

**BIOGRAPHICAL SKETCH**

NAME: Emelia J. Benjamin, MD, ScM, FACC, FAHA

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

POSITION TITLE: Professor of Medicine &amp; Epidemiology, Boston University Schools of Medicine &amp; Public Health; Associate Provost for Faculty Development, Boston University Medical Campus

**EDUCATION/TRAINING**

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Harvard College, Cambridge, MA	AB	06/1979	Psychology/Social Relations
Case Western Reserve University, Cleveland, OH	MD	06/1983	Medicine
Boston City Hospital, Boston, MA	Resident	06/1986	Internal Medicine
Boston University Medical Center, Boston, MA	Fellow	06/1988	Cardiology
Brigham and Women's Hospital, Boston, MA	Fellow	06/1990	Echocardiography
Framingham Heart Study, Framingham, MA	Fellow	06/1990	Epidemiology Research
Harvard School of Public Health, Boston, MA	ScM	06/1990	Epidemiology

**A. Personal Statement**

I am a clinical cardiologist at Boston Medical Center, New England's largest safety net hospital and a cardiovascular genetic epidemiologist with research expertise in atrial fibrillation (**AF**), inflammation, vascular function, tobacco, and cardiovascular epidemiology. I have been an investigator at the Framingham Heart Study (**FHS**) since 1988. At FHS, I serve as Co-I of the core contract, Joint-Director of the Medical Endpoints Committee, and Member of the Executive and Research Committees.

My *research focuses* on the epidemiology, health outcomes, and genomics of AF and cardiovascular disease. I have published over 200 papers focused on the epidemiology, risk factors, genetics, and prognosis of AF. I Co-Chair the **NHLBI's AF Working Group**, which is advising the NHLBI's research agenda in AF. I am leading the *resultant white papers* on AF screening (*Circulation* PMID 33493033), AF secondary prevention (*JAHA* in press), and **AF's structural determinants** (in draft). I have a multi-PI R01 focused on AF and I am Center Director for an American Heart Association (**AHA**) Precision Medicine AF Strategically Focused Research Network (**SFRN**). I co-lead the international "AFGen" genetics consortium. I co-chaired the 2008 NHLBI Prevention of AF Workshop and served as the report's first author (*Circulation* PMC2635942). I had a prior MPI AF grant (5R01HL102214, 2010-2014) examining administrative data, which was highly productive, with 83 papers listed in NIH reporter. I am pursuing translational research by collaborating with basic scientists, geneticists, statisticians, health outcomes experts, electrophysiologists, and bioinformaticians.

For the **AHA**, in the past I have Chaired the Science and Clinical Education Lifelong Learning Committee, the Heart Disease and Stroke Statistics Committee, the Functional Genomics and Translational Biology Council, and the Genomics and Translational Biology, Epidemiology Research Study Section, and served as Science Representative on the national Board of Directors. I am a member of the Supporting Undergraduate Research Experiences (SURE) Oversight Advisory Committee for Underrepresented Ethnic/Racial groups.

I have a *fundamental commitment to professional development and mentoring underrepresented groups in medicine and early-, mid-, and established-investigators in epidemiology and academic medicine*. I am the inaugural Associate Provost for Faculty Development at Boston University Medical Campus (**BUMC**), and inaugural Vice Chair for Faculty Development and Diversity in the Department of Medicine (**DoM**). I co-designed and co-lead the BUMC Early-Career, Mid-Career, Underrepresented Racial/Ethnic Group, and Women's year-long faculty development programs. I have received mentoring awards from the Boston University Dept of Medicine, the AHA Women in Cardiology, and the AHA Functional Genomics Council. I won the 2020 Alliance in Academic Internal Medicine Diversity and Inclusion Award.

For her K23 I will meet with her every two weeks and more frequently as needed. I will provide strategic mentoring on career advancement and grant writing, content expertise on cardiovascular disease epidemiology, and critical feedback when requested on study design, analysis plans, abstracts, manuscripts, and grants.

## Ongoing and recently completed projects that I would like to highlight include:

**18SFRN34110082** Center Director, **Benjamin EJ** 07/01/18-06/30/22  
**AHA Strategically Focused AF Research Network. Center: Advancing AF Precision Medicine**  
The 3 projects will advance our understanding of AF's genetic and clinical risk factors. The Center brings together translational investigators from BUSM, BUSPH, MGH, Broad Institute, & Tougaloo College. The **Basic Project** (PI Ellinor; Lunetta) will further understanding of genetic predisposition to AF in ethnic/racial minorities. The **Clinical Project** (PI Lubitz; Anderson) will implement personalized approaches combining genetic and clinical factors to AF risk estimation in patients with ischemic stroke. The **Population Project** (PI Trinquart) will develop models for lifetime risk of AF and AF complications based on clinical and genetic factors. We are sponsoring a **Cross-AF SFRN Virtual Fellowship** to accelerate synergy & collaborations across Centers & disciplines to train the next generation of translational AF scientists (**PI Benjamin**; White).  
**Role:** PI and Training Director

### Identification of Common Genetic Variants for Atrial Fibrillation and PR interval

2R01 HL092577 MPIs: Ellinor PT/**Benjamin EJ**/Lunetta KM 04/15/09–03/31/22  
**Specific Aims:** 1. Identify loci & genetic variation related to AF by performing large scale, multi-ethnic GWAS of AF; 2. Identify genetic variation related to AF by performing WGS in TOPMed & CCDG sequencing programs; 3. Integrate WGS, GWAS, & MPRA to facilitate functional variant discovery at AF disease loci.  
**Role:** Multi-PI with Drs. Patrick T. Ellinor of MGH and Kathryn M. Lunetta of FHS/BU

### The Framingham Heart Study Physical Examination, Testing and Surveillance

75N92019D00031 PI: Vasan S. Ramachandran 10/01/01-03/31/26  
**Specific Aims:** Provide resources for examination of Original, Offspring, and Third Generation cohorts.  
**Role:** Co-I

### Jackson Heart Study Coordinating Center

NIMHD HHSN26818HV00006R PI: Adolfo Correa 08/16/18-08/12/24  
**Aims Subcontract:** Co-Chair, JHS Scientific Council; Member, Proposal & Publications Committee; Mentor ESI  
**Role:** Subcontract PI

## Training grants – See AHA 18SFRN34110082 above and grants below

### NIH AHA- Tobacco Center for Regulatory Science (A-TRAC) 2.0: Career Enhancement Core

2U54HL120163 MPIs: Rose Marie Robertson, Aruni Bhatnagar 9/19/13-9/18/23  
**Specific Aims:** Develop next-generation of diverse, multidisciplinary TRS scientists at all career stages, funded by pilots and projects/cores via virtual & in-person longitudinal CEC program. 2. Provide funding 3-4 pilot projects annually in years 1-5 to catalyze early career TRS scientists' progression to independence. 3. Conduct robust ATRAC 2.0 CEC training evaluation.  
**Role:** Career Enhancement Core, PI

## K & Training grants EJ Benjamin named Faculty Member

Identify clinical & genetic correlates hepatic fibrosis/fatty liver disease	2019-23	1K23DK113252	1 <sup>o</sup> Mentor, Long, Michelle T.
Facilitators & barriers to HF care in Haiti; community-intervention	2019-23	K23 HL140133	Co-1 <sup>o</sup> Mentor, Kwan, Gene F.
Relations of mitochondrial genetic variation & function with atrial Fib	2019-23	K01 HL143142	Co-1 <sup>o</sup> Mentor, Fetterman, Jessica L
Risk-Guided AF Surveillance in Ischemic Stroke	2020-21	ACC-Merck	1 <sup>o</sup> mentor Ko, Darae
Assessing and addressing cardiovascular health in transgender adults	2020-2023	AHA	Co-1 <sup>o</sup> Mentor, Streed, Jr., Carl G.
Building methods to assess & address CV health in transgender adults	2020-2025	K01 HL151902	Co-1 <sup>o</sup> Mentor, Streed, Jr., Carl G.
Novel methods evaluating association of e cigarette use w/ CV health	2020-2024	K01 HL154130	1 <sup>o</sup> Mentor, Stokes, Andrew
Early ID of Life-Threatening Mass Effect After Ischemic Stroke	2021-2026	K23 NS116033	Co-1 <sup>o</sup> Mentor, Ong, Charlene J.
Novel statistical methods risk communication of AF	2019-22	F31HL145904	Co-1 <sup>o</sup> Mentor, Conner, Sarah

## Completed Grant Support with EJ Benjamin as MPI: Past 3 Years

### AFGen Consortium: Atrial Fibrillation Genomics to Functional Analyses

R01 HL128914 MPIs: **Benjamin, EJ** / Ellinor, PT 8/1/15-5/31/20 NCE  
**Specific Aims:** The purpose of this study is to elucidate the genomics of atrial fibrillation to functional analyses.  
**Role:** Multi-PI, contact PI

## **B. Positions, Scientific Appointments, and Honors - selected**

### **Professional Training/Experience - selected**

2013-present Editorial/Advisory Boards: *European Heart Journal*; *Nature Reviews Cardiology*; *Circulation*  
2004-2016 Associate Editor, *Circulation*  
1996-present Joint Director, Medical Endpoints Committee, Executive Committee, Framingham Study, MA  
1990-present Co- Investigator, Framingham Heart Study, Framingham, MA

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### **Academic Appointments**

2021- Associate Provost, Faculty Development, Boston University Medical Campus, Boston, MA  
2015-2021 Assistant Provost, Faculty Development, Boston University Medical Campus, Boston, MA  
2008- Vice Chair, Faculty Development & Diversity, Medicine Department, BUSM, Boston, MA  
2006- Professor of Epidemiology, Boston University School of Public Health, Boston, MA  
2004- Professor of Medicine, BUSM, Boston, MA  
1998-04 Associate Professor of Medicine, BUSM, Boston, MA  
1990-97 Assistant Professor of Medicine, Boston University School of Medicine (**BUSM**), Boston, MA

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### **Selected Honors**

2021 Inducted, Association of American Physicians  
2020 Alliance for Academic Internal Medicine, **2020 AAIM Diversity, Equity, and Inclusion Award**  
2019 Laennec Clinician/ Educator Lecturer, Council on Clinical Cardiology  
2019 Distinguished Achievement Award, Council on Genomic and Precision Medicine  
2015-present Association of University Cardiologists, 2008, Member 2015-18, Treasurer; **2019-20, President**  
2016 AHA, Gold Heart Award; the highest national AHA award  
2016 AHA, Population Scientist of the Year; the highest national AHA award for population science  
2015 Paul Dudley White Award, American Heart Association  
2015 BUSM, Medicine Department Joel G. Caslowitz, MD Award for Excellence in Teaching—Hospital  
2014-2019 Thomson Reuters List of Highly Cited Researchers; 1 of 402 researchers (top 1%) in medicine.  
2014-15 Boston University Leadership Program, Boston, MA. One of 20 institutional leaders selected.  
2013 AHA - National, 2013 Functional Genomics and Translational Biology Mentoring Award  
2012 **Association of Black Cardiologists, Inc. (ABC)** 2012 Dr. Daniel D. Savage Memorial Science Award. The award is the ABC's highest honor, to recognize scientific achievement & mentoring  
2012 **AHA - National, Women in Cardiology Mentoring Award**  
2011 Boston University Department of Medicine Excellence in Research Mentoring Award  
2007-08 ELAM Fellow - Executive Leadership in Academic Medicine, Drexel University, Philadelphia, PA  
One of 48 women from around the U.S. selected to participate in leadership training  
2000 American Heart Association (**AHA**), New England Affiliate, Great Communicator Award  
2001 Fellow, American Heart Association, Epidemiology & Prevention & Clinical Card. Councils  
1995 **Gender Equity Award**, American Medical Women's Association, BUSM  
1992 Fellow, American College of Cardiology  
1989 Diplomate, Cardiovascular Disease  
1986 Certificate, American Board of Internal Medicine  
1979 Phi Beta Kappa, Harvard College, Cambridge, MA

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### **Activities and Committees, Recent Selected**

2020-2022 AHA, President, Boston Board of Directors  
2018-2020 Boston University, Strategic Planning Task Force  
2018-present Jackson Heart Study, Co-Chair, Scientific Council  
2017-2019 AHA, National Board of Directors, Science Representative  
2017-2021 AHA, Chair, Science and Clinical Education Lifelong Learning Committee (SCILL)  
2015-17 AHA Research Leaders Academy, Co-Chair  
2013-18 AHA Cardiovascular Epidemiology Council, Statistics Committee, Vice Chair & Chair  
2011-12 AHA Committee on Statistics, Council on Epidemiology, Arrhythmia Chapter, Founder  
2014-16 AHA Council Operations Committee, Member  
2012-16 AHA Research Committee, Member  
2011-2012 NIH Search Committee to identify the next Associate Director for Disease Prevention, Member  
2011-present NHLBI's Coronary Artery Risk Development in Young Adults (CARDIA) Study, OSMB, Member  
2010-11 AHA Summit on Atrial Fibrillation, Chair  
2010-15 AHA Manuscript Oversight Committee

2010-12	AHA Study Section, Genomics & Translational Biology & Epidemiology Research, Chair
2009-12	AHA Science Advisory & Coordinating Committee, Member-at-Large (2009-10); FGTB (-2012)
2009	FDA Review AstraZeneca drug application, prevention CVD, JUPITER, Temporary member
2008-12	AHA Interdisciplinary Council on Functional Genomics & Translational Biology, Vice- & Chair
2008-09	NIH/NHLBI, Co-Chair, Workshop on the Prevention of Atrial Fibrillation
2007-11	NIH Study Section: Cardiovascular and Sleep Epidemiology, Chartered Member.
2006-09	ACC/AHA, Primary Prevention of CVD Performance Measures committee
2003-04	AHA National Conference, Co-Chair, <b>Addressing Ethnic Disparities</b>

## C. Contributions to Science

**Peer-reviewed Publications:** 635 Original; 63 Guidelines/science statements; 41 Review; 17 Editorials

**Thomson Reuters/Clarivate List of Highly Cited Researchers 2014-2021.** Ranking among the top 1% most cited for their subject field and year of publication, earning them the mark of exceptional impact.

Google Scholar, Accessed 9/18/2021		
	All	Since 2015
Citations	292323	147709
h-index	192	137
i10-index	691	620

### 1. Women and heart disease

I have published 21 papers focused on women and heart disease, including 3 review articles on women and atrial fibrillation, and ~10 scientific guidelines or statements focused on women and cardiovascular disease.

- Ko D, Rahman F, Martins MA, Hylek EM, Ellinor PT, Schnabel RB, Benjamin EJ and Christophersen IE. Atrial fibrillation in women: treatment. *Nat Rev Cardiol.* 2017;14:113-124. PMID 27786235. PMC5520636
- Ko D, ... Benjamin EJ and Christophersen IE. Atrial fibrillation in women: epidemiology, pathophysiology, presentation, and prognosis. *Nat Rev Cardiol.* 2016;13:321-32. PMID 27053455. PMC5579870
- Mosca L, Benjamin EJ, ... Effectiveness-based guidelines for the prevention of cardiovascular disease in women--2011 update: a guideline from the American heart association. *Circulation.* 2011;123:1243-62. PMID 21325087. PMC3182143
- Redberg RF, Benjamin EJ, .... AHA/ACCF 2009 performance measures for primary prevention of cardiovascular disease in adults: a report of the American College of Cardiology Foundation/American Heart Association task force on performance measures (writing committee to develop performance measures for primary prevention of cardiovascular disease): developed in collaboration with the American Academy of Family Physicians; American Association of Cardiovascular and Pulmonary Rehabilitation; and Preventive Cardiovascular Nurses Association: endorsed by the American College of Preventive Medicine, American College of Sports Medicine, and Society for Women's Health Research. *Circulation.* 2009;120:1296-336. PMID 19770388.

### 2. Professional and Early-Stage Investigator Development

I lead multi-institutional fellowships for AHA AF SFRN (since 2018) & NIH (AHA-NIH A-TRAC since 2013) grants, resulting in educational publications on mentorship and virtual fellowships below (b-d). Publication a is from my role as Associate Provost of Faculty Development. We evaluated our Mid-Career Faculty Development Program.

- Campion MW, Bhasin RM... **Benjamin EJ.** Mid-career faculty development in academic medicine: How does it impact faculty and institutional vitality? *J Fac Dev.* 2016;30:49-64. PMID: 27942418. PMC5145005.
- Russo AR, Solis AC... Glantz SA, Samet JM, Benjamin EJ. Mentoring for success in tobacco regulatory science: A qualitative study. *Tob Regul Sci.* 2017;3:280-292. PMID: 28758143. PMC5533280.
- Di Frances CD... **Benjamin EJ.** Implementing and Evaluating a Mentor Training to Improve Support for Early-Career Scholars in Tobacco Regulatory Science. *Nicotine Tob Res.* 2019. PMID 31095330.
- Ajayi TB,\* Remein CD,\* ... Childs E,\* **Benjamin EJ.\*** A Cross-Center Virtual Education Fellowship Program for Early-Career Researchers in Atrial Fibrillation. *Circ Arrhythm Electrophysiol* 2020;13:e008552. PMID 33031707. PMC7674267.

### 3. Diversity in Cardiovascular Health Sciences and Social Determinants of AF

As Vice Chair of Faculty Development and Diversity in the Boston University School of Medicine I served as the Boston site-PI for the RCT testing a bias reduction workshop 5R35GM122557 to mitigate implicit bias. I have contributed to publications addressing diversity in cardiovascular medicine and social determinants of AF.

- e. Schnabel RB and **Benjamin EJ**. Diversity 4.0 in the cardiovascular health-care workforce. *Nat Rev Cardiol*. 2020;17:751-753. PMID 33051612.
- f. Benjamin IJ, Valentine CM, Oetgen WJ, Sheehan KA, Task F, Brindis RG, Roach WH, Jr., Harrington RA, Levine GN, Redberg RF, Broccolo BM, Hernandez AF, Task F, Douglas PS, Pina IL, **Benjamin EJ**, ... 2020 American Heart Association and American College of Cardiology Consensus Conference on Professionalism and Ethics: A Consensus Conference Report. *J Am Coll Cardiol*. 2021. PMID 33994057.
- g. Kwan GF, ... **Benjamin EJ**, Walkey AJ, .. **Magnani JW**. Racial Differences in Hospital Death for Atrial Fibrillation: The National Inpatient Sample 2001-2012. *Proclins Cardiol*. 2018; 1(1):1005. PMID: 31008458.
- h. Essien UR, Kornej J, Johnson AE, Schulson LB, **Benjamin EJ** and Magnani JW. Social determinants of atrial fibrillation. *Nat Rev Cardiol*. 2021. PMID 34079095.

### 4. Atrial Fibrillation (AF) - Epidemiology:

I am considered one of the world's leading authorities on the epidemiology of AF. With regards to AF publications, I have published ~175 peer-reviewed original research articles, 3 book chapters, 24 review articles, 9 editorials, and contributed to 7 NHLBI research workshops, and 1 AHA symposium on AF's secular trends, lifetime risk, global burden, risk factors, risk prediction models, administrative data base outcomes, patterns/clinical course, prognosis, and prevention.

- a. Lloyd-Jones DM, Wang TJ, ... **Benjamin EJ**. Lifetime risk for development of atrial fibrillation: The Framingham Heart Study. *Circulation*. 2004;110:1042-1046. PMID 15313941.  
*The first publication defining the lifetime risk of AF.*
- b. Schnabel RB... **Benjamin EJ**. Development of a risk score for atrial fibrillation (Framingham Heart Study): a community-based cohort *Lancet* 2009;373:739-745. PMID 19249635; PMCID 2764235.  
*The first article to provide a risk prediction score for atrial fibrillation.*
- c. **Benjamin EJ**, Wolf PA, D'Agostino RB, Silbershatz H, Kannel WB, Levy D. Impact of atrial fibrillation on the risk of death: the Framingham Heart Study. *Circulation* 1998;98:946-952. PMID 9737513  
*First publication establishing that AF in the community predicted an increased risk for all-cause mortality, adjusting for coexistent risk factors.*
- d. **Benjamin EJ**, Chen PS... Ellinor PT... Wyse DG. Prevention of atrial fibrillation: report from a National Heart, Lung, and Blood Institute Workshop. *Circulation* 2009;119:606-618. PMID 19188521; PMCID: PMC2635942. *The first scientific statement emphasizing the critical need for an AF prevention agenda.*

### 5. Atrial Fibrillation Outcomes

I had a prior highly productive MPI AF outcomes grant with Curtis & Heckbert 5R01HL102214 (2010-14), entitled Patterns Of Health Care Use, Treatment & Outcomes In Atrial Fibrillation. The grant has 83 papers listed in NIH Reporter. Allan Walkey received his Outcomes K01HL116768 in 2013, with me as his 1<sup>o</sup> mentor.

- a. Piccini JP, ..., **Benjamin EJ**, Curtis LH. Outcomes of medicare beneficiaries undergoing catheter ablation for atrial fibrillation. *Circulation*. 2012;126;2220-2207. PMID:23019293; PMCID: PMC3500836.
- b. Walkey AJ, .... **Benjamin EJ**. Practice Patterns and Outcomes Associated With Use of Anticoagulation Among Patients With Atrial Fibrillation During Sepsis. *JAMA Cardiol*. 2016;1:682-90. PMID: 27487456.
- c. Piccini JP, Hammill BG, Sinner MF, Jensen PN, Hernandez AF, Heckbert SR, **Benjamin EJ**, Curtis LH. Incidence and prevalence of atrial fibrillation and associated mortality among medicare beneficiaries, 1993-2007. *Circ Cardiovasc Qual Outcomes* 2012;5:85-93. PMID:22235070; PMCID: PMC3332107.
- d. Walkey AJ, Wiener RS, Ghobrial JM, Curtis LH, **Benjamin EJ**. Incident stroke and mortality associated with new-onset atrial fibrillation in patients hospitalized with severe sepsis. *JAMA* 2011;306:2248-54. PMID:22081378; PMCID: PMC3408087.

### Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/emelia.benjamin.1/bibliography/45166649/public/?sort=date&direction=ascending>