appreciation of the science behind the latest advances in craniofacial treatments.

This issue of the Explorer Journal of USC Student Dental Research is a testament to the creativity and hard work of our student investigators, especially the members of the Student Research Group. I invite you all to read on and learn more from the future leaders of dentistry and dental research.

Sincerely,

Avishai Sadan

Dean

G. Donald and Marian James Montgomery

Professor of Dentistry

The Herman Ostrow School of Dentistry of USC



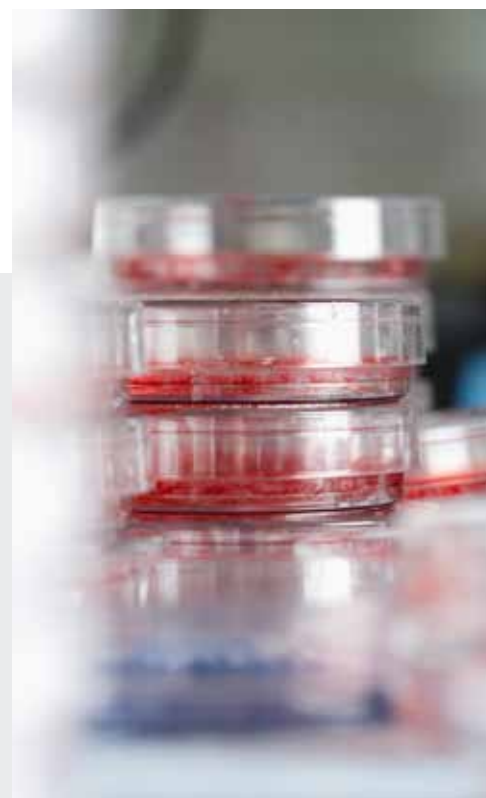
Photo by Philip Channing



Photo by Steve Cohn

RESEARCH AND INNOVATION BY DIVISION

- 6 Division of Dental Public Health & Pediatric Dentistry
- 8 Division of Periodontology, Diagnostic Sciences and Dental Hygiene
- 10 Division of Endodontics, Oral and Maxillofacial Surgery & Orthodontics
- 12 Division of Restorative Sciences
- 14 Division of Biomedical Sciences
- 18 Division of Biokinesiology and Physical Therapy
- 20 Division of Occupational Science and Occupational Therapy



ARTICLES AND FEATURES

- 16 Message from the Student Research Group
- 22 Research Day
- 24 Student Poster Listing
- 32 Summer Explorers Recap
- 34 Guide to Submitting an Abstract in 2011

MESSAGE FROM DR. YANG CHAI

ASSOCIATE DEAN OF RESEARCH

Dear Students,

I am delighted to communicate with each of you about the research opportunities at USC School of Dentistry. Research is the foundation of outstanding oral health care because the advancement of our profession depends upon the generation and dissemination of new and improved knowledge. Training in research will promote professional inquisitiveness, intellectual confidence, and crucial appraisal skills that our dental students will take with them upon graduation and into their practices. At USC School of Dentistry, our faculty and staff are actively involved in conducting research, and exemplify the critical cast of mind that all health care professionals should possess to achieve closer integration among research, education, and clinical practice in order to improve oral health care in the 21st century.



Photo by Philip Channing

Over the years, the collective effort of our faculty continues to place our school among the top Dental Schools in the nation in terms of grant support from the National Institute of Dental and Craniofacial Research, National Institute of Health. The Divisions of Occupational Science and Occupational Therapy (OS/OT) and Biokinesiology and Physical Therapy (BKN/PT) continue to be top-ranked programs of their kind in the nation. In 2009, we have seen enhanced student/resident participation in research as well as a significant increase in funding and high numbers of peer-reviewed scholarly publications. We continue to grow our research in the following areas:

- | | |
|---|--|
| 1) craniofacial genetics and development | 12) mechanism and management of microbial infections |
| 2) stem cells for hard tissue regeneration | 13) saliva diagnostics |
| 4) computer based-learning, | 14) head and neck cancer |
| 5) clinical and translational health sciences | 15) autism |
| 6) health promotion and disease prevention | 16) health disparities/access for underserved populations |
| 7) movement sciences, | 17) health services research |
| 8) rehabilitation science | 18) rehabilitation engineering for aging with a disability |
| 9) graduate/postdoctoral research training | 19) pediatric movement disorders |
| 10) biomedical nanoscience | 20) clinical trials of non-pharmacologic complex |
| 11) biomedical imaging | interventions in neuro-rehabilitation and |
| | musculoskeletal conditions, |

Given the breadth and depth of these research topics carried out by our faculty, there are tremendous opportunities for our students to be involved in the research project of their choice. The research experience will certainly provide our students a competitive advantage in their professional futures. It may also help to open up a future career path not previously considered. I hope that you will take advantage of our ongoing and diverse research projects and enrich your education experience at USC.

Yang Chai, DDS, PhD

George and MaryLou Boone Professor of Craniofacial Molecular Biology

Associate Dean of Research

The Herman Ostrow School of Dentistry of USC

DIVISION OF DENTAL PUBLIC HEALTH & PEDIATRIC DENTISTRY

Update on The Children's Dental Health Project of Los Angeles County

By Andrew Kiss

Recently, the Division of Dental Public Health and Pediatric Dentistry has been focusing its efforts on a large-scale study with profound local significance: "The Children's Dental Health Project of Los Angeles County: The Oral Health Baseline Need Assessment of Underprivileged Children". The following is an interview with Dr. Roseann Mulligan and Dr. Hazem Seirawan, the project co-principal investigators.

What is the overall goal of the project?

The three-phase project was designed to reduce the prevalence of dental caries for underprivileged children in Los Angeles County. The first phase consists of two parts: to measure (1) the oral health and (2) the social determinants of oral health among underprivileged children in the county. The second phase is the intervention phase designed to promote the oral health of children in the county. The goal of the second phase is to measure the available dental resources to treat children in the county. The third phase is the re-evaluation phase designed to measure the success of the intervention.

What is the current phase of the project?

We are at the end of the first phase. Due to the state of the economy and the resulting financial difficulties endured by philanthropic organizations, we are unsure when the intervention is going to begin.

How is this study unique?

This is the first comprehensive study of oral health among underprivileged children in LA County. It focused on minority underprivileged children. The study recruited children from three age groups: 2-5 years old, 6-8 years old and 14-16 years old. The three age groups were selected to sample

children in three stages of dental development: primary dentition (only primary teeth), mixed or transitional dentition (primary and permanent teeth) and permanent dentition (only permanent teeth). The study also measured the children's social determinants of oral health, access to care, oral health behaviors and attitudes toward oral health.

How many children were recruited in your study and where were they recruited from?

More than 2,300 children were recruited. They came from different parts of the county, all the way from Lancaster to Pomona. We recruited the children from 59 sites including Women Infant and Children Centers (WIC), Head Start schools, elementary schools and high schools.

Who funded this project?

The major financial contributors to the project were First 5 LA, the Annenberg Foundation, the California Wellness Foundation and the California Endowment.

Who else supported or helped with the project?

This project is supported by the Children's Oral Health Collaborative, an advocacy group representing many organizations and professionals in LA County that are interested in



promoting the oral health of children. The California Dental Association, all five dental societies in LA County, LA Unified School District, and other school districts in the county also helped with the study.

How did you measure oral health?

We looked at the prevalence of untreated caries including white spot lesions (early stage of caries showing enamel demineralization); we also looked at caries experience or the presence of previous fillings and crowns, the presence of sealants, periodontal health and occlusion. The examiners evaluated each child for the urgency of the dental care needed as immediate (within 24 hours), early care needed (with 15 days), or routine care needed (with 6 months).

Who actually conducted the study?

Two calibrated USC faculty dentists Dr. Sherry Faust and Dr. Ana Wannarka examined the children. This is one of the major strengths of the study since in most other studies the subjects are examined by dental hygienists/assistants, nurses or community volunteers. Dr. Julie Jenks, a USC faculty and pediatric dentist, calibrated the examiners. The co-principal investigators were Dr. Roseann Mulligan and Dr. Hazem Seirawan from USC along with Dr. James Crall from UCLA as a study co-investigator.

Were students involved in the project?

A number of USC dental students helped in facilitating the exam, managing the children at the site and translating. The project team was pleased to hear the many positive feedback from the students about their experience in the field.

Can you describe the social determinants of the children?

The parents were asked to complete a questionnaire about their child's and family's health and social circumstances, including access to care, oral health behaviors and attitudes toward oral health. The majority of the children in the sample were poor with 80% of the children living in homes with household incomes of less than \$35,000 per year.

How did the study exam benefit the children?

The dentists provided oral health education to the children, gave them oral hygiene supplies (toothbrush, toothpaste, floss etc.) and brochures about oral health promotion. The dentists provided the parents with written feedback about the oral health of their children. When children had need for oral care, they were referred to free or low cost dental clinics in their neighborhood.



What were some of the challenges you faced?

Some schools were not interested in participating and we had to send our faculty to the schools to explain to the principals, the teachers and the students the importance of the project and oral health in general. This worked well and resulted in increased participation and motivation.

What is the major finding of this study?

There is a significant epidemic of dental caries in the county. Almost three in four children have untreated dental caries. The results will be published in a peer-reviewed journal in the near future.

Can you describe the next phase of the project?

The second phase of the project is the intervention phase. In summary, this phase will focus on: 1) partnering with community health centers to establish dental homes in conjunction with medical homes that will serve the oral health needs of underprivileged children; 2) supporting a more concrete involvement of the primary care providers and community health workers in the promotion of oral health among those children; and 3) increasing the number of preventive dental measures provided to children (such as sealants and fluoride varnish).

DIVISION OF PERIODONTOLOGY, DIAGNOSTIC SCIENCES AND DENTAL HYGIENE

Spotlight: Research Advances

By Wilson Jing

The University of Southern California's periodontology division at the School of Dentistry has been a perennial vanguard of the field, leading research and innovation. The USC-led publication, *Periodontology 2000* is the top dental research journal in three measurement categories: impact factor, immediacy index and article influence. This incredible honor was largely due to contributions by the USC faculty, with Dr. Jorgen Slots serving as the editor-in-chief and research publications from 25 faculty members over the past 17 years. Currently the periodontal faculty is researching the pathogenesis of oral diseases, developing new disease models, integrating cutting edge treatment technology and promoting worldwide public health programs.

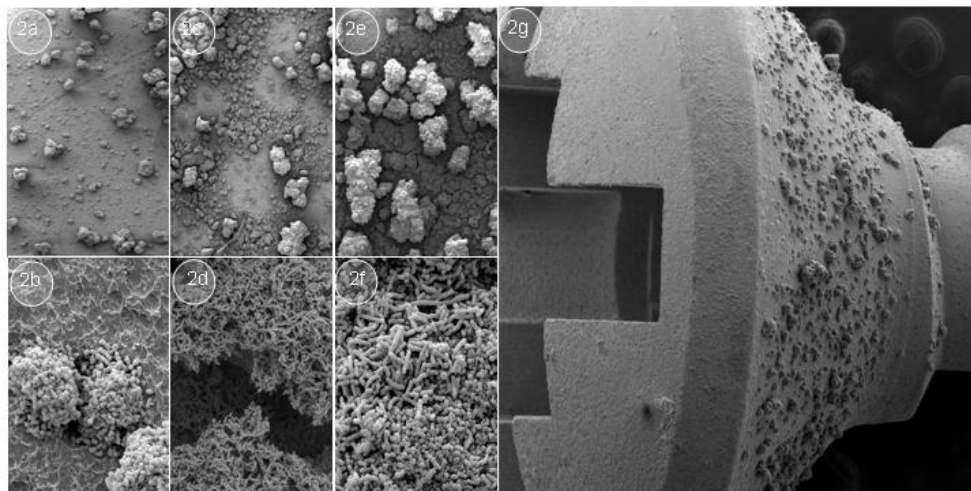
Dr. Jorgen Slots was one of the pioneers who shifted the concept of pathogenesis of periodontitis from the bacteriologically non-specific to the specific plaque hypothesis. In fact, he named *Porphyromonas gingivalis*, one of the most important bacteria involved in the progression of periodontitis. Currently his research focuses on the role of herpesviruses in periodontal disease. Inflamed periodontium during the progressive phase of periodontal disease shows higher incidences of Epstein-Barr virus and cytomegalovirus accumulation and activation. Active herpes viral infection seems to correlate with disease-active periodontitis disease activity and may be a major contributor to the periodontal immune response. The herpesvirus therefore may induce periodontitis by activating immune responses involved in specific tissue-destroying pathways and by predisposing an individual to bacterial carriage or increased bacterial load. The viral interaction with bacteria adds another aspect to the etiopathogenesis of periodontitis which is already believed to include the interplay between bacteria, manipulation of host cell and the immune response.

Reactivation of the herpesviruses can trigger the progression of periodontitis through direct interactions with periodontal cells and indirectly creating suitable environments for the colonization and multiplication of pathogenic bacteria.

Herpesviruses induce pro-inflammatory cytokines having the capability of activating osteoclasts and matrix metalloproteinases. Active herpesviral infection can impair anti-bacterial immune mechanisms encouraging the growth of periodontopathic bacteria. However, the periodontopathic significance between herpesviruses and bacteria is unclear, because certain periodontopathic bacteria may contribute to the re-activation of the herpesvirus. In order to differentiate whether re-activation of the herpes virus is an etiology of destructive periodontal disease or simply an epiphenomenon to gingival inflammation, if etiologically important, the removal of virus must demonstrate reversion or prevention of periodontitis. The development of efficacious anti-herpes viral vaccines in the near future, will further pathogenic research and may offer real hope of obtaining preventive techniques that can achieve a long-lasting state of stable periodontal condition. Control of herpes viruses by vaccination may foreshadow a future with a diminishing role for the traditional periodontal therapies of surgery and antibiotics.

Taking another approach to understand the pathogenesis of periodontitis, Dr. Homa Zadeh is working with other specialists at the USC School of Dentistry to develop an innovative animal model for oral biofilms research. Biofilms play

an important role in the development of oral infections such as periodontitis and peri-implantitis. However, the etiology and pathogenesis of organisms that inhabit oral biofilms remain unclear because of the lack of suitable study models. Previous attempts to establish biofilms in rodents involved the inoculation and injection of pathogens in the oral cavity. However, because of injected pathogen



In vitro establishment of *A. actinomycetemcomitans* biofilm on titanium grit blasted & acid-etched treated surfaces. Small agglomerates of *A. actinomycetemcomitans* biofilm are seen on implant surfaces after one day of culture (2a, 500µm; 2b, 10µm). Large numbers of biofilm clusters are seen to cover most of the surface of treated implants (2c, 500µm; 2d, 5µm) after two days of culture. After three days of culture acid-etched implant surfaces are covered (2e, 500µm; 2f, 5µm) with dense, multilayered biofilm mostly formed on implant shaft region (2g ; 500µm). Photo courtesy of Marcelo Freire.

interaction with indigenous flora, desired oral biofilms were difficult to establish. Even when periodontitis occurred within the oral cavity, injected bacteria are rarely recovered from the inoculated animal. In order to develop an appropriate model, the project required expertise in surgery, biofilms, imaging and bacteria pathogenesis. The interdisciplinary collaboration between **Doctors Homa Zadeh, Steven Goodman, Parish Sedghizadeh and Casey Chen** created a technique to establish biofilm transmucosally in rats by titanium oral implantation. The titanium implants were inoculated with *Aggregatibacter actinomycetemcomitans* (A.a), a bacterium implicated in severe forms of periodontitis, and cultured for three days. Following the cultivation, live/dead staining of the biofilm showed majority (75% with uncompromised membrane integrity) of bacteria that covered the titanium surface continued to thrive. The implants were inserted into the

maxillary alveolar ridge of the palate and followed for 48 days. 2 days after implantation, clinical signs of inflammation, erythema, edema and bleeding appeared on biofilm-inoculated implants. The presence of A.a was detected through PCR and culture 6 weeks after implantation affirming the persistence and progression of interested bacteria. 5 of the 15 rats that underwent implantation with A.a biofilms died due to disseminated foci of infection with detectable A.a purulence.

The results have shown that the nano-textured implant surfaces favor the establishment of *Aggregatibacter actinomycetemcomitans* biofilm. The introduction of bacteria biofilms has both local (inflammation and bone loss) and systemic (bacterial dissemination) manifestations. The periodontitis animal model will give scientists a dependable technique to assess the pathogenicity of specific bacteria and elucidate their pathogenic mechanisms. The future direction of Dr. Zadeh's research will involve the utilization of this periodontitis

animal model to investigate local and systemic T-cell responses to A.a, bacterial virulence molecules responsible for modulating the T-cell response and therapeutic strategies to control A.a biofilm mediated peri-implant infections.

In true fashion of combining cutting edge technology and innovation, **Dr. Parish Sedghizadeh** is currently working on the application of nanosecond-pulsed cold plasma for microbial sterilization. Plasma is the fourth state of matter and usually exists under extremely high temperatures and pressure. However, within the last few decades, physicists and engineers have developed non-thermal or cold plasma, that exists at room temperature and atmospheric pressure. Electrical current is sent in nanosecond pulses through gas to create plasma or ionized gas particles. Dr. Sedghizadeh is working with an oxygen gas based plasma discharge

(continued on page 31)

DIVISION OF ENDODONTICS, ORAL AND MAXILLOFACIAL SURGERY & ORTHODONTICS

Interview with Dr. Anh Le, DDS, PhD

By Bridger Jensen

“In order for you to explore and expand your field you need to have a research component as well as clinical application”

When I met with Dr. Le to discuss her current research projects, I had no idea what powerful applications research has to clinical medicine. One of the questions I asked was, “Do you miss seeing patients on a regular basis?” Her quick reply was, “No. I spend half of my time doing bench top research and half of my time doing clinical work.” I was amazed to hear that one individual could tackle the challenges of bench top research and clinical care for patients.

She explained, “I choose to be active in both areas because my research advances my understanding of clinical treatment. As a clinician, you are trained in specific protocols and ways to manage patients. However, in order to improve and advance your field research is an important component.” Without current research, textbooks remain the same and show no advancement. Dr. Le said, “In order for you to explore and expand your field you need to have a research component as well as clinical application”

A constant search for new ways to approach therapeutic treatment, and new explanations of mechanisms of pathophysiology of disease allow for advancement within our field. One example of this that Dr. Le shared with me is the treatment of aggressive benign tumors. Traditionally, major resection of the jaw was necessary to treat the mass effecting both the esthetic and functional outcomes to the patient were standard treatment. The textbooks we currently have instruct us to treat with resection

in order to prevent recurrence. However, if we understand the pathophysiology of the disease we can alter the clinical outcome. In this field she described, there has been progress. Where we used to resect, now certain tumors, such as giant cell granuloma, we can inject with different compounds, like interferon, to shrink down the size of the tumor. By doing, this it is now possible to save a higher level of tissue surrounding the tumor. Operating in the facial region presents challenges because it is highly esthetic as well as functional. New approaches allow a better outcome in both areas.

Dr. Le reported, “As a result of research we have now changed the way we treat it (giant cell granuloma.) Right now we stage the treatment. Shrinking the tumor with different reagents and then approaching surgically to minimize the loss of facial tissue maintaining both the esthetic and functional components of the facial region.”



BENCHTOP

Dr. Le also described how pharmacological approaches can be changed when the understanding of the biology of a pathological state is clear. In the pharmacological treatment of rheumatoid arthritis, there are inflammatory cytokines that play a big role in prolonging the inflammation of the joint. Traditionally these disorders are treated with a non-specific anti-inflammatory medication. Now, we understand the biology of the disease and a pharmacological approach can be designed to specifically target the inflammatory cytokines, minimizing side-effects. Research benefits not only the field of study but flows into other areas. The above mentioned example was based in rheumatology; however, we in the dental field benefitted from this advancement because the medication could be used also to treat the temporomandibular joint.

Dr. Le described the excitement she feels going into clinic to treat and take care of her patients, "I treat them based on my training and experience. Being a researcher challenges you to think a little more and

design an approach which is specific to this patient. Because I have a research background I am guided to customize my treatment. A treatment based upon reason. My research has allowed me to take a step back from clinical procedure and think

critically about how to solve a problem. Clinical work has guided my bench

top work and

bench

top

work has

guided my

clinical treatments."

I am grateful for the opportunity I had to meet and interview Dr.

Le. She has strong ties to

both research and the clinical application of her science. She

has shown me how a health care professional can benefit from working

in both areas and more importantly how patient care is improved because of it.

BEDSIDE

Dr. Le is an attending physician at LAC+USC Medical Center.

Her current research projects include:

Gingiva Derived MSCs: Role in Immunomodulation and Tissue

Goal: The objective of this project is to isolate gingival stem cells and study their immunomodulation characteristics. Sponsor: NIDCR/NIH

AAOMS Research Summit: Translational Research from Bench To Bedside Principal

Goal: The major goal of this project is to provide an interactive scientific forum to experts from different disciplines and to foster the career development of young clinician-scientists in Oral and Maxillofacial Surgery. Sponsor: NIH

Inflammatory Biomarkers and HPV-Associated Oral Pre-Cancer

Goal: The objective of this study is to determine whether HPV is related to oral pre-malignant cancer and oral cancer in minority patients living in Los Angeles County and to identify inflammation-associated biomarkers as diagnostic and prognostic tools for oral cancer progression. Sponsor: National Cancer Institute

Chemoprevention of Oral Cancer with BBIC

Goal: The major goal of this phase IIb trial is to determine the effect of oral BBIC, a purified soybean extract, in oral cancer prevention. Sponsor: National Cancer Institute

Hypoxia regulation of VEGF/VEGF receptors in Keloids

Goal: The major goal of this project is to study mechanism of hypoxia induced up-regulation of VEGF and its receptors in keloid dermal fibroblasts and microvascular endothelial cells and how these pathways contribute to ECM accumulation. Sponsor: National Institute of Arthritis and Musculoskeletal and Skin Diseases

Scarless Wound Repair

Goal: The major goal of this project is to study the effect of fibromodulin, a TGF beta modulator, on the healing and inflammation of incisional and excisional wounds in an animal model. Sponsor: National Institute of Arthritis and Musculoskeletal and Skin Diseases

DIVISION OF RESTORATIVE SCIENCES

An excerpt from: The Adhesive Revolution – How New Biomimetic Concepts are Changing the Face of Restorative Dentistry

By Maria Paula Paranhos* DDS, MS, Visiting PhD student

Since the early 1990's, Dr. Pascal Magne has focused his attention on "Biomimetic Dentistry", which consists of restoring the biomechanical, structural and esthetic integrity of the teeth in a conservative way. This conservative dentistry is ruled by preservation of as much natural tooth structure as possible and can be predictably achieved due to improvements and understanding of dental materials. Dr. Magne is the Don and Sybil Harrington Professor of Esthetic Dentistry at USC and runs *The Center for Esthetics and Biomimetic Restorative Dentistry (CEEBRD)*. In the past years, this Center has received various research collaborators from all over the world as well as predoctoral dental students, who have been developing cutting edge research to find conservative solutions to restore teeth and dental implants within the biomimetic principle.

Type III Veneers Bonded To Custom Implant Zirconia Abutments

In addition to studies involving the dental structure, the researchers at CEEBRD also study advances associated with implant based restorations. New approaches, combining custom abutments and adhesively placed veneers (Magne et al., JPD 2008), have been evaluated. Since the interest for zirconium oxide (zirconia) ceramics has grown significantly in the past decade, a major trend is the use of zirconia implants and implant abutments. Therefore, bonding to zirconia has represented a major focus in research. The mechanical properties of zirconia, combined to its biocompatibility and optical properties, have justified its use as a metal-free alternative for a wide array of applications. These applications include implant dentistry (fixtures and abutments), prosthodontics, orthodontics (brackets), and restorative dentistry (intraradicular posts). One of the limitations regarding the use of zirconia ceramic restorations is that it is not originally intended to be adhesively cemented. Reliable and stable bond to zirconia, however, needs to be achieved in situations where retention of the restoration relies primarily on adhesion, such as partial veneers and resin-bonded FPDs. Dr. Paranhos developed a series of studies where micromechanical (abrasion methods and laser treatments) and chemical strategies (special zirconia primers) were tested in order to find the best adhesive protocol to restore non-retentive zirconia abutments.

Once the best resin-to-zirconia adhesive protocol was established, the fatigue resistance and failure mode of type III CAD/CAM veneers (porcelain versus composite resin) bonded to non-retentive custom zirconia abutments was

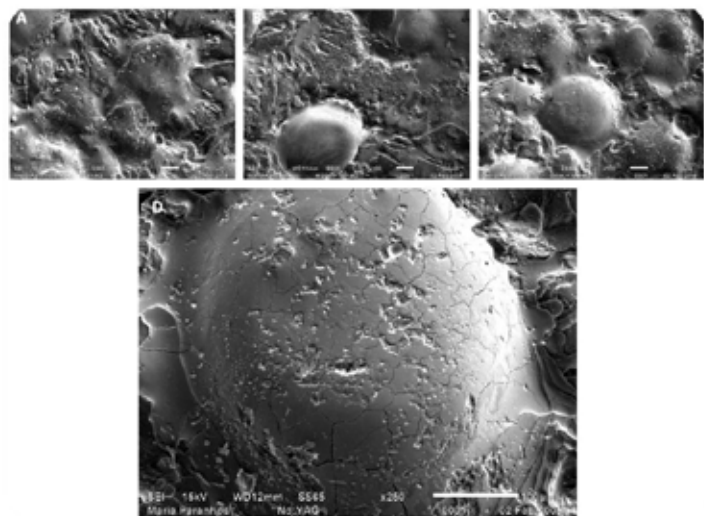


Fig 1 – Scanning electron micrograph of zirconium oxide ceramics impacted with Nd:YAG laser (Paranhos et al., 2009 – submitted for publication)

assessed. The results of this study demonstrated that the type III CAD/CAM porcelain and composite resin veneers showed similar fatigue resistance when bonded to non-retentive zirconia abutments. The most interesting finding in their study is that the resin-to-zirconia bond strength was strong enough to cause cohesive failures in the abutment. Additionally, the composite resin CAD/CAM restorations presented a higher percentage of “friendly” and reparable failures, protecting the abutment. Future research following the same principle of custom abutments is being carried out by Dr. Oderich and Dr. Boff, in posterior teeth. They have been evaluating the fatigue resistance of onlays bonded to custom zirconia and composite resin abutments.

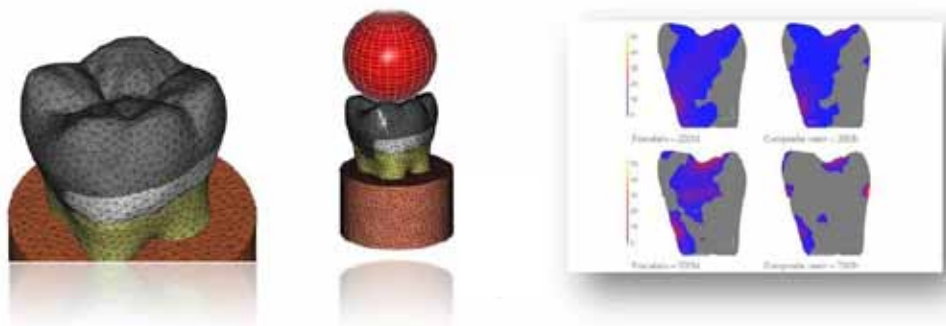


Fig 2 – Type III veneer restoration and custom zirconia implant abutment (Magne et al., 2009 – in preparation)

Virtual Prototyping And Simulation

The CEEBRD, in a thorough collaboration with the industry, is also building significant in-roads in restorative dentistry by combining the use of CT scan data, a medical interactive image control system (Mimics/3-matics, Materialise), and advanced stress simulation software (MSC Marc/Mentat) to generate virtual models of teeth and restorative conditions. The goal of this research, which uses tools from the aerospace and automotive industry, is to propose continued development regarding the facilitation and acceleration of geometry acquisition/modification during the fabrication of virtual models of tooth restorations. The presented method is based on stereolithography (STL) and surface-driven automatic meshing. Advances in virtual prototyping not only facilitate optimization and understanding of biomedical devices but will soon allow us to create patient-specific numeric models from any body part using either MRI, micro-CT or cone beam CT data. For the restorative dentist, the ability to predict tooth/restoration failure is an example of the diagnostic value of virtual prototyping.

Fig 3 - Virtual model of a restored tooth and stress distribution comparisons in simulation software (Magne, JPD 2009 - submitted for publication)



The CEEBRD team includes Dr. Pascal Magne, Dr. Luis Henrique Schlichting, Dr. Maria Paula Paranhos, Dr. Elisa Oderich, and Dr. Luis Boff.

**Dr. Paranhos is a PhD student at the Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, Brazil
CAPES Foundation Brazil – Grant number BEX-1184-08-3*

Dr. Michael Melnick and Dr. Tina Jaskoll, members of the of the Biomedical Sciences Division, work together in the USC Laboratory For Developmental Genetics. Currently, there are several projects involving the wide reaching effects of Cytomegalovirus infection underway in their lab. This research is made possible by the collaboration of USC faculty involved in microbiology, oral pathology and craniofacial development.

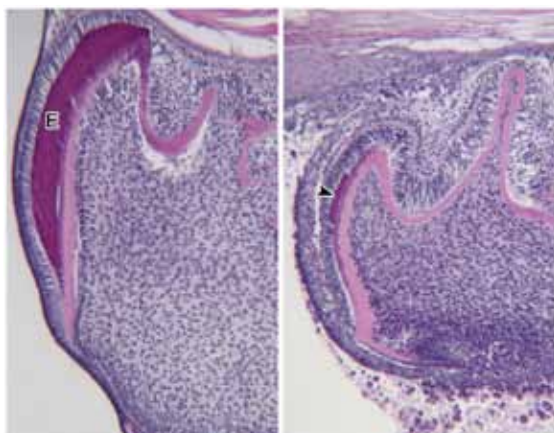
Cytomegalovirus and Oral Pathology

Cytomegalovirus (CMV), an enveloped, double stranded DNA betaherpesvirus, is species-specific and has a slow replication cycle. Nearly a century ago, pathologists reported that postmortem examination of infants less than 1 year of age often revealed large cells containing intranuclear and cytoplasmic inclusion bodies in submandibular salivary glands and, less frequently, in livers, lungs, kidneys, pancreas and thyroid. The large cells (“cytomegalia”) were found in acini and ducts of the infected salivary glands and the ducts were often dilated. By the 1950s, human CMV was isolated and it became apparent that CMV infection was common (from birth to adulthood). CMV establishes a long-lasting persistence in salivary glands and the virus is shed in saliva for months to years before termination of

productive infection and establishment of latency. Human clinical studies and mouse models clearly demonstrate that CMV disrupts organ and tissue development, most frequently that of the central nervous system (microcephaly, mental retardation, deafness and blindness). About 1 in 500 newborns will exhibit major CMV-induced congenital pathology, making CMV one of the most common causes of major birth defects in humans. Recent studies in our laboratory has demonstrated that branchial arch derivatives (submandibular salivary gland, mandible, and teeth) are vulnerable to CMV infection during critical stages of their organogenesis, and that CMV has a particular tropism for neural-crest-derived ectomesenchyme.

CMV and Deafness

Congenital cytomegalovirus (CMV) infection is the most common non-genetic cause of sensorineural hearing loss (SNHL) in children, accounting for between 20 and 60% of all SNHL. It is estimated that at least 8000 infants born annually in the US will have congenital CMV-induced SNHL, with a significant proportion of these children exhibiting delayed onset and progressive deterioration of hearing after the newborn period. Currently, little is known about the mechanism underlying CMV-induced birth defects. Since in utero CMV infection causes SNHL whereas postnatal infection does not, we postulate that CMV-induced cochlear malformations are caused by viral-induced dysregulation of multiple host (embryonic) cell signaling pathways essential for normal cochlear morphogenesis. Our laboratory has recently developed a novel mouse embryonic organ culture model of CMV-induced co-

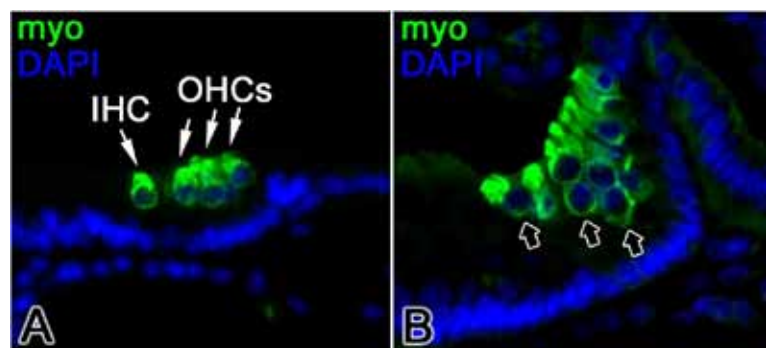


Above: CMV infection of embryonic mouse mandibular first molars in vitro induces tooth dysmorphogenesis and enamel (E) defects. CMV-infected molars are characterized by marked decreases in cusp size, mineralized dentin matrix, enamel (arrowhead) matrix, and root formation as compared to controls.

chlear malformations which mimics the pathology seen in children with congenital CMV infection and are using this in vitro embryonic model to study the molecular pathology of the CMV-induced cochlear abnormalities. Long-term, our goal is to identify the molecular mechanisms underlying CMV-induced cochlear dysmorphogenesis and identify key cellular targets against which new cochlear-specific, postnatal therapies can be directed. This is clinically important because the prevalence of CMV-induced SNHL is considerable, present antiviral therapies are teratogenic in themselves, and long-term use of current antiviral drugs by infected children present serious safety concerns. (Supported by NIH grant R21 DC010424).

Systems Biology

The expression of an individual gene in a developing organ is not a soliloquy; rather, it acts in a chorus of quantitative functional relations appropriately termed a genetic circuit or network. It is the task of systems biology to quantitatively define and analyze the parts (subcircuits) of the whole, the goal being to put it together in the future. Two effective strategies have emerged: (1) infer biologic pathways from large data sets and increasingly powerful tools for managing and searching literature and pathway databases; (2) construct and test increasingly complex mechanistic models of biologic systems. Our laboratory combines

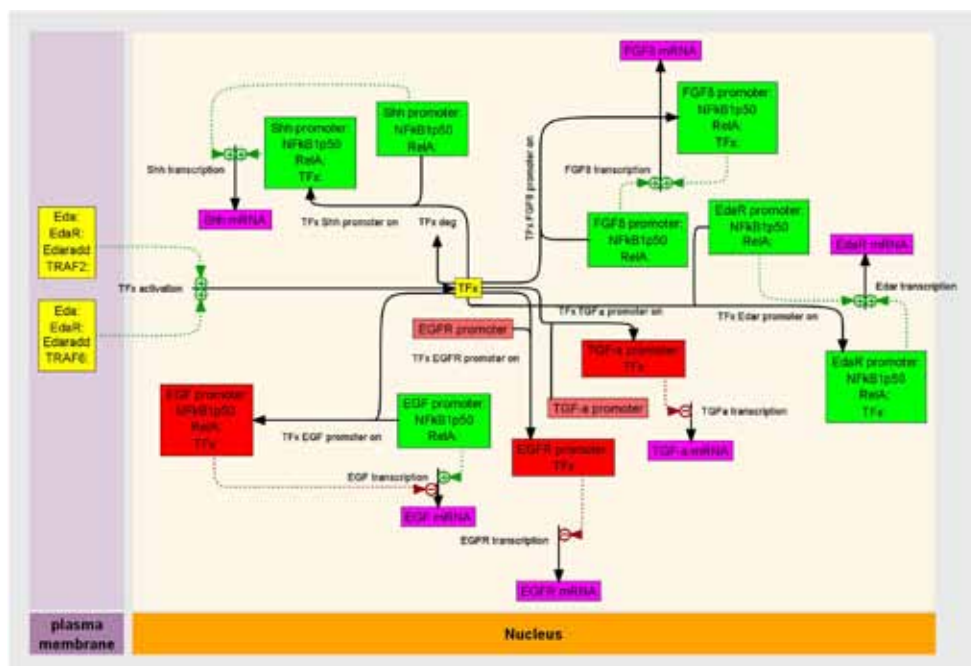


Above: mCMV induced numerous supernumerary hair cells in a disorganized arrangement. Hair cells were labeled with an antibody to myosin VIIa (myo, green) and nuclei were stained with DAPI (blue). Controls (A) display 1 inner hair cell (IHC) and 3 outer hair cells (OHCs). mCMV-infection induced a marked increase in hair cell population; these supernumerary hair cells (open arrows) are densely packed and disorganized.

these strategies to determine the way in which a mechanistic pathway diagram (derived from our prior studies, the literature, and pathway databases) can be programmatically transformed to a corresponding system of ordinary differential equations. Anyone who uses such equations to model a single gene's multiple kinetic parameters soon realizes that large network models quickly become prohibitively complicated.

Thus, we find it helpful to begin with a “soft-focused” level of description for a genetic network, namely to

concentrate on the system behavior of the network while neglecting dynamic molecular details whenever possible. One method of achieving this utilizes Probability Neural Network modeling to derive a gene expression signature that distinguishes among physiologic states or phenotypes. Informed by these results, one may then do kinetic modeling of the complex dynamic system. (Supported by NIH grant RO1 DE014535).



At Left: Kinetic modeling of the ectodysplasin (eda) gene during salivary gland development, and its functional relationship to other key genes.

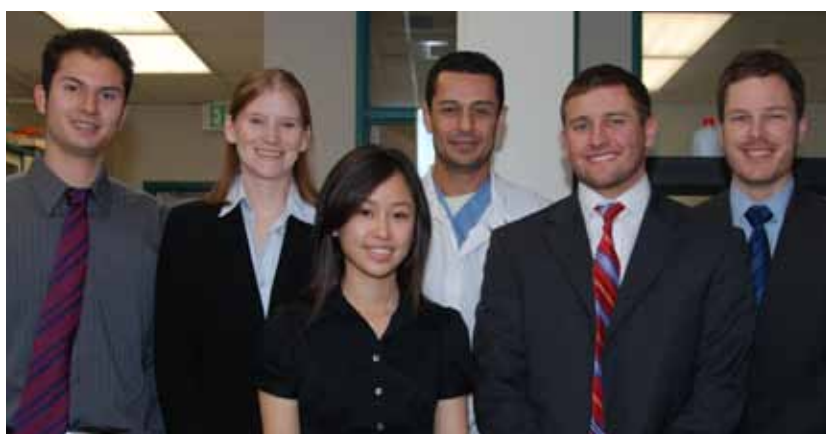
USC STUDENT RESEARCH GROUP (SRG)

By Weston Carpiaux

Working alongside leading researchers in their field of interest, students gain invaluable experience that not only expands their knowledge and develops their skills in the laboratory, but also enhances their dental education. Consistent with USCSD's learner-centered philosophy, SRG strives to help dental and dental hygiene students gain an appreciation and understanding of evidence-based dentistry established by systematic methods. Members present their research in the form of posters, abstracts and oral presentations at conferences across the country and internationally enabling students to establish long lasting networks. Participating in research can help students advance their careers in the field of dental medicine and become expert dentists as well as future leaders.

Following the precedent set by the previous generation of SRG officers, an entirely new group of students have stepped in to renew the Student Research Group's commitment here at USC. With a new set of eyes we remain focused on cultivating interests in scientific inquiry and promoting cutting-edge research among our fellow USC dental students. Backed by another new yet familiar face, advisor Dr. Parish Sedghizadeh, this current executive board has been rapidly implementing a series of exciting programs to ensure the accomplishment of our goals and guarantee the longevity of our results.

Awareness and understanding of both basic science and clinical research advancements is paramount in enhancing not only the clinical judgment of our student body while in school, but also as future practitioners beyond graduation. To enrich our studies and promote lifelong appreciation for scientific literature, the Student Research Group is proud to offer our Journal Club. This once a month meeting hosts the author of a recent dental research publication who then guides students through presentation and discussion of his/her recent work. Not only do students learn about recent advances in the given field, but also get a unique insight from the author on what it took to bring the study from inception on through publication. We would like to thank Annie Hughes of the Wilson Dental Library for her



SRG Officers Issa Kawas, Heather Stephens, Nini Hung, Bridger Jensen, and Weston Carpiaux with SRG Advisor Dr. Parish Sedghizadeh

assistance and extend our gratitude to our most recent guests for making these sessions possible: Dr. Mahvash Navazesh, Dr. Mohammad Sabeti, and Dr. Hessam Nowzari.

Year to year progress of our organization is now being tracked with a newly implemented metrics program. Through recommendation of Dean Avishai Sadan, a weeklong survey and data collection of the student body established a baseline measuring both involvement and views towards student research. Based on this information we are continuing to develop new programs, as well as modify current ones, to address the needs of the student body and can now accurately measure their efficacy over time. It is with this tool that we can truly measure the worth of our organization.

Exciting things are still to come! For questions about SRG activities, advice on how to get involved in research, or to become a member, please contact us at USCSRG@gmail.com

Research On!

Pan Pacific Center for Continuing Oral Health Professional Education

- Globalization
- Excellence
- Diversity



Building a bridge between USC and oral
health care professionals worldwide.

For more information please visit
<http://www.uscdentalcepanpacific.org>

DIVISION OF BIOKINESIOLOGY AND PHYSICAL THERAPY



A Message from Division Chair James Gordon, EdD, PT, FAPTA

The core mission of the School of Dentistry's Division of Biokinesiology & Physical Therapy is to enhance the physical well-being and quality of life of humans and one of the primary ways that we accomplish this is to conduct research that will expand our knowledge of the biological bases of human movement. This interdisciplinary focus on movement, which we call *biokinesiology*, includes four domains of research: (1) the neural basis of motor control and learning, (2) the biomechanics of the musculoskeletal system, (3) exercise and muscle physiology, and (4) the development of normal movement. In this issue

of Explorer, we highlight the three lab groups that are part of the Motor Development domain.

Motor Development research in the Division of Biokinesiology & Physical Therapy includes the following laboratory groups:

Development of Infant Motor Performance Laboratory (DIMPL)

Director: Linda Fetters, PT, PhD, FAPTA

The Development of Infant Motor Performance Laboratory (DIMPL) is dedicated to the study of the development of human action during infancy and early childhood and to the rehabilitation of action for infants and children.

Early Identification and Intervention for Cerebral Palsy

Currently, we are intently studying the early action patterns associated with developmental disorders including cerebral palsy. Our studies include the identification and description of these patterns in prematurely born infants with white matter injury and comparing their movement patterns to patterns of healthy premature infants without injury. The infants with injury are particularly vulnerable to the development of perceptual/motor problems and many will develop cerebral palsy. We have already identified atypical patterns of movements in these infants as early as 1 month of corrected age. We are now developing a creative intervention strategy using a "kicking controlled" computerized infant mobile.



Learning to Act

We have begun to study the process of learning of the mobile task in healthy full-term 4 month old infants. We plan to compare their learning process to the learning processes of premature infants with and without white matter injury. We have used descriptors of learning including parameters of the frequency and quality of kicking behaviors and various kinematic properties associated with learning. Our new line of investigation includes the computational modeling of learning as either exploratory or exploitive. We seek to determine if the process of infant motor learning includes exploratory kicking movements that precede kicking movements that exploit the mobile for reinforcement

Constraint Induced Movement Therapy

We are investigating the best protocol for best effects from constraint induced movement therapy (CIMT) on daily function for children with cerebral palsy (CP). CIMT has been extensively studied in adults post-

stroke, but has only minimal research with children. Our current research focuses on the perceptual information that children with CP use when making reaching and grasping actions. We believe this perceptual information informs the movements that are ultimately used and that this information can be used to shape motor patterns.

Motor Control Development Laboratory

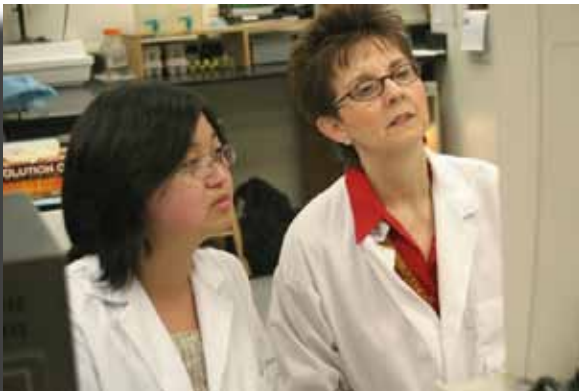
Director: Nina S. Bradley, PhD, PT

In humans, distinct body movements begin during the second month of fetal development. As new imaging technologies become available for prenatal clinical diagnosis and treatment, our understanding fetal movements and their relationship to postnatal behaviors will be essential to maximize the new advances. Thus studies in the Motor Control Development Laboratory seek to extend our understanding of how the nervous system controls fetal movements and to determine if the environment plays a critical role in shaping prenatal motor development.



Our model for prenatal motor development is the chick embryo.

Like the human fetus, the chick embryo generates complex movements early in development. The chick is a valuable model of fetal behavior because it is amenable to combinations of behavioral, physiological, pharmacological and neuroanatomical study throughout embryonic development. For example, our recent studies revealed that chicks begin to practice the leg movements for walking several days before they hatch. Current studies are exploring the impact of constrained leg movements and variations in light exposure on motor development. Our studies will provide fundamental insights into the impact of gravity and intense light exposure on motor control when the infant is born prematurely and exposed to conditions commonly associated with neonatal intensive care.



Perinatal Neuroscience Laboratory

Director: Jack Turman, Jr., PhD

We are interested in understanding the impact of perinatal perturbations on brain and behavioral development. Our research is both interdisciplinary and translational, and although our focus is on studying animal models of perinatal diseases or conditions, we partner with clinical researchers studying interventions targeting preterm infants and their families. Our basic science studies focus on the cumulative impact of neonatal brain injury and maternal deprivation on early postnatal growth, metabolism, feeding behaviors, and learning behaviors. In all of our studies we examine the early postnatal behaviors of both the neonates and their mothers, and the developing maternal-neonatal relationship.



To learn more about biokinesiology & physical therapy, please visit us at www.usc.edu/pt

DIVISION OF OCCUPATIONAL SCIENCE & OCCUPATIONAL THERAPY

A Message from Division Chair Florence Clark, PhD, OTR/L, FAOTA

Occupational Science is the science of everyday living. It is an academic discipline that generates knowledge about the impact of activities (“occupations”) on the health of individuals, communities, nations, and the world. Understanding “real people” in “real lives” requires conceptual and methodological expertise that is being developed through scholarship in the fields of occupational science and occupational therapy.



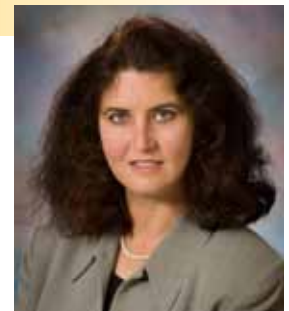
The Division of Occupational Science and Occupational Therapy at USC is internationally recognized for its academic excellence, innovation in research, sustained acquisition of extramural funding, and leadership in implementing successful models of interdisciplinary research. Systematic scholarly inquiry is used to understand the complexities of everyday living and interrelationships amongst core concepts as related to personal, community and global health. Our research programs are particularly concerned with health and well-being; health disparities and cultural influences on health and recovery; ethics, society and social justice; community re-integration and societal participation; family life; engagement, activity and neuroscience; and rehabilitation science. Frequently, our studies are designed to address the intersections of multiple areas. Further, we hold a strong commitment to socially responsive research that supports expansion of knowledge for therapeutic practice across the lifespan.

Methodologically, our strengths include translational research, randomized clinical trial design, and qualitative research approaches. We develop innovative solutions to methodological and analytic challenges related to studying lives in context, facilitate the dissemination of research findings to practitioners and the public, and promote approaches to scholarship for the integration of theory and practice.

Three of our current research projects are: Autism in Urban Context, Neural Basis for the Production and Perception of Prosody, and Lifestyle Redesign® for Pressure Ulcer Prevention in Spinal Cord Injury.

Autism in urban context: Linking heterogeneity with health and service disparities Olga Solomon

Linking Heterogeneity with Health and Service Disparities is a two year multi-method, ethnographic project led by Dr. Olga Solomon that examines health and service disparities in Autism Spectrum Disorders (ASD) diagnosis of African American children living in Los Angeles. Researchers are following a cohort of 16 African American children diagnosed with ASD, their primary caregivers and extended social networks, and the practitioners who serve them, to document the families’ trajectories to an ASD diagnosis. The project is being carried out at two study sites: USC University Center for Excellence in Developmental Disabilities at Childrens Hospital Los Angeles and San Gabriel/Pomona Regional Center. The results of this project will identify opportunities for and barriers to the development of collaboration among families and practitioners in a timely and efficient ASD diagnosis and interventions for African American children.



Lifestyle Redesign for Pressure Ulcer Prevention in SCI

Florence Clark

Advanced pressure ulcers are a common and medically serious complication of spinal cord injury (SCI) and are associated with extremely high treatment costs and reduced quality of life. However, preventive interventions that address this problem have received very little research attention. To address this gap, Lifestyle Redesign® for Pressure Ulcer Prevention in SCI, led by Dr. Florence Clark, is investigating the efficacy of a promising lifestyle intervention in preventing pressure ulcers among at-risk members of the SCI population. The five-year study is a collaboration between researchers from the University of Southern California and Rancho Los Amigos National Rehabilitation Center, who have developed the intervention based on the results of a qualitative investigation of lifestyle and ulcer risk among adults with SCI. The long-term objective of this project is to identify an intervention option that can enhance the health and life quality of the population of adults with SCI while simultaneously diminishing the heavy healthcare burden that results from the problem of SCI-related pressure ulcers.

Neural Basis for the Production and Perception of Prosody

Lisa Aziz-Zadeh

Prosody, the melody and intonation of speech, is a significant and often undervalued component of human communication and social interaction. The Neural Basis for the Production and Perception of Prosody research project is a two year study directed by Dr. Lisa Aziz-Zadeh that explores the application of recent approaches and concepts in human brain mapping to the study of perception and production of prosody. Elucidating the neural basis of prosody will make an important contribution to the neurobiology of non-verbal communication, and by extension, of social communication. Furthermore, this research will improve the understanding of the communication deficits which result from brain injury, as well as the understanding of core deficits of socially isolating neurological and psychiatric disorders (such as stroke), traumatic head injury, and autism.



To learn more about occupational science and occupational therapy, please visit us at www.usc.edu/ot

USC SCHOOL OF DENTISTRY RESEARCH DAY

FEBRUARY 10, 2010

Schedule

- 8:00 Registration
- 9:30 Opening Remarks
Dr. Yang Chai, Dean Avishai Sadan and Vice Provost Randy Hall
- 9:45 Keynote Speaker
Dr. Mary MacDougall
University of Alabama at Birmingham
James R. Rosen Chair of Dental Research
Associate Dean for Research and Director
- 10:45 Posters Viewing and Judging
- 12:30 Keynote Speaker
Dr. Jack Turman, Jr.
University of Southern California
Associate Professor
Division of Biokinesiology & Physical Therapy
- 2:00 Posters Viewing and Discussion
- 3:30 Awards Ceremony

Poster Categories

- Advanced Specialty Program Resident
- Biokinesiology and Physical Therapy Student - Musculoskeletal Biomechanics
- Biokinesiology and Physical Therapy Student- Neural Control and Motor Behavior
- USC School of Dentistry Faculty
- Graduate Postdoctoral Trainee
- Graduate Pre-doctoral Candidate
- Occupational Science and Occupational Therapy Student
- DDS Student - Basic Science
- DDS Student - Clinical Science
- Dental Hygiene Student

Research Day Awards

Poster Category Awards

Awarded to outstanding posters within each category

Dean's Research Award

Awarded to the most outstanding project poster overall

USC Stevens Institute for Innovation Award

Awarded to the poster with the highest likelihood of translating into practical use

The USC Stevens Institute for Innovation is a university-wide resource in the Office of the Provost at the University of Southern California designed to harness and advance the creative thinking and breakthrough research from USC for maximum societal impact. As the first institute of its kind, the USC Stevens Institute empowers USC innovators university-wide to make broader impact with their ideas.

The USC Stevens team prepares USC faculty and students for a lifetime of innovation, supporting innovators from USC's College and all 17 professional schools by integrating intellectual property management and licensing functions with educational programs, community-building, and events designed to stimulate innovation across the university.

The USC Stevens Institute for Innovation was established through a generous \$22M naming gift from USC alumnus and trustee Mark A. Stevens, a partner at the legendary Sequoia Capital venture capital firm, and his wife, Mary.



Advanced Specialty Program Resident

- | | |
|---|---|
| <p>#1 SUANHOW HOWARD FOO
 Advisor - Dr. James Simon
 Endodontic irrigation flow rates and pressure in vitro</p> <p>#2 MARC HAYASHI, TAMARA TOM, PAUL AWAD, AND BILLY HA
 Advisor - Dr. Richard Green
 Caries Risk Assessment for the Head and Neck Cancer Patient</p> <p>#3 JENNY YOO
 Advisor - Dr Holly Moon
 Mandibular Plane Angle Changes with and without extraction of premolars using 3D cone beam imaging</p> <p>#4 BRANDON FOWLER
 Advisor - Dr. Glen Sameshima
 A Comparison of Root Resorption between Invisalign Treatment and Contemporary Orthodontic Treatment</p> <p>#5 CHAD FOSTER
 Advisor - Dr. Glen Sameshima
 Orthodontic Confidence of Senior Dental Students</p> <p>#6 DT FIELDS
 Advisor - Dr. Glenn Sameshima
 A Comparison of Premolar Extraction Rates in Single-Phase versus Two-Phase Treatment of Class II Malocclusions</p> | <p>#7 LISA KAI
 Advisor - Dr. Glenn Sameshima
 Efficiency in Active Self-Ligating Brackets vs. Conventionally Ligated Brackets</p> <p>#8 VIVIAN LEE
 Advisor - Dr. Peter Sinclair
 The Effectiveness of Practice Management Education in Orthodontic Residencies</p> <p>#9 GEORGE ABICHAKE
 Advisor - Dr. Tina Jaskoll and Dr. Michael Melnick
 CMV Induces Stage-Dependent Enamel Defects in Developing Mouse Molars In Vitro</p> <p>#10 CLARA KIM
 Advisor - Dr. Hessam Nowzari
 Bone loss in furcation-involved mandibular molars: retrospective analysis</p> <p>#11 SHERVIN MOLAYEM
 Advisor - Dr. Hessam Nowzari
 Computed Tomographic Measurement of Maxillary Central Incisors to Determine Prevalence of Facial Alveolar Bone Width ≥ 2 mm</p> <p>#12 ALIREZA MOSHAVERINIA
 Advisor - Dr. Winston Chee
 Surface properties and bond strength measurements of N-vinylcaprolactam (NVC)-containing glass-ionomers</p> |
|---|---|

Biokinesiology and Physical Therapy Student - Exercise Science and Musculoskeletal Biomechanics

- | | |
|---|--|
| <p>#13 ALICIA FOSTER
 Advisor - Dr. Christopher Powers
 The Influence of Heel Height on Frontal Plane Ankle Biomechanics</p> <p>#14 HSIANG-LING TENG
 Advisor - Dr. Christopher Powers
 Predictors of Patellofemoral Joint Contact Area</p> <p>#15 KAI-YU HO
 Advisor - Dr. Christopher Powers
 Running and Bone Marrow Edema in Females with Patellofemoral Pain</p> | <p>#16 KRISTEN STEARNS
 Advisor - Dr. Christopher Powers
 Hip and Knee Mechanics During Side-step Cutting in Females Athletes post-Anterior Cruciate Ligament Reconstruction</p> <p>#17 LIANG-CHING TSAI
 Advisor - Dr. Christopher Powers
 Increasing Hip and Knee Flexion During Landing Decreases Tibiofemoral Loading</p> <p>#18 MARK BLANCHETTE
 Advisor - Dr. Christopher Powers
 Influence of Experience on Friction Demand While Walking in High-Heels</p> |
|---|--|

Biokinesiology and Physical Therapy Student - Exercise Science and Musculoskeletal Biomechanics (continued)

#19 SZU-PING LEE

Advisor - Dr. Christopher Powers

Reliability of a new method to assessing hip muscle performance

#20 YI-CHEN CHOU

Dr. Christopher Powers

Heel Height, Pelvis Kinematics and Trunk Muscle Activity During Gait

#21 SHAWN SORENSON

Dr. George Salem

External Load Modifies Lower Extremity Kinetics in the Barbell Squat

#22 YU-JEN CHANG

Advisor - Dr. Kornelia Kulig

Joint Contributions to Support Moment During Running and Hopping in a Runner with Achilles Tendinopathy: An Interlimb Comparison

#23 KATE HAVENS

Advisor - Dr. Susan Sigward

Relation between knee separation distance and lower extremity kinematics

Biokinesiology and Physical Therapy Student - Neural Control and Motor Behavior

#24 YA-YUN LEE

Advisor - Dr. Beth Fisher

Reliability of Cortical Excitability on Gastrocnemius and Tibialis Anterior Muscles using Transcranial Magnetic Stimulation

#25 JILL CAMPBELL STEWART

Advisor - Dr. Carolee Winstein

Initial plan and compensatory adjustments of unconstrained reach actions after sensorimotor stroke

#26 JULIE WERNER AND SHU-YA CHEN

Advisor - Dr. Carolee Winstein

The Extremity Constraint-Induced Therapy Evaluation Trial Re-visited: Feasibility of Data Mining for Task Classification

#27 SHUYA CHEN

Advisor - Dr. Carolee Winstein

Objective quantification of paretic arm non-use for stroke using bilateral arm reaching task

#28 MARK LYLE

Advisor - Dr. Christopher Powers

Relationship between lower extremity dexterity and agility

#29 SUDARSHAN DAYANIDHI

Advisor - Dr. Francisco Valero-Cuevas

Control of an unstable object with dynamic precision grip

#30 HUI-TING GOH

Advisor - Dr. Katherine Sullivan

Development of automaticity in a rapid discrete arm movement is associated with increased movement smoothness.

#31 ANIL SINDHURAKAR

Advisor - Dr. Nina Bradley

Light accelerates the onset of locomotor performance in chicks.

#32 SHAILESH KANTAK

Advisor - Dr. Katherine J Sullivan

Neural substrates of motor memory consolidation: Effects of practice conditions



USCSD Faculty

- #33 CAMILLE DIETERLE**
Green Lifestyle Redesign®: A Wellness Program for Environmental Sustainability
- #34 SHANNON WENDORF**
Lifestyle Redesign® For the Truck Driver Pilot Program
- #35 FLORENCE CLARK**
Well Elderly Study 2: Outcomes and Implications for Gerontological Research
- #36 FLORENCE CLARK AND ERNA BLANCHE**
Lifestyle Redesign® for Pressure Ulcer Prevention in SCI
- #37 HAZEM SEIRAWAN**
Oral Health of Underprivileged Children in Los Angeles County
- #38 JEANNE JACKSON**
Well Elderly 2: Recruitment and Retention of Older Ethnic Minorities
- #39 JIN WOO CHUNG, REYES ENCISO, DANIEL J. LEVENDOWSKI, TODD MORGAN, PHILIP R. WESTBROOK, AND GLENN T. CLARK**
Oral appliance efficacy in positional and non-positional OSA patients
- #40 KAREN McNULTY**
Lifestyle Redesign® for the College Student: Occupational Performance, Satisfaction and Self-Esteem
- #41 MEGAN CHANG**
Well Elderly 2: Mediating Mechanisms of the Lifestyle Redesign® Intervention
- #42 MIKE CARLSON**
Well Elderly 2: Reverse-Scored Items on the CES-D
- #43 OLGA SOLOMON**
Animal Assisted Activity as Socially Assistive Technology: Implications for Autism
- #44 RAND WILCOX**
Well Elderly 2: Effect Size Factors
- #45 REYES ENCISO AND GLENN T. CLARK**
Using the ARES screener and the Berlin questionnaire to predict OSA
- #46 REYES ENCISO, MANUEL NGUYEN, AND GLENN CLARK**
Cone-Beam CT Imaging in Sleep Apnea patients
- #47 TIMOTHY SAUNDERS**
In-Practice Use of OraVerse (Phentolamine Mesylate) to Reverse Soft Tissue Anesthesia
- #48 YAN ZHOU**
Leucine-rich Amelogenin Peptide Induces Osteogenesis through Activation of Canonical Wnt Signaling Pathway



Graduate Postdoctoral Trainee

- #49 QUNZHOU ZHANG**
Advisor - Dr. Anh Le
Mesenchymal Stem Cells Derived from Human Gingiva Enhance Skin Wound Healing by Reprogramming Classically Activated Macrophage to Alternatively Activated Macrophages
- #50 MEGAN CHANG**
Advisor - Dr. Erna Blanche
Using electrodermal activity to understand sensory behaviors in children with autism
- #51 DAMING FAN**
Advisor - Dr. Janet Oldak
Amelogenin-enamelin interactions and cooperation in controlling octacalcium phosphate crystal growth
- #52 KEITH BROMLEY**
Advisor - Dr. Janet Oldak
Identifying the oligomeric states of amelogenin
- #53 ZHI SUN**
Advisor - Dr. Janet Oldak
Amelogenin particle size alterations during proteolysis by MMP-20 in vitro
- #54 ZHAN HUANG**
Advisor - Dr. Malcolm Snead
Bioactive self-assembled peptide amphiphile instructs epithelial cells for enamel regeneration
- #55 RODRIGO S LACRUZ**
Advisor - Dr. Michael Paine
The regulation of pH in the developing dental enamel
- #56 HAIYAN QIN**
Advisor - Dr. Songtao Shi
iPS cells reprogrammed from mesenchymal-like stem/progenitor cells
- #57 HAIYAN QIN**
Advisor - Dr. Songtao Shi
Tumor like MSC in ossifying fibroma pathogenesis and regenerative therapy
- #58 KENTARO AKIYAMA**
Advisor - Dr. Songtao Shi
Cell-based Immunotherapy with Mesenchymal Stem Cells Cures Bisphosphonate-Related Osteonecrosis of the Jaw-like Disease in Mice
- #59 KENTARO AKIYAMA**
Advisor - Dr. Songtao Shi
Utility of PDL Progenitors for in vivo Periodontal Tissue Regeneration
- #60 YI LIU**
Advisor - Dr. Songtao Shi
Improvement Tissue Regeneration by regulating the host immunological system
- #61 JENNIFER DOWNEY**
Advisor - Dr. Steven Goodman
ex vivo Detection of Mechanical Strain Using Streptococcus mutans Biofilms
- #62 SANG-HO OH**
Advisor - Dr. Tae Kim
Evaluation of 3 different types of posterior palatal dam
- #63 JINGYUAN LI**
Advisor - Dr. Yang Chai
Smad4-Shh-Nfic signaling cascade-mediated epithelial-mesenchymal interaction is crucial in regulating tooth root development
- #64 JUN HAN**
Advisor - Dr. Yang Chai
Indirect Modulation of Shh signaling by Dlx5 affects the oral-nasal patterning of palate and rescues cleft palate in Msx1 null mice
- #65 JUN-ICHI IWATA**
Advisor - Dr. Yang Chai
Loss of Tgf-beta receptor type II induces non-canonical Tgf-beta signaling and lipid metabolic aberration in the palatal mesenchyme
- #66 JUNJIE WU**
Advisor - Dr. Yang Chai
TGF- β mediated Dlx5 signaling plays a crucial role in osteo-chondroprogenitor cell lineage determination during mandible development
- #67 TOSHIAKI YOKOTA**
Advisor - Dr. Yang Chai
Epithelial cell-specific ablation of transforming growth factor beta receptor II disrupts epithelial-mesoderm interaction and causes soft palate cleft

Graduate Pre-doctoral Candidate

#68 ARCHANA BHATT

Advisor - Dr. Anh Le

Mesenchymal Stem Cells Derived from Human Gingiva Ameliorate Chemotherapy and/or Radiation Induced Murine Alimentary Mucositis.

#69 CHATCHADA CHINKULPRASERT

Advisor - Dr. Christopher Powers

Lower-Extremity Joint Contributions During Various Stepping Exercises

#70 MARCELO FREIRE

Advisor - Dr. Homa H. Zadeh

Antibody Mediated Osseous Regeneration (AMOR)

#71 SAHAR ANSARI

Advisor - Dr. Homa Zadeh

The Effect of Surface Modification of Zirconia Implants on Bone Osseointegration

#72 LILY TUNG

Advisor - Dr. Mark Urata

Tgf- β Mediated Fgf9 Signaling Regulates Cell Proliferation in Palatal Mesenchymal Cells

#73 LUIS L. BOFF

Advisor - Dr. Pascal Magne

CAD/CAM adhesive restoration of molars with a cracked compromised cusp: effect of fiber-reinforced immediate dentin dealing on the fatigue strength.

#74 MARIA PAULA GANDOLFI

PARANHOS

Advisor - Dr. Pascal Magne

Fatigue Resistance and Failure Mode of Type III Porcelain and Composite Resin Veneers Bonded to Custom Implant Zirconia Abutment

#75 CHIDER CHEN

Advisor - Dr. Songtao Shi

Immunomodulatory Properties of Stem Cells from Human Exfoliated Deciduous Teeth

#76 JAMIE HSIUNG

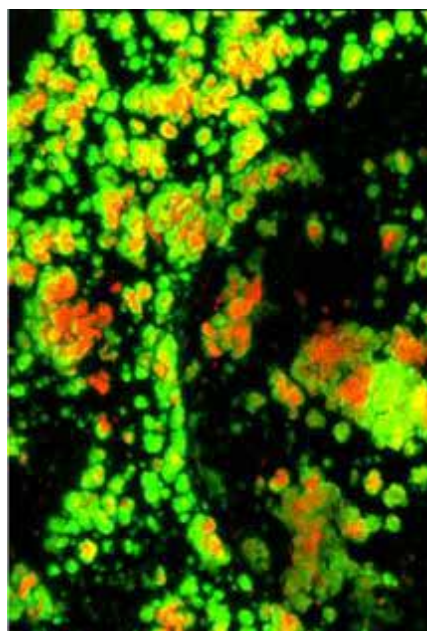
Advisor - Dr. Yang Chai

Transforming Growth Factor Beta Regulates Basal Transcriptional Regulatory Machinery to Control Cell Proliferation and Differentiation in Cranial Neural Crest-derived Osteoprogenitor Cells

#77 SHA LI

Advisor - Dr. Yang Chai

Function of Pten during palatal and tooth development



Occupational Science and Occupational Therapy Student

- #78 ANN KUO**
Advisor - Dr. Florence Clark
Use of Global Activity Ratings to Predict Quality of Life in Older Adults
- #79 ASHWINI VAISHAMPAYAN**
Advisor - Dr. Florence Clark
Individualization of a Manualized Pressure Ulcer Prevention Program: Targeting Risky Life Circumstances Through a Community-Based Intervention for People with Spinal Cord Injury
- #80 BETH PYATAK**
Advisor - Dr. Florence Clark
Occupational Engagement & Diabetes Self-Management in Young Adulthood
- #81 CHANTELE RICE**
Advisor - Dr. Florence Clark
Lifestyle Redesign® Diabetes Program: Take Control of Your Health
- #82 JULIE WERNER**
Advisor - Dr. Florence Clark
Predictors of Computer Use in Community-Dwelling Ethnically Diverse Older Adults
- #83 SUSAN McNULTY**
Advisor - Dr. Linda Fazio
Lifestyle Redesign® for Chronic Headaches
- #84 VIRGINIA SIEVERS**
Advisor - Dr. Linda Fazio
Smoking Cessation Maintenance and Relapse Prevention
- #85 CARLA PEREA**
Advisor - Dr. Linda Fazio
Lifestyle Redesign® Smoking Cessation
- #86 SOOK-LEI LIEW**
Advisor - Dr. Lisa Aziz-Zadeh
The Neural Correlates of Observing Physical Differences and Empathy Correlations
- #87 AARON BONSALE**
Advisor - Dr. Mary Lawlor
Narrative and Occupational Science
- #88 LEAH STEIN**
Advisor - Dr. Sharon Cermak
Oral Care and Sensory Sensitivities in Children with Autism Spectrum Disorder
- #89 LEAH STEIN AND AMANDA FORAN**
Advisor - Dr. Sharon Cermak
Occupational Patterns in Parents of Children with Autism Spectrum Disorder: Revisiting Matuska and Christiansen's Model of Lifestyle Balance
- #90 TIFFANY L. SHUSTER**
Advisor - N/A
Psychosocial and Behavioral Predictors of Mortality in Solid Organ Transplantation

Undergraduate DDS Student - Basic Science

- #91 DEREK HAVAS**
Advisor - Dr. Maggie Zeichner-David
Role of the transcription factor NFI-C in acellular cementum formation
- #92 MI YOUNG KIM**
Advisor - Dr. Maggie Zeichner-David
Expression of Transforming Growth Factor Beta-Induced Protein in Pulp Cells
- #93 NIMA MIRMOGHATADEI**
Advisor - Dr. Maggie Zeichner-David
Are crown and root pulp cells different?
- #94 JOSEPH YU**
Advisor - Dr. Matt Lee
Presence of Shc exerts transcriptional control of SMAD by competing for the TGF- β receptor
- #95 RITA HUANG**
Advisor - Dr. Matt Lee
TGF- β -induced Shc signaling pathway persists in T β RII-deficient cells
- #96 WILSON JING**
Advisor - Dr. Songtao Shi
Endogenous differentiation of human stem cells in murine maxilla

Undergraduate DDS Student - Basic Science (continued)

#97 FLAVIA PANDURU

Advisor - Dr. Tae Kim

A Comparison Between Distribution of Two Types of Articulating Film

#98 KHINE HTET

Advisor - Dr. Tina Jaskoll and Dr. Michael Melnick

CMV-Induced Embryonic Cochlear Pathogenesis

#99 YI-AN CHIANG

Advisor - Dr. Tina Jaskoll and Dr. Michael Melnick

Developmental Expression of a Salivary Gland Tumor Marker: CRTCl

#100 DANIEL KHORSHAD

Advisor - Dr. Maggie Zeichner-David

Fate of Hertwig's epithelial root sheath (HERS) in NFIC (-/-) mouse developing roots.

#101 MYAT HTUT

Advisor - Dr. Yang Chai

TGF- β signaling regulates tongue muscle development through tissue-tissue interaction

#102 XUN XU

Advisor - Dr. Yang Chai

Ectodermal Smad4 and p38 MAPK Are Functionally Redundant in Mediating TGF- β /BMP Signaling during Tooth and Palate Development

#103 YEE HUNG

Advisor - Dr. Yang Chai

Hertwig's Epithelial Root Sheath Cell Fate Analysis

Undergraduate DDS Student - Clinical Science

#104 HEMA KISHORE CHAPALA

Advisor - Dr. A. Thangavelu

Medical Rapid Prototyping -It's role in oral and maxillofacial surgery

#105 SANDEEP POTDAR

Advisor - Dr. Janvier Gasana

Meta-analysis of studies on air pollution in urban areas, along highways, and lung disease, including asthma, among children.

#106 CHARLES ODION

Advisor - Dr. Jennifer Holzman

Retention of dental sealants in the USC Neighborhood Mobile Dental Van

#107 LAWRENCE FUNG

Advisor - Dr. Kent Ochiai and

Dr. Angelo Caputo

Attachment Evaluation of a Ceramic-retained Resin Post and Core Technique.

#108 PAYAM SAMANI

Advisor - Dr. Maggie Zeichner-David

Effect of MTA on mouse epithelial rests of malassez precursor cells in vitro.

#109 ESTHER MOON

Advisor - Dr. Paymon Parish Sedghizadeh

Facial profile preferences among Koreans, Korean-Americans, and Caucasian-Americans.

#110 JUSTIN OLSEN

Advisor - Dr. Paymon Parish Sedghizadeh

Papillary squamous cell carcinoma of the hard palate: Report of a rare case and literature review

#111 JIMMY LAU

Advisor - Dr. Niel Nathason

Designating USC Dental School as a Health Professional Shortage Area

Dental Hygiene Student

#112 IRENE ESTEVES, SHOANA CHAU, DARLENE GRIFFIN, AND SAUL VARGAS

Advisor - Dr. Karen Matsumura-Lem

Plaque, plaque, plaque, virus?: The Viral Aspect of Periodontal Disease

DIVISION OF PERIODONTOLOGY, DIAGNOSTIC SCIENCES AND DENTAL HYGIENE

(continued from page 9) scheme, patent held by USC, conducting research on the efficacy of cold plasma sterilization applied to bacteria and fungus. Sterilization using cold plasma is very potent; in fact much more efficient than the autoclave and results can be achieved much faster. Whereas for standard autoclave the time of completion is measured in minutes, cold plasma sterilization is measured in seconds. Also bacteria over time have adapted to heat and drugs treatments that lead to their demise, but plasma is a brand new sterilization technique with minimal bacterial immunity. The bactericidal mechanism is hypothesized to involve penetration of microorganism cell membrane by ionized gases. Besides research on sterilization capabilities of cold plasma, Doctor Sedghizadeh is collaborating with the USC School of Engineering to develop a hand held cold plasma device that can be used clinically. The device would allow oral health professionals to apply cold plasma to oral bacterial infections, such as periodontitis or pulpitis. Such a device will drastically change prevention and treatment techniques in oral health care.

Dr. Hessam Nowzari is revolutionizing oral health care in his own way. Little attention has been directed toward evidence that an early-in-life oral infection with the potential to reach epidemic proportions is threatening the health of youths around the world. Health professionals and the public seem unaware that the silent disease process of early-in-life oral infection is targeting thousands of children and young adults, their smiles and, consequently, their emotional and psychological lives. Yet, the literature is replete with reports that specific microorganisms are multiplying at an alarming rate with serious impact on youth in many cities, towns, and villages throughout the globe.

The historic public health project aimed to eliminate early-in-life oral infections started in 2003 when Dr. Nowzari was invited for a talk in Casablanca, Morocco. While traveling, he noticed the common occurrence of rare early-in-life oral infections in the local population. The observations lead to his exploration of prevalence among other regions of the world with

similar clinical symptoms. Working with scientists around the globe, from Asia to South America, it was soon clear that certain areas were more affected than others because of different microbiology profiles of the infection. At the 2009 Annual Meeting of the Taiwan Academy of Pediatric Dentistry, Dr. Nowzari along with other scientists presented the global prevalence and pathogenesis of early-in-life periodontal infections along with treatment outcome of 625 (100% success rate) street children in Manila. The aim of Dr. Nowzari's research team is to help raise the level of awareness, so that those who have the power and knowledge to do so can appropriately address the suffering of the youngest members of societies.

The **USC Advanced Periodontics research team** led by Dr. Nowzari were the first to provide evidence that active cytomegalovirus (CMV) infection within enlarged gingival tissue maybe associated with severe clinical complications including renal transplant failure.

According to the National Institutes of Health, more than 25,000 procedures are performed in the United States each year to replace organs, including the heart, kidneys, liver, intestines, and the pancreas. Transplant patients are prescribed numerous medications to prepare them physically and emotionally. "Transplant patients are being given the gift of life, but with it comes a lifetime of taking medications before and after the transplant that can create a host of other complications," says Dr. Hessam Nowzari, director of the School's Advanced Periodontics program.

USC's periodontology division at the School of Dentistry is constantly striving to further the field through research and innovation. Although each faculty member has individual research interests and expertise, the success of the department lies in cooperation. With individual ambitions and interdisciplinary collaboration the faculty is continuing USC's tradition of excellence by resolving the challenges of yesterday today. Ultimately, the dedication for excellence is fueled by the collective desire to provide our patients with better quality of life.

2009 SUMMER RESEARCH FELLOWSHIP PROGRAM AT CCMB

Since 2007, the Center for Craniofacial Molecular Biology at the USC School of Dentistry has hosted the Summer Research Fellowship Program for first year dental students. The program offers a select group of incoming students the opportunity to be engaged in cutting-edge research in the biomedical sciences, with focus on the areas such as craniofacial development and mineralized tissue. While the program seeks to foster dental scientists and educators of the future, any student with a passion or curiosity for research is encouraged to apply. In the end, the program gives students an in-depth look at the opportunities, challenges, and rewards of being involved in dental research.

Descriptions of 2009 Summer Research Projects:

Dina Contreras

Working with Sissada Tannukit, DDS, PhD in Dr. Michael Paine's lab we used techniques such as PCR, ligation, transformation, and mini-prep to clone the Stim2 gene. Stim proteins are calcium sensors in the endoplasmic reticulum (ER) and activate the entry of calcium into the ER lumen. The clinical importance of calcium is the role it plays in the formation of tooth enamel, and studies that have shown that mutations of Stim proteins have been implicated in combined immunodeficiency disease.

Wilson Jing

Over the summer I worked with Doctor Songtao Shi whose lab focused on translational research of dental stem cells. My project involved the transplantation of various human stem cells; dental pulp, periodontal ligament and bone marrow mesenchymal stem cells into the murine jaw bone. The goal of the project is to observe cell differentiation within the adult murine oral environment.

Daniel Khorshad

My area of research is in root formation. With the help of my principle investigator, Dr. Margarita Zeichner-David, we focused on how various antibodies interact in the formation of a tooth's root. The antibody I used was Keratin-14, which is present in epithelial cells. I tested it with knock out and wild type tissues of mice maxillas at different ages. I did immunohistochemistry using the antibody and saw its interaction with the root through the color change that was present once the staining was finished. I wanted to see if there is a difference between the two types of tissues and why there might be a difference.

Andrew Kiss

As a researcher in Dr. Oldak-Moradian's group I worked to better understand the properties of a protein called amelogenin, the main protein involved with enamel formation. Enamel is very interesting because it is the hardest mineralized tissue in the body and it does not regenerate. There is still a lot to be learned about how enamel is formed. During the summer program, I learned and used several interesting techniques that include emission spectroscopy, circular dichorism, dynamic light scattering, transmission electron microscopy, and scanning electron microscopy. I learned to isolate native Amelogenin (P173) from pig jaws and also to manufacture recombinant Amelogenin (rP172) using E. coli. The thrust of my research focused on developing fluorescence spectroscopy as a new technique for studying amelogenin self-assembly.

Myat Htut

During the summer research program, I predominantly participated in two inter-related experiments in palatal and tongue developments. One of them was to investigate the cellular and molecular mechanism crucial for regulating palatal fusion, and the other one was to test whether TGF-beta signaling controls the fate of cranial neural crest cells during tongue development. Besides learning different lab techniques and procedures for experiments, attending seminars and weekly group meetings were really informative and enjoyable.

Tiffany Lee

My project was protein analysis using immunohistochemistry of Proliferating Cell Nuclear Antigen (PCNA) during cementogenesis after knocking out one of the major transcription factors, Nuclear Factor I-C (NFIC), in the mice model.

Cheryl Park

I was part of Dr. Anh Le's lab team and during my summer research, I trained and took part in helping out with some of the projects that were being carried out by my advisor. One of the projects that were going on in the lab was experiment with oral mucositis. Oral mucositis is a serious side effect of the radio and chemo therapy the cancer patients undergo. Thus we experimented with inducing the mice with this disease and giving them stem cell therapy to see if it mitigated the effect. Other experiments that I helped out during summer were mostly genotyping, western blots, mice tooth extractions, and different tissue stainings.

Reflection

The Summer Research Fellowship Program was an excellent opportunity for us to conduct and gain a greater appreciation for research before starting dental school. Our mentors welcomed us into their labs and provided us with an environment where intellectual curiosity was both modeled and encouraged.

As researchers we learned to gather and analyze resources, conduct experiments, and comprehend data in order to reevaluate our hypothesis. We also discovered that despite following protocol and trouble-shooting, failure is an inevitable part of research. However, because of the strong network of supporters, from our mentors, to post docs and lab technicians, who all were willing to patiently teach us, we were able to complete our work with confidence.

We anticipate that the skills and lessons we learned this past summer will extend beyond the lab and translate to Problem-Based Learning. The skills will be vital to us as we navigate through the literature and limitless information we have access to in order to draw strong and coherent conclusions and ask further questions in the true spirit of life-long learning. We enthusiastically encourage next year's incoming students to seize the opportunity to contribute to science through this fantastic program as we reluctantly bid farewell to the summer and eagerly welcome the start of our dental careers.

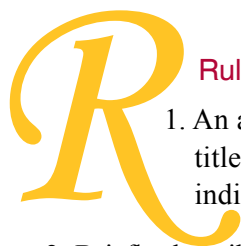


We would like to especially thank our labs and our mentors who encouraged, challenged, and inspired us, making this an incomparable experience and one we will always treasure.

The Summer Research Fellows of 2009 would like to thank all of the Principle Investigators, Post-doctoral fellows, PhD Students, and staff members at the Center for Craniofacial Molecular Biology for their support. Also, many thanks to the ARRA for their generous summer stipend.

READY TO RESEARCH?

SUBMIT YOUR OWN ABSTRACT IN 2011



Rules for Preparation of Abstracts

1. An abstract must have a short, specific title (no abbreviations) that clearly indicates the nature of the project.
2. Briefly describe the objectives of the study unless they are contained in the title. If applicable, include a brief statement of methods. State findings in sufficient detail to support conclusions. Abstracts should not describe research in which the chemical identity or source of the reagent is proprietary or cannot be revealed.
3. Use generic names wherever possible. Product-based names are to be used only when necessary.
4. Avoid beginning sentences with numerals.
5. Standard abbreviations may be used without definition. Nonstandard abbreviations (minimum number) should be placed in parentheses after the first use of the word or phrase abbreviated.
6. No references, credits or grant support should be included in the abstract.
7. No identifying information about patients participating in a study or trial should be used (name or personal information).
8. Check category for submission carefully to assure proper scientific consideration.
9. Proofread abstracts carefully to avoid errors before submission. No corrections will be allowed once abstract has been submitted.

All submissions will be reviewed for content by select USC faculty members. Authors will be contacted should revisions be necessary.

Abstracts Components

1. Abstract Title, Capitalize appropriate words (e.g. In situ Hybridization Studies of Osteocalcin mRNA in Developing Rat Bone)
2. Your Name (e.g. Tommy Trojan)
3. School, Class Year (e.g. USC, 2012) note: you must be a current USC dental student/resident in order to submit an abstract
4. Research Sponsor, Title, Department, School or Organization(e.g. Sponsored by Ima Faculty, DDS, Dept. of Oral Medicine and Diagnostic Sciences, USCSOD, Brigham & Women's Hospital.)
5. Abstract Text (500 word maximum) Include: hypothesis tested, methods used, data, statistical analysis (where appropriate), conclusions (underline)

Sharing your knowledge via abstracts will not only further research at USCSOD, but it will allow you to receive feedback from your peers.

Tips for Writing an Abstract

1. Title: make the title dynamic and conclusive, rather than descriptive.
2. Structure: A well written abstract should have the following identified sections: Introduction, Hypothesis, Methods, Results and Conclusions.
3. Category: Carefully choose the correct category for submission of your work. The submitting author will be required to check a box verifying that all co-authors have read and approved the submission of the abstract. This will replace downloading and faxing a signed copy of the submitted abstract.

USC SCHOOL OF DENTISTRY CONTINUING EDUCATION

Your Trojan Home for Life-Long Learning

JANUARY - JUNE 2010

THE 35TH ANNUAL USC PERIODONTAL AND IMPLANT SYMPOSIUM

GENERAL SESSIONS: FRI - SAT, JAN 29 - 30

DENTAL HYGIENE FORUM: SAT, JAN 30

CADAVER WORKSHOP I: THURS, JAN 28

CADAVER WORKSHOP II: SUN, JAN 31

MASTERING MOLAR ENDODONTICS

FRI - SAT, FEB 5 - 6

BASIC PROTOCOLS IN IMPLANT SURGERY AND RESTORATION

THURS - SUN, FEB 18 - 21

CHRONIC OROFACIAL, ORODENTAL AND HEADACHE PAINS FOR THE DENTIST

FRI - SAT, FEB 19 - 20

PORCELAIN VENEERS: OPTIMIZING RESULTS USING SUPRA-GINGIVAL PRINCIPLES, AND UNDERSTANDING ADHESIONS AND OCCLUSION

FRI, FEB 26

EMERGING DISEASES, INFECTION CONTROL AND CALIFORNIA DENTAL PRACTICE ACT

SAT, FEB 27

APPLIED HYPNOSIS: TREAT PAIN, TMD & OTHER DENTAL CONDITIONS

SAT - SUN, FEB 27 - 28

ORAL SURGERY FOR THE GENERAL PRACTITIONER

SAT, MAR 6

USC RUTH RAGLAND 24TH DENTAL HYGIENE SYMPOSIUM

PART I: SAT, MAR 6

PART II: SUN, MAR 7

IMPLANT THERAPY IN THE ESTHETIC ZONE

FRI - SUN, MAR 12 - 14

ESTHETIC FULL-MOUTH IMPLANT RECONSTRUCTION: FROM TREATMENT PLANNING TO FIXED RESTORATION

MODULE I: FRI, MAR 19

MODULE II: SAT, MAR 20

MODULE III: SUN, MAR 21

MASTERING BONE GRAFTING FOR ESTHETIC IMPLANT SITE DEVELOPMENT - CADAVER WORKSHOP

MODULE I: FRI, MAR 26

MODULE II: SAT, MAR 27

NEW APPROACHES FOR ANTIMICROBIAL TREATMENT OF PERIODONTAL DISEASE - SACRAMENTO

FRI, APR 9

IMPLANT THERAPY IN COMPROMISED SITES

FRI - SUN, APR 9 - 11

COMMON ORAL LESIONS (1): UPDATE ON EARLY ORAL CANCER AND PRECANCER DETECTION

SAT, APR 10

ESTHETIC PERIODONTAL SURGERY FOR THE GENERAL PRACTITIONER - SACRAMENTO

MODULE I: SAT, APR 10

ADVANCED BONE AND SOFT TISSUE AUGMENTATION - CADAVER WORKSHOP

SUN, APR 11

DIGITAL PHOTOGRAPHY IN DENTISTRY

PART I: FRI, APR 16

PART II: SAT, APR 17

A COMMON SENSE APPROACH TO REMOVABLE PARTIAL DENTURE DESIGN

SAT, APR 24

ESTHETIC PERIODONTAL SURGERY FOR THE GENERAL PRACTITIONER - LOS ANGELES

MODULE I: FRI, APR 30

MODULE II: SAT - SUN, MAY 1 - 2

FUNDAMENTALS OF RESTORATIVE IMPLANT DENTISTRY FOR THE GENERAL DENTIST

PART I: FRI, MAY 7

PART II: SAT, MAY 8

OBSTRUCTIVE SLEEP APNEA, SNORING AND DENTAL ADVANCEMENT

FRI - SAT, MAY 7 - 8

THE USES OF PHOTOSHOP & POWERPOINT IN MODERN DAY DENTISTRY: A HANDS-ON COURSE

SAT, MAY 8

PHYSICAL EVALUATION

MON, MAY 17

EMERGENCY MEDICINE

TUES, MAY 18

MONITORING AND CLINICAL EMERGENCY MEDICINE

WED, MAY 19

COMMON ORAL LESIONS (2): SOFT AND HARD TISSUE DISEASES

SAT, MAY 22

ENDODONTICS FROM A TO Z: HANDS-ON WORKSHOP FOR THE GENERAL PRACTITIONER

PART I: FRI - SUN, JUN 4 - 6

PART II: FRI - SUN, JUNE 25 - 27

ADVANCED IMPLANT RESTORATION

FRI - SUN, JUNE 11 - 13

University of Southern California
School of Dentistry
Office of Continuing Education

925 W 34th St Rm 201J
Los Angeles, Ca 90089-0641
t. 213.821.2127
f. 213.740.3973
cedental@usc.edu
www.uscdentalce.org

2010

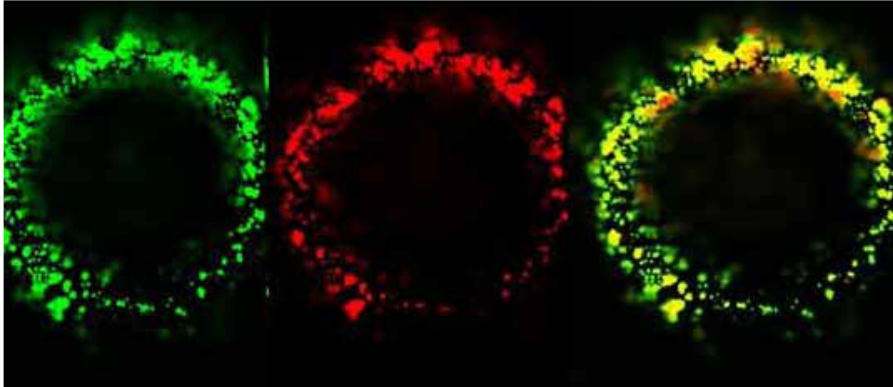
COURSE

SCHEDULE

View more CE courses
and register online at
USCDENTALCE.ORG

USC|SRG

Student Research Group



RESEARCH ON!



the **Herman Ostrow**
School of Dentistry
of USC