

**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: C. Noel Bairey Merz, MD

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

POSITION TITLE: Director and Professor of 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)	Completion Date MM/YYYY	FIELD OF STUDY
University of Chicago, Chicago, IL	B.A.	1977	Biological Sciences
Harvard Medical School, Boston, MA	M.D.	1981	Medicine
University of California, San Francisco, CA		1984	Medical Residency
Cedars-Sinai Medical Center, Los Angeles, CA		1985	Chief Medical Resident
Cedars-Sinai Medical Center, Los Angeles, CA		1986	Cardiology Fellowship
Cedars-Sinai Medical Center, Los Angeles, CA		1987	Chief Cardiology Fellow

**A. Personal Statement**

The **Defining the Testosterone to Estradiol Ratio for Cardiometabolic Health** application is an NIH R01 application with collaborations among Cedars-Sinai Medical Center, University of Texas at Arlington, and University of Colorado at Denver. In this proposed application, we will: **1)** Test the hypothesis that cardiometabolic risk is increased by a high testosterone (T) to estrogens (E) ratio; **2)** Test the hypothesis that a high T to E ratio is associated with impaired endothelial function and immune-mediated inflammation; **3)** Test the hypothesis that optimizing the T to E ratio in transwomen will decrease cardiometabolic risk. I have the expertise, leadership and motivation necessary to successfully lead the proposed project. I have a broad background in cardiovascular and interdisciplinary physiology, with specific training and expertise in leading networks, as well as key scientific areas in this proposal. As a professor of medicine at the Cedars-Sinai Heart Institute and the David Geffen UCLA School of Medicine, I have carried out similar types of studies and trials. As PI of the NHLBI-sponsored WISE observational mechanistic cohort and the WISE ancillary studies and trials, I have a proven track record of leadership in multi-center studies and trials. I have laid the groundwork by validating the measures, establishing core lab protocols and procedures, and by establishing strong networks and collaborations. The current application builds logically on my prior work and enhances the investment made in the WISE study, the Barbra Streisand Women's Heart Center projects, and WISE ancillary trials. I have a demonstrated record of successful and productive research projects in areas of high relevance for the proposed study.

**B. Positions and Honors****Professional Positions**

1982-84 Medical Residency, University of California, San Francisco, CA  
 1984-85 Chief Medical Resident, University of California, San Francisco, CA  
 1985-88 Clinical Cardiology Fellow, Cedars-Sinai Medical Center, Los Angeles, CA  
 1988-90 Assistant Director, Preventive and Rehabilitative Cardiac Center, CSMC, LA, CA

1990-91 Acting Director, Preventive and Rehabilitative Cardiac Center, CSMC, LA, CA  
 1991-Present Director, Preventive and Rehabilitative Cardiac Center, CSMC, LA, CA  
 1992-Present Attending Cardiologist, Cedars-Sinai Medical Center, Los Angeles, CA  
 1990-96 Assistant Clinical Professor of Medicine, UCLA School of Medicine, LA, CA  
 1997-2005 Associate Professor of Clinical Medicine, UCLA School of Medicine, LA, CA.  
 2001-Present Director and Endowed Chair, Women's Health Program, CSMC, LA, CA  
 2005-Present Professor of Medicine, David Geffen UCLA School of Medicine, LA, CA  
 2009-Present Professor of Medicine, Cedars-Sinai Heart Institute, Cedars-Sinai Medical Center, LA, CA

### **Awards and Other Professional Activities (partial listing)**

1989 Fellow, American College of Cardiology  
 1990 Fellow, American Heart Association, Council on Clinical Cardiology  
 4/96 Representative, American College of Cardiology, Professional Labeling of Aspirin, FDA  
 1997-10 General Clinical Research Center, Scientific Advisory Committee, CSMC  
 1/97 Member, Over-the-Counter Advisory Panel, Professional Labeling of Aspirin, FDA  
 3/99-02 Chair, Prevention of Cardiovascular Disease Committee, American College of Cardiology (3-year term)  
 3/99-02 Member, Hypertensive Diseases Committee, American College of Cardiology (3-year term)  
 1998-03 Study Section Member, Risk Prevention Health Behavior – 2, National Institutes of Health  
 2002-07 Member, Board of Trustees, American College of Cardiology  
 2002-05 Member, National Cholesterol Education Program (NCEP), ATP III  
 2005-10 Chair, NIH/NHLBI BARI-2D DSMB  
 2008-12 Member, NHLBI Advisory Council  
 2008-present Member, NCEP – ATP IV

### **C. Contribution to Science**

1. My early publications directly addressed the pathophysiological paradox of women with signs and symptoms of ischemic heart disease but no obstructive coronary artery disease. Funded by NIH-NHLBI, the early Women's Ischemia Syndrome Evaluation (WISE) studies identified a high prevalence of coronary microvascular dysfunction and outlined the clinical phenotype useful to clinicians.
  - a. **Bairey Merz, C.N.**, Olson, M., McGorray, S., Pakstis, D.L., Zell, K., Rickens, C.R., Kelsey, S.F., Bittner, V., Sharaf, B.L., Sopko, G. Physical activity and functional capacity measurement in women: a report from the NHLBI-sponsored WISE study. *Journal of Women's Health and Gender-Based Medicine* 2000; 9(7), 769-777. PMID: 11025869
  - b. von Mering, G.O., Arant, C.B., Wessel, T.R., McGorray, S.P., **Bairey Merz, C.N.**, Sharaf, B.L., Smith, K.M., Olson, M.B., Johnson, B.D., Sopko, G., Handberg, E., Pepine, C.J., Kerensky, R.A. Abnormal coronary vasomotion as a prognostic indicator of cardiovascular events in women: results from the National Heart, Lung, and Blood Institute – Sponsored Women's Ischemia Syndrome Evaluation (WISE). *Circulation* 2004;109(6), 722-725. PMID: 14970106
  - c. **Bairey Merz, C.N.**, Shaw, L.J., Reis, S.E., Bittner, V., Kelsey, S.F., Olson, M., Johnson, B.D., Pepine, C.J., Mankad, S., Sharaf, B.L., Rogers, W.J., Pohost, G.M., Lerman, A., Quyyumi, A.A., Sopko, G. Insights from the NHLBI – Sponsored Women's Ischemia Syndrome Evaluation (WISE) Study: Part II: gender differences in presentation, diagnosis, and outcome with regards to gender-based pathophysiology of atherosclerosis and macrovascular and microvascular coronary disease. *Journal of American College of Cardiology* 2006;47(3 Suppl), S21-9. PMID: 16458167
  - d. Shaw, L.J., **Bairey Merz, C.N.**, Pepine, C.J., Reis, S.E., Bittner, V., Kelsey, S.F., Olson, M., Johnson, B.D., Mankad, S., Sharaf, B.L., Rogers, W.J., Wessel, T.R., Arant, C.B., Pohost, G.M., Lerman, A., Quyyumi, A.A., Sopko, G. Insights from the NHLBI – Sponsored Women's Ischemia Syndrome (WISE) Study: Part I: gender differences in traditional and novel risk factors, symptom evaluation, and gender-optimized diagnostic strategies. *Journal of the American College of Cardiology* 2006;47(3 Suppl), S4-S20. PMID: 16458170

2. In addition to the contributions described above, with a team of collaborators, I directly documented the mechanistic pathways, including investigation of estrogen/testosterone ratio via PCOS, of coronary microvascular dysfunction using various intervention models and intermediate outcome studies.
  - a. Shaw LJ, **Bairey Merz CN**, Azziz R, Stanczyk FZ, Sopko G, Braunstein GD, Kelsey SF, Kip KE, Cooper-DeHoff RM, Johnson BD, Vaccarino V, Reis SE, Bittner V, Hodgson TK, Rogers W, and Pepine CJ. Post-Menopausal Women with a History of Irregular Menses and Elevated Androgen Measurements at High Risk for Worsening Cardiovascular Event-Free Survival: Results from the National Institutes of Health – National Heart, Lung, and Blood Institute (NHLBI) – Sponsored Women's Ischemia Syndrome Evaluation (WISE). *The Journal of Clinical Endocrinology & Metabolism* 2008;93:1276-84.
  - b. Pauly DF, Johnson BD, Anderson RD, Handberg EM, Smith KM, Cooper-DeHoff RM, Sopko G, Sharaf BM, Kelsey SF, **Bairey Merz CN**, Pepine CJ. In women with symptoms of cardiac ischemia, non-obstructive coronary arteries, and microvascular dysfunction, ACE inhibition is associated with improved microvascular function: a double-blind randomized study from the NHLBI Women's Ischemia Syndrome Evaluation (WISE) *Am Heart J*. 2011;162:678-84.
  - c. **Bairey Merz CN**, Olson MB, McClure C, Yang YC, Symons J, Sopko G, Kelsey SF, Handberg E, Johnson BD, Cooper-DeHoff RM, Sharaf B, Rogers WJ, Pepine CJ. A randomized controlled trial of low-dose hormone therapy on myocardial ischemia in postmenopausal women with no obstructive coronary artery disease: Results from the National Institutes of Health/National Heart, Lung and Blood Institute-sponsored Women's Ischemia Syndrome Evaluation (WISE). *Am Heart J* 2010;159:987.
  - d. Mehta PK, Goykhman P, Thomson LE, Shuftelt C, Wei J, Yang Y, Gill E, Minissian M, Berman DS, **Bairey Merz CN**. Ranolazine Improves Angina in Women with Evidence of Ischemia but No Obstructive Coronary Artery Disease; A Pilot, Randomized-Controlled Trial. *J Am Coll cardiol Cardiovascular Imaging* 2011; 4:514-522.
  - e. Bavry AA, Handberg EM, Huo T, Lerman A, Quyyumi AA, Shufelt C, Sharaf B, **Bairey Merz CN**, Cooper-DeHoff RM, Sopko G, Pepine CJ. Aldosterone inhibition and coronary endothelial function in women without obstructive coronary artery disease: An ancillary study of the NHLBI-sponsored Women's Ischemia Syndrome Evaluation (WISE). *Am Heart J*. 2014 Jun;167(6):826-32. doi: 10.1016/j.ahj.2014.01.017. Epub 2014 Mar 1.
  
3. Working to translate our findings to the practicing clinician, as well as explore links between coronary microvascular dysfunction and the new female dominated epidemic of heart failure with preserved ejection fraction (HFpEF), I have conducted study evaluating the detection, diagnosis and management of ischemic heart disease (IHD) in women using cardiac magnetic resonance imaging (MRI), to evaluate subendocardial myocardial perfusion, as well as myocardial fibrosis, diastolic function, and metabolic status (spectroscopy)
  - a. Buchthal, S.D., den Hollander, J.A., **Merz, C.N.**, Rogers, W.J., Pepine, C.J., Reicheck, N., Sharaf, B.L., Reis, S., Kelsey, S.F., Pohost, G.M. (2000). Abnormal myocardial phosphorus-31 nuclear magnetic resonance spectroscopy in women with chest pain but normal coronary angiograms. *New England Journal of Medicine*, 342 (12), 829-835.
  - b. Thomson, L.E., Wei, J., Agarwal, M., Haft-Baradaran, A., Shufelt, C., Mehta, P.K., Gill, E.B., Johnson, B.D., Kenkre, T., Handberg, E.M., Li, D., Sharif, B., Berman, D.S., Petersen, J.W., Pepine, C.J., **Bairey Merz, C.N.** (2015). Cardiac magnetic resonance myocardial perfusion reserve index is reduced in women with coronary microvascular dysfunction. A National Heart, Lung, and Blood Institute – sponsored study from the Women's Ischemia Syndrome Evaluation. *Circulation Cardiovascular Imaging*, 8(4), pii: e002481. doi: 10.1161/CIRCIMAGING.114.002481. PMID: 25801710
  - c. Pepine, C.J., Petersen, J.W., **Bairey Merz, C.N.** (2014). A microvascular-myocardial diastolic dysfunctional state and risk for mental stress ischemia: a revised concept of ischemia during daily life. *JACC: Cardiovascular imaging*, 7(4), 362-365. doi: 10.1016/j.jcmg.2013.11.009. PMID: 24742891

## D. Research Support

### Ongoing Research Support (selected)

- Bairey Merz (PI) 7/1/2014- 6/30/2019  
Erika Glazer Family Foundation  
WISE HFpEF  
The goal of this project is to investigate the approaches to the noninvasive detection and assessment of ischemic heart disease.  
Role: PI
- Mehta & Bairey Merz (PI) 7/1/2015- 6/30/2016  
Ferguson Foundation  
Exploring the Brain-Heart Connection in Women with Takotsubo Cardiomyopathy  
The goal of this project is to investigate the brain-heart connection in women with Takotsubo cardiomyopathy.  
Role: Co-PI
- Bairey Merz (PI) 12/1/2010- 11/30/2016  
IN-US-259-0124  
Gilead Science Inc.  
Treatment with Ranolazine in Microvascular Coronary Dysfunction (R-WISE)  
The goal of this project is to test an FDA-approved medication addressing a novel pathophysiological link with MCD and to provide additional understanding of the pathophysiology of MCD with regard to subendocardial ischemia, which can serve as a template for additional innovative therapeutic target development.  
Role: PI
- 05/01/15 – 02/28/19  
1R01HL124649-01 (PI: Li Debiao)  
NIH  
*Whole-Heart Myocardial Blood Flow Quantification Using MRI*  
The major goal of this project is to develop free breathing, whole-heart, high resolution myocardial perfusion MRI.  
Role: Co-Investigator
- 10/07/13 - 04/30/18  
U10HL119991 (Parker)  
NIH/NHLBI/RT11-312-0214047-51644L  
Title: Pregnancy as a Window to Future Cardiovascular Health: Adverse Pregnancy  
The major goals of this project are to leverage the extensive phenotypic information about adverse pregnancy outcomes (APO) on the large nuMoM2b cohort to systematically elucidate aspects of cardiovascular risk associated with APOs and improve the health of women with a history of APOs.  
Role: Consultant
- 09/01/12 - 08/31/16  
UCLA Team Science Award P30AI026897 / UL1TR0012 (Chew)  
NIH/NIAID (UCLA AIDS Institute/CFAR) / NCATS (UCLA CTSI)  
Title: Cardiovascular and Metabolic Complications of Chronic Hepatitis C in HIV-Coinfected Persons  
The goal of this project is to assess the effect of HIV/Hepatitis C co-infection on endothelial function.  
Role: Co-investigator
- Bairey Merz (PI) 7/1/2013- 6/30/2016  
FAMRI (Flight Attendant Medical Research Initiatives)  
Cardiopulmonary Study Effects of Secondhand-Smoke  
The goal of this project is to ascertain whether standard exercise stress testing can detect subclinical cardiopulmonary disability in subjects with significant exposure to second hand tobacco smoke.  
Role: Principal Investigator

Goodman (PI)

09/01/2015-08/31/2016

University of California – California Breast Cancer Research Program  
STOP Heart Disease in Breast Cancer Survivors

The goal of this project is to compare changes to the heart using non-invasive, state-of-the-art techniques called cardiac magnetic resonance imaging (CMRI) and magnetic resonance spectroscopy (MRS) before and during breast cancer treatment in women prescribed statins and women given a placebo (control).

Role: Co-Investigator

CSR208941

Bairey Merz (PI)

10/1/2015- 6/30/2016

FAMRI (Flight Attendant Medical Research Initiatives)/San Francisco General Hospital

Vascular Aging in Flight Attendants with SHS Exposure

The goal of this project is to explore whether remote SHS can alter vascular compliance and endothelial function in flight attendants with occupational SHS exposure.

Role: Principal Investigator

### **Completed Research Support (selected)**

1 R01 HL090957-01A1 Bairey Merz (PI)

09/17/2008 – 08/31/2015

Women's Ischemia Syndrome Evaluation (WISE) Coronary Vascular Dysfunction

The major goals of this project are to investigate the approaches to the noninvasive detection and assessment of ischemic heart disease.

Role: PI

5R01AT1482 Bairey Merz (PI)

9/1/2005- 8/31/2010

Effects of Traditional Acupuncture on Mechanisms of CHD

The goal of this project is to evaluate the effect of Traditional Acupuncture on arterial vasomotor function and autonomic nervous system tone, two physiologic variables involved in the pathophysiological cascade underlying acute cardiac events and sudden death in CHD patients.