

ONDULLA TYVETTE TOOMER, Ph.D.

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EDUCATIONAL BACKGROUND

PH.D. NUTRITION SCIENCES 2005

M.S. PHYSIOLOGY 2000

B.S.-BIOCHEMISTRY; B.A.-CHEMISTRY 1994

North Carolina State University, Raleigh NC

PROFESSIONAL EXPERIENCE**RESEARCH CHEMIST/USDA ASSISTANT PROFESSOR****Food Science & Market Quality and Handling Research Unit-ARS, USDA**

Dept. Food, Bioprocessing & Nutrition Sciences, NCSU Raleigh, NC May 2, 2016-Current

- Serve as Principal Investigator to identify chemical constituents of raw and processed peanuts that are of nutritional benefit to the American consumer using *in vitro* and *in vivo* models.
- Serve as Principal Investigator to investigate the usefulness of peanuts and/or peanut-by-products as an alternative feed ingredient within the feed industry.

SENIOR STAFF FELLOW-RESEARCH BIOLOGIST

Immunobiology Branch-OARSA-CFSAN-FDA, Laurel, MD August, 2009- May, 2016

- Serve as Principal Investigator conducting research to support regulatory guidance and policy related to food allergens, functional foods (probiotics, prebiotics), and shell egg safety.
- Develop and adapt *in vitro* methodologies to identify, characterize and determine the allergenicity of raw and thermally processed peanuts, tree nuts (almonds, cashew, pine nut), milk egg and shrimp.
- Serve as an active member of Strategic Planning Working Groups to identify and characterize research needs in terms of the desired regulatory and public health outcome.
- Member of CFSAN New Dietary Ingredients Review Team Notifications-Microbiology Review

RESEARCH MOLECULAR BIOLOGIST

Animal Biosciences & Biotechnology Lab, ARS-USDA, Beltsville, MD November, 2006- August, 2009

- As junior scientist use biotechnology, analytical and computational tools, to improve the genetic, reproductive and feed efficiency of poultry by the application of functional genomics and proteomics.

POSTDOCTORAL-NUTRITION AND METABOLISM/MUCOSAL IMMUNOLOGY

Harvard University Medical School, MGH, Boston, MA July 2005 – Nov 10 2006

- Established *In vitro* model (CMT93) to examine the cellular and molecular events of enteric pathogens and how probiotic and/or prebiotics alter these responses.
- Established *In vivo* mouse model to examine the immunological health benefits of early probiotic supplementation and host protection to enteric pathogens.

SELECTED HONORS AND AWARDS

1. Award in the Non-Supervisory category-Raleigh Location Council for Employee Engagement, Diversity, Inclusion, and Outreach (CEEDIO) Committee group recipient of the Southeast Area (SEA) Outreach, Diversity, and Equal Opportunity (ODEO), 2021.
2. ARS Superior Employee Performance Rating, FBNS, Raleigh, NC, 2020.
3. Keynote Speaker, 2018 Food Technology Conference EuroScicon Rome, Italy. May 2018
4. ARS Outstanding Employee Performance Rating, MQHRU, Raleigh, NC, 2019.
5. ARS Outstanding Employee Performance Rating, MQHRU, Raleigh, NC, 2018.
6. FDA-CFSAN Peer Review Merit Promotion GS13 to GS14 2014
7. FDA OARSA Egg Safety Research Award 2011

COURSES TAUGHT

None

GRANTS FUNDED

- Awarded US Soybean Board 2021 Grant-Poultry and Aquaculture Soybean Feeding Trials
- ARS 4th, 6th, 10th, 12th Round Innovation Award Recipient 2017-2020
- NC Peanut Grower's Association Funding Award 2017-2020

CONFERENCE PRESENTATIONS

1. Meeting Abstract, Toomer O.T., Hulse-Kemp, A.M., Dean L.L., Boykin, D.L., Malheiros, R., Anderson, K.E., 2018. 2018 Poultry Science Association Meeting July 2018, "Feeding high-oleic peanuts to layer hens enhances egg yolk color in shell eggs"
2. Meeting Abstract, 2018 American Peanut Research and Education Society Meeting July 2018, Toomer O.T., Sanders, E., Hulse-Kemp, A.M., Malheiros, R., Anderson, K.E., 2018 "Feeding high-oleic peanuts to layer hens enhances egg yolk color and oleic fatty acid content in shell eggs"
3. Meeting Abstract, 2018, Food Technology Meeting, May 2018, Toomer O.T., Pereira M., and Williams K., "Optimizing the Nutrition of Food and Feedstuff with High-Oleic Peanuts and Peanut-By Products"
4. Do, A., Williams, K., **Toomer, O.T.** 2015. "Digestibility and Immunoreactivity of Total Bovine Whole Milk Proteins using an In Vitro Digestibility Model with Pepsin and Pancreatin"-Poster Presentation. - Fifth Annual FDA Foods and Veterinary Medicine Science and Research Conference White Oak Campus, MD. August 13 – 14, 2015
5. **Toomer, O.T. 2014.** "Maternal and Postnatal Dietary Probiotic Supplementation Enhances Splenic Regulatory T helper Cell Population and Reduces Ovalbumin Allergen-Induced Hypersensitivity Responses in Mice"-Oral Presentation. FDA-CFSAN Food Allergen Symposium, Wiley Auditorium, College Park, MD. April 1, 2014
6. **Toomer, O.T. 2014.** "Maternal and Postnatal Dietary Probiotic Supplementation Enhances Splenic Regulatory T Helper Cell Population and Reduces Ovalbumin Allergen-Induced Hypersensitivity Responses in Mice"-Poster Presentation-American Association for Immunologist (AAI) annual meeting, Pittsburgh, PA. May 2-6, 2014
7. **Toomer, O.T. 2013.** Abstract#1639938, "The Effect of Simulated Gastric and Intestinal Digestion on Temporal Stability and Immunoreactivity of Peanut, Almond and Pine Nut Protein Allergens" Poster and Oral Presentation, American Association of Immunologists Meeting, Honolulu Hawaii, May 3-7, 2013.
8. Do, A., and **Toomer, O.T. 2013.** "Pre-treatment with Probiotic, Lactobacillus Acidophilus attenuates NF-Kappa B activation and IP-10 Secretion in Mouse Intestinal Epithelial Cells" Poster Presentation, University of Maryland Bioscience Day, College Park, MD

SELECT PUBLICATIONS

1. Redhead, A.K., Sanders, E., Vu, T.C., Malheiros, R.D., Anderson, K.E. and **Toomer, O.T.** The effects of high-oleic peanuts as an alternate feed ingredient on performance, ileal digestibility, apparent metabolizable energy, and histology of the small intestine in laying hens. *Transl. Anim. Sci.* **2021**; 5(1):txab015. doi: 10.1093/tas/txab015.
2. **Toomer, O.T.** A comprehensive review of the value-added uses of peanut (*Arachis hypogaea*) skins and by-products. *Crit. Rev. Food Sci. Nutr.* **2020**; 30:1-10. doi: 10.1080/10408398.2018.1538101.
3. **Toomer, O.T.**, Sanders, E., Vu, T.C., Malheiros, R.D., Redhead, A.K., Livingston, M.L., Livingston, K.A., Carvalho, L.V. and Ferket, P.R. The effects of high-oleic peanuts as an alternative feed ingredient on broiler performance, ileal digestibility, apparent metabolizable energy, and histology of the intestine. *Transl. Anim. Sci.* **2020**; 4(3):txaa137. doi: 10.1093/tas/txaa137.
4. **Toomer, O.T.**, Livingston, M., Wall, B., Sanders, E., Vu, T., Malheiros, R.D., Livingston, K.A., Carvalho, L.V., Ferket, P.R. and Dean, L.L. Feeding high-oleic peanuts to meat-type broiler chickens enhances the fatty acid profile of the meat produce. *Poult. Sci.* **2020**; 99(4):2236-2245. doi: 10.1016/j.psj.2019.11.015.
5. **Toomer, O.T.**, Sanders, E., Vu, T.C., Livingston, M.L., Wall, B., Malheiros, R.D., Carvalho, L.V., Livingston, K.A., Ferket, P.R. and Anderson, K.E. Potential transfer of peanut and/or soy proteins from poultry feed to the meat and/or eggs produced. *ACS Omega.* **2020**; 5(2):1080-1085. doi: 10.1021/acsomega.9b03218.
6. Warren, M.F., Vu, T.C., **Toomer, O.T.**, Fernandez, J.D. and Livingston, K.A. Efficacy of 1- α -hydroxycholecalciferol supplementation in young broiler feed suggests reducing calcium levels at grower phase. *Front. Vet. Sci.* **2020**; 7:245. doi: 10.3389/fvets.2020.00245.
7. Ferket, P.R., Malheiros, R.D., Moraes, V.M.B., Ayoola, A.A., Barasch, I., **Toomer, O.T.** and Torrent, J. Effects of functional oils on the growth, carcass and meat characteristics, and intestinal morphology of commercial toms. *Poult. Sci.* **2020**; 99(7):3752-3760. doi: 10.1016/j.psj.2020.03.050.
8. Christman, L.M., Dean, L.L., Allen, J.C., Godinez, S.F. and **Toomer, O.T.** Peanut skin phenolic extract attenuates hyperglycemic responses in vivo and in vitro. *PLoS One.* **2019**; 14(3):e0214591. doi: 10.1371/journal.pone.0214591.
9. **Toomer, O.T.**, Livingston, M., Wall, B., Sanders, E., Sipple, L., Vu, T., Malheiros, R.D., Livingston, K.A., Carvalho, L.V., Ferket, P.R. and Drake MA. Meat quality and sensory attributes of meat produced from broiler chickens fed a high oleic peanut diet. *Poult. Sci.* **2019**; 98(10):5188-5197. doi: 10.3382/ps/pez258.
10. **Toomer, O.T.**, Vu, T., Pereira, M. and Williams, K. Dietary supplementation with peanut skin polyphenolic extracts (PSPE) reduces hepatic lipid and glycogen stores in mice fed an atherogenic diet. *J. Funct. Foods.* **2019**; 55:362-370.
11. **Toomer, O.T.**, Hulse-Kemp, A.M., Dean, L.L., Boykin, D.L., Malheiros, R. and Anderson, K.E. Feeding high-oleic peanuts to layer hens enhances egg yolk color and oleic fatty acid content in shell eggs. *Poult. Sci.* **2019**; 98(4):1732-1748.

12. **Toomer O.T.**, Hulse-Kemp, A.M., Dean L.L., Boykin, D.L., Malheiros, R., Anderson, K.E., **2018**. Feeding High-Oleic Peanuts to Layer Hens Temporally Enhances Egg Yolk Color and Oleic Fatty Acid Content in Shell Eggs. *Poultry Science*. (Under-Review, Submitted April 23, 2018).
13. **Toomer, O.T.** Nutritional chemistry of the peanut (*Arachis hypogaea*). *Crit. Rev. Food Sci. Nutr.* 2018; 58(17):3042-3053. doi: 10.1080/10408398.2017.1339015.
14. **Toomer O.T., 2016**. Nutrition Education and Promotion in the USA. *Journal of Food, Nutrition and Population Health*. Editorial. 1(1):4-5.
15. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2016**. Gender and Dose Dependent Ovalbumin Induced Hypersensitivity Responses in Murine Model of Food Allergy. *Journal of Food, Nutrition and Population Health*. 1:1-6.
16. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2015**. Digestibility and Immunoreactivity of Total Shrimp Proteins using an *In Vitro* Digestibility Model with Pepsin and Pancreatin. *Journal of Food Science*. 80(7):T1633-1639.
17. Do A., Williams K., and **Toomer O.T., 2015**. Digestibility and Immunoreactivity of Total Bovine Whole Milk Proteins using an *In Vitro* Digestibility Model with Pepsin and Pancreatin. *Food Chemistry*. 190 (2016) 581–587.
18. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2014**. Early administration of probiotic, *Lactobacillus acidophilus* attenuates Allergen Sensitization in Mice Treated with Ovalbumin. *Immunobiology*. 219 (5):367-376.
19. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2014**. Early administration of probiotic, *Lactobacillus acidophilus* attenuates Allergen Sensitization in Mice Treated with Peanut. *Immunobiology*. 219(9):661-670.
20. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2013**. The Effect of Simulated Gastric and Intestinal Digestion on Temporal Stability and Immunoreactivity of Peanut, Almond and Pine Nut Protein Allergens. *Journal of Agricultural and Food Chemistry*; 61(24):5903–5913
21. **Foye O.T.**, I-Fei. Huang, W.A. Walker, H.N. Shi., **2012**. Early Administration of Probiotics and/or Prebiotics Attenuates Pathogen-mediated Intestinal Inflammation and Smad 7 Cell Signaling. *FEMS Immunol Med Microbiol*. 65(3):467-480
22. Kwegyir-Afful E.K., **Foye O.T.**, Williams K., Luccioli S. **2012**. “A Bioassay for Assessing Dose-Response Relationships in a Food Allergic Mouse Model. *Abstract Journal of Allergy and Clinical Immunology*. 129(2):AB175
23. **Foye-Jackson, O.T.**, J.L. Long, L.A. Blomberg, M. Bakst, K. Becker, B. Wood, J.P. McMurtry, **2011**. Oviductal expression of avidin, avidin-related protein-2, and progesterone receptor in turkey hens in relation to sperm storage: Effects of oviduct tissue type, sperm presence, and turkey line. *Poultry Science*. 90:1539–1547.
24. **Foye, O.T.**, P.R. Ferket, and Z. Uni, **2009**. The Effects of Intra-Amnionic Feeding of Arginine and/or β -Hydroxy- β -Methylbutyrate on Jejunal Gene Expression in the Turkey Embryo and Hatchling. *International Journal of Poultry Science* 8(5): 437-445.

INVITED MANUSCRIPTS

25. **Toomer O.T.**, Do A., Pereira M., and Williams K., **2014**. Chapter “Digestibility, Immunoreactivity and Sensitization of Peanut Proteins Using *In Vivo* and *In Vitro* Experimental Models”, Peanuts: Production, Nutritional Content and Health Implications. Nova Science Publishers. Editor Richard W. Cook. pgs. 1-29.
26. **Foye, O.T.**, P.R. Ferket, and Z. Uni. **2007**. Ontogeny of Energy and Carbohydrate Utilization of the Precocial Avian Embryo and Hatchling. Avian and Poultry Biology Reviews. 18(3): 93-101.

PRIMARY ADVISOR-GRADUATE STUDENTS

1. Master of Science Nutrition-Thien Chung Vu
2. Master of Science Poultry Science-Gustavo Adolfo Quintana Ospina
3. Master of Science Poultry Science-Kari Lynn Harding

WORKSHOPS/SHORT-COURSE/TRAININGS CONDUCTED

None