OB news

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

Fall 2020

Editor: Luis R. Martinez

A MESSAGE FROM THE EDITOR

Happy Fall! The department participation in the Fall 2020 issue was excellent. Our department is a very vibrant and dynamic environment, and this is demonstrated in the newsletter. Kudos to everyone for your accomplishments in these uncertain times. Please begin collecting your news for the Winter quarter (February 2021). My goal is to have a very inclusive newsletter where everyone in the Oral Biology Department is represented, but only YOU can make this happen! Thank you for your contribution.

THE SCIENCE STORY OF THE QUARTER

Dr. Radames J.B. Cordero, Research Associate at the Johns Hopkins Bloomberg School of Public Health and Cofounder and Chief Executive Officer of Melatech

Melanin-based Applications for Human Space Exploration

Ionizing radiation poses a major health risk to astronauts and to individuals that are exposed to radiation therapy. Melanin, the dark pigment in our skin, serves as nature's sunscreen. It is found across all life kingdoms where it may protect the integumentary systems against the damaging effects of ionizing radiation. In fungi, melanins have shown to protect against all types of ionizing radiation. This appears to arise from melanin's remarkable ability to interact and absorb radiation energy and transforming it into innocuous forms such as heat. Can black fungi inspire new solutions to the radiation problem? For the past five years, I have been pioneering the use of

thermal imaging to characterize the ability of fungal melanins to absorb electromagnetic radiation based on heat production. This thermography approach revealed that fungal melanins can absorb the entire solar irradiance and regulate microbial temperatures. In collaboration with the National Aeronautics and Space Administration (NASA) Glenn Research Center, we are currently testing the ability of fungal melanin to absorb and shield against space radiation on the outside of the International Space Station. If successful, fungal melanins may be used to not only protect people and equipment from ionizing radiation in space but also have real benefits for people on Earth. If you want to learn more about this technology look to the following links: https://www.youtube.com/watch?v=O21pnWZAseY, https://melatech.space/#Home

NEWS FROM THE OB OFFICE

As you may know, the OB office staff is working primarily offsite. However, we are continuously checking email and willing to come to the office as needed. We are re-forming our procedures to fit the 'new normal' and are open to suggestions on processes we can implement to make things more convenient for you.

Wishes of health and happiness to all!

Valarie, Misty and Denise

NEW MEMBERS

Davey

Christina Rothenberger is a new graduate student in the lab.

Frias-Lopez

Kevin Beguiristain is the new lab technician.

Gibson

Zavier Eure is a new Ph.D. student in the Gibson lab! Great to have Zavier on board!

Martinez

Dr. Mohamed Hamed is a new post-doctoral trainee in the lab. Mohamed earned his B.S. in Veterinary Medical Science from Mansoura University in Egypt. He also obtained his M.S. and Ph.D. in Pathology from Mansoura University. Then, he pursued postdoctoral trainings in the Department of Neuropharmacology in the Faculty of Medicine at the University of Granada in Spain, the Department of Biology at the University of York in the United Kingdom, and the Department of Medicinal Chemistry in the College of Pharmacy at the University of Florida, USA.

Progulske-Fox

Ashley Turner, Biological Scientist I. Ashley recently obtained her BS in Horticultural Sciences and is currently working in the Progulske-Fox research lab to gain experience, broaden her experiences and to take some time to plan her future.

Toth

Seung Jin Jang (James), DMD/PhD student started his PhD in the Toth lab in August. He will study the transcriptional role of viral interferon regulatory factor 1 of human herpesvirus 8 in viral infection and viral pathogenesis.

NEWS FROM THE STUDENTS

Burne

Kyulim Lee defended her Ph.D. thesis (July) entitled “Investigation of probiotic mechanisms of action of Streptococcus sp. A12.

Lemos-Abranches

Debra Brunson, a Ph.D. candidate virtually presented in the 12th International Biometals Symposia.

Martinez

Yeon Hwa Woo (Donna), Ph.D. candidate, presented a virtual poster entitled “Altered expression of aquaporin-4 in astrocytes after exposure to *Cryptococcus neoformans* capsular polysaccharide” at the Cold Spring Harbor Meeting Glia in Health and Disease (July).

Progulske-Fox

Nickolas Diodati obtained his MS in Medical Sciences in the Progulske-Fox lab during the summer 2020 semester. His thesis was entitled “Evidence for the Existence of a Viable but Non-Culturable State in *Streptococcus mutans*.” After obtaining his MS, Nick was accepted into the College of Medicine Graduate Program in Biomedical Sciences, where he will work to obtain a PhD in the Immunology and Microbiology Concentration. Nick is finishing up his first rotation in the Brady Lab and he will be returning to the Progulske-Fox lab for his second rotation, where he plans to complete his PhD work.

Toth

Lauren Roberts passed the PhD qualifying exam on September 15th.
Lauren Roberts (3rd year PhD student) and Lauren McKenzie Spires (2nd year PhD student) were selected for T90DE021990 Comprehensive training program in oral biology.

The 1st Rotation Presentations for Immunology and Microbiology concentration was held on Oct. 22. The presentations can be accessed by clicking the link below:
https://ufl.zoom.us/rec/share/wjyqjrwbxcxtc4fkTJJ3lrro3X5bOGNDUWrsPUIvNY3pSCR8SQP1f1HAvur-1wm8.nQAWWftTRCwPulWT

NEWS FROM THE RESEARCH FELLOWS

Burne

Lin Zeng published multiple articles this quarter.

Justin Kaspar moved to his new position as an Assistant Professor in the division of Biosciences at the Ohio State University College of Dentistry.

Davey

Fata Moradali moved to his new position as an Assistant Professor at University of Louisville School of Dentistry-Department of Oral Immunology and Infectious Diseases.

Progulske-Fox

Sasanka Chukkapalli was promoted from Research Assistant Scientist to Research Assistant Professor (June).

NEWS FROM THE FACULTY

Brady

Joyce C. Morales-Aparicio, Patricia Lara Vasquez, Surabhi Mishra, Ana L. Barrán-Berdón1, Manasi Kamat, Kari B. Basso, Zezhang T. Wen and L. Jeannine Brady. 2020. The Impacts of Sortase A and the 4′-Phosphopantetheinyl Transferase Homolog Sfp on *Streptococcus mutans* Extracellular Membrane Vesicle Biogenesis. Frontiers in Microbiology. https://www.frontiersin.org/articles/10.3389/fmicb.2020.570219/full

Burne

Lulu Chen, Alejandro R Walker, Robert A Burne, Lin Zeng. 2020. Amino Sugars Reshape Interactions between *Streptococcus mutans* and *Streptococcus gordonii*. Applied and Environmental Microbiology. https://aem.asm.org/content/early/2020/10/19/AEM.01459-20

Justin R Kaspar, Kyulim Lee, Brook Richard, Alejandro R Walker, Robert A Burne. 2020. Direct interactions with commensal streptococci modify intercellular

communication behaviors of *Streptococcus mutans*. ISME Journal. https://www.nature.com/articles/s41396-020-00789-7

Lin Zeng and Robert A Burne. 2020. Molecular mechanisms controlling fructose-specific memory and catabolite repression in lactose metabolism by *Streptococcus mutans*. Molecular Microbiology. https://onlinelibrary.wiley.com/doi/10.1111/mmi.14597

Lin Zeng and Robert A Burne. 2020. Subpopulation behaviors in lactose metabolism by *Streptococcus mutans*. Molecular Microbiology. https://onlinelibrary.wiley.com/doi/10.1111/mmi.14596

Chan

S. John Calise and Edward K. L. Chan. 2020. Anti-rods/rings autoantibody and IMPDH filaments: an update after fifteen years of discovery. Autoimmunity Reviews. https://www.sciencedirect.com/science/article/pii/S1568997220302147?via%3Dihub

Bing Zheng, Rodrigo A. Mora, Marvin J. Fritzler, Minoru Satoh, Donald B. Bloch, Ignacio Garcia-De La Torre, Katherine Boylan, Kathryn Kohl, Mark H. Wener, Luis E. C. Andrade, Edward K. L. Chan. 2020. Establishment of international autoantibody reference standards for the detection of autoantibodies directed against PML bodies, GW bodies, and NuMA protein. Clinical Chemistry and Laboratory Medicine. https://www.degruyter.com/view/journals/cclm/ahead-of-print/article-10.1515-cclm-2020-0981/article-10.1515-cclm-2020-0981.xml

Gregg E. Dinse, Christine G. Parks, Clarice R. Weinberg, Caroll A. Co, Jesse Wilkerson, Darryl C. Zeldin, Edward K. L. Chan, Frederick W. Miller. 2020. Increasing Prevalence of Antinuclear Antibodies in the United States. Arthritis and Rheumatology. https://onlinelibrary.wiley.com/doi/full/10.1002/art.41214

Culp

Sang-Joon Ahn, William Hull, Shailja Desai, Kelly C. Rice, David Culp. 2020. Understanding LrgAB Regulation of *Streptococcus mutans* Metabolism. Frontiers in Microbiology. https://www.frontiersin.org/articles/10.3389/fmicb.2020.02119/full

David J Culp, Z Zhang, R L Evans. 2020. VIP and muscarinic synergistic mucin secretion by salivary mucous cells is mediated by enhanced PKC activity via VIP-induced release of an intracellular Ca 2+ pool. Pflügers Archiv - European Journal of Physiology. https://link.springer.com/article/10.1007/s00424-020-02348-7

Davey

Dr. Davey was awarded a University of Florida Research Foundation Professorship. https://news.ufl.edu/2020/05/uf-research-foundation-names-2020-professors/

Hey-Min Kim and Mary E. Davey. 2020. Synthesis of ppGpp impacts type IX secretion and biofilm matrix formation in *Porphyromonas gingivalis*. NPJ Biofilms and Microbiomes. https://www.nature.com/articles/s41522-020-0115-4

Fernanda G. Rocha, Z D Moye, G Ottenberg, P Tang, D J Campopiano, Frank C. Gibson 3rd, Mary E. Davey. 2020. *Porphyromonas gingivalis* Sphingolipid Synthesis Limits the Host Inflammatory Response. Journal of Dental Research. https://journals.sagepub.com/doi/10.1177/0022034520908784?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed

Frias-Lopez

Jorge Frias-Lopez and Ana E. Duran-Pinedo. 2020. The Function of the Oral Microbiome in Health and Disease. Emerging Therapies in Periodontics. https://link.springer.com/book/10.1007/978-3-030-42990-4

Muhammad Irfan, Renata Z. R. Delgado, Jorge Frias-Lopez. 2020. The Oral Microbiome and Cancer. Frontiers in Immunology. https://www.frontiersin.org/articles/10.3389/fimmu.2020.591088/full

Frias-Lopez and Gibson

Jose Solbiati, Ana Duran-Pinedo, Fernanda Godoy Rocha, Frank C. Gibson III, Jorge Frias-Lopez. 2020. Virulence of the pathogen *Porphyromonas gingivalis* is controlled by the CRISPR-Cas protein Cas3. mSystems. https://msystems.asm.org/content/5/5/e00852-20; Editor's Pick.

Lemos-Abranches

Dr. Lemos presented in the Virtual Streptococcal Seminar series in October.

Augusto R. Lima, Tridib Ganguly, Alejandro R. Walker, Natalia Acosta, Priscila A. Francisco, Roberta Pileggi, José A. Lemos, Brenda P. F. A. Gomes, Jacqueline Abranches. 2020. Phenotypic and Genotypic Characterization of *Streptococcus mutans* Strains Isolated from Endodontic Infection. Journal of Endodontics. https://www.jendodon.com/article/S0099-2399(20)30682-8/fulltext

Lívia A. Alves, Tridib Ganguly, Érika N. Harth-Chú, Jessica Kajfasz, José A. Lemos, Jacqueline Abranches, Renata O. Mattos-Graner. 2020. PepO is a target of the two-component systems VicRK and CovR required for systemic virulence of *Streptococcus mutans*. Virulence. https://www.tandfonline.com/doi/full/10.1080/21505594.2020.1767377

Tridib Ganguly, Jessica K. Kajfasz, Jacqueline Abranches, José A. Lemos. 2020. Regulatory circuits controlling Spx levels in *Streptococcus mutans*. Molecular Microbiology. https://onlinelibrary.wiley.com/doi/abs/10.1111/mmi.14499

Martinez

Dr. Martinez was appointed as a leader of the Profession of Microbiology Track in the organizing committee of the ASM Microbe (general meeting).

Dr. Martinez presented virtually at Hofstra University in NY (October), Ponce Health Sciences University in PR (September), and the XV Symposium of Biosciences and Biotechnology Applied to Pharmacy in Araraquara, Brazil (July).

Hiu Ham Lee, Lilit Aslanyan, Arjun Vidyasagar, Melissa B. Brennan, Maxine S. Tauber, Maria A. Carrillo-Sepulveda, Michael R. Dores, Nathan W. Rigel, Luis R. Martinez. 2020. Depletion of Alveolar Macrophages Increases Pulmonary Neutrophil Infiltration, Tissue Damage, and Sepsis in a Murine Model of *Acinetobacter baumannii* Pneumonia. Infection and Immunity. https://iai.asm.org/content/88/7/e00128-20.long

Hazael Hernandez and Luis R. Martinez. 2020. Coccidioidomycosis: The Valley Fever. Encyclopedia of Mycology (Book chapter).

Ana M. Vargas, Dormarie E. Rivera-Rodriguez, Luis R. Martinez. 2020. Methamphetamine alters the TLR4 signaling pathway, NF-κB activation, and pro-inflammatory cytokine production in LPS-challenged NR-9460 microglia-like cells. Molecular Immunology. https://www.sciencedirect.com/science/article/pii/S0161589019308272?via%3Dihub

Papp

Pandya-Jones A, Markaki Y, Serizay J, Chitiashvili T, Mancia Leon WR, Damianov A, Chronis C, Papp B, Chen CK, McKee R, Wang XJ, Chau A, Sabri S, Leonhardt H, Zheng S, Guttman M, Black DL, Plath K. 2020. A protein assembly mediates Xist localization and gene silencing. Nature. https://www.nature.com/articles/s41586-020-2703-0

Progulske-Fox

Emil Kozarov and Anne Progulske-Fox. 2020. Atherosclerosis microbiome: upcoming target for vaccine and drug development. Vessel Plus. https://vpjournal.net/article/view/3420

Toth

Dr. Toth was awarded with funding ($50,000) from the University of Florida Health Cancer Center with a project entitled “Defining the classification and mutational landscape of gammaherpesvirus B cell lymphomas”.

Dr. Toth was appointed to the editorial board of Viruses.