BIOGRAPHICAL SKETCH

NAME: Fayth Miles

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

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Oakwood University, Huntsville, AL	B.S.	09/2002	Biology
Johns Hopkins University, Baltimore, MD	M.S.	08/2004	Biotechnology
University of Delaware, Newark, DE	Ph.D.	08/2011	Biological Sciences
University of California, Los Angeles, CA	M.S.	03/2014	Epidemiology
University of California, Los Angeles, CA	PD Fellow	08/2015	Cancer Epidemiology
University of Washington/Fred Hutchinson Cancer Research Center, Seattle, WA	PD Fellow	07/2016	Biobehavioral Cancer Prevention
Fred Hutchinson Cancer Research Center, Seattle, WA	PD Fellow	7/01/2017	Cancer Prevention

A. Personal Statement

My training and education have placed me at the interface of molecular biology and epidemiology. My dissertation research involved characterizing TGF-beta expression and signaling during the progression of prostate cancer and involvement in tumor-stromal interactions associated with neuroendocrine differentiation. Subsequently as a postdoctoral fellow, I gained expertise in nutritional and molecular epidemiology of cancer. While part of the Molecular and Genetic Epidemiology of Cancer training program (T32 CA09142; ZF Zhang, PI), I conducted research examining the role of dietary exposures and single nucleotide polymorphisms on risk and/or survival of several cancers including prostate, head and neck, and lung cancers. During this time I was nominated for the UCLA Chancellor's Award for Postdoctoral Research. Subsequently, I conducted research in the Cancer Prevention Program at the Fred Hutchinson Cancer Research Center as a postdoctoral fellow in the Biobehavioral Cancer Prevention and Control Training program (R25 CA092408; DL Patrick, PI). Working with Dr. Marian Neuhouser, I explored the interaction of members of the insulin like growth factor (IGF) axis with vitamin D serum levels in an attempt to clarify the role of vitamin D in prostate cancer. I was subsequently awarded a supplement to an NIH-funded project (R01 CA192222; JW Lampe, PI), involving investigators in biochemistry, human biology, microbiology, experimental nutrition, and biostatistics. Supported through this mechanism, I conducted research to identify disease-relevant plasma metabolites and proteins associated with urinary excretion of enterolactone, a bioactive microbial metabolite of dietary lignans using samples from healthy participants enrolled in a crossover feeding study. Currently, as an investigator in the Loma Linda University School of Public Health with a secondary appointment in the School of Medicine, I am conducting research in the area of molecular epidemiology, examining the interplay of lifestyle factors with alterations in biomarkers in the Adventist Health Study-2 cohort. I am examining associations of dietary patterns with metabolic and DNA methylation profiles, and relevant metabolite-methylation correlations using omics data. The goal is to uncover novel mechanisms for diet-disease relationships – that is, to identify biomarkers and associated biological pathways linked to diet that are predictors of cancer and other chronic diseases. I am particularly interested in understanding the role of race in these diet-biomarker associations in order to reduce health disparities and design effective interventions for disease prevention. I am enthusiastic about multidisciplinary, team-based, and translational research, which is critical for clinical advances that will improve human health.

B. Positions and Honors

Positions and Employment

09/2011 – 06/2012	Fellow, Department of Biological Sciences, University of Delaware, Newark, DE
09/2012 – 08/2015	Fellow, Department of Epidemiology, University of California, Los Angeles, CA
09/2015 – 06/2017	Fellow, Cancer Prevention Program, University of Washington and Fred Hutch, Seattle, WA
08/2017 –	Assistant Professor, School of Public Health and School of Medicine, Preventive Medicine, Loma Linda, CA

Professional Experience and Memberships

2005 –	Member, American Association for Cancer Research
2006 –	Member, Society of Basic Urologic Research
2008 – 2011	Member, Cancer Working Group, Center for Translational Cancer Research, University of Delaware
2014	Community Academic Council Planning Committee, Prevention, Treatment, and Control of Cancer in Our Community IV conference**,** Charles Drew University of Medicine and Science, University of California at Los Angeles School of Medicine, and Healthy African American Families, Los Angeles, CA
2016 –	Member, American Society of Nutrition
2017	Mentor, Health Disparities Research Grant Writing Workshop, Fred Hutch
2017	Member, Geographic Management of Cancer Health Disparities Program (GMaP), NCI
2017	Board Member, African Americans Reach and Teach Health, Seattle, WA
2019	American Institute for Cancer Research (AICR) Grant Review, panel member, Arlington, VA

Honors and Awards

1998	Bausch & Lomb Honorary Science Award
1999 – 2002	Phi Eta Sigma and Alpha Chi National Honor Societies, Oakwood University
2001	Active Chemical Education Research (ACER) Scholarship, Oakwood University, Huntsville, AL
2004 – 2006	Interdisciplinary Graduate Education and Research Training (IGERT) Fellowship, University of Delaware
2006	Minority Scholar Award in Cancer Research, AACR Annual Meeting
2006 – 2007	Delaware GK-12 Teaching Program Fellowship/Recognition Award for Outstanding Service
2009	Dissertation Fellowship, University of Delaware
2012 – 2015	Molecular and Genetic Epidemiology of Cancer Training Program Fellowship (T3209142)
2013	Award of Fellowship Support, Graduate Division, University of California, Los Angeles
2014 & 2015	Chancellor's Award for Postdoctoral Research, Certificate of Nomination, University of California, Los Angeles
2015 – 2016	Biobehavioral Cancer Prevention and Control Training Program Fellowship (R25 CA0924082016)
2016	John Milner Nutrition and Cancer Prevention Research Practicum, NCI, Selected Participant
2016	Summer Institute in Statistics for Big Data, Certificate of Completion, University of Washington
2016	Research Supplement to Promote Diversity in Health-Related Research (Fellow) (R01 CA192222-01A1S1)
2017	Integrative Molecular Epidemiology Workshop: Bridging Cancer Biology and Precision Medicine, AACR, Selected Participant

C. Contributions to Science

I. Diet and Cancer Epidemiology

Dietary added sugar and red or processed meats are pro-inflammatory foods which may be associated with chronic diseases, although little is known about the association of such foods with

cancer risk or survival. Analysis of prostate cancer incidence in a large, prospective study (Prostate, Lung, Colorectal, and Ovarian Cancer) revealed that higher consumption of added sugars from sugar-sweetened beverages was associated with increased prostate cancer risk for men receiving usual medical care. Analysis of cancer survival data from a population-based case-control study conducted in Los Angeles revealed that dietary added sugar, along with red and processed meat was associated with poorer prognosis among patients with head and neck cancer.

a. Miles, F.L., Neuhouser, M.L., and Zhang, Z.F. Concentrated sugars and incidence of prostate cancer in a prospective cohort. *Br J Nutr*., 2018. 120(6):703-710. PMCID: PMC6123266
b. Miles, F.L., Chang, S., Morgenstern, H., Tashkin, D., Rao, J., Cozen, W., Lu, Q., and Zhang, Z.F. Associations of red and processed meat with survival among patients with cancers of the upper aerodigestive tract and lung. *Nutr Res*, 2016. 36(6):620-26. PMCID: PMC4872708
c. Miles, F.L., Chang, S., Morgenstern, H., Tashkin, D., Rao, J., Cozen, W., Lu, Q., and Zhang, Z.F. Associations of sugary beverages with survival among patients with cancers of the upper aerodigestive tract. *CCC,* 2016; 27(11): 1293 – 1300.
d. Miles, F.L., Rao, JY., Eckhert, C.J, Chen, SC, et al. Associations of inflammation-related single nucleotide polymorphisms with prostate cancer survival. Int J Clin Exp Med. 2015. 8(7): 11470–11476. PMCID: 4565348

II. Biomarkers in Cancer Prevention

There is a great need to identify early markers of cancer risk. The role of Vitamin D in prostate cancer risk is unclear, as it has been associated both positively and inversely with prostate cancer incidence. In an attempt to help understand the role of vitamin D in prostate cancer, I examined the interactions between serum Vitamin D and members of the insulin like growth factor (IGF) axis in prostate cancer risk. I discovered that vitamin D was associated with increased cancer risk in the presence of elevated IGF-2. I also examined the associations of single nucleotide polymorphisms with prostate cancer survival, and identified two immunity-related polymorphisms associated with more favorable survival. A separate project was based on a controlled feeding trial in healthy humans, with the goal of identifying metabolites that may be regulated by enterolactone, a metabolite of dietary lignans which has been implicated in prevention of several cancers. I found that excretion of enterolactone was associated significantly with the abundance of hippuric acid (a polyphenol) and also associated with metabolites involved in nucleic, amino, and bile acid synthesis. Most recently I examined biomarkers of dietary intake in plasma, urine, and adipose samples comparing vegetarians with non-vegetarians in the AHS-2 cohort. Several biomarkers that were differential between diet groups may have roles in cancer.

a. Miles, F.L., Lloren, J. C., Haddad, E., Jaceldo-Siegl, K, Knutsen, S., Sabate, J., and Fraser, G. E. Differences in Plasma, Urine, and Adipose Biomarkers of Dietary Intake Between Vegetarian and Non-vegetarian Diet Patterns in the Adventist Health Study-2. J. Nutr. 2019; 149 (4):667-675. PMCID: PMC6461718
b. Miles, F.L., Sandi L. Navarro, Yvonne Schwarz, Haiwei Gu H, Danijel Djukovic, Timothy W. Randolph, Ali Shojaie, Mario Kratz, Meredith A.J. Hullar, Paul D. Lampe, Marian L. Neuhouser, Daniel Raftery, Johanna W. Lampe. Plasma metabolite abundances are associated with urinary enterolactone excretion in healthy participants on controlled diets. *Food Funct*., 2017. 8(9)3209-3218. PMCID: PMC5607107
c. Miles, F.L, Goodman, P.J., Tangen, C. Torkko, K.C., Schenk, J.M., Song, X., Pollak, M., Thompson I.M., and Neuhouser, M.L. Interactions of the Insulin-like Growth Factor Axis and Vitamin D in Prostate Cancer Risk in the Prostate Cancer Prevention Trial. *Nutrients*. 2017. (9):378–90. PMCID: PMC5409717.
d. Miles, F.L., Rao, J.Y., Eckhert, C., Chang, S.C., Pantuck, A., Zhang, Z.F. Associations of immunity-related single nucleotide polymorphisms with overall survival among prostate cancer patients. *Int J Clin Exp Med*. 2015. 8(7):11470-6. PMCID: PMC4565348

III. Biotechniques Involving Fluorescent Probes in Cell and Molecular Biology

Fluorescein derivatives are used frequently in molecular biology for assays of growth, motility, and drug delivery, among others. Calcein acetoxymethyl ester (AM) is one such commonly used fluorochrome. While procedures have been outlined to account for Calcein leakage, previous assays have failed to account for possible treatment-induced changes in intracellular fluorescence after fluorochrome loading. In my research we discovered the existence of artifact in intracellular fluorescence measurements after labeling with Calcein AM as a consequence of treatment with soluble peptides, chemical/synthetic compounds, and changes in cell morphology, all found to alter fluorescence. Such findings provide valuable insight on the use of adequate controls in cell-based and biochemical assays involving fluorochromes.

a. Miles F.L., Lynch J.E., and Sikes RA. Cell-based assays using calcein acetoxymethyl ester show wide variation with treatment and substratum. J Biol Methods. 2015. 2(3): e29. PMCID: PMC4770449.

IV. Cytokine Signaling and Tumor-Stromal Interactions in Cancer

A pleiotropic cytokine commonly associated with cancer progression, TGF-β1 was previously believed to promote growth and aggressive behavior of prostate cancer cells. Working with Dr. Robert Sikes, I helped to advance the knowledge base regarding the role of TGF-β1 in prostate cancer, challenging this paradigm. I found that direct stimulation of prostate cancer cells by TGF-β1 is cytostatic and anti-metastatic; however, TGF-β1 stimulation of bone marrow stromal cells (BMSCs) alters paracrine signaling to create a permissive environment for prostate cancer survival. It is well known that during metastasis and colonization, prostate cancer cells undergo critical interactions with bone marrow stroma. Our laboratory discovered that prostate cancer cells undergo neuroendocrine differentiation or apoptosis as a response to stress induced upon co-culture with BMSC. I discovered that SMAD2/3 is induced and activated during BMSC-induced apoptosis of prostate cancer cells in a mechanism involving signaling by the TGF-β superfamily, though not TGF-β1. Thus, my research shed light on mechanisms associated with BMSC-induced toxicity during prostate cancer:BMSC interactions.

This research provided the foundation for the production of a comprehensive review on changes in the extracellular matrix of cancer-associated fibroblasts and the impact of these changes on cancer progression. This review provided a summary of evidence regarding tumor-promoting, paracrine effects of factors secreted by cancer associated stroma. It was selected to appear in a must-read 2014 compilation of AACR Journals Editor's Picks.

a. Miles, F.L., Tung N.S, Aguiar A.A, Kurtoglu S., and Sikes R.A. Increased TGF-beta1-mediated suppression of growth and motility in castrate-resistant prostate cancer cells is consistent with Smad2/3 signaling. Prostate. 2012. **72**(12): p. 1339-50.
b. Miles F.L, Kurtoglu, S., Ahmer, C., Favate, J.S. and Sikes R.A. TGF-β signaling induced during prostate cancer cell death and neuroendocrine differentiation is mediated by bone marrow stromal cells. Prostate, 2015. 75(15):1802-13.
c. Chung S.-W, Miles F.L., Sikes R.A., Cooper C.R., Farach-Carson M.C., Ogunnaike B.A. Quantitative modeling and analysis of the transforming growth factor beta signaling pathway. Biophys. J., 2009; 96(5):1733-1750. PMCID: PMC2717289
d. Miles F.L., and Sikes, R.A. Insidious Changes in Stromal Matrix Fuel Cancer Progression. Mol Cancer Res., 2014. 12(3); 297–312. PMCID: PMC4066664

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/fayth.miles.1/bibliography/46216388/public/?sort=date&direction=ascending.

D. Research Support

Current Research Support

GRASP-Int'l 2170258 Miles and Pacheco (PIs)
Current
Loma Linda University
Grants for Research and School Partnerships (GRASP)-International Award
The aims of this study are to investigate the associations of Neu5Gc and anti-Neu5Gc auto-antibodies with consumption of red meat and dairy, and pro-inflammatory biomarkers in healthy vegetarian and nonvegetarian participants of the Adventist Health Study-2 cohort, as well as colorectal cancer tissues from individuals with varying dietary patterns. This research seeks to elucidate biological mechanisms linking meat consumption with cancer, and highlight the potential clinical significance of Neu5Gc in diseases associated with chronic inflammation.

Previous Research Support

R01 CA192222-01A1S1 Lampe (PI) 08/1/2016 – 07/31/2017
NIH/NCI
Research Supplement to Promote Diversity in Health-Related Research
The goal of this research supplement to promote diversity in health-related research is to evaluate effects of dietary exposures on biomarkers of cancer-risk pathways. Responsibilities will include research in metabolomics and proteomics - examination of the effect of urinary enterolignan excretion on plasma proteins and metabolites associated with cancer-signaling pathways and gut microbial community profiles, in addition to training through coursework, seminars, presentation of research findings, and gaining experience in the design of randomized, controlled trials.

R25 CA092408 Patrick (PI) 09/01/2015 – 07/31/2016
NIH/NCI
Biobehavioral Cancer Prevention and Control Training Program
This fellowship program provided training in nutrition, genetics, chemoprevention, and social and behavioral science through seminars/meetings, coursework, and mentored support.
My responsibilities included research in the area of Vitamin D-IGF interactions and cancer risk, and examining associations of urinary enterolignans with metabolite abundances and consumption of polyphenols, while working with nutrient databases.

T32 CA09142 Zhang (PI) 10/01/2012 – 08/31/2015
NIH/NCI
The Molecular and Genetic Epidemiology of Cancer Training Program
This interdisciplinary fellowship program provided training in nutrition, biomarkers/genetic predisposition, and methodological approaches in cancer epidemiology through coursework and mentored research. My responsibilities included the application of statistical methods to analyze associations of genetic polymorphisms and dietary exposures with cancer susceptibility and survival.