

RESEARCH SPOTLIGHT

TRANSLATING SCIENCE TO PRACTICE

Translating New Knowledge Across Disciplines

The Penn Dental Medicine research enterprise spans scientific disciplines to translate new knowledge into clinical therapies that are expanding our understanding of disease and advancing patient care. In 2017, faculty and laboratory staff throughout our basic science and clinical departments continued to advance research and scholarship across their respective fields and beyond. Their commitment and passion for discovery are building on the School's reputation as a leader in research and innovation. Here, we are pleased to highlight some of these research and scholarly activities for 2017.

Highly Funded Researchers

The top 10 funded Penn Dental Medicine researchers in fiscal year 2017 based on research grant activity.

FACULTY/DEPARTMENT	FY17 TOTAL
Dr. Kelly Jordan-Sciutto Pathology	\$1,803,152
Dr. George Hajishengallis Microbiology	\$1,411,120
Dr. Henry Daniell Biochemistry	\$1,369,458
Dr. Michel (Hyun) Koo Orthodontics/COH/Pediatrics	\$1,117,107
Dr. Dana Graves Periodontics	\$1,024,892
Dr. Kathleen Boesze-Battaglia Biochemistry	\$947,362
D. Shuying (Sherri) Yang Anatomy & Cell Biology	\$882,265
Dr. Gary Cohen Microbiology	\$805,573
Dr. Claire Mitchell Anatomy & Cell Biology	\$717,085
Dr. Hydar Ali Pathology	\$676,135

Scholarly Impact

The impact of faculty publications measured by the h index* is presented for a selection of research and clinical track faculty for the past five years. Career h-indexes are also included.

RESEARCH TRACK FACULTY (Tenure/Tenure Track/Research Track)

FACULTY	SCOPUS LIFETIME H-INDEX	SCOPUS 5 YR. H-INDEX
Dr. George Hajishengallis, Microbiology	49	22
Dr. Songtao Shi, Anatomy & Cell Biology	67	21
Dr. Henry Daniell, Biochemistry	57	19
Dr. Hyun (Michel) Koo, Orthodontics/COH/Pediatrics	43	15
Dr. Dana Graves, Periodontics	61	13
Dr. Claire Mitchell, Anatomy & Cell Biology	31	12
Dr. Geelsu Hwang, Orthodontics	15	11
Dr. Gary Cohen, Microbiology	63	10
Dr. Anh Le, Oral Surgery/Pharmacology	40	9
Dr. Shuying (Sherri) Yang, Anatomy & Cell Biology	16	9

CLINICAL TRACK FACULTY

(Clinician-Educator/Academic-Clinician Track/Academic Support Staff)

FACULTY	SCOPUS LIFETIME H-INDEX	SCOPUS 5 YR. H-INDEX
Dr. Markus Blatz, Preventive & Restorative Science	24	9
Dr. Betty Hajishengallis, Pediatrics	19	8
Dr. Fusun Ozer, Preventive & Restorative Science	20	7
Dr. Bekir Karabucak, Endodontics	14	6
Dr. Eric Stoopler, Oral Medicine	13	6
Dr. Frank Setzer, Endodontics	11	6
Dr. Thomas Sollecito, Oral Medicine	16	5
Dr. Jonathan Korostoff, Periodontics	19	4
Dr. Arthur Kuperstein, Oral Medicine	5	4
Dr. Rabie Shanti, Oral Surgery/Pharmacology	12	3

* The h-index was developed by J.E. Hirsch, Department of Physics, UCSD and attempts to measure the impact of an individual's publications. As an example, an h-index of 20 means there are 20 publications that have 20 citations or more each in journals covered by the Scopus database.

2017 High Impact Original Articles: Clinical Sciences

Within the School's clinical departments, the following selection of original research articles with Penn Dental Medicine faculty as first or senior authors were published in 2017 in journals with high impact factors.*

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR	DEPARTMENT
Xiao E, Mattos M, Vieira GHA, Chen S, Corrêa JD, Wu Y, Albiero ML, Bittinger K, Graves DT	Diabetes Enhances IL-17 Expression and Alters the Oral Microbiome to Increase Its Pathogenicity.	<i>Cell Host & Microbe</i>	14.9	Periodontics
Corrêa JD, Calderaro DC, Ferreira GA, Mendonça SMS, Fernandes GR, Xiao E, Teixeira AL, Leys EJ, Graves DT* , Silva TA* (*co-senior authors)	Subgingival microbiota dysbiosis in systemic lupus erythematosus: Association with periodontal status	<i>Microbiome</i>	8.5	Periodontics
Hwang G , Koltisko B, Jin X, Koo H	Nonleachable Imidazolium-Incorporated Composite for Disruption of Bacterial Clustering, Exopolysaccharide-Matrix Assembly, and Enhanced Biofilm Removal.	<i>ACS Applied Materials & Interfaces</i>	7.5	Orthodontics/COH/Pediatrics
Hwang G , Liu Y, Kim D, Li Y, Kryan DJ, Koo H	<i>Candida albicans</i> mannans mediate <i>Streptococcus mutans</i> exoenzyme GtfB binding to modulate cross-kingdom biofilm development in vivo.	<i>PLoS Pathogens</i>	6.6	Orthodontics/COH/Pediatrics
Stoopler ET , Ojeda D, Alawi F	Asymptomatic Pigmented Lesions of the Gingiva.	<i>JAMA Dermatology</i>	5.8	Oral Medicine, Pathology

2017 High Impact Original Articles: Basic Sciences

Within the School's basic science departments, the following selection of original research articles with Penn Dental Medicine faculty as first or senior authors were published in 2017 in journals with high impact factors.*

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR	DEPARTMENT
Chen C, Wang D, Moshaverinia A, Liu D, Kou X, Yu W, Yang R, Sun L, Shi S	Mesenchymal stem cell transplantation in tight-skin mice identifies miR-151-5p as a therapeutic target for systemic sclerosis.	<i>Cell Research</i>	15.6	Anatomy & Cell Biology
Li Q, Xu K, Du T, Zhu P, Verma A, Kulkarni M, Prasad T, Daniell H	Oral Delivery of Angiotensin-(1-7) Bioencapsulated in Plant Cells Protect against Diabetes-Induced Tissue Damage and Retinopathy	<i>Diabetes</i>	8.7	Biochemistry
Jin SX, Singh ND, Li LB, Zhang XL, Daniell H	Engineered chloroplast dsRNA silences cytochrome p450 monooxygenase, V-ATPase and chitin synthase genes in the insect gut and disrupts <i>Helicoverpa armigera</i> larval development and pupation.	<i>Plant Biotechnology Journal</i>	7.4	Biochemistry
Fontana J, Atanasiu D, Saw WT, Gallagher JR, Cox RG, Whitbeck JC, Brown LM, Eisenberg RJ, Cohen GH	The Fusion Loops of the Initial Prefusion Conformation of Herpes Simplex Virus 1 Fusion Protein Point Toward the Membrane.	<i>MBio</i>	7.0	Microbiology
Cairns TM, Ditto NT, Lou H, Brooks BD, Atanasiu D, Eisenberg RJ, Cohen GH	Global sensing of the antigenic structure of herpes simplex virus gD using high-throughput array-based SPR imaging.	<i>PLoS Pathogens</i>	6.6	Microbiology

*The Impact Factor identifies the frequency with which an average article from a journal is cited in a particular year. This number can be used to evaluate or compare a journal's relative importance to others in the same field. Journal impact factors are reported in Clarivate Analytics InCites™ Journal Citation Reports®. The JCR, 2016, was used for these figures.

2017 High Impact Review Articles

The following selection of review articles with Penn Dental Medicine faculty as first or senior authors were published in 2017 in journals with high impact factors.*

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR	DEPARTMENT
Hajishengallis G, Reis ES, Mastellos DC, Ricklin D, Lambris JD	Novel mechanisms and functions of complement.	<i>Nature Immunology</i>	21.5	Microbiology
Bowen WH, Burne RA, Wu H, Koo H	Oral Biofilms: Pathogens, Matrix, and Polymicrobial Interactions in Microenvironments.	<i>Trends in Microbiology</i>	11.0	Orthodontics/COH/Pediatrics
Zhang B, Shanmugaraj B, Daniell H	Expression and functional evaluation of biopharmaceuticals made in plant chloroplasts.	<i>Current Opinion in Chemical Biology</i>	7.9	Biochemistry
Kwon K-C, Sherman A, Chang W-J, Kamesh A, Biswas M, Herzog RW, Daniell H	Expression and assembly of largest foreign protein in chloroplasts: oral delivery of human FVIII made in lettuce chloroplasts robustly suppresses inhibitor formation in hemophilia A mice.	<i>Plant Biotechnology Journal</i>	7.4	Biochemistry
Paula AJ, Koo H	Nanosized Building Blocks for Customizing Novel Antibiofilm Approaches.	<i>J Dent Res</i>	4.8	Orthodontics/COH/Pediatrics

2017 New Grant Awards

In 2017, the following new grants of \$50,000 or more were awarded to Penn Dental Medicine.

CLINICAL DEPARTMENTS

Expanding Pediatric Training in Predoctoral Dental Education (See related story, p. 20)

Principal Investigator: Dr. Joan Gluch, Professor and Division Chief, Division of Community Oral Health (Bureau of Health Professions/HRSA/DHHS; \$1,528,175; 7/2017-6/2022)

The Role of NF- κ B in Mesenchymal Stem Cells During Diabetic Wound Healing

Principal Investigator: Dr. Kang Ko from the lab of Dr. Dana Graves, Professor, Dept. of Periodontics (NIDCR/NIH/DHHS; \$500,535; 7/2017-6/2022)

Defining mechanical injury, hypoxia, and disease progression in TMJ OA and pain

Principal Investigator: Dr. Eric Granquist, Assistant Professor of Oral & Maxillofacial (Oral and Maxillofacial Surgery Foundation; \$75,000; 1/2017-12/2017)

Stromal Cell-Derived IL-6 Promotes Stem-Like Cell Generation by Inducing Epithelial-Mesenchymal Transition in Ameloblastoma

Principal Investigator: Dr. Qunzhou Zhang from the lab of Dr. Anh Le, Professor and Chair, Dept. of Oral Surgery/Pharmacology (Oral and Maxillofacial Surgery Foundation; \$75,000; 1/2017-12/2017)

BASIC SCIENCE DEPARTMENTS

Targeted Cultivation of New Periodontal Pathogens

Principal Investigator: Dr. Flavia Teles, Associate Professor, Dept. of Microbiology (NIDCR/NIH/DHHS; \$694,505; 9/2017-12/2018)

Predicting Epitopes in Vaccine and Therapeutic Antibody Research

Principal Investigator: Dr. Gary Cohen, Professor, Dept. of Microbiology (Carterra Inc.; \$50,000; 2/2017-6/2018)

FY17 Patent Awards

The following patents were awarded to Penn Dental Medicine faculty in fiscal year 2017 as part of their research activities.

Expression of the Human IGF-1 Transgenic Plastids

Inventor: Dr. Henry Daniell, Biochemistry

Expression of human interferon in transgenic chloroplasts

Inventor: Dr. Henry Daniell, Biochemistry

Therapeutic Compositions for Bone Repair

Inventor: Dr. Joseph Fiorellini, Periodontics

Therapeutic Compositions for Bone Repair

Inventor: Dr. Dana Graves, Periodontics

Methods of Treating or Preventing Periodontitis Wound Diseases Associated with Periodontitis

Inventor: Dr. George Hajishengallis, Microbiology