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Engineering & Scientific Consulting

Brian Head, Ph.D.

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Professional Profile

Dr. Head is an interdisciplinary scientist specializing in molecular biology with an emphasis on nutritional and biochemical networks regulating health. He received both his M.S. in Animal Sciences and Ph.D. in Molecular and Cellular Biology from Oregon State University.

Dr. Head investigated the effects of poultry feed composition on meat-type, broiler chicken metabolism and growth performance. He has expertise in analytical chemistry techniques including gas chromatography as well as experience with commercial animal husbandry. Dr. Head specializes in micronutrient metabolism, specifically Vitamin E, as it relates to maternal health, pregnancy outcomes, and aging. His work included metabolomic analyses using liquid chromatography with tandem mass-spectrometry (LC-MS/MS). Dr. Head also conducted bioinformatic analyses using transcriptomics and integration of multi-omic datasets. Dr. Head has expertise with the zebrafish model system. Dr. Head participated in human subject clinical trial research modeling the pharmacokinetics of Vitamin E in healthy women.

Before joining Exponent, Dr. Head held a Postdoctoral Fellowship at the National Institute of Child Health and Human Development (NICHD) at The National Institutes of Health (NIH) where he focused on rare genetic disorders of cholesterol metabolism and lysosomal storage disorders. Dr. Head has published numerous research and review articles in peer-reviewed scientific journals and has presented multiple award-winning oral and printed presentations at professional scientific meetings.

Academic Credentials & Professional Honors

Ph.D., Molecular and Cellular Biology, Oregon State University, 2021

M.S., Animal Sciences, Oregon State University, 2016

B.S., Zoology, Oregon State University, 2014

Irwin Fridovich Young Investigator Award, Society for Redox Biology and Medicine, 2020

Marion T. Tsefelas Endowed Graduate Fellow, 2020-2021

Mark Sponenburgh Endowed Graduate Fellow, 2018-2019

Provost’s Distinguished Graduate Fellow, 2017-2018

Certificate of Excellence, Metabolism and Nutrition, Poultry Science Association, 2015

Prior Experience

Postdoctoral Intramural Research Training Award (IRTA) Fellow, Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH. 2021.

Vice Chair, Trainee Council, Society for Redox Biology and Medicine, 2020-2021

Teaching Assistant, Department of Integrative Biology, Oregon State University, 2019-2020

Professional Affiliations

Society for Redox Biology and Medicine (SfRBM)

American Society for Nutrition

Institute of Food Technologists (IFT)

Publications

Traber, MG. and Head, B. Vitamin E: How much is enough, too much and why!. Free Radical Biology and Medicine. 2021; 177: 212-215.

Head, B., and Traber, MG. Expanding role of vitamin E in protection against metabolic dysregulation: Insights gained from model systems, especially the developing nervous system of zebrafish embryos. Free Radical Biology and Medicine. 2021; 176:80-91.

Watt, AT., Head, B, Leonard, SW., Tanguay, RL., and Traber, MG. Gene Expression of CRAL_TRIO Family Proteins modulated by Vitamin E Deficiency in Zebrafish (Danio Rerio). The Journal of Nutritional Biochemistry. 2021; 108801.

Head, B., La Du, J, Barton, C., Zhang, J., Wong, C., Ho, E., Tanguay, RL., and Traber, MG. RedEfish: Generation of the Polycistronic mScarlet: GSG-T2A: Ttpa Zebrafish Line. Antioxidants. 2021; 10 (6), 965.

Head, B., Ramsey, SA., Kioussi, C., Tanguay, RL., and Traber, MG. Vitamin E Deficiency Disrupts Gene Expression Networks during Zebrafish Development. Nutrients. 2021; 13 (2), 468.

Zhang, J.*, Head, B.*, Leonard, SW., Choi, J., Tanguay, RL., and Traber, MG. Vitamin E deficiency dysregulates thiols, amino acids and related molecules during zebrafish embryogenesis. Redox biology. 2020; 38, 101784. (* indicates equal contribution).

Head, B., La Du, J., Tanguay, RL., Kioussi, C., and Traber, MG. Vitamin E is necessary for zebrafish nervous system development. Scientific reports. 2020; 10 (1), 1-14.

Violet, PC., Ebenuwa, IC., Wang, Y., Niyyati, M., Padayatty, SJ., Head, B., Wilkins, K., Chung, S., Thakur, V., Ulatowski, L., Atkinson, J., Ghelfi, M., Smith, S., Tu, H., Bobe, G., Liu, CY., Herion, DW., Shamburek, RD., Manor, D., Traber, MG., and Levine, M. Vitamin E sequestration by liver fat in humans. JCI Insight. 2020; 16;5(1):e133309. doi: 10.1172/jci.insight.133309. PMID: 31821172; PMCID: PMC7030816.

Traber, MG., Leonard, SW., Ebenuwa, IC., Violet, PC., Wang, Y., Niyyati, M., Padayatty, S., Tu, H., Courville, A., Bernstein, S., Choi, J., Shamburek, R., Smith, S., Head, B., Bobe, G., Ramakrishnan, R., and Levine, M. Vitamin E absorption and kinetics in healthy women, as modulated by food and by fat, studied using 2 deuterium-labeled α-tocopherols in a 3-phase crossover design. American Journal of Clinical Nutrition. 2019; Nov 1;110(5):1148-1167. doi: 10.1093/ajcn/nqz172. Erratum in: Am J Clin Nutr. 2020 Jul 1;112(1):239. PMID: 31495886; PMCID: PMC6821549.

Head, B., Bionaz, M., and Cherian, G. Flaxseed and Carbohydrase Enzyme Supplementation Alters

Hepatic n-3 Polyunsaturated Fatty Acid Molecular Species and Expression of Genes Associated with Lipid Metabolism in Broiler Chickens. Veterinary sciences. 2019; 6 (1), 25.

Conrad, M., Kagan, VE., Bayir, H., Pagnussat, GC., Head, B., Traber, MG., and Stockwell, BR. Regulation of lipid peroxidation and ferroptosis in diverse species. Genes & Development. 2018; 32 (9-10), 602-619.

Presentations

Head, B., La Du, J., Tanguay, RL., Kioussi, C., and MG Traber. Vitamin E Prevents Neurodevelopmental Defects in Zebrafish. Oral presentation, Society for Redox Biology and Medicine Annual Meeting, 2020. Awarded Irwin-Fridovich Young Investigator Award.

Zhang, J., Head, B., Leonard, SW., Choi, J., Tanguay, RL., and MG Traber. Vitamin E deficiency dysregulates amino acids and methyl donor compounds during zebrafish embryogenesis. Poster presentation, Society for Redox Biology and Medicine Annual Meeting, 2020.

Head, B., La Du, J., Tanguay, RL., Kioussi, C., and MG Traber. Vitamin E is Necessary to Protect Neural Crest Cells in Developing Zebrafish Embryos. Poster presentation, American Nutrition Science Annual Meeting, 2020.

Head, B., Kioussi, C., Leonard, SW., Tanguay, RL., and MG Traber. Vitamin E deficiency disrupts molecular pathways of energy metabolism in zebrafish embryos. Poster presentation, Society for Redox Biology and Medicine Annual Meeting, 2018.

Head, B., K. D. Apperson, and G Cherian. 2015. Hepatic triacylglycerol content and fatty acid distribution in lipid classes: effect of dietary flax seed and carbohydrase enzyme in broiler chickens. Oral Presentation, Poultry Science Society Annual Meeting 2015. Awarded Certificate of Excellence, Metabolism and Nutrition.