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  Dean, College of Dentistry

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  Senior Executive Associate Dean for Research

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Research has become a new focus at the College of Dentistry. Although our primary mission is to train successful general dentists, dental research is an important part of the educational process.

With the successful hiring of several research-oriented faculty, the University of Tennessee College of Dentistry has appeared in publications ranging from the Dental Products Reports to texts like “Cancer Metastasis – Biology and Treatment.” We are poised to become a leader in dental research with new industry support and a record seven R01 federal grants submitted by July 2010, covering areas from sealants to stem cells.

For this, I would like to thank those who have supported faculty and student research efforts to advance the dental profession – with a special thanks to our alumni.

Timothy L. Hottel, D.D.S., M.S., M.B.A.

Dean, College of Dentistry
The purpose of this compendium of current research efforts in the College of Dentistry at the University of Tennessee Health Science Center is to assist students in selecting areas of research and mentors for their student research projects; to facilitate communication and collaboration in research among faculty; and, to inform the alumni and other health professionals in the Mid-South and the dental industry of the expertise and assistance that is available to prospective researchers in the UT College of Dentistry.

Franklin Garcia-Godoy, D.D.S., M.S.

Senior Executive Associate Dean for Research
Chair, Department of Bioscience Research
Director, Bioscience Research Center
Professor, Department of Physiology
Dental research is being conducted at a variety of laboratories and clinics across the University of Tennessee Health Science Center Campus, as well as at regional medical and public health centers in Tennessee and Arkansas. However, the designated campus dental research centers are listed below.

- **BIOSCIENCE RESEARCH CENTER**
  N102 Dunn Dental Building
  875 Union Avenue

- **CANCER RESEARCH CENTER**
  19 S. Manassas Street

- **CRANIOFACIAL RESEARCH CENTER**
  429 Boling Center
  711 Jefferson Avenue

- **BIOMATERIALS RESEARCH LABORATORY**
  138 Nash Research Building
  894 Union Avenue

- **DENTAL CLINICS**
  Dunn Dental Building, Floors 2-5
  875 Union Avenue
Listed below is a summary of the different types of research currently being conducted by faculty in the College of Dentistry at The University of Tennessee Health Science Center. This list is not exhaustive.

**Biomaterials Research**

**Biomaterials Development**
- Microtensile fracture strength testing
- Profilometer fracture mode testing
- Fatigue, thermocycling and load testing
- Scanning electron microscope evaluation
- Confocal electron microscope evaluation
- Leakage testing
- Hybrid layer evaluation
- Remineralization and demineralization studies
- Color and gloss analysis
- Implant coatings

**Clinical Testing**
- Whitening kits
- Restorative materials
- Endodontic materials
- Periodontal therapies
- Prostodontic devices
- Toothpaste
- Mouthwash
- Adhesives
- Disinfectants
- Analgesics
- Drugs
- Lasers
- Dental instruments and devices
- Toothbrushes (manual or power)
- Ortho appliances/devices
- Dental floss
- Implants
- Plaque and gingivitis
**Toothbrushing**
- Dentifrice testing
- Abrasion testing
- Wear testing
- Clinical testing
- Biofilm

**Biocompatibility Testing**
- Drugs and biomaterials
- In vitro cytotoxicity
- In vivo biocompatibility
- Histological assessment
- Genotoxicity assessment

**Molecular Assays**
- Protein/Gene activation
- PCR
- Gene silencing
- Gene isolation
- Molecular pathway elucidation
- Stem cells

**Craniofacial Research**

**Inflammation Research**
- Tissue alterations in periodontal diseases
- Cellular response to anti-inflammatory drugs (i.e., COX inhibitors, transcription factor inhibitors), natural products (i.e., myrrh oil, tea tree oil, cranberry components), and oral rinses
- Levels of arachidonic acid metabolites in gingival crevicular fluid in gingivitis/periodontitis
- Role of fibroblast production of matrix metalloproteinases and inflammatory mediators in periodontal diseases and inflammatory TMJ destruction
- Effects of methamphetamine on gingival fibroblasts and neutrophils in periodontitis

**Innate Immunity**
- Role of peroxidase enzymes of leukocytes and saliva in producing antimicrobial oxidizing agents that protect tissues against microbial infection and inflammation
- Antibiotic peptides produced by human leukocytes, oral epithelial cells, and the salivary glands. Mechanisms of antimicrobial activity and the molecular basis for microbial resistance
**Oral Cancer**
- Analysis of tumor cell invasion and metastatic potential
- Testing therapeutic potential of anti-tumor agents
- Immunolocalization of specific tumor antigens in cells and tissue

**Proteomic Analysis and Protein Expression Patterns**
- Proteomic analysis of cells and tissues
- Molecular market identification, characterization, and prognostic value

**Bone Metabolism**
- Effects of drugs (i.e., bisphosphonates and statins) and natural products (i.e., cranberry components) on soft tissue cell (gingival fibroblast and epithelial cell) production of mediators of bone metabolism (i.e., IL-6, RANKL, OPG)

**Gingival Fibroses**
- Gingival fibroblast production/regulation of extracellular matrix molecules and matrix metalloproteinases in gingival fibroses (hereditary/idiopathic, drug-induced)

**Molecular Assays**
- PCR
- Bacterial gene isolation and gene product identification
- Protein expression from isolated gene
- DNA analysis

**Clinical Testing**
- Assay for efficacy of mouthwash and toothpaste, using in vitro analysis
- Evaluation of periodontal therapy products
- Effects of natural products such as cannabidiol
- Testing for biofilm in dental waterline (screening and enumeration of microbial populations in dental waterlines; culturing anaerobic bacteria)

**Biomaterials Testing**
- Cellular and tissue response to implant materials and other biomaterials
- Cytotoxicity of implant and other biomaterials
- Genotoxicity testing
- Biofilm formation
The following is a list of College of Dentistry faculty who are currently engaged in industrially or federally funded research projects. The title, role, sponsor, duration, and brief abstract are listed for each funded project. This list does not include university or alumni-sponsored research projects.

**JEGDISH BABU, B.S., M.S., PH.D. (BIOSCIENCE RESEARCH)**

- **Title:** Influence of cranberry juice components on denture related stomatitis and inflammatory reactions of gingival fibroblasts
  - Role: PI
  - Sponsor: Cranberry Institute of Wisconsin
  - Type: Private Grant
  - Until: July 31, 2011
  - Abstract: This study investigates the role of high molecular weight components isolated from cranberry juice in the prevention of fungal biofilm formation on denture material. Additionally, the study also focuses on suppression of highly inflammatory cytokines and metalloproteinases by human gingival fibroblasts.

- **Title:** Influence of cranberry components on gingival epithelial cell production of bone resorptive mediators and adherence of periodontopathogens
  - Role: Co-PI
  - Sponsor: Cranberry Institute of Wisconsin
  - Type: Private Grant
  - Until: Submitted March 2010 (pending)
  - Abstract: This study investigates the high molecular weight of cranberry components interaction with human gingival epithelial cells to secrete bone resorptive materials and prevention of adhesion of periodontal pathogens to epithelial cells.
JOEL BUMGARDNER, PH.D. (BIOMEDICAL ENGINEERING - UTHSC & UNIVERSITY OF MEMPHIS)

- **Title:** Dual delivery of growth factors and/or antibiotics from chitosan-composites for bone regeneration
  - **Role:** PI
  - **Sponsor:** Department of the Army, US Army Medical Research Program
  - **Type:** Federal
  - **Until:** September 30, 2010
  - **Abstract:** Development of a chitosan calcium sulfate resorbable dual delivery vehicle for antibiotics and growth factors to prevent infection and stimulate healing in catastrophic orthopedic injuries.

- **Title:** Biocompatibility assessment of particles generated by drilling PEEK optima implants
  - **Role:** CI
  - **Sponsor:** Sonoma Orthopedics
  - **Type:** Industrial Contract
  - **Until:** August 31, 2010
  - **Abstract:** Evaluation of in vivo response to particles generated by drilling of PEEK that is used as an intramedullary fracture fixation device.

- **Title:** PROP Hypothesis Development Award Opportunity (x2)
  - **Role:** CI
  - **Sponsor:** Department of Defense (DoD) CDMRP
  - **Type:** Federal
  - **Until:** March 31, 2012
  - **Abstract:** To develop chitosan-carbon nanotubes coating and delivery system for preventing biofilms in catastrophic injuries

  Use of polyester for the development of tissue engineered soft tissue-bone constructs.

FRANKLIN GARCIA-GODOY, D.D.S., M.S. (BIOSCIENCE RESEARCH)

- **Title:** The biocompatibility screening of restorative treatments
  - **Role:** PI
  - **Sponsor:** NIH – NIDCR
  - **Type:** R56
  - **Until:** August 31, 2011
  - **Abstract:** The goal of this study is to screen the biocompatibility of restorative dental treatments.
Title: The biocompatibility screening of restorative treatments
Role: PI
Sponsor: NIH-NIDCR
Type: R01
Until: August 31, 2010
Abstract: The goal of this study is to screen the biocompatibility of restorative dental treatments.

Title: Preclinical effectiveness of cytotoxicity assays
Role: Co-I
Sponsor: NIH-NIDCR
Type: R03
Until: August 31, 2010
Abstract: The goal of this study is to measure the cytotoxicity of biomaterials using screening assays.

Title: Dentsply Tulsa Endodontics
Role: Co-I
Sponsor: Tulsa Dental
Type: Industry-Sponsored
Until: September 30, 2010
Abstract: The goal of this study is to create tissue-engineered regenerative endodontic therapies.

LIANG HONG, D.D.S., M.S., PH.D. (PEDIATRIC DENTISTRY & COMMUNITY ORAL HEALTH)

Title: Genome-wide association study of periodontitis: A planning grant
Role: Co-PI
Sponsor: NIH-NIDCR
Type: RC2
Until: September 2011
Abstract: The goal of this project is to identify genes with GWA analyses followed by validation in an independent population. The hypothesis is that risk genes for periodontitis can be detected with a powerful GWAS.
**Title:** Development of miniature plasma brush for dental clinical applications  
**Role:** Co-I  
**Sponsor:** NIH-NIDCR  
**Type:** R44 (SBIR Phase II)  
**Until:** June 30, 2012  
**Abstract:** The main objective of this project is to develop a miniature atmospheric cold plasma brush (m-ACPB) for dental clinical applications. The innovation of this project is the utilization of the recently developed novel non-thermal atmospheric plasma technology for dental treatment to prevent tooth decay and improve durability and longevity of dental composite restorations.

**MAURICE LEWIS, D.D.S. (RESTORATIVE DENTISTRY)**

**Title:** A clinical study to evaluate the safety and efficacy of high-adhesion whitening strips under extended wear regimen relative to a marketed control  
**Role:** CI  
**Sponsor:** Procter & Gamble  
**Type:** Industry Sponsored  
**Until:** September 30, 2010  
**Abstract:** Clinical trial of new whitening strips as compared to marketed control.

**ADAM LLOYD, B.D.S., M.S. (ENDODONTICS)**

**Title:** Visualization of sealer movement during single-cone obturation with EndoSequence BC Sealer  
**Role:** PI  
**Sponsor:** Real World Endodontics/Brasseler USA  
**Type:** Industry-Sponsored  
**Until:** N/A  
**Abstract:** Assess movement of a bioceramic sealer into the intricacies of root canal anatomy during single-cone obturation.
**Llewellyn Powell, D.M.D. (Prosthodontics)**

- **Title:** A clinical study to evaluate the safety and efficacy of high-adhesion whitening strips under extended wear regimen relative to a marketed control
- **Role:** CI
- **Sponsor:** Procter & Gamble
- **Type:** Industry Sponsored
- **Until:** September 30, 2010
- **Abstract:** Clinical trial of new whitening strip as compared to marketed control.

**Christopher Nosrat, D.D.S., Ph.D. (Bioscience Research)**

- **Title:** Neurotrophin specificity and function in the taste system
  - **Role:** PI
  - **Sponsor:** NIH-NIDCD
  - **Type:** R01
  - **Until:** June 30, 2011
  - **Abstract:** Investigation of the roles of neurotrophins, and in particular, BDNF during development and in the adult taste system. Working to generate and analyze novel transgenic mice as part of this study.

- **Title:** Neurotrophin specificity and function in the taste system
  - **Role:** PI
  - **Sponsor:** NIH-NIDCD ARRA Supplement to R01
  - **Type:** R01
  - **Until:** March 31, 2011
  - **Abstract:** Analyzing taste transgenic mice using laser capture micro-dissected taste tissue, microarray analysis and bioinformatics.

- **Title:** Roles of NGF in Familial Dysautonomia
  - **Role:** CI
  - **Sponsor:** NIH/NINDS
  - **Type:** R01
  - **Until:** March 31, 2012
  - **Abstract:** Investigation of the interrelationship between IKBKAP and NGF.
JAMES SIMON, D.D.S. (RESTORATIVE DENTISTRY)

- **Title:** A clinical study to evaluate the safety and efficacy of high-adhesion whitening strips under extended wear regimen relative to a marketed control
- **Role:** PI
- **Sponsor:** Procter & Gamble
- **Type:** Industry-Sponsored
- **Until:** September 30, 2010
- **Abstract:** Clinical trial of new whitening product as compared to marketed control.

DAVID TIPTON, D.D.S., PH.D. (BIOSCIENCE RESEARCH)

- **Title:** Influence of cranberry juice components on denture-related stomatitis and inflammatory reactions of gingival fibroblasts
- **Role:** Co-PI
- **Sponsor:** Cranberry Institute of Wisconsin
- **Type:** Private Grant
- **Until:** July 31, 2011
- **Abstract:** This project investigates anti-inflammatory effects of cranberry components in oral disease processes: denture-related stomatitis caused C. albicans, and aggressive periodontitis (AP). Studies include 1) determining fungicidal and fungistatic effects of cranberry components to inhibit periodontopathogen LPS stimulation of gene activation and production of tissue destructive cytokines and matrix metalloproteinases by AP human gingival fibroblasts.

- **Title:** Influence of cranberry components on gingival epithelial cell production of bone resorptive mediators and adherence of periodontopathogens
- **Role:** PI
- **Sponsor:** The Cranberry Institute of Wisconsin
- **Type:** Private Grant
- **Until:** Submitted March 2010 (pending)
- **Abstract:** The goals of this study are to determine whether cranberry NDM interferes with aspects of pathogenesis of periodontitis, namely inhibition of adherence of periodontopathogens to human gingival epithelial cells, and LPS-stimulated gingival epithelial cell production of molecules that degrade, or promote degradation, of periodontal bone.
SECTION I: Faculty in Research
The Department of Bioscience Research houses the College of Dentistry’s Research Faculty, or faculty whose majority effort is dedicated to conducting dental research.
**Jegdish P. Babu, B.S., M.S., Ph.D.**  
*Associate Professor, Department of Bioscience Research*

**Office Phone:** (901) 448-4342  
**Email:** jbabu@uthsc.edu

**Research:**  
*Bacterial pathogenesis:* Genomics of Fusobacterium nucleatum, focusing on the bacterial proteins that interfere with neutrophil defensive functions. Project involves cloning and expression of bacterial proteins, which interfere with chemotaxis and superoxide production.

*Bacterial LPS and neutrophil interactions:* Study focus on the differences in LPS ability to prime the neutrophils and monocytes. The LPS used in these studies were isolated from various periodontal pathogens.

*Biofilm studies:* Project involves creation of biofilm and studying the influence of various agents which disrupt or reduce the biofilm, in vitro. Study also extends to the biofilm formed on the denture surfaces, leading to the denture-induced stomatitis.
MUSTafa KH. DABBOUS, PH.D.
Professor, Department of Bioscience Research
Professor, Department of Molecular Science

Office Phone: (901) 448-6167
Email: mdabbous@uthsc.edu

Research:
Periodontal Disease: Molecular basis of connective tissue alterations during periodontal disease; in particular, the role of inflammatory cells in the modulation of fibroblast function; changes in proteolytic enzyme levels in crevicular fluid in gingivitis and periodontitis, the role of enzyme inhibitors as potential therapeutic means; and, the mechanism of gingival fibrosis (hereditary and drug-induced).

Oral Cancer: Tumor progression and metastasis; focusing on the mechanisms of tumor invasion and metastatic spread, tumor markers, and the mechanism of Kaposi’s sarcoma progression in HIV positive and HIV negative patients.
FRANKLIN GARCIA-GODOY, D.D.S., M.S.
Senior Executive Associate Dean for Research
Chair, Department of Bioscience Research
Director, Bioscience Research Center
Professor, Department of Physiology, University of Tennessee Health Science Center
Adjunct Professor, Department of Biomedical Engineering, University of Memphis
Adjunct Professor, Department of Biomedical Engineering, Florida International University
Senior Clinical Investigator, The Forsyth Institute, Boston, Massachusetts
Adjunct Professor, Department of Conservative Dentistry and Periodontology, University of Munich

Office Phone: (901) 448-6333
Email: godoy@uthsc.edu

Research Interests:
Specialty in pediatric dentistry. Leading advocate of developing and introducing new treatments to improve the lives of children, teenagers, and young adults.

A leader in clinical research. Currently involved in demineralization/remineralization studies, dental erosion research, plaque and gingivitis, biomaterials development, biocompatibility testing methods, and stem cell and tissue engineering.
Research:
Growth and development, primarily regarding the craniofacial complexes and the dentition.

Research topics can be clustered into three areas:
(1) Orthodontic Treatment of Adults: since adults are not growing, their orthodontic correction is accomplished wholly by tooth movement (rather than controlling jaw growth). Research focuses on how these changes are achieved and the stability of the results.
(2) Cleft Lip and Palate: CL/P is the most common branchial arch error in humans. Research revolves around the development of the palate and the dentition in children with CL/P.
(3) Root Resorption: external apical root resorption causes a loss of root length, which is a common iatrogenic consequence of orthodontic tooth movement. Research examines the factors that control this resorption process.
CHRISTOPHER NOSRAT, D.D.S., PH.D.
Professor, Department of Bioscience Research

Phone: (901) 448-2150
Email: cnosrat@uthsc.edu

Research:
Interested in:
(1) The role of neurotrophic factors in the development of oral tissues
(2) The role of stem cells from human dental pulp in tissue engineering and repair.
MARK SCARBECZ, PH.D.
Director, Planning and Assessment
Professor, Department of Bioscience Research

Office Phone: (901) 448-1211
Email: mscarbecz@uthsc.edu

Research:
In addition to the analysis of clinical research data, research interests include the role of women in dentistry; racial, ethnic, and socio-economic disparities in oral health; the relationship between oral health and general health; and, the well-being and quality improvement in dental education.

Current research:
Assessment of dental patient satisfaction and patient-reported dental care disparities between patient groups
EDWIN L. THOMAS, B.A., M.S., PH.D.
Professor, Department of Bioscience Research

Office Phone: (901) 448-4879
Email: elthomas@uthsc.edu

Research:
Saliva and the Prevention of Oral Disease: study to examine -
(1) How saliva components (histidine-rich peptides known as histatins and enzyme lactoperoxidase) block microbial growth
(2) How pathogenic micro-organisms become resistant to these protective substances
(3) How these natural defenses can be increased to prevent dental caries and infection of oral tissues

Leukocytes and Inflammation: investigating ways to identify neutrophil toxins, determine how they kill micro-organisms, and learn how the body protects itself against these toxins.
DAVID A. TIPTON, D.D.S., PH.D.
Professor, Department of Bioscience Research
Professor, Department of Periodontology

Office Phone: (901) 448-7220
Email: dtipton@uthsc.edu

Research:
Periodontal and Temporomandibular Joint (TMJ) Destruction: ongoing research of the establishment of diseased TMJ synovial fibroblasts and aggressive periodontitis (AP) fibroblasts, and their characterization including proliferation; their production of cytokines, growth factors and matrix and growth factor production; role of fibroblasts in RANK/RANKL/OPG system of bone metabolism, including effects of drugs such as bisphosphonates and statins.

Anti-inflammatory Effects of Cranberry Components and Other Natural Products: investigating the effects of non-dialyzable, high molecular weight cranberry components (NDM) on AP fibroblasts.

Hereditary and Drug-Induced (cyclosporine, nifedipine, phenytoin, cannabidiol) Gingival Fibrosis: characterization of fibroblasts from fibrotic gingival - identification of abnormalities in extracellular matrix synthesis and breakdown; contribution of fibroblasts to gingival inflammation; role of oncogenes in hyperproliferation of fibrotic fibroblasts; investigation of means of inhibiting matrix overproduction.

Osteogenic Potential of Mesenchymal Stem-Like Periodontal Ligament Cells: osteoblastic differentiation of periodontal ligament mesenchymal stem cells, through assessment of alkaline phosphatase activity and alizarin red staining for calcium.
ANTHEUNIS VERSLUIS, PH.D.
Director, Biomaterials
Professor, Department of Bioscience Research

Office Phone: N/A
Email: N/A

Research:
Extensive experience in the evaluation of biomaterials and biomechanics of dental materials.

Previous research projects:
- Evaluation of sub-critical fatigue crack propagation in a restorative composite
- Fatigue and plaque rupture in myocardial infarction
- Tooth deformation patterns in molars after composite restoration.

*Dr. Versluis will officially start at UTHSC in September 2010.
# Bioscience Research Staff

## Bioscience Research Center

**Laurel Wedel, M.A.**
Communications Specialist; Grants & Clinical Research Coordinator
[lwedel@uthsc.edu](mailto:lwedel@uthsc.edu)
(901) 448-2210

**Nancy Turner**
Administrative Aide
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## Cancer Research Center

**Irina Vukmanovic Nosrat, D.D.S.**
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**Zoran Pavivevic, M.D.**
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**Shailaja Kishan Rao, Ph.D.**
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**Michelle Sims, B.S.**
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## Craniofacial Research Center

**Margaret Jefferson**
Sr. Research Assistant
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**Iva Pendleton**
Admin. Service Assistant
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(901) 448-6167

**Geraldine Moore**
Lab Assistant
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(901) 448-6167

## Nash Research Building (Biomaterials Laboratory)

**Lena Haney**
Sr. Research Assistant
[lhaney@uthsc.edu](mailto:lhaney@uthsc.edu)
(901) 448-6265

**Nancy Pecora, B.S.C., B.A., M.B.A.**
Research Coordinator
[npecora@uthsc.edu](mailto:npecora@uthsc.edu)
(901) 448-6263
PART B: Other Faculty in Research

The following is a list of other faculty who are engaged in research in the College of Dentistry. Faculty are listed alphabetically, by last name, according to department.
DEPARTMENT of BIOLOGIC and DIAGNOSTIC SCIENCES

N228 Dunn Dental University of Tennessee Memphis, TN 38163 (901) 448-6227

INTERIM DEPARTMENT CHAIR: John Covington, D.D.S., M.S.

CESAR MIGLIORATI, D.D.S., M.S., PH.D.
Director, Division of Oral Medicine
Professor, Department of Biologic and Diagnostic Sciences

Office Phone: (901) 448-2613
Email: migliorati@uthsc.edu

Research:
• Biosphosphonate-related osteonecrosis research
APRIL BUFFINGTON, D.D.S.
Assistant Professor, Department of Endodontics

Office Phone: (901) 448-6254
Email: abuffington@uthsc.edu
Research:
• Laboratory testing of endodontic products

ADAM LLOYD, B.D.S., M.S.
Assistant Professor, Department of Endodontics

Office Phone: (901) 448-1793
Email: alloyd@uthsc.edu
Research:
• Canal shaping properties of endodontic instruments assessed by 3D micro-computerized tomography
JEFF PHEBUS, D.D.S.
Assistant Professor, Department of Endodontics

Office Phone: (901) 448-6438
Email: jphebus@uthsc.edu

Research:
• Ultra-structural evaluation of resin-dentin bond in root canals conditioned with phosphoric acid and ethylenediamine tetra-acetic acid.
DEPARTMENT of ORAL and MAXILLOFACIAL SURGERY
N327 Dunn Dental University of Tennessee Memphis, TN 38163 (901) 448-6236

DEPARTMENT CHAIR:
Lawrence Weeda, D.D.S.

JAMES M. CHRISTIAN, D.D.S.
Program Director, Residency Training Program in OMS
Associate Professor, Department of Oral and Maxillofacial Surgery

Office Phone: (901) 448-6236
Email: jchris19@uthsc.edu

Research:

NICHOLAS GERARD, D.M.D., M.D.
Assistant Professor, Department of Oral and Maxillofacial Surgery

Office Phone: (901) 448-6234
Email: ngerard@uthsc.edu

Research:
DANIEL REAVES, D.D.S.
Associate Professor, Department of Oral and Maxillofacial Surgery

Office Phone: (901) 448-6234
Email: Daniel.Reaves@va.gov

Research:
• Degussa implant research
EDWARD F. HARRIS, PH.D.
Professor, Department of Bioscience Research
Professor, Department of Orthodontics
Professor, Department of Pediatric Dentistry

Office Phone: (901) 448-6265
Email: eharris@uthsc.edu

Research:
Please see the Department of Bioscience Research for listing of current research.
DEPARTMENT of PEDIATRIC DENTISTRY and COMMUNITY ORAL HEALTH
S217 Dunn Dental University of Tennessee Memphis, TN 38163 (901) 448-6206

ACTING DEPARTMENT CHAIR:
Billy W. McCann, D.D.S.

MARTIN DONALDSON, D.D.S.
Director, Postgraduate Pediatric Dentistry
Associate Professor, Department of Pediatric Dentistry and Community Oral Health

Office Phone: (901) 448-6206
Email: mdonald1@uthsc.edu

Research:
*Dr. Donaldson is the Faculty Advisor for all graduate pediatric dentistry research projects.

LIANG HONG, D.D.S., M.S., Ph.D.
Associate Professor, Department of Pediatric Dentistry and Community Oral Health

Office Phone: (901) 448-6206
Email: lhong3@uthsc.edu

Research:
- Genome-wide association study of periodontitis: A planning grant
- Miniature plasma brush development
- Dental public health training programs
PRADEEP ADATROW, D.D.S., M.S.D., M.PH.
Director, Undergraduate Clinic
Associate Professor, Department of Periodontology

Office Phone: (901) 448-4756
Email: padatrow@uthsc.edu

Research:
- Nano-fibrous chitosan barrier membranes for guided tissue regeneration in maxillofacial blast injuries
- Stimulation and activation of pro-inflammatory cytokine Il-18 by lipopolysaccharide of periodontal pathogens.
- Long-term clinical evaluation of mini-implants used to immediately stabilize mandibular complete denture

PAUL S. BLAND, D.D.S.
Chair and Associate Professor, Department of Periodontology

Office Phone: (901) 448-6242
Email: p bland@uthsc.edu

Research:
- Assessment of dental patient satisfaction and patient-reported dental care disparities between patient groups
ANASTASIOS KARYDIS, D.D.S., M.S., PH.D.
Assistant Professor, Department of Periodontology

Office Phone: (901) 448-6242
Email: akarydis@uthsc.edu

Research:
- Distribution and osteogenic potential of mesenchymal stem-like periodontal ligament cells in periodontal health and disease
- Assessment of dental patient satisfaction and patient-reported dental care disparities between patient groups

SWATI RAWAL, B.D.S., M.D.S., M.S.
Director, Graduate Periodontics
Assistant Professor, Department of Periodontology

Office Phone: (901) 448-1963
Email: srawal@uthsc.edu

Research:
- Distribution and osteogenic potential of mesenchymal stem-like periodontal ligament cells in periodontal health and disease
JACOB SHILOAH, D.D.S., D.M.D.
Professor, Department of Periodontology

Office Phone: (901) 448-6242
Email: jshiloah@uthsc.edu

Research:
• Distribution and osteogenic potential of mesenchymal stem-like periodontal ligament cells in periodontal health and disease

SIDNEY H. STEIN, D.M.D., PH.D.
Associate Professor, Department of Periodontology

Office Phone: (901) 448-6242
Email: sstein@uthsc.edu

Research:
• Statins regulate IL-1 induced RANKL and OPG production by human gingival fibroblasts
**DEPARTMENT of PROSTHODONTICS**

S501 Dunn Dental  University of Tennessee  Memphis, TN 38163  (901) 448-6930

**DEPARTMENT CHAIR:**  
Russell Wicks, D.D.S.

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**SWATI AHUJA, B.D.S., M.D.S., D.D.S.**  
*Assistant Professor, Department of Prosthodontics*

**Office Phone:**  (901) 448-7180  
**Email:**  sahuja@uthsc.edu

**Research:**  
- A comparison of the effects of occlusal adjustment and splint therapy on symptoms reduction in TMD

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**ROBERT BRANDT, D.D.S., M.S.**  
*Professor, Department of Prosthodontics*

**Office Phone:**  (901) 448-6272  
**Email:**  rbrandt@uthsc.edu

**Research:**  
- Longitudinal study of four 2.0mm implants immediately loaded under a complete mandibular denture
DAVID CAGNA, D.M.D., M.S.
Director, Graduate Prosthodontics
Professor, Department of Prosthodontics

Office Phone:  (901) 448-6930
Email:  dcagna@uthsc.edu

Research:
- Effects of a denture adhesive on retention of mandibular complete dentures
- Vibration modal analysis based evaluation of implant integration
- ERA implant clinical study – 1,3 and 5- year follow-up

WAINSCOTT HOLLIS, D.D.S.
Assistant Professor, Department of Prosthodontics

Office Phone:  (901) 448-6288
Email:  whollis@uthsc.edu

Research:
- Longitudinal study of four 2.0mm implants immediately loaded under a complete mandibular denture
KENNETH KING, D.D.S.
Associate Professor, Department of Prosthodontics

Office Phone: (901) 448-6830
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Research:
- Tooth shade duplication utilizing a spectrophotometer

LLEWELLYN POWELL, D.M.D.
Assistant Professor, Department of Prosthodontics

Office Phone: (901) 448-4495
Email: lpowell8@uthsc.edu

Research:
- Clinical trial to evaluate safety and efficacy of high adhesion whitening strips under extended wear regimen relative to a marketed control
- Assessment of oral health of Memphis-area adults
DEPARTMENT of RESTORATIVE DENTISTRY
S401 Dunn Dental  University of Tennessee  Memphis, TN 38163  (901) 448-6254

INTERIM DEPARTMENT CHAIR:
Janet Harrison, D.D.S.

BERNARD BLEN, D.D.S.
Assistant Professor, Department of Restorative Dentistry

Office Phone: (901) 448-4489
Email: bblen@uthsc.edu

Research:
- Effect of water disinfectants on composite bond strength

LAURA DARNELL, D.M.D., PH.D.
Assistant Professor, Department of Restorative Dentistry

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Email: ldarnell@uthsc.edu

Research:
- Mechanical properties of materials
- Characterization of mechanical, chemical, and micro-structural properties of enamel and dentin
- Composite/dentin bonding systems
JANET HARRISON, D.D.S.  
Chair and Professor, Department of Restorative Dentistry

Office Phone: (901) 448-6692  
Email: jharrison@uthsc.edu

Research:
- The effects of hand-piece lubricants on composite bonds

ROBERT HATCH, D.D.S.  
Assistant Professor, Department of Restorative Dentistry

Office Phone: (901) 448-4489  
Email: rhatch1@uthsc.edu

Research:  
- Bond strength of hybrid resin composites
MAURICE LEWIS, D.D.S.
Assistant Professor, Department of Restorative Dentistry

Office Phone: (901) 448-6239
Email: mlewis@uthsc.edu

Research:
- Clinical study comparing the safety and efficacy of high adhesion whitening strips under extended wear regime relative to marketed control
- Tobacco cessation research – emphasis on smokeless forms
- Toothpicks versus dental floss comparative study for interproximal plaque control in Type 3 and Type 4 periodontal patients

BARRY MARK OWENS, D.D.S.
Associate Professor, Department of Restorative Dentistry

Office Phone: (901) 448-6275
Email: bowens@uthsc.edu

Research:
- Ultra-structural evaluation of resin-dentin bond in root canals conditioned with phosphoric acid and ethylenediamine tetra-acetic acid.
JAMES SIMON, D.D.S.
Director, Esthetic Dentistry
Professor, Department of Restorative Dentistry

Office Phone: (901) 448-6641
Email: jfsimon@uthsc.edu

Research:
- Vital tooth bleaching - current clinical study comparing the safety and efficacy of high-adhesion whitening strips under extended wear regime relative to a marketed control

WALETHA WASSON, D.D.S.
Associate Professor, Department of Restorative Dentistry

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Email: wwasson@uthsc.edu

Research:
- Clinical investigations on esthetics, color, science, and behavioral sciences
- Found of the Tennessee Smiles Program
OTHER DENTAL RESEARCH FACULTY

JOEL D. BUMGARDNER, PH.D.
Associate Professor, University of Memphis
Joint Biomedical Program (UTHSC & University of Memphis)
Adjunct Professor, Department of Bioscience Research UTHSC

Office Phone: (901) 678-5243
Email: jbmgrdnr@memphis.edu

Research:
• Specialty in biomaterials used in dental crown and bridge applications and in implants for dental/craniofacial and orthopedics.
• Research focus is in biocompatibility testing, corrosion/degradation, surface modification and in tissue engineering/regenerative medicine and drug delivery.
SECTION II: Students in Research
STUDENTS IN Dental Research
The College of Dentistry uses a variety of tools to improve human oral health, two of which are education and research. In recent years, the College has worked to expand its student research opportunities, creating an overlap between education and research, and helping students to better prepare for their future in dentistry.

Whereas research is more common in post-doctoral and residency programs, in the pre-doctoral program, there are many opportunities for students to enjoy research training and receive hands-on experience conducting research in one of the dental research laboratories and clinics on campus (for a list of Dental Research Centers, please refer to page 6).

For most UT dental students, the first opportunity to get involved in research will be during the summer after the first year of dental school (end of D1). During this summer session, students will have the most time to dedicate to research. However, limited time is also available at the end of the second year (D2) with varying amounts of additional time allotted in the following year to writing abstracts and presenting posters at meetings (such as the Hinman Student Research Symposium and IADR/AADR annual meetings). For students in their third and fourth year (D3 and D4) who are interested in participating in research, individual research electives can also be arranged for the duration of one semester.

In regards to funding for research, a modest stipend is available for a limited number of students to participate in the Student Summer Research Program, which is funded by the UT Dental Alumni Research Training Award (see Alumni Research Training Award section for more information about this program). Students are encouraged to apply for private and federal grants and fellowships as well.
At the University of Tennessee College of Dentistry (CoD), student research is a highly valuable scholarly activity, viewed as an integral component of the academic experience. Therefore, College administrators make it a priority to provide students with a variety of research opportunities, and, starting at new student orientation, faculty stress the importance of engaging in research during at least one of the four years on campus.

The CoD Student Research Program for pre-doctoral students provides funding for student research projects. This program was initiated in 1974, at which time limited funding was available to two students through the L.G. Noel Foundation. Over the next several years, interest in this program grew and attracted 18-20% of incoming students each year.

To provide more funded research opportunities and promote student participation in research, College administrators established the Summer Research Training Program. This program was supported by an NIH training grant awarded to UT CoD by the National Institute of Dental and Craniofacial Research (NIDCR). This T35 grant continued for several years before it was phased out in 2005.

In the wake of the loss of NIDCR funding, the UT Dental Alumni Association, in recognizing the importance of this student research program, committed funds for the Summer Student Research Training Program, for a period of ten (10) years. This current program for pre-doctoral students has been described by reviewers at NIDCR as a “model program” for other dental schools.

This program provides stipends for ten (10) dental students per year. During the summer, students receiving funding will engage in individualized research projects under the guidance and expertise of a faculty investigator who specializes in basic science, clinical science, or translational research. Students will work with their faculty mentor in his/her laboratory or clinic for the duration of eight (8) to ten (10) weeks. After this time, students will be required to present their research data in an oral presentation to their colleagues, faculty, and dental alumni. Student researchers will also be encouraged to present their research at national and international forums (including AADR/IADR meetings and the Hinman Student Research Symposium). All student researchers will be required to present their research as table clinics or posters at the annual Student Research Day held on campus each February.
DETAILS OF THE PROGRAM:

The Alumni Student Research Training program provides an opportunity for dental students to participate in cutting edge research experiences. The research training which the students receive individually allows the students to have an excellent opportunity for professional and academic growth, and it introduces students to different career opportunities in dental research and academic dentistry.

DETAILS ON THE PROGRAM:

**Stipend:** $1,200 per month*

**Duration:** 1-2 months (summer)

**Eligibility:** Any UTHSC dental student in good academic standing

**Application:** Available in the Craniofacial or Bioscience Research Center Offices

**Deadline:** Annually by February 1st

FOR MORE INFORMATION, PLEASE CONTACT:

Craniofacial Research Center
(901) 448-6167

- Or -

Bioscience Research Center
(901) 448-6333

* A travel allowance will be provided to students for presenting their abstracts at the AADR/IADR annual meetings.
SELECTING A RESEARCH MENTOR:

The first step to engaging in research in the College of Dentistry is to explore research topics and project ideas. It is important to find research that not only has practical value, but also fascinates you. Keep in mind that it is not necessary to narrow your interests to one specific topic – your faculty research mentor can help you further develop the details of your research proposal.

In order to find a faculty research mentor whose interests align with your own, use these hints for selecting a research mentor:

1) Review Section I: Faculty in Research of this handbook. Faculty who are currently engaged in research are listed alphabetically according to department, with a brief synopsis of their current research topics. Thoroughly read through each individual’s research interests and use the contact information provided to set a meeting to discuss your interests further.

2) Set up a consultation with Dr. Franklin Garcia-Godoy, Senior Executive Associate Dean for Research (901-448-6333 or godoy@uthsc.edu), to discuss your research interests and receive feedback from him regarding the feasibility of your research topic and suggestions for which faculty might best serve as your mentor.

3) Talk to a D2, D3, or D4 student and ask for references. Seek out those students who have participated in the program in previous years.

4) Talk to your faculty, particularly those for the classes that you enjoy or in areas where you feel your interests reside.

5) Do a little background research into your topic; read journal articles related to your topic and arm yourself with support for your research.
**Steps to Follow:**

Now that you know that you want to participate in research, follow the steps listed below to begin the process:

1) Make an appointment with the Senior Executive Associate Dean for Research, Dr. Franklin Garcia-Godoy, to discuss research interests and possible faculty mentors.

2) Contact the Grants & Clinical Research Coordinator (448-2210) or the Craniofacial Research Center (448-6167) to pick-up the application guidelines.

3) Call your prospective mentor to arrange for a meeting to discuss your interest in research and ask him/her for input on research topics. This should be completed between September and January before the summer in which you want to do research.

4) Work with your mentor to develop a simple proposal.

5) Submit your application by February 1st (annually).

6) An ad hoc committee will review all applications and will choose the ten (10) grant recipients according to the follow criteria:
   - Scientific merit
   - Feasibility of project completion during project period
   - Clarity and conciseness

7) Award notifications will be sent by March 15th (annually).

8) For those who receive an award: You will be responsible for arranging the start date with your mentor and the schedule for your summer research – make sure to build flexibility into that schedule and major holidays and/or vacations.
The Hinman Student Research Symposium was established in 1995 to highlight student achievements in research. The Hinman is co-sponsored by the Thomas P. Hinman Dental Society, with participation of the National Institute of Dental and Craniofacial Research, the ADEAGies Foundation, the Procter & Gamble Company, and the Tennessee Dental Association Foundation.

The Hinman Student Research Symposium is held every year at the Historic Peabody Hotel in Memphis, which is centrally located in the Mid-South, right along the Mississippi.

The symposium consists of competitive, scientific sessions with awards for the best presentations, a banquet with a nationally acclaimed key-note speaker, exhibits, and numerous networking opportunities as well as touring the “beautiful Bluff City.”

The Hinman begins on a Friday at noon, consisting of registration and poster set-up. This is followed by a reception and welcoming banquet. The symposium continues on Saturday with both morning and afternoon scientific sessions and many opportunities for fun and more networking.

But the Hinman isn’t all academia. Following a tour of Elvis Presley’s Graceland Mansion, you’ll be on your own for the evening on Beale Street, “Home of the Blues.”

On Sunday, the scientific sessions will continue in the morning and close with the presentation of awards.

Outside of the Hinman Student Research Symposium, and the activities listed above, Memphis offers many more opportunities for exploration – from the Pyramid to Sun Studios to boat tours on the Mississippi to the lesser known but worthwhile National Civil Rights Museum, Pink Palace Museum, Brooks Art Gallery, Dixon Gardens, and the unique Ornamental Metal Museum. Tree-shaded parks and neighborhoods, good food, and warm Southern hospitality await you.

For further information, please visit the Hinman online at: www.uthsc.edu/dentistry/admission/hinman