

## Quarterly Newsletter

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*A report on Scholarship and Academic Activities of Interdepartmental Food Science Graduate Program (IFSGP)*



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**Grad Committee Members:** Dr. Bruce Applegate, Dr. Carlos Corvalan, Dr. Bruce Hamaker, Dr. Owen Jones, Dr. Charles Santerre

Welcome new Food Science Spring 2021 graduate students!!



Juan Archila Godinez  
M.S.  
Feng Lab



Jack Burnett  
Ph.D.  
Oliver Lab



Monique Felix  
M.S.  
Lindemann Lab



Dahye Le  
Ph.D.  
Oh Lab



Megan Low  
M.S.  
Feng Lab



Edward Moncada  
M.S.  
Reddivari Lab



Anurag Pujari  
Ph.D.  
Lindemann Lab

## Peer-Reviewed Research Publications

1. Adetola, O.Y., Kruger, J., **Ferruzzi, M.G., Hamaker, B.R.** & Taylor, J.R. (2021). Potential of moringa leaf and baobab fruit food-to-food fortification of wholegrain maize porridge to improve iron and zinc bioaccessibility. *International Journal of Food Sciences and Nutrition*, 1-13. doi.org/10.1080/09637486.2021.1911962
2. **Bai, X., Liu, D., Xu, L., Drolia, R., Gallina, L.F.,** Cox, A.D., and **Bhunja, A.K.** 2021. Biofilm-isolated *Listeria monocytogenes* exhibits reduced systemic dissemination at the early (12-24 h) stage of infection in a mouse model. *Npj Biofilm and Microbiome* 7,18.
3. Bai, J., Farias-Pereira, R., Jang, M., Zhang, Y., Lee, S.M., Kim, Y.S., Park, Y., Ahn, J.B., Kim, G.H. & **Kim, K.H.** (2021). Azelaic Acid Promotes *Caenorhabditis elegans* Longevity at Low Temperature Via an Increase in Fatty Acid Desaturation. *Pharmaceutical Research*, 38(1), 15-26.
4. **Barrett, T. & Feng, Y.** (2021). Evaluation of food safety curriculum effectiveness: A longitudinal study of high-school-aged youths' knowledge retention, risk-perception, and perceived behavioral control. *Food Control*, 121, 107587.
5. **Benyathiar, P.,** Selke, S. E., Harte, B.R. & **Mishra, D.K.** (2021). The Effect of Irradiation Sterilization on Poly (Lactic) Acid Films. *Journal of Polymers and the Environment*, 29(2), 460-471.
6. **Cantu-Jungles, T.M.,** Zhang, X., **Kazem, A.E.,** Iacomini, M., **Hamaker, B.R.** & Cordeiro, L.M. (2021). Microwave treatment enhances human gut microbiota fermentability of isolated insoluble dietary fibers. *Food Research International*, 143, 110293.
7. Chen, D., Zhu, X., Ilavsky, J., Whitmer, T., Hatzakis, E., **Jones, O.G. & Campanella, O.H.** (2021). Polyphenols Weaken Pea Protein Gel by Formation of Large Aggregates with Diminished Noncovalent Interactions. *Biomacromolecules*, 22(2), 1001-1014.
8. **Chen, H. & Feng, Y.** (2021). Moving Forward to the Future: A Review of Microbial Food Safety Education in China. *Foodborne Pathogens and Disease*. <https://doi.org/10.1089/fpd.2020.2889>
9. Chuang, E., **Thomas, M. & Feng, Y.** (2021). Young adult food safety knowledge gaps and perceptions of roommates' food handling practices: A survey of university students in Indiana. *Food Control*, 126, 108055.
10. De Groote, H., Munyua, B., Traore, D., Taylor, J.R., **Ferruzzi, M.,** Ndiaye, C., Onyeoziri, I.O. & **Hamaker, B.R.** (2021). Measuring consumer acceptance of instant fortified millet products using affective tests and auctions in Dakar, Senegal. *International Food and Agribusiness Management Review*, 24(3), 499-522.
11. **Desam, G.P., Jones, O.G. & Narsimhan, G.** (2021). Prediction of the effect of sucrose on equilibrium swelling of starch suspensions. *Journal of Food Engineering*, 294, 110397.
12. Dillon, S.M., Abdo, M.H., Wilson, M.P., Liu, J., Jankowski, C.M., Robertson, C.E., **Tuncil, Y., Hamaker, B.R.** Frank, D.N., MaWhinney, S., Wilson, C.C. & Erlandson, K.M. (2021). A Unique Gut Microbiome-Physical Function Axis Exists In Older People With HIV: An Exploratory Study. *AIDS Research and Human Retroviruses*. 37 (7), <https://doi.org/10.1089/aid.2020.0283>
13. Dufour, D., Hershey, C., **Hamaker, B.R.** & Lorenzen, J. (2021). Integrating end-user preferences into breeding programmes for roots, tubers and bananas. *International Journal of Food and Technology*, 56, 1071-1075.
14. **Erickson, D.P.,** Dunbar, M., Hamed, E., **Ozturk, O.K., Campanella, O.H.,** Keten, S. & **Hamaker, B.R.** (2021). Atomistic Modeling of Peptide Aggregation and  $\beta$ -Sheet Structuring in Corn Zein for Viscoelasticity. *Biomacromolecules*. 22 (5), 1856–1866
15. Fei, X., **Jones, O.G., Reuhs, B.L. & Campanella, O.H.** (2021). Soluble pectin acts as a particle stabilizer of tomato suspensions: The impact on tomato products rheological characterization. *LWT*, 139, 110508.

16. Fogaça, M.B.T, **Bhunia, A.K.**, Lopes-Luz, L., Pontes de Almeida, E.P.R., Vieira, J.D.G., and Buhner-Sékula, S. 2021. Antibody- and Nucleic Acid-based Lateral Flow Immunoassay for *Listeria monocytogenes* Detection. *Analytical and Bioanalytical Chemistry* 413, 4161-4180
17. **Helmick, H., Turasan, H., Yildirim, M., Bhunia, A., Liceaga, A., and Kokini, J.** 2021. Cold denaturation of proteins: Where bioinformatics meets thermodynamics to offer a mechanistic understanding – pea protein as a case study. *Agricultural and Food Chemistry* 69: 6339–6350
18. Hernandez-Franco, J.F., Mosley, Y.Y.C., Franco, J., Ragland, D., **Yao, Y.** & HogenEsch, H. (2021). Effective and Safe Stimulation of Humoral and Cell-Mediated Immunity by Intradermal Immunization with a Cyclic Dinucleotide/Nanoparticle Combination Adjuvant. *The Journal of Immunology*, 206(4), 700-711.
19. Higashiyama, Y., **Turasan, H.**, Cakmak, M. & **Kokini, J.** (2021). Fabrication of pristine electrospun kafirin nanofiber mats loaded with thymol and carvacrol. *Journal of Materials Science*, 56(11), 7155-7170.
20. **Kanach, A.**, Botorff, T., Zhao, M., Wang, J., Chiu, G.T. & **Applegate, B.** (2021). Evaluation of anhydrous processing and storage methods of the temperate bacteriophage  $\phi$ V10 for integration into foodborne pathogen detection methodologies. *Plos One*, 16(4), e0249473.
21. Kulathunga, J., **Reuhs, B.L.**, Zwinger, S. & **Simsek, S.** (2021). Comparative Study on Kernel Quality and Chemical Composition of Ancient and Modern Wheat Species: Einkorn, Emmer, Spelt and Hard Red Spring Wheat. *Foods*, 10(4), 761.
22. Lopes-Luz, L., Mendonça, M., Bernardes Fogaça, M., Kipnis, A., **Bhunia, A.K.** & Bührer-Sékula, S. (2021). *Listeria monocytogenes*: review of pathogenesis and virulence determinants-targeted immunological assays. *Critical Reviews in Microbiology*, 1-20. DOI: 10.1080/1040841X.2021.1911930
23. Luna, G.C., **Martin-Gonzalez, F.S.**, **Mauer, L.J.** & **Liceaga, A.M.** (2021). Cricket (*Acheta domesticus*) protein hydrolysates' impact on the physicochemical, structural and sensory properties of tortillas and tortilla chips. *Journal of Insects as Food and Feed*, 7(1), 109-120.
24. Madigan, M.T., Kempfer, M.L., Bender, K.S., Jung, D.O., Sattley, W.M., **Lindemann, S.R.**, Konopka, A.E., Dohnalkova, A.C. & Fredrickson, J.K. (2021). A green sulfur bacterium from epsomitic Hot Lake, Washington, USA. *Canadian Journal of Microbiology*, 67(4), 332-341.
25. Miao, M. & **Hamaker, B.R.** (2021). Food Matrix Effects for Modulating Starch Bioavailability. *Annual Review of Food Science and Technology*, 12, 169-191
26. Mummidi, S., Farook, V.S., **Reddivari, L.**, Hernandez-Ruiz, J., Diaz-Badillo, A., Fowler, S.P., Resendez, R.G., Akhtar, F., Lehman, D.M., Jenkinson, C.P., Arya, R., Lynch, J.L., Canas, J.A., DeFronzo, R.A., Hale, D.E., Blangero, J., Lopez-Alvarenga, J.C., Duggirala, R. & Vanamala, J.K. (2021). Serum carotenoids and Pediatric Metabolic Index predict insulin sensitivity in Mexican American children. *Scientific Reports*, 11(1), 1-11.
27. Orsi, R.H., Chaturongakul, S., **Oliver, H.F.**, Ponnala, L., Gaballa, A. & Wiedmann, M. (2021). Alternative  $\sigma$  Factors Regulate Overlapping as Well as Distinct Stress Response and Metabolic Functions in *Listeria monocytogenes* under Stationary Phase Stress Condition. *Pathogens*, 10(4), 411.
28. **Rivera, F.J.C.**, **Mishra, D.K.**, **Ozadali, F.** & **Benyathiar, P.** (2021). Real-Time Detection of Fouling-Layer with a Non-Intrusive Continuous Sensor (NICS) during Thermal Processing in Food Manufacturing. *Sensors*, 21(4), 1271.
29. **Ryan, V.E.**, **Bailey, T.W.**, **Liu, D.**, Vemulapalli, T., Cooper, B., Cox, A.D. & **Bhunia, A.K.** (2021). *Listeria* adhesion protein-expressing bioengineered probiotics prevent fetoplacental transmission of *Listeria monocytogenes* in a pregnant Guinea pig model. *Microbial Pathogenesis*, 151, 104752.
30. Shin, M., Park, H., Kim, S., **Oh, E.J.**, Jeong, D., Florencia, C., **Kim, K.H.**, Jin, Y.S. & Kim, S.R. (2021). Transcriptomic Changes Induced by Deletion of Transcriptional Regulator GCR2 on Pentose Sugar Metabolism in *Saccharomyces cerevisiae*. *Frontiers in Bioengineering and Biotechnology*, 9, 228.
31. Sun, Q, Wu, S., Yin, R., **Bai, X.**, **Bhunia, A.K.**, Zheng, Y., Wang, F., Blatchley III, E.R. (2021). Effects of fulvic acid size on microcystin-LR photodegradation and detoxification in the chlorine/UV process. *Water Research*. 193:116893
32. **Sundarram, A.**, **Britton, B.C.**, Liu, J., Desiree, K., Ogas, R., Lemaster, P., Navarrete, B., Nowakowski, H., Harrod, M.K., Marks, D., Ebner, P. & **Oliver, H.F.** (2021). Lytic Capacity Survey of Commercial *Listeria* Phage Against *Listeria* spp. with Varied Genotypic and Phenotypic Characteristics. *Foodborne Pathogens and Disease*. 18 (6), 413-418.
33. Tarhan, Ö., **Hamaker, B.R.** & **Campanella, O.H.** (2021). Structure and binding ability of self-assembled  $\alpha$ -lactalbumin protein nanotubular gels. *Biotechnology Progress*, 37, e3127.
34. **Thomas, M.S.** & **Feng, Y.** (2021). Food Handling Practices in the Era of COVID-19: A Mixed-Method Longitudinal Needs Assessment of Consumers in the United States. *Journal of Food Protection*. 84 (7), 1176–1187

35. **Thomas, M.**, Haynes, P., **Archila, J.**, Nguyen, M., Xu, W. & **Feng, Y.** (2021). Exploring Food Safety Messages in an Era of COVID-19: Analysis of YouTube Video Content. *Journal of Food Protection*. 84 (6): 1000–1008.
36. Tongdeesoontorn, W., **Mauer, L.J.**, Wongruong, S., Sriburi, P., Reungsang, A. & Rachtanapun, P. (2021). Antioxidant Films from Cassava Starch/Gelatin Biocomposite Fortified with Quercetin and TBHQ and Their Applications in Food Models. *Polymers*, 13(7), 1117.
37. **Turasan, H.** & **Kokini, J.** (2021). Novel Nondestructive Biosensors for the Food Industry. *Annual Review of Food Science and Technology*, 12, 539-566.
38. Turksoy, S., **Erturk, M.Y.** & **Kokini, J.** (2021). Behavior of semolina, hard, soft wheat flour dough at different aging times and temperatures through LAOS properties and molecular interactions of proteins. *Journal of Food Engineering*, 301, 110549.
39. **Voelker, A.L.**, **Felten, C.**, Taylor, L. & **Mauer, L.J.** (2021). Effects of polyphenols on crystallization of amorphous sucrose lyophiles. *Food Chemistry*, 338, 128061.
40. **Voelker, A.L.**, Taylor, L.S., & **Mauer, L.J.** (2021). Chemical stability and reaction kinetics of thiamine mononitrate in the aqueous phase of bread dough. *Food Research International*, 140, 110084.
41. Wang, Y.J., **Deering, A.** & Kim, H.J. (2021). Effects of Plant Age and Root Damage on Internalization of Shiga Toxin-Producing Escherichia coli in Leafy Vegetables and Herbs. *Horticulturae*, 7(4), 68.
42. **Woodbury, T.J.**, Lust, A.L. & **Mauer, L.J.** (2021). The effects of commercially available sweeteners (sucrose and sucrose replacers) on wheat starch gelatinization and pasting, and cookie baking. *Journal of Food Science*, 86(3), 687-698.
43. Wu, B., Chang, H., Marini, R., Chopra, S. & **Reddivari, L.** (2021). Characterization of Maize Near-Isogenic Lines With Enhanced Flavonoid Expression to Be Used as Tools in Diet-Health Complexity. *Frontiers in Plant Science*, 11, 2249.
44. **Xu, L.**, **Bai, X.** & **Bhunia, A.K.** (2021). Current State of Biosensors Development and their Application in Foodborne Pathogen Detection. *Journal of Food Protection*. 84 (7),1213-1227
45. **Zhang, X.**, Xie, J., **Chen, T.**, **Ma, D.**, **Yao, T.**, Gu, F., **Lim, J.**, Tuinstra, M.R. & **Hamaker, B.R.** (2021). High arabinoxylan fine structure specificity to gut bacteria driven by corn genotypes but not environment. *Carbohydrate Polymers*, 257, 117667.
46. Zou, J., **Reddivari, L.**, Shi, Z., Li, S., Wang, Y., Bretin, A., Ngo, V.L., Flythe, M., Pellizzon, M., Chassaing, B. & Gewirtz, A.T. (2021). Inulin fermentable fiber ameliorates type I diabetes via IL-22 and short-chain fatty acids in experimental models. *Cellular and Molecular Gastroenterology and Hepatology*.  
<https://doi.org/10.1016/j.jcmgh.2021.04.014>

## Graduated Students with Thesis/Dissertation Titles

1. **Emmanuel Ayua-PhD (Hamaker):** Studies on Extrusion Processing of Instant Porridge Flours for African Processor Optimization, Acceptance, Marketability for Consumers, and Improvement in *in vitro* Fecal Fiber Fermentation
2. **Xingjian Bai-PhD (Bhunia):** Pathogenesis of Biofilm-Isolated *Listeria monocytogenes* and Biofilms Control using Food-Grade Natural Antimicrobials
3. **Jingfan Chen-PhD (Yao):** Exploring Functional Carbohydrate Polymers: Their Interactions with Small-Molecule Fluorescent Probe (Molecular Rotor) and Active Compounds
4. **Enrico Federici-PhD (Jones):** Physical and Chemical Treatment of Zein to Improve Gluten-Free Bread Quality
5. **Anna Hayes-PhD (Hamaker):** *In vitro* and *in vivo* Investigations of Carbohydrates with Different Digestibilities for Improved Satiety and Metabolic Health
6. **Carine Nkemngong-PhD (Oliver):** Optimizing Sanitation and Disinfection Practices; Clostridioides difficile Spores and Dry Surface Biofilms of Staphylococcus aureus and Pseudomonas aeruginosa As Models
7. **Arianna Romero Marica-MS (Lindemann):** Effect of Glucan Chemical Structure on Gut Microbiota Composition and Function
8. **Luping Xu-MS (Bhunia):** Mammalian Cell-based Biosensors for Foodborne Pathogen Detection

## Graduate Student/Post Doctorate Achievements/Awards

1. **Juan Archila** - Consumer Food Safety Education Virtual Conference Student Scholar, March 2021
2. **Food Science Graduate Student Association (FSGSA)** - College of Agriculture Unsung Diversity Hero Award, April 2021
3. **Sora Kim** - Emerging Leaders in Nutrition Science Abstract Recognition Award Program of the American Society for Nutrition Finalist, Spring 2021
4. **Dongqi Liu** – 2nd place in Beyond Boundary Cross-Disciplinary Poster Presentation Competition (Ph.D. cohort) in Indiana Branch of American Society for Microbiology Spring Meeting, 2021
5. **Hansel Mina Cordoba** - Consumer Food Safety Education Virtual Conference Student Scholar, March 2021
6. **Anbukani “Connie” Muniandy**-American Society for Baking Product Development Team, March 2020  
- Phi Tau Sigma Student Achievement Scholarship, Spring 2021
7. **Travis Woodbury**-PMCA Student Outreach Program Scholarship to attend the Professional Manufacturing Confectioners Association, Spring 2021