This fall issue, I’m excited to celebrate the 4th birthday of this Dental Research newsletter. The duration of this newsletter marks the time frame of large growth and expansion in research here at the College of Dentistry.

One of my goals when I accepted the position as Senior Executive Associate Dean for Research was to engage more faculty, especially non-research faculty, in research pursuits that compliment their specific practice.

This past year, we’ve had 48% of all full-time faculty participate in research in some capacity. Whether mentoring a dental student’s research project, developing their own internal protocols, or investigating on behalf of private industry our faculty has been busy uncovering new ideas and practices in the dental profession.

I’m equally impressed that four of our faculty members have submitted five grant applications to the National Institutes of Dental and Craniofacial Research within the National Institutes of Health this past fall cycle.

As always this dedication to research has an impact on our dental students. This year we were honored to host the 20th Annual Hinman Student Research Symposium at the famous Peabody Hotel. This milestone recognizes 20 years of guiding the nation’s dental students in the fundamentals of research and how their work can considerably impact how the current and future state of dental practice.

We will continue to push the envelope further here at the College of Dentistry in a way that partners with other health science fields and puts dental research in the same realm of medical research. I’m proud of the creativity that our faculty has displayed through their extracurricular research topics.
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D-4 student Ammaar Abidi presents his poster at the 20th Annual Hinman Student Research Symposium at the Peabody Hotel.

Dr. Edward Harris is the honorary scientist of Volume 26, Issue 3 of the Dental Anthropology Journal called: Edward Harris Tribute.
Research Faculty

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Professor, Department of Physiology, University of Tennessee Health Science Center
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Adjunct Professor, Department of Conservative Dentistry and Periodontology, University of Munich

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This fall the College of Dentistry was honored to hold the 20th annual Hinman Student Research Symposium. On October 31st through November 2nd, the College of Dentistry hosted its largest amount of dental schools at the Hinman Student Research Symposium. UTHSC dental students represented 6 of 88 students from 47 dental schools from across the U.S. and Canada at the famous Peabody Hotel.

The Symposium was sponsored by the University of Tennessee, College of Dentistry and co-sponsored by the Hinman Dental Society, which holds one of the nation’s largest continuing dental education meetings each March in Atlanta. The Symposium was also supported in part by grants from the National Institute for Dental and Craniofacial Research (NIDCR), the ADEAGies Foundation, the Procter & Gamble Company, the University of Tennessee, College of Dentistry Alumni Association, the Tennessee Dental Association Foundation, and the Colgate-Palmolive Company.

Dr. Patrick H. Yancey III, President of the Hinman Dental Society, welcomed the participants, praised the Symposium organizers and the student participants, and presented an overview of the upcoming Hinman Meeting to be held in Atlanta on March 26-28, 2015. The keynote speaker at the Welcoming Banquet was Dr. Lawrence A. Tabak, Principal Deputy Director and Senior Investigator of the National Institutes of Health and former Director of the NIDCR. Dr. Tabak spoke on “The Top 10 Things I Have Learned,” which included valuable insights on working with others, benefiting from the mentor-mentee relationship, and being guided by your data even when the results conflict with your understanding of how things work.

**Award Winners**

**Most Outstanding Presentations in Clinical Research**

**Kevin Carey**, K Markowitz  
An In Vitro Study Assessing the Treatment of Artificial White Spots with Resin Infiltrant **Rutgers University**, Newark, New Jersey

**Sarah EF Kaplan**, R Ohrbach  
Comparison of Modes of Self-Report of Waking-State Oral Parafunctional Behaviors **University at Buffalo**, New York

**Sawan V Prabhu**, KJ Zullig  
The Association between Dental Visits and Selected Oral Risk and Protective Factors among College Students **West Virginia University**, Morgantown

**Cassandra R Stewart**, N Obi, E Epane, A Akbari, K Ravella, L Halpern, JH Southerland, PR Gangula  
Effect of Diabetes on Salivary Gland Protein Expression of Tetrahydrobiopterin and Nitric Oxide Synthesis and Function **Meharry Medical College**, Nashville, Tennessee

**Most Outstanding Presentations in Basic Science Research**

**Nicolas Branshaw**, D Serge, E Salih  
Topographical Distribution of Phosphorylation and Hydroxyproline Sites in Dentin Collagen Type I by Mass Spectrometry **Boston University**, Massachusetts, **Harvard University**, Boston, Massachusetts
**Jeffrey Dyke**, L Mailli, R Plant, A Letra, S Blanton, JT Hecht, B Chiquet Genetic Variations Associated with the Etiology of Non-syndromic Cleft Lip with or without Cleft Palate Following Knockdown of CRISPLD2. *The University of Texas Health Science Center at Houston*

**Adiha Khan**, I El-Ayachi, G T-Huang Odontoblastic Differentiation of iPS Derived from Dental Stem Cells versus HeSC. *The University of Tennessee Health Science Center*, Memphis


**2014 President’s Award for Excellence in Dental Research from the National Students Research Group of the American Association for Dental Research**

**Amanda Francis**, H Huang, S Wallet, T Langaee, I Aukhil, L Shaddox Epigenetic Regulation of the Inflammatory Response in Localized Aggressive Periodontitis. *University of Florida*, Gainesville

Dr. Franklin Garcia-Godoy offers keynote speaker Dr. Lawrence Tabak, Principal Deputy Director and Senior Investigator of the NIH, recognition for his contributions in science, health care, as an educator, researcher and administrator.

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**Technology Spotlight**

**ElectroPlus E1000 Test System by Instron**

**Location**
Biomaterials Research Center

**Description**
The E1000™ Instron is a state-of-the-art electrodynamic test instrument designed for dynamic and static testing on a wide range of materials and components.

**Applications**
The E1000 can evaluate materials in:
- compression,
- tension,
- shear, and
- bending for both static and fatigue.

A wide variety of test can be performed to accurately evaluate the physical properties of many devices.
YANHUI ZHANG, M.S., PH.D. – BIOSCIENCE RESEARCH

Dr. Yanhui Zhang’s works with Dr. Franklin Garcia-Godoy in different areas of dental research such as: plaque glycolysis and regrowth, caries research, saliva genetics and biomarkers, oral cancer research, and biocompatibility of dental material. Cutting edge research at the Bioscience Research Center (BRC) are empowered by state of the art research facilities as well as advanced research technologies: ZEISS EVO HD Scanning Electron Microscopy (SEM), Zeiss AxioObserver Z1 fluorescence microscope with live imaging systems; Real Time PCR, microarray gene profiling, molecular cloning, gene silencing, tissue culture, western blotting, cell proliferation assay, cell migration assay, and cell invasion assay. Dr. Zhang is also passionate at mentoring students. Two of her students have received James C. Ragain Award in Dental Research, and one student received Sigma Xi award.

Plaque glycolysis and regrowth (PGRM)
Dr. Zhang works closely with the Clinical Research Center (CRC) at the College of Dentistry to conduct industrial sponsored clinical trials. The BRC and CRC team are one of the top three most successful centers in the world that run clinical trials using plaque glycolysis and regrowth model (PGRM). PGRM is a proven clinical assay for testing the biological activity of Antigingivitis/Antiplaque Drug Products (Food and Drug Administration 21 CFR Part 356 Vol 68: 103, 2003). Along with the BRC and CRC team, Dr. Zhang has successfully completed nine industrial sponsored clinical trials within four years; more clinical trials and pilot study projects are actively ongoing currently.

Dental caries research
The assessment of plaque acidogenicity is important in dental caries research. The gold standard, Beetrode or telemetry, are complex and costly techniques and limit large scale clinical studies. Dr. Zhang has developed simplified a plaque sampling method to challenge the gold standard. This method may represent a low cost and high throughput solution to enable large scale clinical studies in plaque acidogenicity. In addition, Dr. Zhang the BRC team have successfully introduced fluorescent reporters into Streptococcus mutans and S. sanguinis. These fluorescent reporter systems lay important ground for further biofilm research and antimicrobial tests.

Saliva genetics and biomarkers
Dr. Zhang continually collects saliva samples, using microarray gene profiling and real time polymerase chain reaction(qRT-PCR), identifying the biomarkers for dental caries, oral cancer and other system diseases.

Oral cancer Research
Oral cancer is the sixth most common cancer in the world, and relative survival rates are among the lowest of major cancers. Tetraspanin web proteins play critical roles in many cancers;
however, little research has been done on Tetraspanins in oral cancer. Under the direction of Dr. Franklin Garcia-Godoy, Dr. Zhang is the first to have compared P53 and Tetraspanins in oral cancer SCC-25 and CAL27 cells to the normal gingiva GN23 fibroblasts and immortalized, nonmalignant S-G cells.

**Biocompatibility of dental material research**

This project was developed by Dr. Franklin Garcia-Godoy’s NIH R01 funded project. Millions of Americans are being treated with dental restorative materials each year. It is critical to develop a more clinical relevant biocompatibility screening method to update ISO 7405 and ISO 10993 standards, and ultimately prevent the unnecessary health risk from the cytotoxicity of dental restorative materials. Dr. Zhang is working diligently to develop a novel, high throughput and systematic method to screen the biocompatibility of dental restorative materials, using molecular and cellular technologies to benefit public health.

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**Clinical Research**

The following is a list of current clinical research studies being conducted by UT College of Dentistry faculty. The title, investigators, and study objective are listed for each project.

**Plaque Glycolysis and Saliva Genetics – A Pilot Study**

*Study Objective:* To improve the sensitivity of our laboratory and clinical methods used in plaque analysis and advance the prevention of oral disease including dental caries.

*Principal Investigator:* Dr. Franklin Garcia-Godoy

*Co-Investigators:* Dr. Yanhui Zhang and Colette Stewart

*Research Staff:* Laura Rush

**Osteonecrosis of the Jaw (ONJ) Case Registry**

*Study Objective:* This ONJ case registry will describe the natural history of positively-adjudicated ONJ in subjects with cancer with an observation period of 5 years

*Principal Investigator:* Dr. Cesar Migliorati

*Research Staff:* Laura Rush

**A Study to Assess the Effects on Plaque Glycolysis of a Dentrifice as Compared to Marketed Controls**

*Study Objective:* To assess plaque acidogenicity of a test mouthrinse as compared to a marketed controls in a clinical trial.

*Principal Investigator:* Dr. Franklin Garcia-Godoy

*Co-Investigators:* Dr. Yanhui Zhang

*Research Staff:* Laura Rush and Colette Stewart
Cranio-Facial Relationship Manipulation with an Oral Appliance Mitigating the Severity and Frequency of Motor Tics Associated with Neuro-Psychiatric Disorders such as Tourette Syndrome and Chronic Tic Disorder

Study Objective: To study the use of oral appliances in mitigating severity, frequency of motor and vocal tics in those with tourette’s syndrome and/or chronic tic syndrome.

Principal Investigator: Dr. Timothy Hottel
Co-Investigators: Dr. Robert Brandt, Dr. Martha Wells, Dr. Eliott Taynor (Long Island, NY) and Dana Watcher (Long Island, NY)
Research Staff: Laura Rush

Publications

The following is a list of publications by College of Dentistry faculty from mid-January 2014 to present, and recent as well as upcoming presentations.

PUBLICATIONS


Woods T, Bhattacharyya I, Cohen D, Rawal Y. Desmoplastic fibroma of the mandible: A series of three cases and review of literature. Head and Neck Pathology 2014; in press


Tylka D. He was part of the e-book: Occlusion, a primer for students of occlusion. American College of Prosthodontists Task Force on Occlusion Education, 2014.

PRESENTATIONS


Qayyum S, Hoskoppal D, Rawal Y. Intraosseous (central) sebaceous adenocarcinoma. Presentation at the College of American Pathologists 2014 meeting, September 7-10, Chicago.

Ivanoff C. Is to participate as a plenary lecturer at the Anniversary Scientific Conference at the Medical University of Plovdiv in May 2015.

Farahani SS, Munger K, Gallottini M, Bielenberg D. “Neuropilin-1 and oral squamous cell carcinoma.” Poster and the poster discussion session on drug targets during the West Cancer / University of Tennessee Health Science Center- 2014 Cancer Research Symposium on November 4, 2014, Germantown, TN.

Event & News

Novel Approaches in Cancer Treatment

Dr. Subhash Chauhan is a professor of the Department of Pharmaceutical Sciences her at UTHSC. Dr. Subhash primarily focuses on identifying and characterizing novel diagnostic and therapeutic targets for cancer.

The lecture given on November 18th at the Memphis Section of the AADR fall seminar, focused on some of his lab’s recent developments with novel trans-membrane mucin MUC13, which is a highly over-expressed ovarian and pancreatic cancer cells.

Dean Hottel Receives Grant from the TicTocStop, Inc. for Clinical Research

TicTocStop is a non-profit organization in New York dedicated to research in the treatment of Tourette Syndrome (TS).

Dr. Hottel will lead a clinical trial study that will test the effectiveness of a newly developed oral appliance that has been shown to significantly reduce the number and severity of motor tics associated with TS and Chronic Tic Disorder.

The clinical trial will take place here at the College of Dentistry and at the private practice of Elliot Taynor, DDS in Port Jefferson, NY.
The following is a list of current grants/sponsorships held by UT College of Dentistry faculty.

**FEDERAL/FOUNDATION GRANTS**

- **Stem cell-based therapy for regenerative endodontics**
  - PI: George Huang (Bioscience Research)
  - NIH/NIDCR RO1

- **Hinman Student Research Symposium**
  - PI: Franklin Garcia-Godoy, D.D.S., M.S., Ph.D., Ph.D. (Bioscience Research)
  - NIH/NIDCR (R13)

- **Osteonecrosis of the jaw (ONJ) case registry**
  - PI: Cesar Migliorati
  - Amgen

- **Stem cell-mediated periodontal ligament regeneration for avulsed teeth**
  - PI: Dr. George Huang, (Bioscience Research)
  - American Association of Endodontics

- **Advanced nursing Education (ANE) Grant**
  - PI: Susan Patton
  - Co-I: Drs Cesar Migliorati, Timothy Hottel, Cassandra Ballard-Holder, Margaret Hartig, and Pamela Connor
  - HRSA

- **Plaque pH analysis project**
  - PI: Dr. Franklin Garcia-Godoy
  - Procter & Gamble

- **Bioscience endodontics research**
  - PI: Dr. Franklin Garcia-Godoy

- **Colgate research**
  - PI: Dr. Franklin Garcia-Godoy
  - Colgate

- **Bioscience Research Gift**
  - PI: Dr. Franklin Garcia-Godoy
  - Procter & Gamble

- **Study to Assess the Effects on Plaque Glycolysis of a Dentifrice as Compared to Marketed Controls**
  - PI: Dr. Franklin Garcia-Godoy
  - Co-I: Dr. Yanhui Zhang
  - Procter & Gamble
• **Protocol to integrate 3-D photography**
  - PI: Dr. Holland Maness
  - American Association of Orthodontists Foundation

• **Cranio-facial relationship manipulation with an oral appliance mitigating the severity and frequency of motor tics associated with neuro-psychiatric disorders such as tourette syndrome and chronic tic disorder**
  - PI: Dr. Timothy Hottel
  - Co-I: Drs. Robert Brandt, Martha Wells, Eliott Taynor (Long Island, NY)
  - TicTocStop

• **In vitro bioactivity evaluation of three dental cements**
  - PI: Dr. Franklin Garcia-Godoy
  - NuSmile
The UTHSC College of Dentistry was founded in 1878 making it the oldest dental college in the South, and the third oldest public college of dentistry in the United States.

The College contains a 4-year dental program, totaling approximately 320 students. In addition, students in the Postgraduate dental programs and Dental Hygiene are included.

The College is dedicated to providing professional, graduate, and postgraduate education; conducting dental research; and, delivering state-of-the-art patient care and public service.