

# RESEARCH SPOTLIGHT

TRANSLATING SCIENCE TO PRACTICE

## Advancing Discovery, Clinical Care 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 2018, faculty and research 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.

On the pages that follow, we are pleased to highlight some of these research and scholarly activities for 2018.

## Highly Funded Researchers

The top 10 funded Penn Dental Medicine researchers for fiscal year 2018 based on research grant activity.

FACULTY/DEPARTMENT	FY18 TOTAL
Dr. George Hajishengallis, Microbiology	\$1,797,269
Dr. Henry Daniell, Biochemistry	\$1,545,674
Dr. Kelly Jordan-Scuitto, Pathology	\$1,466,844
Dr. Shuyung (Sherri) Yang, Anatomy & Cell Biology	\$1,253,319
Dr. Michel (Hyun) Koo, Orthodontics/COH/Pediatrics	\$1,195,566
Dr. Dana Graves, Periodontics	\$1,125,106
Dr. Thomas Sollecito, Oral Medicine	\$737,115
Dr. Bruce Shenker, Pathology	\$687,588
Dr. Gary Cohen, Microbiology	\$682,621
Dr. Claire Mitchell, Anatomy & Cell Biology	\$674,075

## FY18 Patent Awards

The following patents were awarded to Penn Dental Medicine faculty in fiscal year 2018 as part of their research activities.

Administration of Plant-Expressed Oral Tolerance Agents

*Inventor: Dr. Henry Daniell, Biochemistry*

Chloroplasts Engineered to Express Pharmaceutical Proteins

*Inventor: Dr. Henry Daniell, Biochemistry*

Use of Flaxseed and Flaxseed Derivatives for Treatment of Neurological Disorders and Viral Diseases

*Dr. Kelly Jordan-Scuitto, Pathology*

## 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	52	24
Dr. Songtao Shi, Anatomy & Cell Biology	71	21
Dr. Henry Daniell, Biochemistry	67	18
Dr. Hyun (Michel) Koo, Orthodontics/COH/Pediatrics	47	17
Dr. Dana Graves, Periodontics	64	14
Dr. Chider Chen, Oral Surgery	23	13
Dr. Cagla Espinoza, Pathology	12	11
Dr. Gary H. Cohen, Microbiology	64	9
Dr. Kathleen Boesze-Battaglia, Biochemistry	27	9
Dr. Mark Wolff, Preventive & Restorative Sciences	26	8

### 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	26	10
Dr. Evlambia (Betty) Hajishengallis, Pediatrics	13	10
Dr. Bekir Karabucak, Endodontics	15	7
Dr. Frank Setzer, Endodontics	14	6
Dr. Jonathan Korostoff, Periodontics	19	5
Dr. Mel Mupparapu, Oral Medicine	15	5
Dr. Thomas P. Sollecito, Oral Medicine	17	4
Dr. Eugene Ko, Oral Medicine	4	4
Dr. Chun-Hsi Chung, Orthodontics	16	3
Dr. Eric Stoopler, Oral Medicine	14	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.

## 2018 High Impact Original Articles: Clinical Sciences

Within the clinical departments, the following original research articles with faculty as first/senior authors were published in 2018 in high impact journals.

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR*	DEPARTMENT
Liu, Y., Naha, P.C., Hwang, G., Kim, D., Huang, Y., Simon-Soro, A., Jung, H.-I., Ren, Z., Li Y., Gubara, S., Alawi, F., Zero, D., Hara, A.T., Cormode, DP., <b>Koo H.</b>	Topical ferumoxytol nanoparticles disrupt biofilms and prevent tooth decay in vivo via intrinsic catalytic activity.	<i>Nature Communications</i>	12.35	Orthodontics/COH/Pediatrics
Kim, D., Liu, Y., Benhamou, R.I., Sanchez, H., Simón-Soro, Á., Li, Y., Hwang, G., Fridman, M., Andes, D.R., <b>Koo, H.</b>	Bacterial-derived exopolysaccharides enhance antifungal drug tolerance in a cross-kingdom oral biofilm.	<i>ISME Journal</i>	9.52	Orthodontics/COH/Pediatrics
<b>Stoopler, E.T.</b> , Sollecito, T.P., <b>Alawi, F.</b>	A White Patch on the Tongue.	<i>JAMA Dermatology</i>	8.11	Oral Medicine, Pathology
Alharbi, M.A., Zhang, C., Lu, C., Milovanova, T.N., Yi, L., Ryu, J.D., Jiao, H., Dong, G., O'Connor, J.P., <b>Graves, D.T.</b>	FOXO1 deletion reverses the effect of diabetic-induced impaired fracture healing.	<i>Diabetes</i>	7.27	Periodontics
<b>Jeon, H.H.</b> , Yu, Q., Lu, Y., Spencer, E., Lu, C., Milovanova, T., Yang, Y., Zhang, C., Stephanchenko, O., Vafa, R.P., Coelho, P.G., <b>Graves, D.T.</b>	FOXO1 regulates VEGFA expression and promotes angiogenesis in healing wounds	<i>Journal of Pathology</i>	6.25	Periodontics, Orthodontics

## 2018 High Impact Original Articles: Basic Sciences

Within the basic science departments, the following original research articles with faculty as first/senior authors were published in 2018 in high impact journals.

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR*	DEPARTMENT
Mitroulis I, Ruppova K, Wang B, Chen L-S, Grzybek M, Grinenko T, Eugster A, Troullinaki M, Palladini A, Kourtzelis I, Chatzigeorgiou A, Schlitzer A, Beyer M, Joosten LAB, Isermann B, Lesche M, Petzold A, Simons K, Henry I, Dahl A, Schultze JL, Wielockx B, Zamboni N, Mirtschink P, Coskun Ü, <b>Hajishengallis G, Netea MG, Chavakis T (co-senior authors)</b>	Modulation of Myelopoiesis Progenitors Is an Integral Component of Trained Immunity.	<i>Cell</i>	31.40	Microbiology
Kou, X., Xu, X., Chen, C., Sanmillan, M.L., Cai, T., Zhou, Y., Giraudo, C., Le, A., <b>Shi, S.</b>	The Fas/Fap-1/Cav-1 complex regulates IL-1RA secretion in mesenchymal stem cells to accelerate wound healing.	<i>Science Translational Medicine</i>	16.71	Anatomy and Cell Biology
Dutzan, N., Kajikawa, T., Abusleme, L., Greenwell-Wild, T., Zuazo, C.E., Ikeuchi, T., Brenchley, L., Abe, T., Hurabielle, C., Martin, D., Morell, R.J., Freeman, A.F., Lazarevic, V., Trinchieri, G., Diaz, P.I., Holland, S.M., Belkaid, Y., <b>Hajishengallis, G., Moutsopoulos, N.M. (co-senior authors)</b>	A dysbiotic microbiome triggers TH17 cells to mediate oral mucosal immunopathology in mice and humans.	<i>Science Translational Medicine</i>	16.71	Microbiology
Liu, D., Kou, X., Chen, C., Liu, S., Liu, Y., Yu, W., Yu, T., Yang, R., Wang, R., Zhou, Y., <b>Shi, S.</b>	Circulating apoptotic bodies maintain mesenchymal stem cell homeostasis and ameliorate osteopenia via transferring multiple cellular factors.	<i>Cell Research</i>	15.39	Anatomy and Cell Biology
Li, Y., Zhong, C., Liu, D., Yu, W., Chen, W., Wang, Y., Shi, S., <b>Yuan, Y.</b>	Evidence for Kaposi Sarcoma Originating from Mesenchymal Stem Cell through KSHV-induced Mesenchymal-to-Endothelial Transition.	<i>Cancer Research</i>	9.13	Microbiology

## 2018 High Impact Review Articles

The following review articles with Penn Dental Medicine faculty as first/senior authors were published in 2018 in high impact journals.

AUTHORS	ARTICLES	JOURNAL	IMPACT FACTOR*	DEPARTMENT
Lamont, R.J., Koo, H., <b>Hajishengallis, G.</b>	The oral microbiota: dynamic communities and host interactions.	<i>Nature Reviews Microbiology</i>	31.85	Microbiology
Cormode, D.P., Gao, L., <b>Koo, H.</b>	Emerging Biomedical Applications of Enzyme-Like Catalytic Nanomaterials.	<i>Trends in Biotechnology</i>	13.58	Orthodontics/COH/Pediatrics
Bowen, W.H., Burne, R.A., Wu, H., <b>Koo, H.</b>	Oral Biofilms: Pathogens, Matrix, and Polymicrobial Interactions in Microenvironments.	<i>Trends in Microbiology</i>	13.58	Orthodontics/COH/Pediatrics
Taylor, L.F., <b>Yuan, Y.</b>	Structure of Herpesvirus Capsid Sheds Light on Drug Discovery.	<i>Trends in Microbiology</i>	11.78	Microbiology
Kufta, K., Forman, M., Swisher-McClure, S., Sollecito, T.P., <b>Panchal, N.</b>	Pre-Radiation dental considerations and management for head and neck cancer patients.	<i>Oral Oncology</i>	4.64	Oral Maxillofacial Surgery

\*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, 2017, was used for these figures.

## 2018 New Grant Awards

In 2018, the following new grants over \$150,000 were awarded to Penn Dental Medicine faculty.

### CLINICAL DEPARTMENTS

#### *Diabetes Reversal and the Subgingival Microbiota*

Principal Investigator: Dr. Dana Graves, Professor, Dept. of Periodontics (NIDCR/NIH/DHHS; Total Award \$2,365,741; 8/2018-6/2023)

#### *Enzymatic Approach for Targeting Mannans/EPS to Disrupt Cross-kingdom Cariogenic Biofilms*

Principal Investigator: Dr. Geelsu Hwang, Dept. of Orthodontics (NIDCR/NIH/DHHS; Total Award \$1,720,689; 7/2018 - 6/2023)

#### *Penn Dental Medicine Faculty Loan Repayment Program*

Principal Investigator: Dr. Joan Gluch, Professor, Division of Community Oral Health (Health Resources & Services Administration; Total award \$993,600; 9/2018 - 8/2023)

#### *Glucosyltransferases Inhibitors and Anti-biofilm Activity Project*

Principal Investigator: Dr. Hyun (Michel) Koo, Professor, Dept. of Orthodontics & Divs. Pediatrics/Community Oral Health (Procter & Gamble Company; Total Award \$150,000; 4/2018 - 3/2019)

### BASIC SCIENCE DEPARTMENTS

#### *Oligodendrocyte Damage and Dysfunction in HIV Associated Neurocognitive Disorder*

Principal Investigator: Dr. Kelly Jordan-Sciutto, Professor, Dept. of Pathology (National Institute of Mental Health/NIH/DHHS; Total award \$3,435,639; 4/2018 - 12/2022)

#### *Roles of KSHV Tegument Proteins in Virion Assembly*

Principal Investigator: Dr. Yan Yuan, Professor, Dept. of Microbiology (NIDCR/NIH/DHHS); Total award \$ 2,080,332; 4/2018 - 3/2023)

#### *Development of an Oral FVIII Therapeutic*

Principal Investigator: Dr. Henry Daniell, W.D Miller Professor, Dept. of Biochemistry (Shire Pharmaceuticals; Total Award \$1,027,135; 12/2018 - 3/2021)

#### *Technology Transfer and the Cross Verification Studies for FVIII Immune Tolerance Program*

Principal Investigator: Dr. Henry Daniell, W.D Miller Professor, Dept. of Biochemistry (Shire Pharmaceuticals; Total award \$700,474; 12/2018 - 3/2022)

#### *Immune Biomarkers for Clinical Monitoring Prevention and Reversal of FVIII Inhibitors*

Principal Investigator: Dr. Henry Daniell, W.D Miller Professor, Dept. of Biochemistry (Shire Pharmaceuticals; Total award \$315,813; 12/2018 - 4/2020)

#### *Development of an Oral FIX Therapeutic*

Principal Investigator: Dr. Henry Daniell, W.D Miller Professor, Dept. of Biochemistry (Shire Pharmaceuticals; Total award \$315,813; 12/2018 - 8/2021)

#### *Effect of HIV and ART Therapy on Developmental Myelination*

Principal Investigator: Dr. Kelly Jordan-Sciutto, Professor, Dept. of Pathology (Children's Hospital of Philadelphia; Total award \$175,686; 6/2018 - 3/2020)