

Quarterly Newsletter

Vol. 4 Issue 2

Summer/Fall 2021

A report on Scholarship and Academic Activities of Interdepartmental Food Science



Graduate Chair: Dr. Arun K. Bhunia
(bhunia@purdue.edu)

Co-Chair: Dr. Andrea Liceaga

Graduate Program Coordinator: Mitzi Barnett
(mbarnett@purdue.edu)

Graduate Student Representatives: Nicholas Gallina

Grad Committee Members: Dr. Bruce Applegate, Dr. Carlos Corvalan, Dr. Bruce Hamaker, Dr. Owen Jones, Dr. Ganesan Narsimhan

Welcome new Food Science Summer/Fall 2021 graduate students!!



April Arbour
Ph.D.
Huang Lab



Zachary "Zach" Berglund
M.S.
Feng Lab



Zhuoran Chen
M.S.
Yao Lab



Connor Horn
Ph.D.
Oliver Lab



Anael Kimble
M.S.
Jones Lab



Anh "Louie" Le
M.S.
Kokini Lab



Rosa Lopez Rivera
Ph.D.
Hamaker Lab



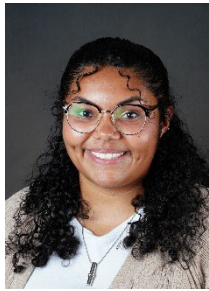
Vignesh Nathan
M.S.
Reddivari Lab



Kayla Roy
M.S.
Reddivari Lab



Rachel "Rae" Silver
Ph.D.
Oliver Lab



Paige Smith
M.S.
Mauer/Yao Lab



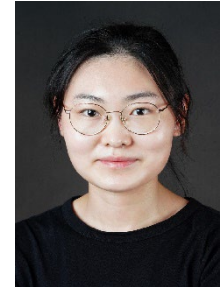
Juan Velasquez
M.S.
Huang Lab



Maxwell "Max" Voorn
M.S.
Oliver Lab



Xinruo "Tina" Zhao
M.S.
Hamaker Lab



Rui Zhu
M.S.
Jones Lab

Peer-Reviewed Research Publications

1. Aguilar-Toalá, J.E., Arioli, S., Behare, P., Belzer, C., Berni Canani, R., Chatel, J.M., D'Auria, E., Queiroz de Freitas, M., Elinav, E., Esmerino, E.A., Garcia, H.S., Gomes da Cruz, A., Gonzalez-Cordova, A.F., Guglielmetti, S., Guimaraes, J.D.T., Hernandez-Mendoza, A., Langella, P., **Liceaga, A.M.**, Magnani, M., Martin, R., Mohamad Lal, T.M., Mora, D., Moradi, M., Morelli, L., Mosca, F., Nazzaro, F., Pimentel, T.C., Ran, C., Ranadheera, C.S., Rescigno, M., Salas, A., Sant'Ana, A.S., Sivieri, K., Sokol, H., Taverniti, V., Vallejo-Cordoba, B., Zelenka, J. & Zhou, Z. 2021. Postbiotics—when simplification fails to clarify. *Nature Reviews Gastroenterology & Hepatology*, 18, 825–826.
2. Akram, S., **Bao, Y.**, Butt, M.S., Shukat, R., Afzal, A. & **Huang, J.Y.** 2021. Fabrication and characterization of gum arabic-and maltodextrin-based microcapsules containing polyunsaturated oils. *Journal of the Science of Food and Agriculture*. 101, 6384–6394
3. **Bai, X., Nakatsu, C.H. & Bhunia, A.K.** 2021. Bacterial Biofilms and Their Implications in Pathogenesis and Food Safety. *Foods*, 10(9), 2117.
4. **Bhunia, A.K.** 2021. Food safety concerns of biofilm-forming zoonotic bacterial pathogens. *Indian J. Anim. Health* 60(2), 44-51 (Invited)
5. Boonmee, A., **Oliver, H.F.** & Chaturongakul, S. 2021. *Listeria monocytogenes* 10403S Alternative Sigma-54 Factor σ_L Has a Negative Role on Survival Ability Under Bile Exposure. *Frontiers in Microbiology*, 12, 713383.
6. **Britton, B.C.**, Sarr, I. & **Oliver, H.F.** 2021. *Enterobacteriaceae*, coliform, yeast, and mold contamination patterns in peanuts compared to production, storage, use practices, and knowledge of food safety among growers in Senegal. *International Journal of Food Microbiology*, 109437.
7. Bruhn, C. & **Feng, Y.** 2021. Exploring consumer response to labeling a processing aid that enhances food safety. *Food Protection Trends*, 41(3), 305-313.
8. **Cantu-Jungles, T.M., Bulut, N.**, Chambry, E., Ruthes, A., Iacomini, M., Keshavarzian, A., Johnson, T. & **Hamaker, B.R.** 2021. Dietary Fiber Hierarchical Specificity: the Missing Link for Predictable and Strong Shifts in Gut Bacterial Communities. *mBio*, 12(3), e01028-21.

9. **Chen, H. & Feng, Y.** 2021. Moving Forward to the Future: A Review of Microbial Food Safety Education in China. *Foodborne Pathogens and Disease*, 18(8). 547-566
10. **Chen, H., Gibson, K. & Feng, Y.** 2021. Identification of Food Safety Education Needs for Military Veteran Farmers. *Food Protection Trends*, 41(6), 534-546.
11. **Davies, F.K., Fricker, A.D., Robins, M.M., Dempster, T.A., McGowen, J., Charania, M., Beliaev, A.S., Lindemann, S.R. & Posewitz, M.C.** 2021. Microbiota associated with the large-scale outdoor cultivation of the cyanobacterium *Synechococcus* sp. PCC 7002. *Algal Research*, 58, 102382.
12. **Erlandson, K.M., Liu, J., Johnson, R., Dillon, S., Jankowski, C.M., Kroehl, M., Robertson, C.E., Frank, D.N., Yuncil, T., Higgins, J., Hamaker, B. & Wilson, C.C.** 2021. An exercise intervention alters stool microbiota and metabolites among older, sedentary adults. *Therapeutic Advances in Infectious Disease*, 8, 20499361211027067.
13. **Fang, F., Reuhs, B.L. & Xu, Q.** 2021. Short-term high temperature with shear produces tomato suspensions with desirable rheological properties. *Journal of Food Engineering*, 311, 110736.
14. **Federici, E., Selling, G.W., Campanella, O.H. & Jones, O.G.** 2021. Thermal treatment of dry zein to improve rheological properties in gluten-free dough. *Food Hydrocolloids*, 115, 106629.
15. **Fu, W., Li, S. & Reddivari, L.** 2021. Complexation With Polysaccharides Enhanced Polyphenol Gastrointestinal Stability and Activity. *Current Developments in Nutrition*, 5(Supplement_2), 314-314.
16. **Galagarza, O.A., Ramirez-Hernandez, A., Oliver, H.F., Álvarez Rodríguez, M.V., Valdez Ortiz, M.D.C., Pachari Vera, E., Cereceda, Y., Diaz-Valencia, Y.K. & Deering, A.J.** 2021. Occurrence of Chemical Contaminants in Peruvian Produce: A Food-Safety Perspective. *Foods*, 10(7), 1461.
17. **Hamaker, B.R.** 2021. Current and future challenges in starch research, *Current Opinion in Food Science*, 40, 46-50.
18. **Hall, F.G. & Liceaga, A.M.** 2021. Isolation and proteomic characterization of tropomyosin extracted from edible insect protein. *Food Chemistry: Molecular Sciences*, 3, 100049.
19. **He, W., Tian, L., Fang, F., Chen, D., Federici, E., Pan, S. & Jones, O.G.** 2021. Limited hydrolysis and conjugation of zein with chitosan oligosaccharide by enzymatic reaction to improve functional properties. *Food Chemistry*, 348, 129035.
20. **Helmick, H., Hartanto, C., Bhunia, A., Liceaga, A. & Kokini, J.L.** 2021. Validation of Bioinformatic Modeling for the Zeta Potential of Vicilin, Legumin, and Commercial Pea Protein Isolate. *Food Biophysics*, 16, 474-483
21. **Helmick, H., Nanda, G., Ettestad, S., Liceaga, A. & Kokini, J.L.** 2021. Applying text mining to identify relevant literature in food science: Cold denaturation as a case study. *Journal of Food Science*. 86:4851–4864.
22. **Jeong, D., Park, H., Jang, B.K., Ju, Y., Shin, M.H., Oh, E.J., Lee, J.L. & Kim, S.R.** 2021. Recent advances in the biological valorization of citrus peel waste into fuels and chemicals. *Bioresource Technology*, 323, 124603.
23. **Jia, F., Bai, X., Zhang, X., Fu, Y., Li, Y., Li, X. & Kokini, J.L.** 2021. A Low-Field Magnetic Resonance Imaging Aptasensor for the Rapid and Visual Sensing of *Pseudomonas aeruginosa* in Food, Juice, and Water. *Analytical Chemistry*, 93(24), 8631-8637.
24. **Khalid, K.H., Ohm, J.B. & Simsek, S.** 2021. Influence of bread-making method, genotype, and growing location on whole-wheat bread quality in hard red spring wheat. *Cereal Chemistry*. 00,1–15
doi.org/10.1002/cche.10509
25. **Kim, S. & Kim, K H.** 2021. Modulation of Cholesterol Metabolism Improves Response to Enzalutamide Treatment in Prostate Cancer. *Current Developments in Nutrition*, 5(Supplement_2), 269-269.
26. **Lamothe, L.M., Cantu-Jungles, T.M., Chen, T., Green, S., Naqib, A., Srichuwong, S. & Hamaker, B.R.** 2021. Boosting the value of insoluble dietary fiber to increase gut fermentability through food processing. *Food & Function*, 12(21), 10658-10666.
27. **Lauer, J.R., Simsek, S. & Bergholz, T.M.** 2021. Fate of Salmonella and Enterohemorrhagic Escherichia coli on Wheat Grain. *Journal of Food Protection*, 84(12), 2109-2115.
28. **Li, C. & Hamaker, B.R.** 2021. Effects of different storage temperatures on the intra-and intermolecular retrogradation and digestibility of sago starch. *International Journal of Biological Macromolecules*, 182, 65-71.
29. **Li, S. & Reddivari, L.** 2021. Improvement of Gut Barrier Function by Potato Anthocyanins Is Dependent on Gut Microbiota. *Current Developments in Nutrition*, 5(Supplement_2), 344-344.
30. **Li, S., Wang, T., Fu, W., Kennett, M., Cox, A.D., Lee, D., Vanamala, J.K.P. & Reddivari, L.** 2021. Role of Gut Microbiota in the Anti-Colitic Effects of Anthocyanin-Containing Potatoes. *Molecular Nutrition & Food Research*, 65, 2100152.

31. Li, S., Wang, T., Wu, B., **Fu, W.**, Xu, B., Pamuru, R.R., Kennett, M., Vanamala, J.K.P. & **Reddivari, L.** 2021. Anthocyanin-containing purple potatoes ameliorate DSS-induced colitis in mice. *The Journal of Nutritional Biochemistry*, 93, 108616.
32. **Liceaga, A.M.** 2021. Processing insects for use in the food and feed industry. *Current Opinion in Insect Science*, 48, 32-36.
33. **Lim, J., Ferruzzi, M.G. & Hamaker, B.R.** 2021. Dietary starch is weight reducing when distally digested in the small intestine. *Carbohydrate Polymers*, 273, 118599.
34. López, A.M.M. & **Simsek, S.** 2021. Solvent retention capacity: Supplemental solvents for evaluation of gluten quality. *Journal of Cereal Science*, 102, 103339.
35. **Lu, C., Bao, Y. & Huang, J.Y.** 2021. Fouling in Membrane Filtration for Juice Processing. *Current Opinion in Food Science*, 42, 76-85.
36. **Malm, M. & Liceaga, A.M.** 2021. Physicochemical properties of chitosan from two commonly reared edible cricket species, and its application as a hypolipidemic and antimicrobial agent. *Polysaccharides*, 2(2), 339-353.
37. **Malm, M., Liceaga, A.M., San Martin-Gonzalez, F., Jones, O.G.,** Garcia-Bravo, J.M. & Kaplan, I. 2021. Development of Chitosan Films from Edible Crickets and Their Performance as a Bio-Based Food Packaging Material. *Polysaccharides*, 2(4), 744-758.
38. McClements, D.J., Barrangou, R., Hill, C., **Kokini, J.L.**, Lila, M.A., Meyer, A.S. & Yu, L. 2021. Building a Resilient, sustainable, and healthier food supply through innovation and technology. *Annual review of food science and technology*, 12, 1-28.
39. **Mehta, H.N., Benyathiar, P., Mishra, D.K. & Varney, M.** 2021. Complementary experiments for parameter estimation in heat transfer model. *Food and Bioproducts Processing*, 128, 240-246.
40. Mendoza-Salazar, A., Santiago-López, L., Torres-Llanez, M.J., Hernández-Mendoza, A., Vallejo-Cordoba, B., **Liceaga, A.M. & González-Córdova, A.F.** 2021. In Vitro Antioxidant and Antihypertensive Activity of Edible Insects Flours (Mealworm and Grasshopper) Fermented with *Lactococcus lactis* Strains. *Fermentation*, 7(3), 153.
41. Min, H.J., **Mina, H.A., Deering, A.J. & Bae, E.** 2021. Development of a smartphone-based lateral-flow imaging system using machine-learning classifiers for detection of *Salmonella* spp. *Journal of Microbiological Methods*, 188, 106288.
42. **Muniandy, A., Benyathiar, P., Mishra, D.K. & Ozadali, F.** 2021. Dynamic Thermal Properties Estimation Using Sensitivity Coefficients for Rapid Heating Process. *Foods*, 10(8), 1954.
43. Na-Nakorn, K., **Hamaker, B.R. & Tongta, S.** 2021. Physicochemical and rheological properties of cooked extruded reformed rice with added protein or fiber. *LWT*, 151, 112196.
44. **Nkhata, S.G., Liceaga, A.M., Rocheford, T., Hamaker, B.R. & Ferruzzi, M.G.** 2021. Storage of biofortified maize in Purdue Improved Crop Storage (PICS) bags reduces disulfide linkage-driven decrease in porridge viscosity. *LWT*, 136, 110262.
45. **Nino, M.C., Reddivari, L., Ferruzzi, M.G. & Liceaga, A.M.** 2021. Targeted Phenolic Characterization and Antioxidant Bioactivity of Extracts from Edible *Acheta domesticus*. *Foods*, 10(10), 2295.
46. Onyeoziri, I.O., **Torres-Aguilar, P., Hamaker, B.R.,** Taylor, J.R. & de Kock, H.L. 2021. Descriptive sensory analysis of instant porridge from stored wholegrain and decorticated pearl millet flour cooked, stabilized and improved by using a low-cost extruder. *Journal of Food Science*, 86(9), 3824-3838.
47. **Ozturk, O.K.,** Kaasgaard, S.G., Palmén, L.G., Vidal Jr, B.C. & **Hamaker, B.R.** 2021. Enzyme treatments on corn fiber from wet-milling process for increased starch and protein extraction. *Industrial Crops and Products*, 168, 113622.
48. **Ozturk, O.K.,** Kaasgaard, S.G., Palmén, L.G., Vidal Jr, B. & **Hamaker, B.R.** 2021. Protein matrix retains most starch granules within corn fiber from corn wet-milling process. *Industrial Crops and Products*, 165, 113429.
49. Parois, S.P., Eicher, S.D., **Lindemann, S.R. & Marchant, J.N.** 2021. Potential improvements of the cognition of piglets through a synbiotic supplementation from 1 to 28 days via the gut microbiota. *Scientific Reports*, 11(1), 1-15.
50. Qin, W., Ying, W., **Hamaker, B. & Zhang, G.** 2021. Slow digestion-oriented dietary strategy to sustain the secretion of GLP-1 for improved glucose homeostasis. *Comprehensive Reviews in Food Science and Food Safety*, 20(5), 5173-5196.
51. Rahman, A., Fehrenbach, J., Ulven, C., **Simsek, S. & Hossain, K.** 2021. Utilization of wheat-bran cellulosic fibers as reinforcement in bio-based polypropylene composite. *Industrial Crops and Products*, 172, 114028.
52. Ramirez-Gutierrez, D.M., Ileleji, K.E. & **Deering, A.J.** 2021. Evaluation of Novel Portable Passive and Cabinet Solar Dryers in Sun Drying of Mint Leaves under Indiana Weather Conditions. *Transactions of the ASABE*, 64(3), 1083-1094.

53. Román-Ochoa, Y., Delgado, G.T.C., Tejada, T.R., Yucra, H.R., Durand, A.E. & **Hamaker, B.R.** 2021. Heavy metal contamination and health risk assessment in grains and grain-based processed food in Arequipa region of Peru. *Chemosphere*, 274, 129792.
54. **Romero Marcia, A.D., Yao, T.,** Chen, M.H., Oles, R.E. & **Lindemann, S.R.** 2021. Fine Carbohydrate Structure of Dietary Resistant Glucans Governs the Structure and Function of Human Gut Microbiota. *Nutrients*, 13(9), 2924.
55. **San Martín-González, M.F.,** Cai, H. & **Huang, J.Y.** 2021. Economic and environmental performance of instantaneous water heating system for craft beer production. *Food and Bioprocess Processing*, 127, 472-481.
56. Song, H.S., **Lindemann, S.R.** & Lee, D.Y. 2021. Predictive Modeling of Human Microbiota and Their Role in Health and Disease. *Frontiers in Microbiology*, 3731.
57. Tandazo, A.S., **Ozturk, O.K., Hamaker, B.R. & Campanella, O.H.** 2021. Rice starch and Co-proteins improve the rheological properties of zein dough. *Journal of Cereal Science*, 102, 103334.
58. **Thomas, M. S. & Feng, Y.** 2021. Consumer Risk Perception and Trusted Sources of Food Safety Information During the COVID-19 Pandemic. *Food Control*, 108279.
59. Tsai, J.H., **Huang, J.Y.** & Wilson, D.I. 2021. Life cycle assessment of cleaning-in-place operations in egg yolk powder production. *Journal of Cleaner Production*, 278, 123936.
60. Vargas, M.C.A. & **Simsek, S.** 2021. Clean Label in Bread. *Foods*, 10(9), 2054.
61. **Voelker, A.L.,** Taylor, L.S. & **Mauer, L.J.** 2021. Effect of pH and concentration on the chemical stability and reaction kinetics of thiamine mononitrate and thiamine chloride hydrochloride in solution. *BMC Chemistry*, 15(1), 1-14.
62. Wiese, G.N., Biruete, A., Moorthi, R.N., Moe, S.M., **Lindemann, S.R.** & Gallant, K.M.H. 2021. Plant-Based Diets, the Gut Microbiota, and Trimethylamine N-Oxide Production in Chronic Kidney Disease: Therapeutic Potential and Methodological Considerations. *Journal of Renal Nutrition*, 31(2), 121-131.
63. Wu, B., Vanamala, J. K., Chopra, S. & **Reddivari, L.** 2021. Near-Isogenic Lines as Powerful Tools to Evaluate the Effect of Individual Phytochemicals on Health and Chronic Diseases. In *Plant Biotechnology*, pp. 249-256.
64. Wu, W., Zhang, Z., Chao, Z., Li, B., Li, R., Jiang, A., **Kim, K.H.** & Liu, H. 2021. Transcriptome analysis reveals the genetic basis of skeletal muscle glycolytic potential based on a pig model. *Gene*, 766, 145157.
65. Xu, C., Couvillion, S.P., Sontag, R.L., Isern, N.G., Maezato, Y., **Lindemann, S.R.,** Chowdhury, T.R., Zhao, R., Morton, B.R., Chu, R.K., Moore, R.J., Jansson, J.K., Bailey, V.L., Mouser, P.J., Romine, M.F., Fredrickson, J.F. & Metz, T.O. 2021. MetFish: a Metabolomics Pipeline for Studying Microbial Communities in Chemically Extreme Environments. *Msystems*, 6(3), e01058-20.
66. Yue, Y., Wang, J., Shen, P., **Kim, K.H.** & Park, Y. 2021. Methylglyoxal influences development of *Caenorhabditis elegans* via lin-41-dependent pathway. *Food and Chemical Toxicology*, 152, 112238.
67. Yun, E.J., Seo, S.O., Kwak, S., **Oh, E.J.,** Lee, S.H., Jin, Y.S. & **Kim, K.H.** 2021. Fast filtration with a vacuum manifold system as a rapid and robust metabolome sampling method for *Saccharomyces cerevisiae*. *Process Biochemistry*, 110, 195-200.
68. Zhao, M., Liang, Q., Diaz-Amaya, S., **Deering, A.J.,** Stanciu, L., Chiu, G.T.C. & Allebach, J.P. 2021. Spectral Imaging to Differentiate Contaminant Levels. *Electronic Imaging*, 2021(16), 342-1.
69. Zhao, S., Dien, B.S., **Lindemann, S.R.** & Chen, M.H. 2021. Controlling autohydrolysis conditions to produce xylan-derived fibers that modulate gut microbiota responses and metabolic outputs. *Carbohydrate Polymers*, 271, 118418.
70. Zhong, C., Reibman, A.R., **Mina, H.A. & Deering, A.J.** 2021. Designing a Computer-Vision Application: A Case Study for Hand-Hygiene Assessment in an Open-Room Environment. *Journal of Imaging*, 7(9), 170.
71. Zhou, X., **Campanella, O.H., Hamaker, B.R. & Miao, M.** 2021. Deciphering molecular interaction and digestibility in retrogradation of amylopectin gel networks. *Food & Function*. 12, 11460-11468
72. Zhu, Y., **Kim, S.Q.,** Zhang, Y., Liu, Q. & **Kim, K.H.** 2021. Pharmacological inhibition of acyl-coenzyme A: cholesterol acyltransferase alleviates obesity and insulin resistance in diet-induced obese mice by regulating food intake. *Metabolism*, 123, 154861.
73. 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 IL22 and Short-Chain Fatty Acids in Experimental Models. *Cellular and Molecular Gastroenterology and Hepatology*, 12(3), 983-1000.

Book Chapter

1. **Zhang, G. & Hamaker, B.R.** 2021. Whole grain Carbohydrates. *Whole Grains and Health*, Editor(s): Rikard Landberg, Nathalie Scheers, pp 55-69.

Graduated Students with Thesis/Dissertation Titles

1. **Brianna Britton – PhD (Oliver):** *Listeria monocytogenes* and Drain Microbiomes in Retail Delis During COVID-19 and an Assessment of Microbial Contamination in Senegalese Peanuts
2. **Javier Cruz Padilla-MS (Mishra):** Characterization and Development of Microbubble on Enclosed Systems Cleaning and Cleaning in Place Process
3. **Wenyi “Chloe” Fu – MS (Reddivari):** Anthocyanins and Polysaccharides Interaction on Gut Barrier Function
4. **Morgan Malm – PhD (Liceaga):** Purification and Characterization of *Acheta domesticus* and *Grylloides sigillatus* Cricket Chitin and Chitosan for Bioactive and Bio-Based Food Packaging Applications
5. **Maria Catalina Nino Bernal – MS (Liceaga):** Phenolic Characterization and Bioactivity of Microwave-Assisted Extracts from Edible House Cricket (*Acheta domesticus*)
6. **Sarah Pitts – MS (Mauer):** The Impact of Dietary Fiber and Sucrose Alternatives on Texture Perception of Cookies
7. **Tianming Yao – PhD (Hamaker/Lindemann):** Fine Arabinoxylan Structure Impacts on Human Gut Microbiota Composition and Function: Potential Substrates for Management of Microbiome Composition and Health Benefit

Graduate Student/Post Doctorate Achievements/Awards

1. **Anbukani “Connie” Muniandy**-Graduate Agriculture Research Spotlight, June 2021
ISBT Beverage Scholarship – October 2021
2. **Harrison Helmick**-Cereals and Grains (AACCI) Poster Competition, First Place, November 2021
3. **Merlyn Thomas**-Cereals and Grains (AACCI) Student Research Video Competition, November 2021