# BIOGRAPHICAL SKETCH

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NAME: Omene, Coral

eRA COMMONS USER NAME (credential, e.g., agency login): omenec01

POSITION TITLE: Assistant Professor

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)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| The City College of New York | BS | 06/1994 | Biology |
| Columbia University | MPhil | 07/1998 | Molecular Biology |
| Columbia University | PhD | 02/2002 | Molecular Biology |
| Columbia University, College of Physicians & Surgeons | MD | 05/2003 | Medicine |
| NY Presbyterian Hospital-Columbia University | | 06/2004 | Internship (Medicine) |
| NY Presbyterian Hospital-Columbia University | | 06/2006 | Residency (Medicine) |
| NYU Langone Medical Center, New York University | | 06/2009 | Hem/Onc Fellowship |

**A. Personal Statement**

As a physician scientist and medical oncologist, I have been drawn to, and fascinated specifically by, the challenging breast cancer subtype, triple negative breast cancer (TNBC), especially given its aggressive nature, poor prognosis, and its cruel predilection for young Black women. My research interests are both clinical and translational. I worked on an NIH K08 research project aimed at modifying the risk for developing triple negative breast cancer, using caffeic acid phenethyl ester (CAPE), the major active component derived from the natural product propolis, a honeybee product with diverse impressive anti-tumor effects to modify the risk of TNBC development in a *Trp53* mammary radiation chimera model (a TNBC mouse model). This research has the potential to be readily translatable as chemoprevention in the clinical setting for TNBC patients. My work dovetails well with my interests in breast cancer disparities research, where in a pilot funded by the New Jersey Commission on Cancer Research and The Rutgers Cancer Institute of New Jersey (P30CA072720) - Cancer Health Equity and Catchment Area Research Pilot Award, I am evaluating the gene rearrangement landscape of tumors and their response to neoadjuvant chemotherapy in Black women with triple negative breast cancer and the role of obesity in this regard. This may reveal therapeutic strategies that when tested through clinical trials can impact on the survival of affected minority populations. I personally see and manage breast cancer patients of all stages and subtypes and I am responsible for all oncological treatment decisions and follow up care. I actively participate in the recruitment of patients to many breast cancer clinical trials of all the different subtypes. I feel this is the best bench to bedside mechanism we have to improve patient care. I am working on investigator-initiated clinical trials testing drug induced weight loss for obesity during the adjuvant treatment for hormone receptor positive breast cancer in populations enriched for Black women. I am leading a project to increase clinical trial participation among Black breast cancer patients funded by the V Foundation for Cancer Research in partnership with ESPN. I am the site Principal Investigator of multiple breast cancer clinical trials and currently serve as Co-Chair for the BIG TEN Cancer Research Consortium (CRC) Breast Cancer Clinical Trial Working Group. I serve as Co-Chair and Co-founder of the Diversity Committee for the BIG TEN CRC to educate, advocate, and engage the Big Ten CRC community to create partnerships and use resources in conducting clinical trials to ensure equitable access for underrepresented populations.

**B. Positions, Scientific Appointments, and Honors**

**Positions**

2017-Present Attending Physician, Robert Wood Johnson University Hospital, Rutgers Cancer Institute of New Jersey
2017-Present Assistant Professor, Rutgers Robert Wood Johnson Medical School
2014-2017 Assistant Professor, New York University (School of Medicine), NYU Langone Medical Center
2014-2017 Attending Physician, Bellevue Hospital Center
2010-2012 Breast Cancer Research Fellow, New York University Langone Medical center
2010 Dean's Committee of Women (faculty mentor to female medical students), NYULMC
2009-2014 Clinical Instructor, New York University (School of Medicine), NYU Langone Medical Center
2009-2014 Clinical Assistant Attending Physician, Bellevue Hospital Center
2009-2010 Dean's Scholar, New York University Langone Medical Center Physician Scientist Training Grant (PSTP)
1994-1999 NIGMS MARC Pre-doctoral Fellow in the MD/PhD program, Columbia University, P&S

**Honors**

2021 AACR Minority and Minority-Serving Institution Faculty Scholar in Cancer Research Award
2016 Certificate of Excellence for Scientific Presentation, 2nd Place Award at the Center to Reduce Cancer Health Disparities (CRCHD), PDW at NIH/NCI
2015 Gerald Weissmann Young Scholar Award in recognition of contributions as a Physician Scientist to the NYULMC Community
2015 AACR Molecular Biology in Clinical Oncology Workshop Scholar
2014 Cancer Disparities Research Network Travel Scholarship
2011 AACR Minority Scholar in Cancer Research Award
2011 NSABP Minority Investigator Travel Award
2010 Breast Cancer Research Fellow, New York University Langone Medical Center
2010 The Dorothea Zucker-Franklin Award For Excellence In Research - in recognition of outstanding investigation as a Junior Faculty member at Research Day, Department of Medicine, NYU Langone Medical Center
2009 Medical Oncology certification
2009 Dean's Scholar, New York University Langone Medical Center Physician Scientist Training Grant (PSTP)
2009 ASCO/AACR Methods in Clinical Cancer Research Workshop Scholar
2006 Internal Medicine certification
2002 Alfred Steiner Award for Dean's day Medical Student Research, Columbia
1994 Graduated with honors in Biology (Summa Cum Laude)
1994 Phi Beta Kappa
1994 Jonas E. Salk Award - For recognition of high ability, scholarship, sound character, interest in research and indication of originality in scientific pursuits
1994 City College Academy for Professional Preparation (CCAPP) - For academic achievement, perseverance, and dedication
1994 Sir August A. Gavasci Award - For graduation with honors in biology
1994 Drs. Isabella and Jerome Karle Award - For outstanding academic record and continuing pursuit of a PhD degree
1994 NIGMS MARC Pre-doctoral Fellowship
1993 Rebecca Mage Award
1991-1994 Minority Access to Research Careers (MARC) scholar, CCNY
1991-1993 National Dean's List

**C. Contributions to Science**

1. I worked in the laboratory of Krystyna Frenkel, PhD who focused on trying to identify novel therapeutic targets in the area of breast cancer, with a major emphasis on preclinical biomarkers, chemoprevention, and carcinogenesis. We discovered that caffeic acid phenethyl ester (CAPE), a natural product derived from propolis, a honeybee product known for its anti-oxidant and anti-inflammatory properties, has impressive anti-tumor effects. We have shown CAPE's anticancer properties and activities in human breast cancer, including, ER+/PR+/Her2+, triple negative breast cancer cells, as well as breast cancer

stem cells. This may involve an inhibition of angiogenesis, the induction of cyclin dependent kinase inhibitors causing cell cycle arrest, and the induction of apoptosis. Furthermore, with the collaboration of Owen A. O'Connor, MD, PhD, we made the discovery that propolis and CAPE, have epigenetic properties and can function as a histone deacetylase inhibitor (Patent Publication PROPOLIS AND CAFFEIC ACID PHENETHYL ESTER AND USES THEREOF, No. WO/2013/012477, Jan. 24, 2013; No. US-2014-0127316-A1, May 8, 2014. International filing date 5/2012, US Filing date, May 2011. **Coral O. Omene**, Owen A. O'Connor, Krystyna Frenkel). Interestingly, in TNBC, CAPE and propolis induce increased expression of the 'silenced' ER gene. This observation provided, for the first time, a strong scientific basis for the biological effects of this time-honored natural product and raises the prospect that this pharmacologic mechanism can be exploited as chemoprevention in women.

a. **Omene C**, Wu J, Frenkel K. Caffeic Acid Phenethyl Ester (CAPE) derived from Propolis, a Honeybee Product, Inhibits Growth of Breast Cancer Stem Cells, INVESTIGATIONAL NEW DRUGS Epub 2011 May 3. 30(4):1279-88, 2012. PMID: 21537887. PMCID: PMC3388256.

b. **Omene C***, Wu J*, Karkaszka J, Bosland M, Eckard J, Klein CB, Frenkel K.Caffeic Acid Phenethyl Ester (CAPE), Derived from a Honeybee Product Propolis, Exhibits a Diversity of Anti-tumor Effects in Preclinical Models of Human Breast Cancer, CANCER LETTERS. 2011 Sep 1; 308(1):43-53. (* Share 1st authorship equally). PMID: 21570765. PMCID: PMC3144783.

c. **Omene C**, Kalac M, Wu J, Marchi E, Frenkel K, O'Connor OA. Propolis and its Active Component, Caffeic Acid Phenethyl Ester (CAPE), Modulate Breast Cancer Therapeutic Targets via an Epigenetically Mediated Mechanism of Action. JOURNAL OF CANCER SCIENCE & THERAPY. 2013 Oct 21;5: 334-342. PMID: 24466386. PMCID: PMC3898618.

2. I have actively participated in clinical trials. I am a site Principal Investigator of multiple cooperative group and industry clinical trials including PALLAS, KEYNOTE 355, ASCENT 03, 04 and 05,TROPICS-02, BTCRC BRE16-042, HCRN-BRE20-468, EAZ171, COMPASSHER2-PCR, COMPASSHER2-RD, EFC15935, ISPY2 and co-investigator for many others. I identify, screen and enroll patients onto clinical trials, which I feel is the best bench to bedside mechanism we have to improve patient care. My participation in clinical trials has resulted in a number of publications.

a. Singh JC, Novik Y, Stein S, Volm M, Meyers M, Smith J, **Omene C**, Speyer J, Schneider R, Jhaveri K, Formenti S, Kyriakou V, Joseph B, Goldberg JD, Li X, Adams S and Tiersten A. Phase 2 trial of everolimus and carboplatin combination in patients with triple negative metastatic breast cancer. BREAST CANCER RESEARCH, 2014 Mar 31;16(2):R32. PMID: 24684785. PMCID: PMC4053575.

b. Chan N, Riedlinger GM, Lu Se, Pham KT, Kirstein LJ, Eladoumikdachi FE, George MA, Potdevin LB, Kowzun MJ, Desai SA, Tang DM, **Omene CO**, Wong ST, Rodriguez-Rust L, Kumar S, Kearney TJ, Liu C, Ganesan S, Toppmeyer DL, Hirshfield KM. Neoadjuvant liposomal doxorubicin and carboplatin is effective and tolerable for the treatment of triple negative breast cancer. CANCER RESEARCH, 2019, 79 (4 Supplement).

c. Cortes J, Cescon DW, Rugo HS, Nowecki Z, Im SA, Yusof MM, Gallardo C, Lipatov O, Barrios CH, Holgado E, Iwata H, Masuda N, Otero MT, Gokmen E, Loi S, Guo Z, Zhao J, Aktan G, Karantza V, Schmid P; KEYNOTE-355 Investigators (**Omene C** and others). Pembrolizumab plus chemotherapy versus placebo plus chemotherapy for previously untreated locally recurrent inoperable or metastatic triple-negative breast cancer (KEYNOTE-355): a randomised, placebo-controlled, double-blind, phase 3 clinical trial. LANCET. 2020 Dec 5;396(10265):1817-1828. PMID: 33278935.

d. Bardia A, Hurvitz SA, Tolaney SM, Loirat D, Punie K, Oliveira M, Brufsky A, Sardesai SD, Kalinsky K, Zelnak AB, Weaver R, Traina T, Dalenc F, Aftimos P, Lynce F, Diab S, Cortés J, O'Shaughnessy J, Diéras V, Ferrario C, Schmid P, Carey LA, Gianni L, Piccart MJ, Loibl S, Goldenberg DM, Hong Q, Olivo MS, Itri LM, Rugo HS; ASCENT Clinical Trial Investigators (**Omene C** and others). Sacituzumab Govitecan in Metastatic Triple-Negative Breast Cancer. N ENGL J MED. 2021 Apr 22;384(16):1529-1541. PMID: 33882206.

3. I am interested in investigating potential mechanism(s) by which biology and modifiable factors, such as obesity, which is prevalent in Black/African American women, interconnect and contribute to worse outcomes resulting in cancer disparities. I am currently evaluating the gene rearrangement landscape and response to neoadjuvant chemotherapy in Black women with triple negative breast cancer and the possible role of obesity in this regard as well as clinical trials for obesity during the adjuvant treatment of hormone receptor positive breast cancer. The ultimate goal being the development of interventional strategies that will help close the disparity gaps that exist in breast cancer care. Consequently, I reviewed in Nature Review Endocrinology, a timely pre-clinical paper on the effect of obesity and resistance to therapy which may lead to new clinical trial strategies. I also co-authored multiple papers on obesity and mortality in Black minority women and aggressive breast cancer development and adipokine receptor expression in the triple negative breast cancer subtype all of which lends itself to prevention strategies that can be tested through clinical trials.

    a. **Omene C** and Bandera E. Anti-VEGF therapy - a role in obesity-related breast cancer. NATURE REVIEWS ENDOCRINOLOGY, 2018 Jun;14(6):329-330. PMID: 29695750. PMCID: PMC6497165.

    b. Xing CY, Doose M, Qin B, Lin Y, Plascak JJ, **Omene C**, He C, Demissie K, Hong C, Bandera EV, Llanos A. Pre-Diagnostic Allostatic Load Predicts Poorly Differentiated and Larger Breast Tumors among Black Women: Findings from the Women's Circle of Health Follow-Up Study. CANCER EPIDEMIOLOGY BIOMARKERS & PREVENTION, 2019 Nov 12. doi: 10.1158/1055-9965.EPI-19-0712. [Epub ahead of print]. PMID: 31719063.

    c. Llanos AAM, Yao S, SIngh A, Aremu JB, Khiabanian H, Lin Y, **Omene C**, Omilian AR, Khoury T, Hong CC, Ganesan S, Foran DJ, Higgins M, Ambrosone CB, Bandera EV, Demissie K. Gene expression of adipokines and adipokine receptors in the tumor microenvironment: associations of lower expression with more aggressive breast tumor features. BREAST CANCER RESEARCH AND TREATMENT. 2020 Published online October 16 2020. PMID:33067778.

    d. Bandera EV, Qin B, Lin Y, Zeinomar N, Xu B, Chanumolu D, Llanos A, **Omene C**, Pawlish KS, Ambrosone C, Demissie K, Hong C. Association of body mass index, central obesity, and body composition with mortality after breast cancer diagnosis in a population-based prospective study of Black breast cancer survivors. JAMA ONCOLOGY. Published online June 04, 2021 doi:10.1001/jamaoncol.2021.1499.

4. My completed research grant (NIH K08 CURE Scholar) proposal builds on data from a series of complex mouse experiments (developed by my former mentor, Dr. Barcellos-Hoff in *Cancer Cell)*, a *Trp53* mammary radiation chimera model (TNBC mouse model) that shows radiation acts via the microenvironment and drives mammary cancers that are more aggressive and more frequently ER negative. Our published data show that this occurs by repressing aspects of anti-tumor immunity resulting in an immunosuppressive tumor microenvironment (TME) and that dietary intervention with caffeic acid phenethyl ester (CAPE) mitigated radiation's systemic effects and reversed the immunosuppressive TME ultimately resulting, among others, in significantly reduced tumor growth. This research has the potential to be readily translatable as chemoprevention in the clinical setting. One of the most notable findings was that host irradiation increases the frequency of ER-negative breast cancer and the cell of origin for ER negative cancer is thought to be early progenitor stem cells. Our data show that mammary epithelial cells treated with CAPE exhibit reduced mammosphere forming efficiency, indicative of decreased stem cells self-renewal and that this is associated with changes suggesting an effect on lineage commitment. In addition, my expertise in mammary stem cells and stem cell assays was critical in the following collaboration with Dr. Barcellos-Hoff and Dr. Martinez-Ruiz that details how TGFβ regulates the mammary stem cell population.

    a. **Omene C**, Ma L, Moore J, Ouyang H, Illa-Bochaca I, Chou W, Patel M, Sebastiano C, Demaria S, Mao JH Karagoz K, **Gatza ML** and Barcellos-Hoff MH. Aggressive Mammary Cancers Lacking Lymphocytic Infiltration Arise in Irradiated Mice and Can be Prevented by Dietary Intervention. CANCER IMMUNOLOGY RESEARCH, 2020 Feb;8(2):217-229. doi: 10.1158/2326-6066.CIR-19-0253. Epub 2019 Dec 12. PMID: 31831632. PMCID: PMC7002223.

b. **Omene C,** Patel M, Kannan K, Heguy A, Barcellos-Hoff MH. CAPE (caffeic acid phenethyl ester) induces a mammary stem cell lineage restriction to a luminal phenotype via chromatin remodeling. CANCER RESEARCH, 2015, 75(15 Suppl).

c. **Omene C**, Patel M, Kannan K, Heguy A, Barcellos-Hoff MH. Mammary stem cell modulation of wildtype and Trp53 null stem cells by CAPE (caffeic acid phenethyl ester), a potential therapeutic agent. CANCER RESEARCH, 2016, 76(4 Suppl).

d. Martinez-Ruiz H, Illa-Bochaca I, **Omene C**, Hanniford D, Hernando-Monge E, Barcellos-Hoff MH. TGFβ Restricts Mammary Lineage Commitment by Stringent Regulation of BRCA1. SCIENCE SIGNALING, 2016, 6;9 (457). PMID: 27923913. PMCID: PMC5619986.

Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/1hSfgiIWN0GkY/bibliography/public/