

OB news

The E-newsletter of the UFCD's Oral Biology Department Winter 2021

Editor: Luis R. Martinez

A MESSAGE FROM THE EDITOR



Happy Winter everyone! I cannot believe I have been a member of the Department of Oral Biology for a year. Time really flies! The Spring semester is in full swing and this 2nd issue of OB news summarizes the past three months of many accomplishments and successes of students, research fellows, and faculty in the department. One of those success stories is told by Dr.

Justin Kaspar, a former member of the Burne lab and now an Assistant Professor at The Ohio State University College of Dentistry. Dr. Kaspar kindly shares his experience on starting a new lab in times of a pandemic. I am grateful for Justin's contribution to this issue and wish him great success in his future endeavors. Please begin collecting your news for the Summer quarter (June 2021). If you have any suggestion in how to improve this communication email me your thoughts to LMartinez@dental.ufl.edu. Thank you very much for your support.

THE SCIENCE STORY OF THE QUARTER

Dr. Justin Kaspar, Assistant Professor at The Ohio State University College of Dentistry, Division of Biosciences

Finding a faculty position and setting your lab in times of Covid-19

In August 2019, I received an invitation to interview for an assistant professor position at The Ohio State University College of Dentistry. I had submitted applications



to several different universities, and was just excited for the opportunity to interview for the first time and considered that alone a “win”. I doubted that I was a real contender for the position – surely there was someone better with more experience or funding they were considering. However, in February 2020, I was offered the position and have been in Columbus, OH since July 2020. Several takeaways from my job search process that I would offer to anyone as advice: 1) start planning your application and writing early, even before you have a job in mind you want to apply to. It took me weeks/months to write potential research or teaching statements that are usually required when applying. I would write it, leave it alone for several days/weeks, then come back and edit/re-write sections to improve the documents. Also, having to write before you are ready will help you prioritize what you need to get done to improve yourself as a candidate such as a clearer research focus or experience with teaching. It will help you identify your strengths/weaknesses. Don't let your first application to a potential 'dream job' be one of your first drafts. 2) Apply for all positions you think only 'might' be relevant! Each time you submit you get a little better at the process, including writing out your CV, cover letter or improving those research/teaching statements. It also lets others know you are on the job market. Maybe that one position won't work out, but people talk between departments/colleges about and will remember you, potentially opening up opportunities down the road even if that position doesn't work out in your favor. 3) Don't doubt yourself, and go for it! When I applied to my current position, I didn't think they would hire me – like I said, all I really was hoping for or expecting was to just make the interview cut. However, you never know, you could really be the top candidate when you apply and have a real shot at the position. Don't let self-doubt or 'imposter syndrome' keep you from applying.

I'm thankful that even with starting in the middle of a pandemic, the lab has been operational since late 2020. I have a group of undergraduate pre-dental students that are helping for the time being and we are starting to churn out our first data, some of which I got to show at the recent Mark Wilson conference a couple weeks ago (thanks Ann and Jacob for all your work with the conference!). Our research focus will be exploring interactions of oral bacteria when they are grown together – an offshoot of the NIDCR-funded F32 project I received while at UF. So far, we have done RNA-Seq of

Streptococcus mutans co-cultures with different oral and non-oral streptococci and are finding a specific *S. mutans* transcriptomic response to commensal streptococci compared to when *S. mutans* is grown either alone or with other mutans group streptococci. You can read about some of the data in a recent ISME publication from myself and other members of the Burne lab. Hopefully I will get to show you the rest at future conferences and catch up with all the members of the Oral Biology department! I miss all of you and wish everyone good luck in the future! See you soon!

If you want to learn more about Dr. Kaspar's research and progress, click on his lab website link: <https://www.kasparlab.org/>

NEWS FROM THE OB OFFICE

As you may know, the OB office staff is continuing to working primarily offsite. However, the mail is being checked/delivered 1-2 times per week. We are almost at the 1-year point when UF shut down and many things have changed. Please feel free to provide to Denise any suggestions on how the office staff can make tasks easier for you.

Continued wishes of Health and Happiness to all!

Valarie, Misty, and Denise

20th Annual Mark Wilson Conference

The 2021 Mark Wilson Conference was successfully held virtually on February 10-11th. The conference featured talented new and established investigators studying pathogenic strategies and molecular interactions of oral microbiota, the host response to oral bacteria, and translational oral medicine. The keynote speakers were Drs. Lauren Bakaletz and Hyun "Michel" Koo, both prominent researchers. Dr. Bakaletz is a College of Medicine Distinguished Professor and the Director of the Center for Microbial Pathogenesis at The Abigail Wexner Research Institute at The Ohio State University. She spoke on DNABII protein-targeted therapeutic and prevention approaches for biofilm diseases. Dr. Koo is a Professor of Orthodontics and Director of the Center for Innovation and



Precision Dentistry at the University of Pennsylvania who spoke on the form and function of oral biofilms in relation to spatial design. Despite the challenging times, the event was very well organized by Dr. Anne Progulske-Fox, the meeting director, and Mr. Jacob Burks, the assistant director. Kudos!

ONGOING COURSES

First iteration of the Oral Microbiology and Immunology graduate course is well on its way (participating faculty includes: Drs. Jose Lemos (course director), Jacqueline Abranches, Lin Zeng, Fernanda Rocha, Anne Progulske-Fox, Bernadett Papp, Luis R. Martinez, and Jeannine Brady

NEWS FROM THE STUDENTS

Burne

Dr. Kyulim Lee published a first author article in Molecular Microbiology.

Gibson

Zavier Eure co-authored a study published in Infection and Immunity.

Martinez

Preethi Sudhakara co-authored an article in mBio with data generated during her 1st rotation as a PhD student.

Undergraduate student Daniela Chow was accepted into the Postbaccalaureate IRTA program at the National Institutes of Health in Bethesda, MD.

Marlynn Cadena defended her master's thesis on Dec. 14th, 2021. Her thesis was entitled "Identification of Interkingdom Interactions of *Cryptococcus neoformans* in Pigeon Excreta using Next Generation Sequencing." She accepted a position as a High School Science Teacher for advanced students.

Yeon Hwa Woo defended her PhD thesis entitled “Impact of *Cryptococcus neoformans* Polysaccharide Capsule on Astrocytes” on Nov. 18th, 2020.

Papp

Gabriela Peguero (McKnight Fellow, PhD student, UF GSO Diversity Co-chair) presented her research poster on the virtual 2020 UFH Cancer Center Research Symposium in 2020 December. This annual conference was virtual due to the Covid-19 emergency.



Natalie Atyeo (DMD-PhD candidate, T90 supported trainee) successfully passed her Qualifying Exam in November. Natalie received an outstanding score for her submitted F30 grant and it was just awarded by NIDCR. Title: “Forkhead factor regulation in oral viral infection”

The 2nd Rotation Presentations for the Immunology and Microbiology concentration were held on Dec. 17, 2020.

NEWS FROM THE RESEARCH FELLOWS

Burne

Dr. Lin Zeng published multiple articles this quarter.

Davey

Dr. Dev Ranjit is now a US citizen, congrats to Dev!

Dr. Hey-Min Kim and Fata Moradali were co-authors in a research article published in the Journal of Bacteriology.

Gibson

Dr. Fernanda Rocha first authored a study published in Infection and Immunity.

Lemos-Abranches

Dr. Jessica Kajfasz first authored a study published in the Journal of Bacteriology.

Progulske-Fox

Dr. Sasanka Chukkapalli co-authored a study published in the Journal of Oral Microbiology.

Toth

Dr. Abhishek Kumar co-authored a study published in PLoS Pathogens.

NEWS FROM THE FACULTY

Brady

Dr. Brady presented at the 20th Annual Mark Wilson Conference.

Burne

Li, Z-R, Du Y, Sun J, Pan A, Zeng L, Maboudian R, Qian P-Y, Burne RA, Zhang W. 2021. Mutanofactin promotes adhesion and biofilm formation of cariogenic *Streptococcus mutans*. **Nature Chem Biol.** *In Press*.

<https://www.biorxiv.org/content/10.1101/2020.08.22.262196v1.full.pdf+html>

Lee K, Kaspar JR, Rojas-Carreño G, Walker AR, Burne RA. 2021. A single system detects and protects the beneficial oral bacterium *Streptococcus* sp. A12 from a spectrum of antimicrobial peptides. **Mol. Microbiol.** *In Press*.

<https://onlinelibrary.wiley.com/doi/epdf/10.1111/mmi.14703>

Costa Oliveira BE, Ricomini Filho AP, Burne RA, Zeng L. 2021. The Route of Sucrose Utilization by *Streptococcus mutans* Affects Intracellular Polysaccharide Metabolism. **Frontiers Microbiol.** **12:** 636684.

<https://www.frontiersin.org/articles/10.3389/fmicb.2021.636684/full>

Chen L, Walker AR, Burne RA, Zeng L. 2020. Amino sugars reshape interactions between *Streptococcus mutans* and *Streptococcus gordonii*. **Appl Environ Microbiol.** **87(1):** e01459-20. <https://aem.asm.org/content/aem/87/1/e01459-20.full.pdf>

Culp DJ, Hull W, Bremgartner MJ, Atherly TA, Christian KN, Killeen M, Dupuis MR, Schultz AC, Chakraborty B, Lee K, Wang DS, Afzal V, Chen T, Burne RA. 2020. *In Vivo* Colonization with Candidate Oral Probiotics Attenuates Colonization and Virulence of *Streptococcus mutans*. **Appl Environ Microbiol.** **87 (4)**: e02490-20
<https://aem.asm.org/content/aem/87/4/e02490-20.full.pdf>

Chan

Harrandah AM, Chukkapalli SS, Bhattacharyya I, Progulske-Fox A, Chan EKL. 2020. Fusobacteria modulate oral carcinogenesis and promote cancer progression. **J Oral Microbiol.** **13 (1)**: 1849493.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7717872/pdf/ZJOM_13_1849493.pdf

Van Hoovels L, Broeders S, Chan EKL, Andrade L, de Melo Cruvinel W, Damoiseaux J, Viander M, Herold M, Coucke W, Heijnen I, Bogdanos D, Calvo-Alén J, Eriksson C, Kozmar A, Kuhi L, Bonroy C, Lauwerys B, Schouwers S, Lutteri L, Vercammen M, Mayer M, Patel D, Egner W, Puolakka K, Tesija-Kuna A, Shoenfeld Y, de Sousa MJR, Hoyos ML, Radice A, Bossuyt X. 2020. Current laboratory and clinical practices in reporting and interpreting anti-nuclear antibody indirect immunofluorescence (ANA IIF) patterns: results of an international survey. **Auto Immun Highlights.** **11 (1)**: 17.
<https://autoimmunhighlights.biomedcentral.com/articles/10.1186/s13317-020-00139-9>

Zheng B, Wang Z, Mora RA, Liu A, Li C, Liu D, Zhai F, Liu H, Gong H, Zhou J, Liu J, Chen L, Wu L, Yuan L, Ying L, Jie L, He M, Hao M, Xu P, Lu Q, Han S, Chen S, Chen S, Zhu S, Sun W, Guo X, Chen Y, Wang Y, Qu Y, Li Z, Niu Z, Han Z, Chan EKL. 2020. Anti-DFS70 Antibodies Among Patient and Healthy Population Cohorts in China: Results from a Multicenter Training Program Showing Spontaneous Abortion and Pediatric Systemic Autoimmune Rheumatic Diseases Are Common in Anti-DFS70 Positive Patients. **Front Immunol.** **11**: 562138.
<https://www.frontiersin.org/articles/10.3389/fimmu.2020.562138/full>

Culp

Dr. Culp is the first author of a research article published in collaboration with Dr. Burne's lab in Applied and Environmental Microbiology.

Davey

Vermilyea DM, Moradali MF, Kim HM, Davey ME. 2021. PPAD Activity Promotes Outer Membrane Vesicle Biogenesis and Surface Translocation by *Porphyromonas gingivalis*. **J. Bacteriol.** **203 (4)**: e00343-20. <https://jb.asm.org/content/jb/203/4/e00343-20.full.pdf>

Dr. Davey co-authored a research article published in collaboration with Dr. Gibson's lab in Infection and Immunity.

Frias-Lopez and Duran-Pinedo

Hreha TN, Foreman S, Duran-Pinedo A, Morris AR, Diaz-Rodriguez P, Jones JA, Ferrara K, Bourges A, Rodriguez L, Koffas MAG, Hahn M, Hauser AR, Barquera B. 2021. The three NADH dehydrogenases of *Pseudomonas aeruginosa*: Their roles in energy metabolism and links to virulence. **PLoS One.** **16 (2)**: e0244142. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0244142>

Monleon-Getino T, Frias-Lopez J. 2020. A priori estimation of sequencing effort in complex microbial metatranscriptomes. **Ecol Evol.** **10 (23)**: 13382-13394. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/ece3.6941>

Gibson

Dr. Gibson presented at the 20th Annual Mark Wilson Conference.

Rocha FG, Ottenberg G, Eure ZG, Davey ME, Gibson FC 3rd. 2020. Sphingolipid Containing Outer Membrane Vesicles Serve as a Delivery Vehicle to Limit Macrophage Immune Response to *Porphyromonas gingivalis*. **Infect Immun.** *In Press*. <https://iai.asm.org/content/iai/early/2020/12/17/IAI.00614-20.full.pdf>

Lemos-Abranches

Dr. Lemos was the alumni speaker for the virtual event celebration of the 55th anniversary of the Microbiology and Immunology PhD program at the Federal University of Rio de Janeiro in Brazil.

Kajfasz JK, Zuber P, Ganguly T, Abranches J, Lemos JA. 2021. Increased oxidative stress tolerance of a spontaneously-occurring perR gene mutation in *Streptococcus mutans* UA159. **J Bacteriol.** *In Press.*

<https://jb.asm.org/content/jb/early/2021/01/28/JB.00535-20.full.pdf>

Kundra S, Colomer-Winter C, Lemos JA. 2020. Survival of the Fittest: The Relationship of (p)ppGpp With Bacterial Virulence. **Front Microbiol.** **11:** 601417.

<https://www.frontiersin.org/articles/10.3389/fmicb.2020.601417/full>

Lima AR, Herrera DR, Francisco PA, Pereira AC, Lemos J, Abranches J, Gomes BPFA. 2020. Detection of *Streptococcus mutans* in symptomatic and asymptomatic infected root canals. **Clin Oral Investig.** doi: 10.1007/s00784-020-03676-9.

file:///C:/Users/lrmar/Downloads/Lima2020_Article_DetectionOfStreptococcusMutans.pdf

Martinez

Dr. Martinez was recently recognized for his work with the American Association for the Advancement of Science, or AAAS, Leshner Leadership Institute for Public Engagement with Science, which is honoring Institute Fellows and their work as part of its five-year anniversary. https://dental.ufl.edu/wordpress/files/2020/12/LLI_Faces-of-Fellowship-2020.pdf

Dr. Martinez presented several virtual talks at the University of Texas at El Paso (November), UF College of Veterinary Medicine Seminar Series (December), and the Dept. of Microbiology & Pathology at the University of Guadalajara (December).

Mitha AN, Chow D, Vaval V, Guerrero P, Rivera-Rodriguez DE, Martinez LR. 2021. Methamphetamine compromises the adaptive B cell-mediated immunity to antigenic challenge in C57BL/6 mice. **Front Toxicol.** *In Press*.

<https://www.frontiersin.org/articles/10.3389/ftox.2021.629451/abstract>

Lee HH, Sudhakara P, Desai S, Miranda K, Martinez LR. 2021. Understanding the basis of METH mouth using a rodent model of methamphetamine injection, sugar consumption, and *Streptococcus mutans* infection. **mBio.** *In Press*.

Belisario J, Lee HH, Laknauth H, Rigel NW, Martinez LR. 2021. *Acinetobacter baumannii* strains deficient in the Clp chaperone-protease genes have reduced virulence in a murine model of pneumonia. **Pathogens.** **10**:204.

<https://www.mdpi.com/2076-0817/10/2/204>

Mancini JD, Yao S, Martinez LR, Shakil H, Li TS. 2021. Gut microbiome changes with osteopathic treatment of constipation in Parkinson's disease: a pilot study. **Neurology (ECronicon).** **13.2**:19-33. <https://www.echronicon.com/ecne/pdf/ECNE-13-00846.pdf>

Woo YH, Martinez LR. 2021. *Cryptococcus neoformans*-astrocyte interactions: effect on fungal blood brain barrier disruption, brain invasion, and meningitis progression. **Crit Rev Microbiol.** **21**:1-18.

<https://www.tandfonline.com/doi/abs/10.1080/1040841X.2020.1869178?journalCode=imby20>

Pruksaphon K, Ching MN, Nosanchuk JD, Ratanabanangkoon K, Roytrakul S, Martinez LR, Youngchim S. 2020. Characterization of a novel yeast phase-specific antigen expressed during in vitro thermal phase transition of *Talaromyces marneffe*. **Sci Rep.** **10**: 21169. <https://www.nature.com/articles/s41598-020-78178-5.pdf>

Papp

Drs. Papp and Toth had their multi-PI R01 grant funded by NIDCR. Title: “Immune evasion mechanisms by a tumor herpesvirus in the oral cavity”. The major goal of our collaborative project is to determine the genome-wide transcriptional regulatory role and interactions partners of viral factors and to characterize their targets in oral epithelial cells during KSHV infection. Congratulations!

Progulske-Fox

Dr. Progulske-Fox co-authored a research article published in collaboration with Dr. Chan’s lab in the Journal of Oral Microbiology.

Toth

Kim YJ, Kim Y, Kumar A, Kim CW, Toth Z, Cho NH, Lee HR. 2021. Kaposi's sarcoma-associated herpesvirus latency-associated nuclear antigen dysregulates expression of MCL-1 by targeting FBW7. **PLoS Pathogens**. **17(1)**: e1009179.

<https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1009179>