

**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: MUSCAT, JOSHUA E

eRA COMMONS USER NAME (agency login): JMUSCAT

POSITION TITLE: Professor

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

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Vassar College, Poughkeepsie, NY	AB	06/1982	Biopsychology
Yale University	MPH	01/1986	Epidemiology
New York University	PHD	01/2001	Environ. Health Sci.

**A. Personal Statement**

My research interests include behavioral, environmental and molecular approaches to understanding and preventing cancer both at Penn State and in collaboration with several international consortiums including the International Head and Neck Cancer Epidemiology Consortium, the International Lung Cancer Consortium, PANC3, and Stomach Cancer Pooling Project. I have had an active interest in cancer disparities, especially in determining racial and socioeconomic differences in risk, with an emphasis on tobacco-related cancers. In collaboration with lab-based science, I have been involved in the application of exposure biomarkers to address question on individual susceptibility and risk reduction.

**B. Positions and Honors****Positions and Employment**

1982 – 1983 Management Analyst, D.C. Department of Transportation, Washington, DC  
 1985 – 1987 Project Director, Ohio Department of Health, Columbus, OH  
 1987 – 1988 Research Analyst, Memorial Sloan-Kettering Cancer Center, New York, NY  
 1988 – 1997 Staff Associate in Public Health, Cornell University Medical College, New York, NY  
 1988 – 2004 Associate Research Scientist, American Health Foundation - Institute for Cancer Prevention, New York, NY  
 2000 – 2004 Senior Lecturer, New York Medical College, Valhalla, NY  
 2004 – 2007 Associate Professor, Department of Health Evaluation Sciences, Penn State College of Medicine, Hershey, PA  
 2007 – Present Professor, Department of Public Health Sciences (previously Health Evaluation Sciences), Penn State College of Medicine, Hershey, PA  
 2015-Present Co-program leader, Population Health and Cancer Control Program, Penn State Cancer Institute

**Other Experience and Professional Memberships**

Member, American Association for Cancer Research  
 Member, American Society for Preventive Oncology  
 Member, American Society for Human Genetics

**C. Contribution to Science**

1. My recent interests have been in the area of the epidemiology of nicotine dependence. Our efforts have focused on identifying physiological factors that underlie epidemiologic observations of high risk smokers. In particular, we have established a research program relating how nicotine dependence itself is an independent risk factor for tobacco-related cancers. These results are leading us to possibly establishing or recommending new criteria for effective tobacco smoke interventions and risk screening for lung cancer.

- a. Muscat JE, Stellman SD, Caraballo RS, Richie JP Jr. Time to first cigarette after waking predicts cotinine levels. *Cancer Epidemiol Biomarkers Prev.* 2009 Dec;18(12):3415-20. PubMed PMID: [19959690](#); PubMed Central PMCID: [PMC2952424](#).
  - b. Muscat JE, Ahn K, Richie JP Jr, Stellman SD. Nicotine dependence phenotype, time to first cigarette, and risk of head and neck cancer. *Cancer.* 2011 Dec 1;117(23):5377-82. PubMed PMID: [21826643](#); PubMed Central PMCID: [PMC3213279](#).
  - c. Muscat JE, Ahn K, Richie JP Jr, Stellman SD. Nicotine dependence phenotype and lung cancer risk. *Cancer.* 2011 Dec 1;117(23):5370-6. PubMed PMID: [21826644](#); PubMed Central PMCID: [PMC3213292](#).
  - d. Mercincavage M, Branstetter SA, Muscat JE, Horn KA. Time to first cigarette predicts cessation outcomes in adolescent smokers. *Nicotine Tob Res.* 2013 Dec;15(12):1996-2004. PubMed PMID: [23811009](#); PubMed Central PMCID: [PMC4318927](#).
2. I have had a long-standing interest on the health effects of tobacco smoke. It is well known that tobacco smoking is a major cause of lung and other cancers and cardiovascular disease and has been the major cause of premature mortality for many decades. What was surprising in my early research was that the relationship between tobacco and many forms of malignancies had not been well characterized. For example, large cell carcinoma of the lung is the 4th leading cause of lung cancer mortality but its relationship with tobacco exposure was never systematically investigated. Malignant mesothelioma is a less common disease caused by asbestos exposure, but here too, the relationship with smoking was never established since many asbestos-exposed workers were current or former smokers. Our studies were the first to show that tobacco is a major cause of large cell carcinoma of the lung but not a risk factor for mesothelioma. Through collaborations of international consortiums and pooling projects, we continue to understand basic relationships of smoking with disease. For example, we showed the first conclusive evidence that smoking and alcohol are independent risk factors for head and neck cancer.
- a. Muscat JE, Harris RE, Haley NJ, Wynder EL. Cigarette smoking and plasma cholesterol. *Am Heart J.* 1991 Jan;121(1 Pt 1):141-7. PubMed PMID: [1985356](#).
  - b. Muscat JE, Wynder EL. Cigarette smoking, asbestos exposure, and malignant mesothelioma. *Cancer Res.* 1991 May 1;51(9):2263-7. PubMed PMID: [2015590](#).
  - c. Muscat JE, Stellman SD, Zhang ZF, Neugut AI, Wynder EL. Cigarette smoking and large cell carcinoma of the lung. *Cancer Epidemiol Biomarkers Prev.* 1997 Jul;6(7):477-80. PubMed PMID: [9232332](#).
  - d. Hashibe M, Brennan P, Benhamou S, Castellsague X, Chen C, Curado MP, Dal Maso L, Daudt AW, Fabianova E, Fernandez L, Wünsch-Filho V, Franceschi S, Hayes RB, Herrero R, Koifman S, La Vecchia C, Lazarus P, Levi F, Mates D, Matos E, Menezes A, Muscat J, Eluf-Neto J, Olshan AF, Rudnai P, Schwartz SM, Smith E, Sturgis EM, Szeszenia-Dabrowska N, Talamini R, Wei Q, Winn DM, Zaridze D, Zatonski W, Zhang ZF, Berthiller J, Boffetta P. Alcohol drinking in never users of tobacco, cigarette smoking in never drinkers, and the risk of head and neck cancer: pooled analysis in the International Head and Neck Cancer Epidemiology Consortium. *J Natl Cancer Inst.* 2007 May 16;99(10):777-89. PubMed PMID: [17505073](#).
3. I have had an interest in other emerging environmental risk factors for cancer. I conducted the first large scale studies of mobile phone use and intracranial cancers. I worked with the U.S. Food and Drug Administration in developing warning labels for mobile phones. I was involved in the Long Island Breast Cancer project, examining the risks associated with organochlorine pesticides.
- a. Muscat JE, Malkin MG, Thompson S, Shore RE, Stellman SD, McRee D, Neugut AI, Wynder EL. Handheld cellular telephone use and risk of brain cancer. *JAMA.* 2000 Dec 20;284(23):3001-7. PubMed PMID: [11122586](#).
  - b. Muscat JE, Malkin MG, Shore RE, Thompson S, Neugut AI, Stellman SD, Bruce J. Handheld cellular telephones and risk of acoustic neuroma. *Neurology.* 2002 Apr 23;58(8):1304-6. PubMed PMID: [11971109](#).
  - c. Muscat JE, Britton JA, Djordjevic MV, Citron ML, Kemeny M, Busch-Devereaux E, Pittman B, Stellman SD. Adipose concentrations of organochlorine compounds and breast cancer recurrence in Long

Island, New York. Cancer Epidemiol Biomarkers Prev. 2003 Dec;12(12):1474-8. PubMed PMID: [14693740](#).

- d. Farooq U, Joshi M, Nookala V, Cheriya P, Fischman D, Graber NJ, Stellman SD, Muscat J. Self-reported exposure to pesticides in residential settings and risk of breast cancer: a case-control study. Environ Health. 2010 Jun 25;9:30. PubMed PMID: [20579356](#); PubMed Central PMCID: [PMC2909990](#).

Complete List of Published Work in My Bibliography:

<http://www.ncbi.nlm.nih.gov/myncbi/joshua.muscat.1/bibliography/41981071/public/?sort=date&direction=ascending>

**D. Research Support**

**Ongoing Research Support**

5P50 DA036107-03 (Muscat/Foulds) 09/30/2013-08/31/2018  
NIH/NIDA

Pennsylvania State University Tobacco Center of Regulatory Science (TCORS)

The overall goal of the Penn State Tobacco Center of Regulatory Science (TCORS) is to develop a leading state-of-the-art research and training infrastructure that will inform policy on the regulation of tobacco products.

Role: PI

5 R01 DA026815-05 (Muscat) 09/15/2011-05/31/2016  
NIH

Socioeconomic Status and Smoking Exposure in Appalachia

The goal of this study is to determine the relationship between various indices of socio-economic status, psychological stress, and tobacco smoke exposure in Appalachian Pennsylvania.

Role: PI

1 R03 CA201951-01 (Muscat/Zhu) 12/23/2015-11/30/2017  
NIH

Time to First Cigarette and Early Detection in the National Lung Screening Trial

The current study proposes to study the effects of a nicotine dependence behavior, the time to first cigarette (TFFC) after waking, on the early detection of lung cancer and overall survival time in the NLST.

Role: Multiple PI

5 R21 CA 181962-02 (Branstetter) 12/3/2014-11/30/2016  
NIH

Effect of Price on Consumption of Cigarettes with High and Low Nicotine Content

The present study proposes to conduct a series of laboratory-based protocols to determine how a fivefold increase in price per puff will influence the smoking behaviors of cigarettes with one of three levels of nicotine: high (.7mg/cigarette), moderate (.3mg/cigarette), and low (e.g., non-addicting; 0.07mg/cigarette)

Role: Co-Investigator

1 R21 DA040177-01 (Liu, D.) 09/30/2015-08/31/2017  
NIDA

Methods to Unveil the Genetic Architecture for Nicotine Dependence via NGS data

These projects have the potential to bring a paradigm shift to the genetic analysis of nicotine dependence.

The methods and tools will also be valuable for studying other similar complex traits.

Role: Co-Investigator

5 K12 HD055882-08 (Weisman) 09/26/2007-07/31/2017  
NICHD; Office of Research on Women's Health (ORWH)

Career Development Program in Women's Health Research at Penn State

The purpose of this BIRCWH project is to provide mentored research career development for junior faculty members, known as BIRCWH Scholars, who are conducting interdisciplinary research on women's health or on sex/gender differences in health.

Role: Advisor

**Completed Research Support**

No Number Assigned (Richie) 10/15/2013-10/14/2015  
Orentreich Foundation for the Advancement of \$541,664

Science

Dietary Methionine and Cysteine Restriction in Healthy Adults

A reduction in energy intake has been linked to enhanced longevity in a number of species. In this dietary intervention, we will conduct a controlled feeding study of Met and Cys restricted diets in healthy adults.

Role: Co-Investigator

5 R21 CA 156229-02 (Spratt) 7/1/2011-6/30/2014

NIH

Repair of Tobacco Carcinogens in the Susceptibility of Lung Cancer

The long-term goal of this project is to develop highly specific DNA repair tests that can measure the repair capacity of multiple DNA adducts simultaneously.

Role: Co-Investigator

3 R01 DA026815-03S1(Muscat) 6/1/2013-5/31/2014

NIH

Socioeconomic Status and Smoking Exposure in Appalachia (Admin Supplement)

We will then determine whether on a per cigarette basis, women are exposed to greater amounts of nicotine and tobacco smoke. This will be tested comparing biomarkers of nicotine metabolites and topography data between men and women.

Role: PI

W911QY-11-C-0002 (Muscat) 3/1/2011-2/28/2013

US Department of Defense, ONR

Novel rare SNPS and lung cancer

Our overall goal will be to validate the allele frequency of selected rare SNPS from the NCLBI Tumor Sequencing Project, which contains genetic data on lung adenocarcinoma samples.

Role: PI

4100050904 (Gallagher) 7/20/2012-12/31/2013

Tobacco Settlement Funds

UGT Genetic Variation and Colorectal Cancer Risk

The goals of our study are to perform a comprehensive genetic association study of genetic variation in the UGT genes for association with colorectal cancer risk by looking for frequency differences between people with colorectal cancer, compared to healthy individuals.

R01 DE013158-07A2 (Lazarus) 5/1/2007-4/30/2013

NIH/NIDCR

UDP-Glucuronosyltransferase Genotype & Cancer Risk

The major goal of this program project is to examine the role of UGTs in genetic susceptibility to cancer.

Role: Co-Investigator

No Number Assigned (Omeicinski/Lazarus) 3/1/2011-2/28/2013

NFGC

Genetics of Microsomal Epoxide Hydrolase (EPHX1) as a Risk Modifier of Human Lung Cancer

This case control molecular epidemiology project will assess potential multivariate risk associations for lung cancer incidence in humans with selected single nucleotide polymorphisms identified in loci encompassing microsomal epoxide hydrolase, UDP-glucuronosyl transferase and cytochrome P450 genes; genes whose products play critical roles in the bioactivation of polyaromatic hydrocarbons present in cigarette smoke.

Role: Co-Investigator