

## 2021-2022 PUBLICATIONS AND PRODUCTS FOR NE1939 PROJECT

### Published Journal Articles (31 TOTAL, 1 JOINT)

1. Belury MA, Ros E, Kris-Etherton PM. Weighing evidence of the role of saturated and unsaturated fats and human health. *Adv Nutr* 2021; in press 13 Snoke, DB and Belury MA. A dietary fatty acid that may tweak energy metabolism. *Inform* 2021; 32, 34-6
2. Belury MA, Cole RM, Andridge R, Keiter A, Raman SV, Lustberg MB, Kiecolt-Glaser JK. Erythrocyte long chain omega-3 fatty acids are positively associated with lean mass and grip strength in women with recent diagnoses of breast cancer. *J Nutr* 2021; 151: 2125-33
3. Belury MA, Clark BC, McGrath R, Cawthon PM. Linoleic acid intake and physical function: Pilot results from the Health ABC energy expenditure sub-study. *Adv Geriatr Med Res* 2022; 4(1):e220001. doi: 10.20900/agmr20220001.
4. Butler MJ, Deems NP, Muscat S, Butt CM, Belury MA, Barrientos RM. Dietary DHA prevents cognitive impairment and inflammatory gene expression in aged male rats fed a diet enriched with refined carbohydrates. *Brain Behav Immun* 2021; 98:198-209
5. Cao L, Pechan T, Lee S, Cheng WH. Identification of Selenoprotein H Isoforms and Impact of Selenoprotein H Overexpression on Protein But Not mRNA Levels of 2 Other Selenoproteins in 293T Cells. *J Nutr.* 2021; 151(11):3329-3338. doi: 10.1093/jn/nxab290.
6. Cole RM, Angelotti A, Sparagna GC, Ni A, Belury MA. Linoleic acid-rich oil alters circulating cardiolipin species and fatty acid composition in adults: A randomized controlled trial. *Mol Nutr Food Res* 2022; 66:e2101132; doi: 10.1002/mnfr.202101132.
7. Eshghjoo S, Jayaraman A, Sun Y, Alaniz RC. Microbiota-Mediated Immune Regulation in Atherosclerosis. *Molecules.* 2021 Jan 1;26(1):179. doi: 10.3390/molecules26010179.
8. Eubank, JM, Oberlin, DJ, Alto, A, et al. Effects of Lifestyle Factors on Cognition in Minority Population of Older Adults: A Review. *Frontier Nutrition.* 2022 (841070) doi: 10.3389/fnut.2022.841070 (**JOINT PUBLICATION**)
9. Frankhouser DE, Steck S, Sovic MG, Belury MA, Wang Q, Clinton SK, Bundschuh R, Yan PS, Yee LD. Dietary Omega-3 Fatty Acid Intake Impacts Peripheral Blood DNA Methylation -Anti-inflammatory Effects and Individual Variability in a Pilot Study. *J Nutr Biochem* 2021, 99:108839
10. Gumper-Fedus K, Hart PA, Belury MA, Crowe O, Cole RM, Pita Grisanti V, Badi N, Liva S, Hinton A, Coss C, Ramsey ML, Noonan A, Conwell DL, Cruz-Monserrate Z. Altered plasma fatty acid abundance is associated with cachexia in treatment-naïve pancreatic cancer. *Cells* 2022; 11(5):910. doi: 10.3390/cells11050910
11. Lee JH, Lin L, Ye X, Wolfrum C, Chen Y, Guo S, Sun Y. GHS-R in brown fat potentiates differential thermogenic responses under metabolic and thermal stresses. *PLoS One.* 2021 Apr 1;16(4):e0249420. doi: 10.1371/journal.pone.0249420.
12. Lee JH, Fang C, Li X, Wu CS, Noh JY, Ye X, Chapkin RS, Sun K, Sun Y. GHS-R suppression in adipose tissues protects against obesity and insulin resistance by regulating adipose angiogenesis and fibrosis. *Int J Obes (Lond).* 2021 Jul;45(7):1565-1575. doi: 10.1038/s41366-021-00820-7.
13. Lee JH, Xue B, Chen Z, Sun Y. Neuronal GHS-R Differentially Modulates Feeding Patterns under Normal and Obesogenic Conditions. *Biomolecules.* 2022 Feb 11;12(2):293. doi: 10.3390/biom12020293.
14. Madison, AA, Belury, MA, Andridge, R, Renna, ME, Shrout, MR, Malarkey, WB, Lin, J, Epel, ES, Kiecolt-Glaser, JK. Omega-3 supplementation and stress reactivity of cellular aging biomarkers: An

ancillary substudy of a randomized, controlled trial in midlife adults. *Mol Psychol* 2021; 26(7):3034-3042

15. Manford AG, Rodriguez-Perez F, Shih KY, Shi Z, Berdan CB, Choe M, Titov DV, Nomura DK, Rape M. A cellular mechanism to detect and alleviate reductive stress. *Cell*. 2020 Oct 1;183(1):46-61.
16. Mullens DA, Ivanov I, Hullar MAJ, Randolph TW, Lampe JW, Chapkin RS. Personalized Nutrition Using Microbial Metabolite Phenotype to Stratify Participants and Non-Invasive Host Exfoliomics Reveal the Effects of Flaxseed Lignan Supplementation in a Placebo-Controlled Crossover Trial. *Nutrients*. 2022 Jun 8;14(12):2377. doi: 10.3390/nu14122377.
17. Noh JY, Herrera M, Patil BS, Tan XD, Wright GA, Sun Y. The expression and function of growth hormone secretagogue receptor in immune cells: A current perspective. *Exp Biol Med (Maywood)*. 2022 Sep 23;15353702221121635. doi: 10.1177/15353702221121635
18. Noh JY, Wu CS, DeLuca JAA, Devaraj S, Jayaraman A, Alaniz RC, Tan XD, Allred CD, Sun Y. Novel Role of Ghrelin Receptor in Gut Dysbiosis and Experimental Colitis in Aging. *Int J Mol Sci*. 2022 Feb 17;23(4):2219. doi: 10.3390/ijms23042219.
19. Pradhan G, Wu CS, Villarreal D, Lee JH, Han HW, Gaharwar A, Tian Y, Fu W, Guo S, Smith RG, Sun Y.  $\beta$  Cell GHS-R Regulates Insulin Secretion and Sensitivity. *Int J Mol Sci*. 2021 Apr 11;22(8):3950. doi: 10.3390/ijms22083950.
20. Pradhan G, Lee JH, Wu CS, Wang H, Lin L, Donti T, Graham BH, Rajan AS, Balasubramanyam A, Samson SL, Guo S, Sun Y. Mechanistic Investigation of GHS-R Mediated Glucose-Stimulated Insulin Secretion in Pancreatic Islets. *Biomolecules*. 2022 Mar 6;12(3):407. doi: 10.3390/biom12030407.
21. Ro SH, Bae J, Jang Y, Myers JF, Chung S, Yu J, Natarajan SK, Franco R, Song HS. Arsenic toxicity on metabolism and autophagy in adipose and muscle tissues. *Antioxidants*. 2022;11(4): 689. doi: 10.3390/antiox11040689.
22. Snoke DB, Angelotti A, Borkowski K, Cole RM, Newman JW, Belury MA. Linoleate-Rich Safflower Oil Diet Increases Linoleate-Derived Bioactive Lipid Mediators in Plasma, and Brown and White Adipose Depots of Healthy Mice. *Metabolites*, 12: 743, doi: 10.3390/metabo12080743.
23. Snoke DB, Nishikawa Y, Cole RM, Ni A, Angelotti A, Vodovotz Y, Belury MA. Dietary naringenin preserves insulin sensitivity and grip strength and attenuates inflammation but accelerates weight loss in a mouse model of cancer cachexia. *Mol Nutr Food Res* 2021; 65: e2100268
24. Tuchaai E, Endres V, Jones B, Shankar S, Klemashevich C, Sun Y, Wu CS. Deletion of ghrelin alters tryptophan metabolism and exacerbates experimental ulcerative colitis in aged mice. *Exp Biol Med (Maywood)*. 2022 Sep;247(17):1558-1569. doi: 10.1177/15353702221110647.
25. Wei Q, Lee JH, Wu CS, Zang QS, Guo S, Lu HC, Sun Y. Metabolic and inflammatory functions of cannabinoid receptor type 1 are differentially modulated by adiponectin. *World J Diabetes*. 2021 Oct 15;12(10):1750-1764. doi: 10.4239/wjd.v12.i10.1750.
26. Wong LY, Francis SL, Hopkins H, Boudreau H. Virtual delivery of Fresh Conversations, a SNAP-ED program: participant perceived impact and satisfaction. *Journal of Nutrition in Gerontology and Geriatrics* (2022): 1-10. <https://doi.org/10.1080/21551197.2022.2107594>
27. Wong L.Y., Francis, S.L., Genschel, U., Arthur, A., Xu, F., Weidauer, L., Monroe-Lord, L., Ventura-Marra, M., Sahyoun, N.R., Kendall, C. Covid-19 Impacts on Aging Adults' Food Practices, Physical Activity Levels, and Stress Levels. *Journal of Public Health*. <https://doi.org/10.1007/s10389-022-01742-y> **(JOINT PUBLICATION)**

28. Wu CS, Muthyala SDV, Klemashevich C, Ufondu AU, Menon R, Chen Z, Devaraj S, Jayaraman A, Sun Y. Age-dependent remodeling of gut microbiome and host serum metabolome in mice. *Aging (Albany NY)*. 2021 Feb 17;13(5):6330-6345. doi: 10.18632/aging.202525.
29. Xu, F., Earp, J.E., Blissmer, B.J., Lofgren, I.E., Delmonico, M.J., & Greene, G.W. (2022). The demographic specific abdominal fat composition and distribution trends in US adults. *Journal of Environmental Research and Public Health*. 19(19), 12103. doi: 10.3390/ijerph191912103.
30. Yang X, Heinemann M, Howard J, Huber G, Iyer-Biswas S, Le Treut G, Lynch M, Montooth KL, Needleman DJ, Pigolotti S, Rodenfels J, Ronceray P, Shankar S, Tavassoly I, Thutupalli S, Titov DV, Wang J, and Foster PJ. Physical bioenergetics: Energy fluxes, budgets, and constraints in cells. *PNAS*. 2021 Jun 29;118(26):e2026786118.
31. Zeng H, Safratowich BD, Cheng WH, Larson KJ, Briske-Anderson M. Deoxycholic Acid Modulates Cell-Junction Gene Expression and Increases Intestinal Barrier Dysfunction. *Molecules*. 2022; 27(3):723. doi: 10.3390/molecules27030723.

### Published Research Abstracts (10 TOTAL)

1. Bignell W., Franck K., Cobbles A., Kelley S., Johnson K. (2022). Results from a Mixed-Methods Survey and Focus Group to Assess Social Media and Technology Use by Older Adults in Northeast Tennessee to Inform Development of a Virtual Supper Club Nutrition Education Intervention. Poster presented at: Academy of Nutrition and Dietetics Food and Nutrition Expo Annual Conference, October 7, 2022; Orlando, Florida.
2. Veronica Sanchez, Hye Won Han and Yuxiang Sun (2021). Ghrelin signaling regulates LPS induced activation of autophagy and NF- $\kappa$ B signaling in RAW 264.7 macrophages. Undergraduate symposium at University of Texas at Austin, October 18, 2021 (Oral presentation and received honorary mention)
3. Ji Yeon Noh and Yuxiang Sun (2021). Ghrelin receptor deletion on gut dysbiosis and experimental colitis in aging. CADA-South Winter Retreat, Hilton College Station & Conference Center, December 11, 2021.
4. Hongying Wang and Yuxiang Sun (2021). Neuronal ablation of GHS-R mitigates diet-induced neuroinflammation improving depression and memory. CADA-South Winter Retreat, Hilton College Station & Conference Center, December 11, 2021.
5. Da Mi Kim and Yuxiang Sun (2021). Nutrient-sensing GHS-R in macrophage reprogramming and meta-inflammation. CADA-South Winter Retreat, December 11, 2021 at Hilton College Station & Conference Center, December 11, 2021.
6. Veronica Sanchez, Hye Won Han and Yuxiang Sun (2022). Ghrelin signaling regulates LPS induced activation of autophagy and NF- $\kappa$ B signaling in RAW 264.7 macrophages. Undergraduate symposium at Harvard University, Jan 21-23, 2022.
7. Wanbao Yang, Fenghua Zhou, Quan Pan, Kimberly Allred, Clinton Allred, Yuxiang Sun, David Threadgill, David Dostal, Carl Tong, and Shaodong Guo (2022). Sexual Dimorphism in Control of Heart Failure in Insulin Resistance. Experimental Biology Philadelphia, Pennsylvania, USA April 2-5, 2022
8. Investigating the Mechanism of Human Conserved miR-987 in Heart Maintenance (AAAS 2021) • The Role Of Human Conserved Microrna-193 In The Aging Drosophila Heart (AHA BCVS 2022) • Drosophila As A Model To Study The Effect Of Dietary Fat On Neuronal Health Yu J. Garlic chive-derived exosome-like nanoparticles inhibit the NLRP3 inflammasome in obesity. CADA Annual Meeting, 2022, New Orleans, LA.
9. Yu J. Hepatoprotective functions of dietary-derived exosome-like nanoparticles in aged mice. CADA FASEB Liver Biology Conference, 2022, New Orleans, LA.
10. Huang YC, LeGrand C, Cheng WH. Impact of Gut R. torques on Type 2 Diabetes in Selenium-deficient Mice. FASEB J. 2022;35(S1): <https://doi.org/10.1096/fasebj.2022.36.S1.L7599> (Experimental Biology 2022)

## Invited Talks (16 TOTAL)

1. Oct. 21-26, 2021 Invited speaker, 2nd International Conference on Precision Nutrition and Metabolism in Public Health and Medicine. Rhodes, Greece (invited by organizer Dr. Patrick J. Stover). Title: Dynamic roles of ghrelin signaling in nutrient sensing and immunometabolism.
2. Dec. 3, 2021 Invited talk, Department of endocrinology and animal biosciences, Rutgers University Title: The Good, the bad and the ugly of gut hormone ghrelin signaling in energy metabolism and inflammation
3. June 23, 2022 Invited speaker, USDA multi-state NE1939 annual meeting, June 22-24, 2022, Ankeny, IA Title: Ghrelin signaling in obesity and aging
4. Sept. 16, 2022 Invited talk, Department of Biochemistry and Molecular biology, University of New Mexico Title: Nutrient-sensing ghrelin signaling in health and disease: an immunometabolic perspective
5. Dec. 3, 2021 Invited Seminar Speaker, Department of Animal Sciences, Rutgers, The State University of New Jersey Title: The neuroendocrine role of nutrient-sensing ghrelin signaling and beyond
6. Feb. 18, 2022 Invited talk, Endo Grand Rounds, Division of Endocrinology, UT Southwestern Medical Center (Zoom) Title: Nutrient-sensing ghrelin signaling in health and disease: an immunometabolic perspective
7. May 27, 2022. Translational Research for Cancer Cachexia: Focus on Mitochondria and Energy Metabolism. Pancreatic cancer group, OSU Comprehensive Cancer Center, Ohio State University Medical Center
8. May 1, 2022. Targeting inflammation and metabolism with linoleic acid: When research comes full circle. American Oil Chemist's Society annual meeting, Atlanta, GA
9. April 28, 2022. Does dietary fat target mitochondria to influence skeletal muscle? Ohio University, Athens
10. April 20, 2022. Using dietary linoleic acid to reduce ectopic lipids in the liver: Implications for treating non-alcoholic fatty liver disease. Institute for Behavioral Medicine Research, OSU Medical Center
11. October 27, 2021. Cellular targets of linoleic acid (18:2n6) to impact energy metabolism, National Chung Hsing University, Taichung, Taiwan
12. July 9, 2021. Invited speaker, Nutrition's impact on cardiovascular disease and metabolism. Cardiometabolic Science Bootcamp, OSU Wexner Medical Center
13. Fall 2022. McNeill, E. Examining the role of high fat diet in the miRNA gene regulation axis in the Brain. Nebraska Center for the Prevention of Obesity Diseases. Lincoln NE. \
14. 2022. Yu J. Dietary extracellular vesicle-like nanoparticles, NLRP3 inflammasome, and chronic inflammation. School of Veterinary Medicine & Biomedical Sciences, University of Nebraska Lincoln, 2022, Lincoln NE
15. February 2022. Cheng WH. Role of Selenium in Male Reproduction. Department of Biological Sciences, Mississippi State University. November 2021. 2. Cheng WH. Optimized selenium status, gut microbiota, and diabetes. The 12<sup>th</sup> International Symposium on Selenium in Biology and Medicine, Honolulu, Hawaii, USA.
16. June 2022. Cheng WH. Selenium Regulation of Aging in Telomere-humanized mice. 17th International Conference on Trace Element in Man and Animals, Aachen, Germany.

### **Theses and Dissertations (2 TOTAL)**

1. Wong, LY. COVID-19 and aging adults: Virtual education and behavior impacts. Iowa State University. <https://dr.lib.iastate.edu/handle/20.500.12876/4vGXOkNr> Liu B. Therapeutic effects of dietary vesicle-like nanoparticles on NLRP3 inflammasome-mediated inflammatory diseases. Ph.D. Dissertation, University of Nebraska Lincoln, 2022, Lincoln NE
2. Wang QZ. Physiological roles of selenoprotein H in mice. Dissertation. Fall 2021 2. Huang YC. Optimized Selenium Status, Gut Microbiota, and Type 2 Diabetes. Dissertation. Spring 2022

### **Grants and Contracts (21 TOTAL, \$2,302,056 total awarded)**

1. Sally Jones, PI. Sarcopenia Prevention for Women. Funding Period: October 1, 2021 through September 30, 2022; Funder: National Institutes of Health; Grant Amount: \$1,000,000.
2. Whitney Bignell, PI; Kristen Johnson, Co-PI. Among Older Adults in Northeast Tennessee Funder: Administration for Community Living. Funding Period: September 1, 2021- August 31, 2022 Title of Grant: Socially Nutritious: Addressing Food Insecurity Living; Grant Amount: \$192,500
3. Yuxiang Sun, PI. Nutrient-sensing GHS-R in macrophage reprogramming and inflamm-aging. Funding Period: October 1 through September 30. Funder: National Institutes of Health Grant Amount: \$325,342.
4. Yuxiang Sun, PI. Myeloid GHS-R in neuroinflammation of Alzheimer's Disease. Funding Period: October 1 through September 30. Funder: BrightFocus Foundation. Grant Amount: \$100,000
5. Yuxiang Sun, PI. Ghrelin: a unique biomarker for nutritional state and inflamm-aging. Funding Period: October 1 through September 30. Funder: Texas A&M AgriLife Institute for Advancing Health Through Agriculture (IHA), Texas A&M University Grant Amount: \$150,000.
6. Yuxiang Sun, PI. Improving the healthspan of aging adults through diet and physical activity. Funding Period: October 1 through September 30. Funder: Texas A&M University, USDA multi-state fund Grant Amount: \$40,000.
7. Martha Belury, PI. Attenuation of Cancer Cachexia by Flavonoids: Identifying the Neuromuscular and Neuroimmunologic Effects of Naringenin. Period: Jan 2022- Jan 2023. Funder: CAFFRE Internal Amount: \$23,500
8. Martha Belury, PI. Two mouse studies will address the neuromuscular and metabolic effects of naringenin diets on the pathogenesis of cancer cachexia. Effects of Dietary Soybean Oil on Liver Fat, Body Composition and Cardiometabolic Disease Risk in Adults with NAFLD. Period: Sep 2021-Sep 2023. United Soybean Board, Soy Nutrition Institute. Amount: \$846,200
9. Martha Belury, PI. In a double blind, randomized controlled study, diets of adults with NAFLD will be fortified with soybean or control oil to determine effects on liver fat concentration changes without weight loss. National Needs Fellowship: Multidisciplinary Training of Fellows in Food & Nutrition for Obesity & Cancer Prevention. Period: Nov 2018- Oct 2023. USDA 2017-09503 *This is a pre-doctoral training grant to provide stipend, tuition and fees for three distinguished pre-doctoral fellows who are under-represented in life science. Fellows will pursue a PhD in nutrition and foods sciences areas. Role: Project Director Co-Investigator*
10. Steve Clinton, PI. A New Paradigm in Foods for Health at OSU: Multi-omics Integration in the Era of Nutrition. President's Research Excellence (PRE), Internal Period Jan 2022 – Dec 2024. Amount: \$200,000.

11. Kedryn Baskin, PI. Optimizing Mitochondrial Functional Analysis on Fresh and Frozen Muscle Biopsy Tissue. Foods for Health Initiative, Internal Period Jun 2021 – May 2022. Amount: \$50,000.
12. Tonya Orchard, PI. Remote Assessment of Cognition, Insulin Resistance and Omega-3 Fatty Acid Biomarkers in Obese Breast Cancer Survivors at Risk for Cognitive Impairment. College of Education and Human Ecology, Internal Period: Jan 2021 – Dec 2021 Amount: \$40,000
13. Zach Conrad, PI. Cardiometabolic Effects of Low Carbohydrate/Healthy Fat Diets / Macronutrient intakes & diet quality for contemporary consumer diets. International Association of Food and Nutrition Science Period: Nov 2020-Oct 2022. Amount: \$ 273,000
14. Zobeida Cruz-Monserrate, PI. 5% Mediators of Pancreatic Cancer-Associated Cachexia. CA R21 256409 Period: Dec 2020- Nov 2022. Amount: \$400,000
15. ISU PI. National Resource Center on Nutrition and Aging: A partnership with Iowa and the ACL. Funding Period: September 1, 2022 – August 30, 2023. Funder: DHHS, ACL. Amount: \$242,315.
16. ISU PI. Wellness and Independence through Nutrition (WIN): Food Assistance Outreach. Funding Period: October 1, 2021 – September 30, 2022. Funder: Iowa Department of Human Services Grant Amount: \$34,137.
17. Investigating the role of human conserved MIR-193 in drosophila heart health. Funding Period: January 1, 2022 – January 1, 2023. Funder: American Heart Association. Grant Amount: \$64,072.
18. Melissa Ventura-Marra, PI. Expanding Nutrition Student Competency in Telehealth to Improve Diet and Prevent Chronic Disease in Adults with Obesity. April 15 through September 30, 2022. Funder: USDA NIFA Grant Amount for this period: ~\$120,000 (\$969,631 over 4 year period).
19. Jiujiu Yu, PI. Role of chive-derived exosome-like nanoparticles in suppressing inflammation in obesity. Funding Period: October 1, 2021 through September 30, 2022. Funder: National Institutes of Health Grant Amount: \$138,000
20. Jiujiu Yu, PI. Dietary exosome-like nanoparticles and their impact on the gut microbiome in obesity. Funding Period October 1, 2021 through September 30, 2022. Funder: United States Department of Agriculture Grant Amount: \$ 100,000.
21. Jiujiu Yu, Co-investigator. Effect of a pulse-based USDA-diet on gut microbial metabolites and biomarkers of healthspan: A 18-week randomized controlled crossover feeding study in older adults. Funding Period October 1, 2021 through September 30, 2022. Funder: USDA-ARS Pulse Crop Initiative Grant Amount: \$604,076.
22. Jiujiu Yu, Co-investigator. The role of lean-pork within a plant-based dietary pattern for improving iron reserve, muscle-fitness, and markers of health span in older adults: A multi-disciplinary randomized controlled feeding study. Funding Period October 1, 2021 through September 30, 2022. Funder: National Pork Board Human Nutrition Grant. Amount: \$250,000.
23. Wen-Hsing Cheng, PI. Selenium Regulation of Selenoprotein Expression and Glucose Metabolism in Mice. Funding Period: May 16, 2022 through May 15, 2023. Funder: mississippi agricultural and forestry experiment station. Amount: \$3,000.