Curriculum Vitae

Hyun Koo, D.D.S., M.S., Ph.D.

Professor (tenured), School of Dental Medicine, University of Pennsylvania

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Personal Statement: My research activity has focused on understanding the relationship between biofilms and oral infectious disease and seeking novel therapeutic strategies that effectively control the most pathogenic elements of *the disease dental caries*. I have published extensively in the area of dental caries and biofilm research, using molecular, biochemical and confocal imaging methodologies. Furthermore, I have conducted several animal and human-based studies to help translate our discoveries done *in vitro*. I have >90 publications in several prestigious journals including *Science, PLoS Pathogens,* ACS *Nano*, *Infection and Immunity, Antimicrobial Agents and Chemotherapy*, *Caries Research* and *Journal of Dental Research* (2015 *h*-index of 32; Thomson Reuters/Web of Science). I have a strong track-record of conducting productive and multidisciplinary research in collaboration with domestic and international institutions, and have competed successfully for extramural grants from NIH and USDA. Our work has become recognized internationally based on invitations to participate in international conferences and lectures at dental schools/institutions. I have served as a standing member of the Special Grants Review Committee of NIH/NIDCR, and have routinely participated as an *ad hoc* reviewer or consultant for several NIH review panels. I have been also a member of the AADR Hatton Awards Committee. I also teach undergraduate and graduate level courses with the goal of promoting critical thinking and assessment of clinical relevance. I have mentored/co-mentored 9 graduate students (MS and PhD levels) and supervised 6 Post-Doctoral fellows, 6 of whom were recipients of the AADR Hatton and IADR/GSK Innovation in Oral Care Awards. Moreover, the majority of them have obtained academic or tenure-track faculty positions. I have also served as the Associate Director of the NIH-sponsored Training Program in Oral Science, which provides enhanced training opportunities for the next generation of oral biologists. In parallel, I have been fostering cross-disciplinary interactions beyond the traditional biomedical sciences by including emerging fields such as nanotechnology and bioengineering to advance the field of *Caries Research*. In summary, my fundamental career objectives are to: (1) ensure the translation of knowledge from our research efforts into innovative and broader clinical applications aimed at prevention of dental caries, (2) train dentist/scientists to develop interdisciplinary approaches to study oral health-related issues and (3) help them ensure a successful transition to independent research careers. I believe these goals can be achieved by pursuing excellence, while being ever mindful of my ethical obligations as a researcher and an educator.

Education:

1989-1993	D.D.S., State University of São Paulo (UNESP), Brazil
1993-1996	M.S. in Food Science and Engineering (Biochemistry) Mentor: *Yong K Park, MD, PhD* State University of Campinas (UNICAMP), Brazil
1996-1999	Ph.D. in Oral Biology (Microbiology) Mentor: *Jaime A. Cury, DDS, PhD*; Co-mentor: *William H. Bowen, BDS, PhD* State University of Campinas (UNICAMP), Brazil University of Rochester Medical Center, Rochester, NY

Postgraduate Training and Fellowship Appointments:

1999-2001	Post-doctoral Fellow in Oral Biology Sponsor: *William H. Bowen, BDS, PhD* University of Rochester Medical Center, Rochester, NY
2011-2012	NIH Adjunct Researcher (Visiting Scientist) Sponsor: *Kenneth M. Yamada, MD, PhD* National Institute of Dental and Craniofacial Research (NIDCR) National Institutes of Health (NIH), Bethesda, MD

Faculty Appointments:

1997-1999	Instructor in Dentistry, Piracicaba School of Dentistry State University of Campinas (UNICAMP), Brazil
2001-2002	Instructor in Dentistry, Eastman Department of Dentistry University of Rochester Medical Center, Rochester, NY
2002-2008	Assistant Professor of Dentistry, Eastman Department of Dentistry University of Rochester Medical Center, Rochester, NY
2006-2008	Assistant Professor of Microbiology & Immunology, Department of Microbiology & Immunology, University of Rochester Medical Center, NY
2008-2013	Associate Professor (tenured) of Dentistry, Microbiology & Immunology, Center for Oral Biology, University of Rochester Medical Center, Rochester, NY
2013-	Professor (tenured) and Director of Research, Levy Center for Oral Health, Department of Orthodontics, Divisions of Pediatric Dentistry and Community Oral Health, School of Dental Medicine, University of Pennsylvania, Philadelphia, PA

Hospital Appointments:

1993-1994	Dentist at São Paulo State Military Hospital, Dental Unit Araraquara, Brazil

Awards, Honors and Membership in Honorary Societies:

Individual:

1998	IADR/Colgate-Palmolive Research in Prevention Award
2001	IADR/Colgate-Palmolive Research in Prevention Award
2001	The Basil G. Bibby Fellowship Award for Excellence in Oral Health Research
2006	Excellence in Research Incentives Program – University of Rochester
2006	IADR/GlaxoSmithKline Innovation in Oral Care Award
2006	IADR Distinguished Scientist Award – Young Investigator Award
2007	IADR Basil G. Bibby Young Investigator in Cariology Award
2009	Best of USDA National Research Initiative Grants
2011	Honorary Professor, West China College of Stomatology, Sichuan University, China

By students/fellows (as mentor/supervisor):

2004	IADR/Unilever Hatton Award Competition, Brazilian Division of IADR - Junior (Simone Duarte)
2004	The Basil G. Bibby Fellowship Award for Excellence in Oral Health Research (Patricia Nino de Guzman)
2007	AADR/Unilever Hatton Award Competition - Senior (Post-doc) category (Simone Duarte)
2008	AADR/Unilever Hatton Award Competition - Senior (Post-doc) category (Marlise Klein)
2011	AADR/Unilever Hatton Award Competition - Senior (Post-doc) category (Jin Xiao)
2012	AADR/Unilever Hatton Award Competition - Senior (Post-doc) category (Megan Falsetta)
2013	IADR/GlaxoSmithKline Innovation in Oral Care Award (Marlise Klein)
2014	Penn Dental Medicine Research Retreat AADR Travel Award (Geelsu Hwang)
2015	Summer Research Program Scholarship – Penn Dental Medicine (Victor Sun)
2015	Penn Dental Medicine Research Retreat AADR Travel Award (Lizeng Gao)
2015	IADR/GlaxoSmithKline Innovation in Oral Care Award (Lizeng Gao)

** IADR-International Association for Dental Research; AADR-American Association for Dental Research*

National Scientific Committees:

2008-	*Ad hoc* reviewer for NIH Study section, RCMI and COBRE review panels, NIDCR Dental Materials RFA Review, Challenge Grants in Health and Science Research review panel, RUMP Special Emphasis review panel, Dental-related SBIR/STTR review panel, and Drug Discovery and Mechanisms of Antimicrobial Resistance Study Section.
2010-2014	Standing member, Special Grants Review Committee of the NIH/NIDCR
2012-2015	Member, Hatton Awards Committee of the AADR
2015	NIDCR/NIH Consultant Panel, Workshop on Remineralization: Current State of Science and Future Directions

International Scientific Committees:

2001- External Advisory Committee for the Ph.D. and M.S. program in Pharmacology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil

Academic Committees at the University of Rochester Medical Center:

2004-2005 Chair, Basil G. Bibby Fellowship Award Review Committee
2005-2006 President, Rochester Section of the AADR
2004-2008 Member, Eastman Dental Center Safety Committee
2010-2012 Associate Director, NIH/NIDCR T32 Training Program in Oral Science
2006-2013 Member, University Committee on Animal Resources (UCAR)
2007-2013 Member, Oversight Committee for the Pathology & Morphology Imaging Core
2008-2013 Member, M.S. and Ph.D. thesis Committee, Department of Microbiology & Immunology
2011-2013 Member, Ph.D. thesis Committee, Department of Pathology
2012-2013 Associate Director, NIH/NIDCR T90R90 Training Program in Oral Science

Academic Committees at the University of Pennsylvania – School of Dental Medicine:

2013- Chair, Penn Dental Medicine Research Retreat
2013- Chair, AADR Travel Award Committee
2013- Member, Committee on Faculty Appointments and Promotions
2013- Member, Committee of Professors
2014- Member, D.Sc.D. Program Admissions Committee
2014- Member, Faculty Mentoring and Development Committee
2014- Member, Curriculum Revision Committee
2014- Co-Chair, Levy Research Seminar Series Committee
2015- Member, Biochemistry Chair Search Committee
2015- Member, Research Assist. Prof. of Periodontics Search Committee
2015- Chair, Anatomy and Cell Biology Faculty Position Search Committee
2015- Chair, Committee on Faculty Appointments and Promotions

Editorial Positions:

2002- *Ad hoc* reviewer for the following journals: *Caries Research, FEMS Microbiology Letters, Archives of Oral Biology, Planta Medica, Journal of Applied Microbiology, Annals of Microbiology, Journal of Medical Microbiology, European Journal of Medicinal Chemistry, Molecular Oral Microbiology, Critical Reviews in Food Science and Nutrition, Journal for Dental Research*, *PLoS One, Microbiology, Applied Environmental Microbiology, Antimicrobial Agents and Chemotherapy, Journal of Bacteriology, Journal of Antimicrobial Chemotherapy*
2008-2009 Guest editorial member for *Advances in Dental Research* (E-supplement to the *Journal of Dental Research* for the Proceedings of AADR Symposium "Fluoride and Caries Decline")

2008- Editorial board of *Journal of Dental Science*
2012- Review Editorial board of *Frontiers in Cellular and Infection Microbiology*
2014- Editor, Microbiology section, *Current Oral Health Reports*
2015- Editorial board of *International Journal of Oral Science*
2015- Editorial board of *Journal of Dental Research*

Major Teaching and Training Responsibilities:

Lecturer:

1997-1999 Biochemistry (dental students), Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil
2002-2013 Oral Biology, Graduate Program (Ph.D. students and dental residents), University of Rochester Medical Center, Rochester, NY
ORB 580: Cariology (2002-2013)
ORB 493: Oral Microbiology (2004-2013)
ORB 579: Saliva and Salivary Glands (2004-2013)
2013- Dental Caries lecture in Biochemistry and Microbiology of Dental Caries (dental students), School of Dental Medicine, University of Pennsylvania
2013- Dental Caries lecture in Pediatric Dentistry (dental residents), School of Dental Medicine, University of Pennsylvania),
2013- Orientation in Research in Orthodontics, School of Dental Medicine, University of Pennsylvania
2013- Research Seminar in Orthodontics, School of Dental Medicine, University of Pennsylvania
2013- Ortho Research thesis defense presentation, School of Dental Medicine, University of Pennsylvania
2014- Orientation in Research in Pediatric Dentistry, School of Dental Medicine, University of Pennsylvania
2015- Pediatric Dentistry (dental students, Pedo 704), School of Dental Medicine, University of Pennsylvania

Training Activities:

Post-Doctoral Trainees and Fellows

2005-2007 Simone Duarte, D.D.S., Ph.D. Post-Doctoral Fellow. *Current Position: Assistant Professor (tenure-track) of Pharmacology, New York University – College of Dentistry*. ***2007 Recipient of AADR Hatton Award (Senior/Post-doctoral category)***

2006-2009 Marlise Klein, D.D.S., Ph.D. Post-Doctoral Fellow. *Current Position: Assistant Professor (tenure-track) of Biomaterials, State University of Sao Paulo (UNESP), Brazil*. ***2008 Recipient of AADR Hatton Award (Senior/Post-doctoral category) and 2013 Winner of IADR/GSK Innovation in Oral Care Award.***

2010-2013 Jin Xiao, D.D.S., Ph.D. Post-Doctoral Fellow. *Current Position:* *Assistant Professor (tenure-track) of Dentistry, University of Rochester Medical Center.* ***2011 Recipient of AADR Hatton Award (Senior/Post-doctoral category).***

2010-2011 Guoping Feng, Ph.D. Post-Doctoral Fellow. *Current Position:* *Post-Doctoral Associate, Cornell University.*

2010-2013 Megan Falsetta, Ph.D. Post-Doctoral Fellow. *Current Position:* *Research Associate, University of Rochester Medical Center.* ***2012 Recipient of AADR Hatton Award (Senior/Post-doctoral category)***

2013-2015 Lizeng Gao, Ph.D. Post-Doctoral Fellow. *Current Position: Professor, School of Medicine, Yangzhou University, China.* ***2015 Winner of IADR/GSK Innovation in Oral Care Award***

2012- Geelsu Hwang, Ph.D. Post-Doctoral Associate

2014- Yuan Yu, D.D.S., Ph.D. Research Fellow

2014- Dongyeop Kim, Ph.D. Research Fellow

Graduate Students

2002-2006 Joanne Thimothe, Ph.D. in Food Science, Cornell University (Co-mentored with Dr. Olga Padilla-Zakour). *Current Position:* *Food Industry (Bimbo USA)*

2002-2005 Simone Duarte (D.D.S.), Ph.D. in Pharmacology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil (Co-mentored with Dr. Pedro L. Rosalen). ***2004 Recipient of IADR/Unilever Hatton Divisional Award, Brazilian Division (Junior category).***

2003-2006 Regiane Yatsuda (D.D.S.), Ph.D. in Pharmacology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil (Co-mentored with Dr. Pedro L. Rosalen). *Current Position:* *Assistant Professor (tenure-track), State University of Bahia, Brazil.*

2004-2007 Ramiro Murata (D.D.S.), Ph.D. in Pharmacology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil (Co-mentored with Dr. Pedro L. Rosalen). *Current Position:* *Assistant Professor (tenure-track), Ostrow School of Dentistry, University of Southern California (USC).*

2005-2008 Jin Xiao (D.D.S.), Ph.D. in Dentistry, West China College of Stomatology, Sichuan University, China (Co-mentored with Dr. Xue Dong Zhou).

2009-2012 Bruno B. Silva (D.D.S.), Ph.D. in Pharmacology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil (Co-mentored with Dr. Pedro L. Rosalen). *Current Position:* *Post-Doctoral Fellow, University of São Paulo, Brazil*

2008-2012 Punsiri M. Colonne, Ph.D. in Pathology, University of Rochester Medical Center. *Current Position:* *Post-Doctoral Fellow, University of Illinois, Chicago*

2012-2014 Benyamin Horev, M.S. in Biomedical Engineering, University of Rochester (Co-mentored with Dr. Danielle Benoit at Rochester)

2013-2015 Jinzhi He, D.D.S., Ph.D. candidate in Oral Biology, West China College of Stomatology, Sichuan University, China. *Current Position: Faculty, Department of Endodontics, West China School of Stomatology, Sichuan University, China*

2014- Jiayi Zhou, M.S. candidate in Biomedical Engineering, University of Rochester (Co-mentored with Dr. Danielle Benoit at Rochester)

2014- Jia Tian, dual-degree D.M.D./M.S. candidate in Bioengineering, Penn Dental Medicine and Penn Engineering

2015- Sara Bukhari (D.D.S.), M.S. (Endodontics) candidate, Penn Dental Medicine

2015- Guillaume Jouanny (D.D.S.), M.S. (Endodontics) candidate, Penn Dental Medicine

Pre-Doctoral Students

2003 Kevin Bolden (Meharry Medical College), Dental Student Summer Research, Students in Health Professional Schools Grant

2009 Isadora Gonzalez-Rosario (University of Puerto Rico), Dental Student Summer Research Training Program in Oral Sciences (Summer)

2010 Lena DeBaz (University of Rochester), Independent Research Course in Oral Biology (Spring/Fall). *Accepted into Case Western Reserve University School of Dental Medicine*

2011 Jorge L. Pantoja (University of Puerto Rico), Dental Student Summer Research Training Program in Oral Sciences (Summer)

2011 Mirela Kuralic (University of Rochester), Independent Research Course in Oral Biology (Spring). *Accepted into Tufts University of Dental Medicine*

2011 Chia-Hua Pai (University of Rochester), Independent Research Course in Oral Biology (Fall)

2015 Victor Sun, Dental Student Summer Research, Penn Dental Medicine

Others (Visiting Scientists)

2005-2006 Jaime A. Cury, D.D.S., Ph.D. Visiting Scholar. *Current Position: Professor of Cariology, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil*

2005-2006 Altair A. Del Bel Cury, D.D.S., Ph.D. Visiting Scholar. *Current Position: Professor of Prosthodontics, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil*

2008-2010 Jae-Gyu Jeon D.D.S., Ph.D. Visiting Scholar. *Current Position: Vice-Dean, School of Dentistry, Chonbuk National University, Korea*

Lectures by Invitation: (selected from >30 to date in academic institutions/scientific meetings)

2015 Invited Speaker at the 37th Asia Pacific Dental Congress (APDC), Suntec Singapore, Singapore.

2015 Invited Speaker, 2nd Penn Periodontal Conference, University of Pennsylvania, Philadelphia, PA

2015	Research Seminar at the Faculty of Dentistry, University of Hong Kong, Hong Kong
2015	Keynote Speaker for Thai Society of Cariology, Bangkok, Thailand
2015	Research Seminar and Workshop at the Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand
2014	Research Seminar at the School of Dentistry, University of Louisville, Louisville, KY
2013	Research Seminar at the School of Dentistry, University of Minnesota, Minneapolis, MN
2013	Research Seminar Series, New Jersey Dental School, University of Medicine and Dentistry of New Jersey, Newark, NJ
2012	Levy Research Seminar Series, School of Dental Medicine, University of Pennsylvania, Philadelphia, PA
2012	90th General Session of IADR, Symposium on Natural Products as Sources of Therapeutic Agents for Oral Diseases Prevention, Iguassu Falls, Brazil
2012	Syracuse University, Department of Biomedical and Chemical Engineering, Syracuse, NY
2012	Laboratory of Cell and Developmental Biology Seminar, National Institute of Dental and Craniofacial Research, NIH, Bethesda, MD
2012	Dean's Seminar Series, University of Florida, Department of Oral Biology, Gainesville, FL
2011	Seminar Series in the Graduate Program in Dentistry, Piracicaba School of Dentistry, State University of Campinas (UNICAMP), Brazil
2011	Speaker at the International Symposium on Microbial Biofilms, Chengdu, China
2011	Speaker at the Rochester Conference on Oral Biology: Post-Genomics for the Oral Microbiome, Rochester, NY
2011	Seminar on "Natural Technology" & Sustainable Packaging Trends, Tom's of Maine, Sable Oaks, South Portland
2010	Indiana University, School of Dentistry - Oral Health Research Institute, Indianapolis, IN
2009	Speaker at the 5th American Society for Microbiology (ASM) Conference on Biofilms, Cancun, Mexico
2009	IFT Annual Meeting, USDA, CSREES NRI Bioactive Food Components for Optimal Health Program, Best of NRI Symposium, Anaheim, CA
2008	International Conference on Novel Anticaries and Remineralizing Agents, Vina del Mar, Chile
2008	Seminar, J&J Consumer & Personal Products Worldwide, Morris Plains, NJ

2008 Department of Cariology and Comprehensive Care Seminar Series, New York University, College of Dentistry, New York, NY

2007 Graduate Program in Plant Biology, State University of New Jersey at Rutgers, New Brunswick, NJ

2007 Seminar, The Procter & Gamble Company, Miami Valley Innovation Center, Cincinnati, OH

2007 Seminar, Ocean Spray Cranberries, Inc., Lakeville-Middleboro, MA

2007 85th General Session of the IADR, Symposium on Cariogenic Dental Biofilms, New Orleans, LA

Organizing Roles in Scientific Meetings:

2007 85th General Session of IADR, symposium on Cariogenic Dental Biofilms, New Orleans, LA

2011 Rochester Conference on Oral Biology: Post-Genomics for the Oral Microbiome, University of Rochester, Rochester, NY

2012 90th General Session of IADR, symposium on Natural Products as Sources of Therapeutic Agents for Oral Diseases Prevention, Iguassu Falls, Brazil

Memberships in Professional and Scientific Societies:

American Association for the Advancement of Science (AAAS)
American Association for Dental Research (AADR)
American Society for Microbiology (ASM)
International Association for Dental Research (IADR)

Bibliography:

Research Publications, peer reviewed (*total of 91 publications;* ***2015 h-index 32***):

1. Horev B, Klein MI, Hwang G, **Koo H**[*], Benoit DSW[*]. pH-activated nanoparticles for targeted delivery and controlled drug release to disrupt oral biofilms. ***ACS Nano***, 9(3):2390-404, 2015. *Co-senior authors. *Highlighted in Science (2015)*
2. Hwang G, Marsh G, Gao L, Waugh R, **Koo H**. Binding Force Dynamics of *Streptococcus mutans*-glucosyltransferase B to *Candida albicans*. ***J Dent Res***, 2015 [Epub aheah of print].
3. Song F, **Koo H**, Ren D. Effects of Material Properties on Bacterial Adhesion and Biofilm Formation. ***J Dent Res***, 2015 [Epub aheah of print].
4. Fears KP, Gonzalez-Begne M, Love CT, Day DE, **Koo H**. Surface-induced changes in the conformation and glucan production of glucosyltransferase adsorbed on saliva-coated hydroxyapatite. ***Langmuir***, 2015 Apr 13. [Epub ahead of print]
5. Miller JH, Avilés-Reyes A, Scott-Anne K, Gregoire S, Watson GE, Sampson E, Progulske-Fox A, **Koo H**, Bowen WH, Lemos JA, Abranches J. The collagen binding protein cnm

contributes to oral colonization and cariogenicity of *Streptococcus mutans* OMZ175. ***Infect Immun***, 83(5):2001-10, 2015.

6. Klein MI, Hwang G, Santos PH, Campanella OH, **Koo H**. *Streptococcus mutans*-derived extracellular matrix in cariogenic oral biofilms. ***Front Cell Infect Microbiol***. 5:10, 2015

7. Petrie RJ, **Koo H**, Yamada KM. Generation of compartmentalized pressure by a nuclear piston governs cell motility in a 3D matrix. ***Science***, 345(6200):1062-5, 2014. *Selected for perspective/commentary articles in Nature Reviews Molecular Cell Biolology (2014) and Science (2014).*

8. **Koo H**, Bowen WH. *Candida albicans* and *Streptococcus mutans*: a potential synergistic alliance to cause virulent tooth decay in children. ***Future Microbiol***. 2014;9(12):1295-

9. Hwang G, Klein MI, **Koo H**. Analysis of the mechanical stability and surface detachment of mature *Streptococcus mutans* biofilms by applying a range of external shear forces. ***Biofouling***, 30(9):1079-91, 2014.

10. Petrie RJ, **Koo H**. Direct measurement of intracellular pressure. ***Curr Protoc Cell Biol***, 63:12.9.1-9, 2014

11. Nguyen PT, Falsetta ML, Hwang G, Gonzalez-Begne M, **Koo H**. α-Mangostin disrupts the development of *Streptococcus mutans* biofilms and facilitates its mechanical removal. ***PLoS One***, 28;9(10):e111312, 2014

12. Falsetta ML, Klein MI, Colonne P, Scott-Anne KK, Gregoire S, Pai CH, Gonzalez M, Krysan DJ, Bowen WH, **Koo H**. Symbiotic relationship between *Streptococcus mutans* and *Candida albicans* synergizes the virulence of plaque-biofilms *in vivo*. ***Infect Immun***, 82(5):1968-81, 2014. **Highlighted in ASM Microbe journal (2014).*

13. Sumei L, Klein MI, Heim KP, Fan Y, Bitoun JP, Ahn SJ, Burne RA, **Koo H**, Brady LJ, Wen JT. Production of eDNA by *Streptococcus mutans* is up-regulated in biofilms and influenced by components of the protein secretion machinery. ***J Bacteriol***, 196(13):2355-66, 2014.

14. Falsetta ML, **Koo H**. Beyond mucosal infection: a role for *C. albicans*-Streptococcal interactions in the pathogenesis of dental caries. ***Curr Oral Health Rep***, 1:86-93, 2014.

15. **Koo H**, Falsetta ML, Klein MI. The exopolysaccharide matrix: a virulence determinant of cariogenic biofilm. ***J Dent Res***, 92(12):1065-73, 2013.

16. Lemos JA, Quivey RG Jr, **Koo H**, Abranches J. *Streptococcus mutans*: a new Gram-positive paradigm? ***Microbiology***,159(Pt 3):436-45, 2013.

17. Hsu JC, **Koo H**, Harunaga JS, Matsumoto K, Doyle AD, Yamada KM. Region-specific epithelial cell dynamics during branching morphogenesis. ***Dev Dyn***, 242(9):1066-77, 2013

18. Feng G, Klein MI, Gregoire S, Singh AP, Vorsa N, **Koo H**. Specific degree-of-polymerization of A-type proanthocyanidin oligomers impacts Streptococcus mutans glucan-mediated adhesion and transcriptome responses within biofilms. ***Biofouling***, 29(6):629-40, 2013.

19. Bueno-Silva B, Alencar SM, **Koo H**, Ikegaki M, Silva GV, Napimoga MH, Rosalen PL. Anti-inflammatory and antimicrobial evaluation of neovestitol and vestitol isolated from Brazilian red propolis. ***J Agric Food Chem***, 61(19):4546-50, 2013

20. da Cunha MG, Franchin M, Galvão LC, de Ruiz AL, de Carvalho JE, Ikegaki M, de Alencar SM, **Koo H**, Rosalen PL. Antimicrobial and antiproliferative activities of stingless bee *Melipona scutellaris* geopropolis. ***BMC Complement Altern Med***, 13:23, 2013.

21. Xiao J, Klein MI, Falsetta ML, Lu B, Delahunty CM, Yates III JR, Heydorn A, **Koo H**. The exopolysaccharide matrix modulates the interaction between 3D architecture and virulence of a mixed-species oral biofilm***. PLoS Pathog***, 8(4):e1002623, 2012

22. Falsetta ML, Klein MI, Lemos JA, Silva BB, Agidi PS, Scott-Anne KK, **Koo H**. Novel anti-biofilm chemotherapy targets exopolysaccharide synthesis and stress tolerance in *Streptococcus mutans* to modulate virulence expression *in vivo.* ***Antimicrob Agents Chemother***, 56(12):6201-11, 2012

23. Klein MI, Scott Anne KM, Gregoire S, Rosalen PL, **Koo H**. Molecular approaches for viable bacterial population and transcriptional analyses in a rodent model of dental caries. ***Mol Oral Microbiol***, 27(5): 2012

24. Franchin M, da Cunha MG, Denny C, Napimoga MH, Cunha TM, **Koo H**, de Alencar SM, Ikegaki M, Rosalen PL. Geopropolis from *Melipona scutellaris* decreases the mechanical inflammatory hypernociception by inhibiting the production of IL-1β and TNF-α. ***J Ethnopharmacol*** 143(2):709-15, 2012

25. Klein MI, Xiao J, Lu B, Delahunty CM, Yates JR, **Koo H**. *Streptococcus mutans* protein synthesis during mixed-species biofilm development by high-throughput quantitative proteomics. ***PLoS One***, 7(9): e45795, 2012

26. Gregoire S, Xiao J, Silva BB, Gonzalez I, Agidi PS, Klein MI, Ambatipudi KS, Rosalen PL, Bauserman R, Waugh RE, **Koo H**. Role of glucosyltransferase B in the interactions of *Candida albicans* with *Streptococcus mutans* and experimental pellicle formed on hydroxyapatite surface. ***Appl Environ Microbiol***, 77:6357-67, 2011

27. Klein MI, Xiao J, Heydorn A, **Koo H**. An analytical tool-box for comprehensive biochemical, structural and transcriptome evaluation of oral biofilms mediated by mutans streptococci. ***J Vis Exp***. 25 pii:2512, 2011

28. Bowen WH, **Koo H**. Biology of *Streptococcus mutans*-derived glucosyltransferases: role in extracellular matrix formation of cariogenic biofilms. ***Caries Res***, 45:69-86, 2011. **Caries Research Top Cited Paper Impact factor (2012 and 2013).*

29. Jeon JG, Rosalen PL, Falsetta ML, **Koo H**. Natural products in caries research: current (limited) knowledge, challenges and future perspective. ***Caries Res***, 45:243-63, 2011.

30. Jeon JG, Pandit S, Xiao J, Gregoire S, Falsetta ML, Klein MI, **Koo H**. Influences of *trans-trans* farnesol, a membrane-targeting sesquiterpenoid, on *Streptococcus mutans* physiology and survival within mixed-species oral biofilms. ***Int J Oral Sci***, 3(2):98-106, 2011

31. Catalán MA, Scott-Anne K, Klein MI, **Koo H**, Bowen WH, Melvin JE. Elevated incidence of dental caries in a mouse model of cystic fibrosis. ***PLoS One*** 6(1):e16549, 2011

32. Branco-de-Almeida LS, Murata RM, Franco EM, Dos Santos MH, de Alencar SM, **Koo H**, Rosalen PL. Effects of 7-epiclusianone on *Streptococcus mutans* and caries development in rats. ***Planta Med*** 77(1):40-5, 2011

33. **Koo H**, Xiao J, Klein MI, Jeon JG. Exopolysaccharides produced by *Streptococcus mutans* glucosyltransferases modulate the establishment of microcolonies within multispecies biofilms. ***J Bacteriol***,192:3024-32, 2010

34. Klein MI, DeBaz L, Agidi S, Lee H, Xie G, Lin AH, Hamaker BR, Lemos JA, **Koo H**. Dynamics of *Streptococcus mutans* transcriptome in response to starch and sucrose during biofilm development. ***PLoS One*** 5(10):e13478, 2010

35. Ambatipudi K, Hagen FK, Delahunty CM, Han X, Shafi R, Hryhorenko J, Gregoire S, Marquis R, Melvin JE, **Koo H**, Yates JR. Human common salivary protein 1 (Csp-1) promotes binding of *Streptococcus mutans* to experimental salivary pellicle and glucans formed on hydroxyapatite surface. ***J Proteome Res***, 9:6605-14, 2010

36. **Koo H**, Duarte S, Murata RM, Scott-Anne K, Gregoire S, Watson GE, Singh AP, Vorsa N. Influence of cranberry proanthocyanidins on formation of biofilms by *Streptococcus mutans* on saliva-coated apatitic surface and dental caries development in vivo. ***Caries Res*** 44:116-126, 2010

37. Lemos JA, Abranches J, **Koo H**, Marquis RE, Burne RA. "Protocols to study the physiology of oral biofilms." ***Meth Mol Biol*** 666: 87-102, 2010

38. Murata RM, Branco-de-Almeida LS, Franco EM, Yatsuda R, dos Santos MH, de Alencar SM, **Koo H**, Rosalen PL. Inhibition of *Streptococcus mutans* biofilm accumulation and development of dental caries *in vivo* by 7-epiclusianone and fluoride. ***Biofouling*** 26:865-72, 2010

39. Xiao J, **Koo H**. Structural organization and dynamics of exopolysaccharide matrix and microcolonies formation by *Streptococcus mutans* in biofilms. ***J Appl Microbiol*** 108:2103-13, 2010

40. Aires CP, **Koo H**, Sassaki GL, Iacomini M, Cury JA. A procedure for characterizing glucans synthesized by purified enzymes of cariogenic *Streptococcus mutans*. ***Int J Biol Macromol*** 46:551-4, 2010

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Alternative Media:

Press Release of Research Projects: Some examples of the press release documents featuring our research projects are listed below:

http://www.msnbc.msn.com/id/22453814
http://www.sfgate.com/cgibin/article.cgi?f=/n/a/2007/12/31/national/w103932S56.DTL
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Grant Support

Current:

S. mutans-Candida interactions synergize the virulence of cariogenic biofilms (Koo H), **NIH/NIDCR, R01 DE023814**, 09/01/2015 - 08/31/2020, *Role: Principal Investigator*

Molecular basis for caries-inhibiting effects of cranberry flavonoids (Koo H), **NIH/NIDCR, R01DE016139-04**, 07/01/2010 - 06/30/2016, *Role: Principal Investigator*

Deciphering and controlling the signaling processes in bacterial multicellular systems and Bacteria-host Interactions (Ren D), **National Science Foundation, EFRI-MIKS1137186**, *Role: Principal Investigator of subcontract with Syracuse University*, 10/01/11 - 9/30/16

Controlled release *in situ* of antibiofilm agents via pH-activated nanoparticles (Klein M), **IADR/GlaxoSmithKline Award**, *Role: Investigator*, 04/01/2013 - 03/31/2016

Pending:

A novel anti-caries approach to modulate virulence of cariogenic biofilms (Koo H), **NIH/NIDCR, 2R01DE018023-07,** *Role: Principal Investigator*

Completed:

Environmental influences and dental caries (Bowen WH), **NIH/NIDCR, P01DE11549**, *Role: Investigator of Subproject 3*: Salivary Arginine/Lysine/Peptides and Caries Experience, 09/01/1995 - 12/31/2005

Effects of natural agents with fluoride on caries (Koo H), **NIH/NIDCR, R03DE15441**, *Role: Principal Investigator*, 08/01/2003 - 05/31/2005

Influence of cranberry on plaque-related diseases (Koo H), **NIH/NIDCR, R01DE016139**, *Role: Principal Investigator*, 01/01/2004 - 12/01/2007

Improving clinical outcomes for early childhood caries (Berkowitz R), **NIH/NIDCR, R21DE016280**, *Role: Investigator*, 05/01/2005 - 08/31/2008

Influence of Grape (*Vitis vinifera*) polyphenols on dental biofilm related oral diseases (Koo H), **USDA, NRI2006-35200-16589**, *Role: Principal Investigator*, 12/01/2005 - 11/30/2008

A novel therapeutic approach to prevent formation of cariogenic biofilm (Koo H), **IADR/GlaxoSmithKline Award**, *Role: Principal Investigator*, 07/01/2006 - 07/31/2008

Low pH-mediated membrane biosynthesis in *S. mutans* (Quivey R), **NIH/NIDCR, R01DE017157**, *Role: Investigator*, 07/01/2007 - 05/31/2012

Training Program in Oral Science (Quivey R), **NIH/NIDCR, 5T32 DE07202-20**, *Role: Associate Director*, 08/01/2010 - 07/31/2012

Improving clinical outcomes for severe early childhood caries (Berkowitz R), **NIH/NIDCR, R34 DE016280**, *Role: Investigator*, 5/1/12 - 4/30/13

Training Program in Oral Science (Quivey R), **NIH/NIDCR, T90 DE021985/R90 DE022529**, *Role: Associate Director*, 8/1/11 - 7/31/13

Role of the Spx regulator in *S. mutans* (Lemos J), **NIH/NIDCR, R01 DE019783**, *Role: Investigator*, 02/05/2010 - 07/31/2013

Evaluation of a novel anti-caries approach to modulate virulence of *S. mutans* (Koo H), **NIH/NIDCR, R01DE018023**, *Role: Principal Investigator*, 04/01/2008 - 06/30/2014