BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Karrune Woan

eRA COMMONS USER NAME (credential, e.g., agency login): WVWOAN

POSITION TITLE: Assistant Professor of Clinical Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of Miami	B.S.	08/2002	06/2006	Biochem, Immunology
University of Florida Moffitt Cancer Center	M.D., Ph.D.	07/2006	05/2014	Tumor Immunology
University of Minnesota		06/2014	06/2016	Resident, Internal Med
University of Minnesota		07/2016	03/2021	Fellow, Hem/Onc/BMT

A. Personal Statement

My long term professional goal is to work as a physician-scientist to improve patient outcomes through basic and translational research. My prior and ongoing experience has been focused on elucidating basic, mechanistic insights into immune dysregulation in cancer in order to identify therapeutic targets to augment antitumor immunity. Through my training, I have developed a strong foundation in molecular biology, cancer biology, immunology, and genetics. My predoctoral research with Dr. Sung Lan Hsia focused on normalizing cellular bioenergetics to re-sensitize transformed cells to apoptotic signals. As a doctoral candidate under the mentorship of Dr. Eduardo Sotomayor, I found that histone deacetylases (HDACs) 6 and 11 regulate T cell activation and immune tolerance. I matriculated into the Physician Scientist Training Pathway which consists of general internal medicine residency, subspecialty fellowship training in hematology, oncology, and transplantation, and protected research time. My postdoctoral research with Dr. Jeffrey Miller has focused on augmenting natural killer (NK) cell activity against cancer. More specifically, I have been investigating CD38 as a potential novel checkpoint in NK cell activation, incorporating induced pluripotent stem cells. I have recently started my first faculty position as an Assistant Professor where Dr. Preet Chaudhary will be my primary mentor. He is a successful physician-scientist whose research has focused on virally induced lymphoma and chimeric antigen receptor T cells. He has mentored countless individuals, many continuing onto successful careers in academic medicine. Therefore, he has the expertise, resources, and track record to support my research proposal and career development. Throughout my research experiences, I have been fortunate to present my work in oral and poster form at international scientific meetings, been first author on 3 and co-author on 7 primary research manuscripts, 4 review articles, and co-inventor on 3 patents. I am seeking funding to hire a research technician to enable me to run a successful lab, publishing manuscripts and securing independent research funding so that I am competitive for a tenure track lab-based position as a physician-scientist in malignant hematology.

B. Positions and Honors

Positions and Employment

2014-2016 Resident in Internal Medicine, University of Minnesota
2014-2021 Trainee in the Physician Scientist Training Pathway, University of Minnesota
2021-Present Assistant Professor of Clinical Medicine, Division of Hematology, University of Southern California

Other Experience and Professional Memberships

2016-Present Member, American Society of Hematology
2016-Present Member, American Society of Clinical Oncology

Honors and Awards

2006 Exemplary Performance in Essentials of Patient Care, University of Florida College of Medicine
2008 Distinguished Service Award, University of Florida College of Medicine
2010 Outstanding Abstract Achievement Award, American Society of Hematology
2011 Travel Award, Central Society for Clinical Research
2011 Abstract Achievement Award, American Society of Hematology
2011 Outstanding Oral Presentation Award, Moffitt Scientific Symposium
2017-2020 T32 Fellowship
2019 ASH/EHA Translational Research Training in Hematology Fellowship

C. Contributions to Science

1. **Early Career:** My contributions as an undergraduate student involved elucidating the anti-neoplastic effects of Coenzyme Q10. Our hypothesis was that mitochondrial dysregulation contributes to resistance to apoptosis, and normalization of bioenergetics using Coenzyme Q10 could re-sensitize transformed cells to intrinsic regulatory mechanisms. An IV formulation is currently undergoing testing in clinical trials.

    a. Narain NR, Persaud I, Russell KJ, Woan KV, Malik LH, Ricotti CA, Nassiri M, Barrientos A, Hsia SL. Coenzyme Q10: a novel bcl-2 drug target for the treatment of melanoma. American Association of Cancer Research. April 2006, Washington, DC.
    b. Persaud I, Narain NR, Woan K, Russell KJ, Malik LH, Ricotti CA, Li J, Elgart G, Hsia SL. Attenuation of tumor angiogenesis in murine melanoma model using liposomal formulation of Coenzyme Q10. American Association of Cancer Research. April 2006, Washington, DC.
    c. Woan KV, Narain NR, Persaud I, Ricotti CA, Panchal RJ, Russell KJ, Malik LH, Li J, Hsia SL. Coenzyme Q10 enhances the proliferation and migration of fibroblasts and keratinocytes: a possible implication for wound healing. Society for Investigative Dermatology. May 2005, St. Louis, MO.

2. **Graduate Career:** My graduate research project in immune tolerance established histone deacetylase (HDACs) 6 and 11 as regulators of CD4 T cell reactivity in part through regulation of Tbet. Furthermore, HDACs 6 and 11 regulates tumor cell cytokine production and expression of MHC and costimulatory molecules. HDACs 6 and 11 exert opposing actions and therefore altering the balance could enable better fine tuning of immune responses.

    a. Woods DM*, Woan KV* [co-first authors], Cheng F, Sodré AL, Wang D, Wu Y, Wang Z, Chen J, Powers J, Pinilla-Ibarz J, Yu Y, Zhang Y, Wu X, Zheng X, Weber J, Hancock WW, Seto E, Villagra A, Yu XZ, Sotomayor EM. T cells lacking HDAC11 have increased effector functions and mediate enhanced alloreactivity in a murine model. Blood. 2017 Jul 13;130(2):146-155.
    b. Woan KV, Lienlaf M, Perez-Villaroel P, Lee C, Cheng F, Knox T, Woods DM, Barrios K, Powers J, Sahakian E, Wang HW, Canales J, Marante D, Smalley KS, Bergman J, Seto E, Kozikowski A, Pinilla-Ibarz J, Sarnaik A, Celis E, Weber J, Sotomayor EM, Villagra A. Targeting histone deacetylase 6 mediates a dual anti-melanoma effect: Enhanced antitumor immunity and impaired cell proliferation. Mol Oncol. 2015 Aug;9(7):1447-57.
    c. Woods DM*, Woan KV* [co-first authors], Cheng F, Wang H, Perez P, Lee C, Lienlaf M, Atadja P, Seto. E., Weber J, Sotomayor EM, Villagra A. The antimelanoma activity of the histone deacetylase inhibitor panobinostat (LBH589) is mediated by direct tumor cytotoxicity and increased tumor immunogenicity. Melanoma Research. 2013 October; 23(5): 341-348.
    d. Bergman JA, Woan K, Perez-Villarroel P, Villagra A, Sotomayor EM, Kozikowski AP. Selective histone deacetylase 6 inhibitors bearing substituted urea linkers inhibit melanoma cell growth. Journal of Medicinal Chemistry. 2012 Nov; 55(22): 9891-9.

3. **Postdoctoral Career:** As a physician-scientist in training, I have focused on identifying novel mechanisms of NK cell reactivity. Our lab has previously found a subset of NK cells in CMV seropositive individuals that have memory-like properties being primed to reactivate in response to viral reactivation, termed adaptive NK cells. We hypothesize that these cells also have augmented anti-tumor activity. I have identified CD38 as a potential negative regulator of NK cell function that may have implications in regulating adaptive NK cells. I have also worked on induced pluripotent stem cell derived NK cells as a platform to study NK cell biology and to translate to a cellular product for the treatment of multiple myeloma in combination with daratumumab.

    a. Cichocki F, Woan K, Wu CY, Blazar BR, Bjordahl R, Valamehr B, Miller JS. NK Cells Lacking CD38 Are Resistant to Oxidative Stress-Induced Death. American Society of Hematology. December 2019, Orlando, FL.
    b. Woan KV, Miller JS. Harnessing Natural Killer Cell Antitumor Immunity: From the Bench to Bedside. Cancer Immunology Research. 2019 Nov;7(11):1742-1747
    c. Woan K, Bjordahl B, Cichocki F, Gaidarova S, Pride C, Kaufman DS, Malmberg KJ, Cooley S, Valamehr B, Miller JS. CD38-Deficient, CD16-Engineered NK Cells Exhibit Enhanced Antibody-Dependent Cellular Cytotoxicity without NK Cell Fratricide to Augment Anti-Myeloma Immunity in Combination with Daratumumab. American Society of Hematology. December 2018, San Diego, CA.

Complete List of Published Work in Listed in PubMed:
https://www.ncbi.nlm.nih.gov/pubmed/?term=woan+k

D. Additional Information: Research Support and/or Scholastic Performance

Research Support

5T32HL007062 (Vercellotti) 07/01/2017 – 06/30/2020
NHLBI
Hematology Research Training Program
The objective of this program is to train the next generation of research leaders in hematology. The fellowship provides funding for protected research time, an educational program on various aspects of having a successful, independent career, and mentorship.
Role: Trainee
Funding provided: approximately 85% of salary

Scholastic Performance

YEAR	COURSE TITLE	GRADE
	University of Minnesota	
2018	Biostatistics I	A