





**Accelerating Medicines Partnership® Program in Heart Failure
Inaugural Meeting
September 29, 2022
Gaylord National Resort & Convention Center
National Harbor, Maryland**



CONTENT

	Zoom dial-in details	Page 3
	AMP HF Inaugural Meeting Participants	Pages 4 - 7
	Preliminary Meeting Agenda	Pages 8 - 11
2	Accelerating Medicines Partnership® Overview	Pages 12 - 13
7	Impact Through Alliances: Industry Outlook Shared	Pages 14 - 16
10	Vision	
	i. Bayer AG	Pages 17 - 19
	ii. Cytokinetics	Pages 20 - 22
	iii. Ionis Pharmaceuticals, Inc.	Pages 23 - 25
	iv. Novartis AG	Pages 26 - 27
	v. Ultromics	Pages 28 - 32
	vi. American Heart Association®	Pages 33 - 40
	vii. American Society of Echocardiography	Pages 41 - 44
Appendix	AMP HF Consortium Stakeholders Bio Sketches	Page 45 - 75
	Heartshare Briefing Materials	
	Gaylord National Resort & Convention Center Map of Meeting Rooms	

Meeting dial-in details and FNIH Events and Program Contact

Meeting dial-in details

Join Zoom Meeting

<https://fnih.zoom.us/j/85311340763?pwd=Ujd1VEhKWtItMTRlUS90b1lrM0xyUT09>

Meeting ID: 853 1134 0763

Passcode: 347834

One tap mobile

+13017158592,,85311340763#,,,,*347834# US (Washington DC)

+13126266799,,85311340763#,,,,*347834# US (Chicago)

Dial by your location

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+1 669 444 9171 US

+1 669 900 6833 US (San Jose)

+1 719 359 4580 US

+1 253 215 8782 US (Tacoma)

+1 346 248 7799 US (Houston)

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FNIH Events Contact

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FNIH Program Contact

Harina Raja

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Accelerating Medicines Partnership® - Heart Failure
Gaylord National Resort & Convention Center, Maryland | September 29, 2022
Inaugural Meeting Participants

Industry

Bayer AG

Lothar Roessig, M.D., Vice President, Head of Clinical Development in Therapeutic Area Cardio-Rena

Karen Paraschin, M.D., Ph.D., Global Clinical Leader, Research & Development, Therapeutic Area Cardiology & Nephrology, Cardiology & Nephrology

Cytokinetics, Inc.

Stephen Heitner, M.D., Vice President, Clinical Research and Therapeutic Area Lead, Cardiovascular

Fady Malik, M.D., PH.D., Executive Vice President, Research and Development

Ionis Pharmaceuticals, Inc.

Michela Brambatti M.D., M.S., Director, Clinical Development

Jason Duran, MD, Ph.D., Associate Director of Clinical Development

Adam Mullick*, Ph.D., Vice President of Cardiovascular and Renal Drug Discovery

Novartis AG

William Chutkow, M.D., Ph.D., Executive Director, Heart Failure Drug Discovery, Cardiovascular & Metabolic Diseases, Novartis Institute for Biomedical Research

Mike Mendelson*, M.D., Sc.M., Director in Translational Medicine and Data Science, Novartis Institute for Biomedical Research

Claudio Gimpelewicz*, M.D., Senior Global Program Clinical Head, CRVM

Christopher O'Donnell, M.D., Global Head Cardiovascular and Metabolism Translational Medicine

Martin Lefkowitz, M.D., Vice President, Global Clinical Research and Development

Ultromics

Ross Upton, Ph.D., Chief Executive Officer, Founder

Gary Woodward, M.Sc., Ph.D., Chief Technical Officer

Andrew Reeve, M.B.A., Chief Revenue Officer

Ashley Akerman*, Ph.D., Clinical Research Scientist

Amir Hasan*, M.Eng., Chief Operating Officer

Non- Profit

American Heart Association®

Mariell Jessup, M.D., M.D., FACC, FAHA, FESC, Chief Science and Medical Officer

Jennifer Hall*, Ph.D., FAHA, Chief of Data Science and Analytics

American Society of Echocardiography

Judy Hung, M.D., FASE, Director of the Echocardiography Section, Division of Cardiology

Director of the Division of Clinical Research, Massachusetts General Hospital

Andrea Van Hoever, M.S.G.H., Deputy Director

Devon Weaver, M.A., Research Coordinator

Heart Failure Society of America

Mark Drazner, M.D., M.Sc, FHFA, President, Clinical Chief of Cardiology, University of Texas Southwestern Medical Center

Patient Representative

Cynthia Chauhan, Mayo Clinic

HeartShare Program

Faraz Ahmad, M.D., M.S., Assistant Professor of Medicine (Cardiology) and Preventive Medicine (Health and Biomedical Informatics), Northwestern University; HeartShare Co-investigator, Data Translation Center

Laura Alagna, M.I.S., Senior Project Manager, Northwestern University

Lauren Balmert-Bonner, Ph.D., Assistant Professor of Preventive Medicine (Biostatistics) and Pediatrics, Northwestern University; HeartShare Core Leader, Data Management Core

Alain Bertoni, M.D., M.P.H., Professor, Epidemiology and Prevention, Wake Forest University; HeartShare Co-PI, Wake Forest Clinical Center

Barry Borlaug, M.D., Professor of Medicine and Director of Circulatory Failure Research, Mayo Clinic; HeartShare PI, Mayo Clinical Center

Javed Butler, M.D., M.P.H., M.B.A., Senior Vice President, Baylor Scott and White Health; HeartShare Steering Committee Co-chair

Martin Cadeiras, M.D., Health Services Associate Clinical Professor – HCOMP; HeartShare Co-PI, UC Davis Clinical Center

Nipavan Chiamvimonvat, M.D., Roger Tatarian Endowed Professor of Cardiovascular Medicine, Associate Chief for Research, Division of Cardiovascular Medicine, Co-Director, UC Davis Cardiovascular Research Institute (CVRI), Staff Cardiologist at Sacramento VA Medical Center, University of California Davis; HeartShare PI, UC Davis Clinical Center

Julio Chirinos, M.D., Ph.D., Associate Professor of Medicine, University of Pennsylvania; HeartShare PI, Penn Clinical Center

Akshay Desai, M.D., M.P.H., Medical Director, Cardiomyopathy and Heart Failure Program, Advanced Heart Disease Section, Brigham and Women's Hospital, and Associate Professor, Harvard Medical School; HeartShare Co-PI, Mass General Brigham Clinical Center

Margaret Doyle, Ph.D., Associate Professor, Department of Pathology & Laboratory Medicine, University of Vermont

Ahmed Fayyaz, M.D., Postdoctoral Fellow, Mayo Clinic; HeartShare Research Skills Trainee

Hanna Gaggin, M.D., M.P.H., Assistant Professor of Medicine, Massachusetts General Hospital; HeartShare Research Skills Trainee

Michael Givertz, M.D., Medical Director, Heart Transplant and Mechanical Circulatory Support, Brigham and Women's Hospital, Professor, Harvard Medical School; HeartShare Co-PI, Mass General Brigham Clinical Center

Bret Goodpaster, Ph.D., Senior Investigator and Scientific Director, AdventHealth Translational Research Institute; HeartShare Biopsy Core Lab Co-PI

Michael Hammond, M.D., M.P.H., Postdoctoral Scholar, Northwestern University; HeartShare Study Coordinator

Anna Hemnes*, M.D., Associate Professor of Medicine, Division of Allergy, Pulmonary, and Critical Care Medicine, Vanderbilt University

Leighton T. Izu*, Ph.D., Professor of Pharmacology, University of California, Davis
Jamie Justice, Ph.D., Assistant Professor, Gerontology and Geriatric Medicine, Wake Forest University; HeartShare Biopsy Core Lab Co-PI
Sadiya Khan, M.D., M.Sc., Assistant Professor of Medicine (Cardiology) and Preventive Medicine (Epidemiology), Northwestern University; HeartShare PI, Northwestern Clinical Center
Abel Kho, M.D., Director, Institute for Public Health and Medicine - Center for Health Information Partnerships; Director, Institute for Augmented Intelligence in Medicine; Professor of Medicine and Preventive Medicine, Northwestern University; HeartShare Co-PI, Data Translation Center
Dalane Kitzman, M.D., Professor of Cardiovascular Medicine and Geriatrics/Gerontology, Wake Forest University; HeartShare Co-PI, Wake Forest Clinical Center
Adrienne Kline, M.D., Ph.D., Postdoctoral Scholar, Northwestern University; HeartShare Research Skills Trainee
Gregory Lewis, M.D., Section Head, Heart Failure, Director, Cardiopulmonary Exercise Testing Laboratory, Medical Director, Cardiac Transplantation Program, Massachusetts General Hospital; HeartShare PI, Mass General Brigham Clinical Center
Javier Lopez, M.D., Associate Professor, Division of Cardiovascular Medicine, University of California Davis; HeartShare Co-PI, UC Davis Clinical Center
Dylan Lowe, Ph.D., Project Manager, Eureka
Yuan Luo, Ph.D., Associate Professor of Preventive Medicine (Health and Biomedical Informatics), Northwestern University; HeartShare Co-PI, Data Translation Center
Praneet Mylavarapu, M.D., Postdoctoral Scholar, Northwestern University; HeartShare Research Skills Trainee
Alanna Morris*, M.D., Assistant Professor of Medicine, Emory University
Savren Nelson, Program Coordinator, Northwestern University
Jeff Olgin, M.D., Chief of Cardiology and the Gallo-Chatterjee Distinguished Professor of Medicine, University of California San Francisco; HeartShare PI, Eureka Platform
Carlos Plappert, M.D., Visiting Scholar, Northwestern University
Laura Rasmussen-Torvik, Ph.D., M.P.H., Chief of Epidemiology and Associate Professor of Preventive Medicine (Epidemiology), Northwestern University; HeartShare Co-PI, Northwestern Clinical Center
Margaret Redfield, M.D., Professor of Medicine, Mayo Clinic; HeartShare Co-PI, Mayo Clinical Center
Oday Salman, M.D., Postdoctoral Research Fellow, University of Pennsylvania; HeartShare Research Skills Trainee
Denise Scholtens, Ph.D., Director, Northwestern University Data Analysis and Coordinating Center; Chief of Biostatistics in the Department of Preventive Medicine; Professor of Preventive Medicine (Biostatistics) and Neurological Surgery, Northwestern University; HeartShare Co-PI, Data Translation Center
Sanjiv Shah, M.D., Stone Endowed Professor of Medicine, Director of Research, Bluhm Cardiovascular Institute, Northwestern University; HeartShare Contact Primary Investigator
Svati Shah, M.D., M.H.S., Professor of Medicine, Division of Cardiology, Associate Dean for Genomics, Duke University School of Medicine; HeartShare Steering Committee Co-chair
Ryan Sisk, M.S., Laboratory Manager, Northwestern University
Scott Solomon, M.D., Director, Clinical Trials Outcomes Center, Edward D. Frohlich Distinguished Chair, Professor of Medicine, Harvard Medical School and Brigham and Women's Hospital; HeartShare Co-PI, Mass General Brigham Clinical Center

Lauren Sparks, Ph.D., Associate Investigator at the Translational Research Institute for Metabolism and Diabetes, AdventHealth Research Institute; HeartShare Biopsy Core Lab Co-PI
Firas Webhe, M.D., Ph.D., Medical Director, Center for Artificial Intelligence in the Bluhm Cardiovascular Institute, Northwestern University; HeartShare Core Lead, Data Portal Core

U.S. Food and Drug Administration

Norman Stockbridge, M.D., Ph.D., Director, OCHEN-DCN,

The National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health

Gary Gibbons*, M.D., Director of NHLBI

David Goff, M.D., Ph.D., FACP, FAHA, Director, Division of Cardiovascular Sciences

Patrice Desvigne Nickens, M.D., Program Director, Heart Failure and Arrhythmias Branch

Dina Paltoo*, Ph.D., MPH, Assistant Director, Scientific Strategy and Innovation

Vandana Sachdev, M.D., Director of the Echocardiography Laboratory, Co-Chair for AMP HF

Renee Wong, Ph.D., Chief of the Heart Failure and Arrhythmias Branch, Division of Cardiovascular Sciences

Jacqueline Wright, Dr.PH., FAHA, Health Scientist Administrator

Veronique Roger, M.D., M.P.H., Senior Investigator, Laboratory of Heart Disease Phenomics

Meagan Grant*, Scientific Advisor, Scientific Strategy and Innovation

Sweta Ladwa, M.P.H, PMP, Senior Scientific Program Manager

Emily Tinsley, M.S., Ph.D., Clinical Trials Specialist

Keyvan Farahani*, Ph.D., Biomedical Imaging Informatics Specialist, National Cancer Institute

Foundation for the National Institutes of Health (FNIH)

Julie Gerberding, M.D., M.P.H., Chief Executive Officer

Courtney Silverthorn*, Ph.D., Associate Vice-President, Research Partnerships

Stacey Adam, Ph.D., Associate Vice-President, Research Partnerships

Steven Hoffmann, M.S., Associate Vice-President, Research Partnerships

Tania Kamphaus, M.Sc., Ph.D., Director, Metabolic Disorders

Lynette Nguyen, Ph.D., PMP, Senior Scientific Project Manager, Metabolic Disorders

Harina Raja, M.S., Scientific Project Manager, Metabolic Disorders

Mira Patel, Director, Meetings and Events

Jasmine Buchanan, Meetings and Events Coordinator

Jenny Cardenas, Meetings and Events Coordinator

David Carmel, M.B.A., Chief Growth and Innovation Officer

Katherine Thompson, Director of Communications

Sam Mooney, Communications Officer

Suzanne Béchamps*, Communications Officer

Aimee Ahmed, Director of Development

Heidi Blythe, MPA, Director of Development

Brianna Mills, Development Officer

Matt Slater*, Development Officer

Maria Mathews*, Development Associate

Jenny Lee*, M.P.H., Ph.D., Science Writer (IQ Solutions)

(*) Attending virtually



Accelerating Medicines Partnership® in Heart Failure
Gaylord National Resort & Convention Center, Maryland | September 29, 2022
8:00 AM -7:30 PM ET
Inauguration Program Preliminary Agenda

CONTINENTAL BREAKFAST & REGISTRATION - EASTERN SHORE 2

8:00 AM -9:15 AM

AMP HF INAUGURAL MEETING - EASTERN SHORE 2

Session 1: Introductions and Project Overview

- | | |
|----------|---|
| 9:30 AM | 1. Welcome Remarks
Julie Gerberding, M.D., M.P.H., Chief Executive Officer, FNIH |
| 9:35 AM | 2. Accelerating Medicines Partnership®
Courtney Silverthorn, Ph.D., Associate Vice-President, Research Partnerships, FNIH |
| 9:40 AM | 3. NHLBI Vision
Gary Gibbons, M.D., Director, NHLBI |
| 9: 45 AM | 4. Regulatory Impact on the Collaboration
Norman Stockbridge, M.D., Ph.D., Director, OCHEN-DCN, FDA |
| 9:50 AM | 5. Journey to AMP HF
David Goff, M.D., Ph.D., Director, Division of Cardiovascular Sciences, NHLBI |
| 9:55 AM | 6. AMP HF Research Plan Overview
Vandana Sachdev, M.D., Senior Research Clinician, Director of the Echocardiography Laboratory, Division of Intramural Research, NHLBI Co-Chair for AMP HF |
| 10:00 AM | 7. Impact Through Alliances: Industry Outlook
William Chutkow, M.D., Ph.D., Executive Director, Heart Failure Drug Discovery, Cardiovascular & Metabolic Diseases, Novartis Institute for Biomedical Research |
| 10:05 AM | 8. Voice of the Patient
Cynthia Chauhan, Mayo Clinic |
| 10:10 AM | 9. AMP HF Organizational Overview, Governance, and Partner Introductions
Tania Kamphaus, M.Sc., Ph.D., Director, Metabolic Disorders, Research Partnerships, FNIH |

Session 2: Shared Vision for AMP HF

- | | |
|----------|---|
| 10:15 AM | 10. Shared Vision
Industry partners |
|----------|---|

Bayer AG, Cytokinetics, Inc., Ionis Pharmaceuticals, Inc., Novartis AG, Ultromics
Not-for-profits
American Heart Association®, American Society of Echocardiography

11:00 AM **Coffee break**

Session 3: HeartShare: Data Translation Center & Clinical Centers

- 11:15 AM 11. **Challenges in HFpEF and the Birth of AMP HF**
Javed Butler, M.D., M.P.H., M.B.A., Senior Vice President, Baylor Scott and White Health, Distinguished Professor of Medicine, University of Mississippi, HeartShare Steering Committee Co-chair
- 11:25 AM 12. **Promise of AMP HF in Accelerating Therapeutic Discoveries**
Svati Shah, M.D., M.H.S., Professor of Medicine, Division of Cardiology, Associate Dean for Genomics, Duke University School of Medicine, HeartShare Steering Committee Co-chair
- 11:35 AM 13. **Vision for AMP HF**
Sanjiv Shah, M.D., Stone Endowed Professor of Medicine, Director of Research, Bluhm Cardiovascular Institute, Northwestern University, PI, HeartShare Data Translation Center
- 11:45 AM 14. **Closing Remarks and Adjournment**
Sanjiv Shah, M.D. and Tania Kamphaus, M.Sc., Ph.D.

LUNCH - EASTERN SHORE 2

12:00 PM -1:00 PM

HEARTSHARE SC WORKSHOP

Please view the briefing book in Attachment A

EASTERN SHORE 2

1:15 PM **Study Updates**
Deep Phenotyping, Data Portal, Eureka, Extant datasets/images, Publications & Ancillary Studies, Research Skills Committees

1:50 PM **Breakout Session 1**

EASTERN SHORE 2

- ❖ Deep Phenotyping
- ❖ Eureka

MAGNOLIA 1

- ❖ ML/AI
- ❖ Data Portal

2:35 PM

Breakout Session 2

EASTERN SHORE 2

- ❖ Multi-omics/ TOPMed
- ❖ Extant datasets/images

MAGNOLIA 1

- ❖ Research Skills
- ❖ Publications & Ancillary Studies

EASTERN SHORE 2

3:20 PM

Scientific presentations

The Value of Skeletal Muscle and Adipose Tissue Biopsies to HeartShare

Bret Goodpaster, Ph.D., Senior Investigator and Scientific Director,
AdventHealth Translational Research Institute
HeartShare Biopsy Core Lab Co-PI

Jamie Justice, Ph.D., Assistant Professor, Gerontology and Geriatric Medicine,
Wake Forest University
HeartShare Biopsy Core Lab Co-PI

Lauren Sparks, Ph.D., Associate Investigator at the Translational Research
Institute for Metabolism and Diabetes, AdventHealth Research Institut
HeartShare Biopsy Core Lab Co-PI

NHLBI Pulmonary Vascular Disease Phenomics (PVDOMICS) Project

Anna Hemnes, M.D., Associate Professor of Medicine, Division of Allergy,
Pulmonary, and Critical Care Medicine, Vanderbilt University

Application of the Functional Connectome to Identify HFpEF Subtypes

Leighton Izu, Ph.D., Professor of Pharmacology, University of California, Davis

Strategies to Enhance Diversity, Equity, and Inclusion in Clinical Trial Enrollment

Alanna Morris, M.D., Assistant Professor of Medicine, Emory University

MAGNOLIA 1

4:05 PM

Recruitment (*collaborative brainstorming session*)

Svati Shah, M.D., M.H.S.

4:30 PM

Milestones for the upcoming year

Sanjiv Shah, M.D.

4:45 PM

Open Forum

RECEPTION - EASTERN SHORE 2

6:00 PM- 7:30 PM

6:15 PM

Celebratory Remarks

Tania Kamphaus, M.Sc., Ph.D.

Mark Drazner, M.D., M.Sc., FHFSA, President, HFSA
Clinical Chief of Cardiology, University of Texas Southwestern Medical Center

7:15 PM

Closing Remarks

Tania Kamphaus, M.Sc., Ph.D. and Vandana Sachdev, M.D.



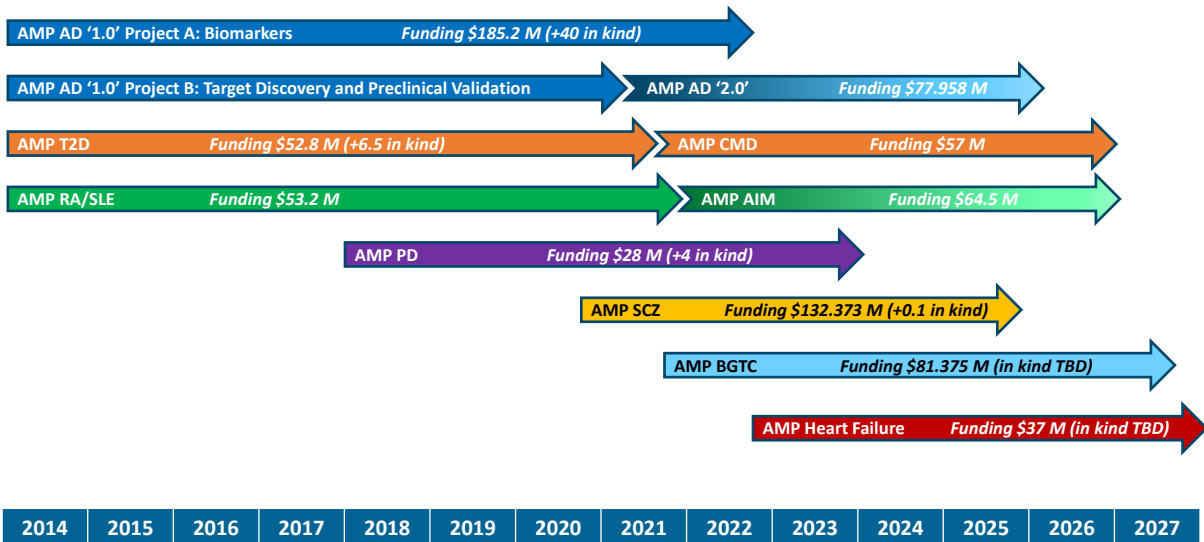
Courtney Silverthorn , Ph.D.
Associate Vice-President, FNIH

Accelerating Medicines Partnership®

Overview



AMP Timelines



The Accelerating Medicines Partnership® (AMP®) Program by the numbers



As of September 2022



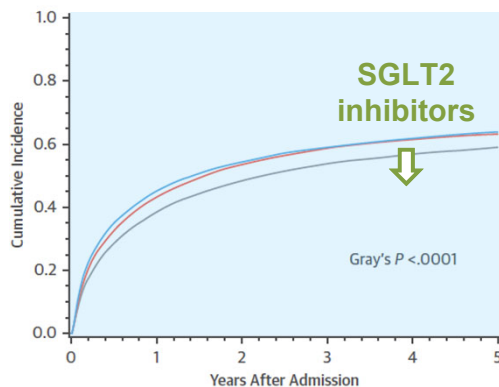
William Chutkow, M.D., Ph.D.
Novartis Institute for Biomedical
Research



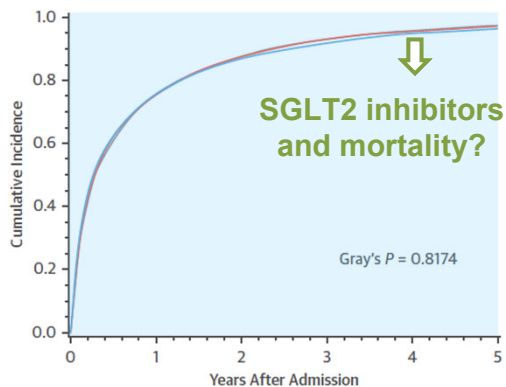
Impact Through Alliances: Industry Outlook

HFpEF morbidity and mortality is considerable and there are few evidence based therapies

5 year heart failure readmission



5 year composite of mortality/
readmission



— HFpEF (EF ≥50%) — HFbEF (EF 41-49%) — HFrEF (EF ≤40%)



Shah KS, *J Am Coll Cardiol* (2017)

Complex challenges for HFpEF exceed any single organization's ability to address alone

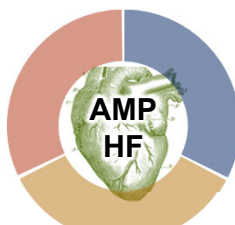
Critical gap	Industry Impact
Poor understanding of HFpEF disease mechanism(s) ; human genomic and multi-omic determinants need defining	Weak therapeutic hypothesis → Low clinical PoS
	Limited target discovery and validation
Heterogeneous HFpEF populations; patient classification by clinical features, not molecular features	Variable response → clinical failure or reduced absolute benefit impacting approval and uptake
	Exposure to drug risks without clear drug benefits
Lack of robust risk-predicting or surrogate response biomarkers	Larger, longer, more expensive trials
Unable to establish translatable preclinical models; preclinical tools not a starting point to understand HF biology	Poor target selection and drug prosecution, poor translatability → high drug development costs



The AMP-HF Public Private Partnership promises to leverage core strengths to address the complex gaps impeding HFpEF clinical and drug success

Pharma

- Drug development expertise
- Clinical development expertise
- Clinical (& pre-clinical) datasets
- Funding



Academia

- Scientific and clinical expertise
- Clinical research
- Broad, large, cohort & trial datasets
- Innovation (basic mechanism, biomarker development, computational methods)

FNIH, NIH, Regulatory

- Funding
- Project management and data repository infrastructure
- Regulatory engagement

Adapted from Davis AM, SLAS Discovery (2021)

- Goals and incentives must be aligned; metrics to evaluate performance
- Critical data scale in a trustworthy data repository → clear Data Management plan
- Prickly intellectual property considerations



Industry consideration for impact and value from FNIH AMP-HF alliance

Issue	Industry considerations and limitations	Consortium impact
Proprietary data vs. ideal data	(+) Superb 'prevalent' HF clinical dataset with well-captured longitudinal events (-) Insufficient power or lack critical replication (-) Streamlined trials limit exploratory phenotypes	✓ Cost-effective access to pooled, high-quality, harmonized trial and cohort data → promise to achieve data scale to address key drug-development gaps ✓ Unique deeply-phenotyped prospective cohort, prohibitive to generate internally
Analysis	(+) Excel at focused, program-specific questions (-) Limited internal Data Science bandwidth, particularly for complex, open-ended questions	✓ Large analytic community ✓ Innovative statistical & machine learning methods ✓ Industry Steering Co coordinating scientific objectives
Clinical & Regulatory application	(-) challenges applying novel molecular profiling to clinical development programs, regulatory pathways, and improving clinical practice	✓ Engagement with FDA, Pharma, Academic and NIH leadership throughout
IP	(-) Loss of potential IP (-) Conflicting IP incentives: safeguarding IP to filing vs. publishing (-) Data privacy and unexpected drug response or safety findings	✓ Pre-competitive access to well-defined scientific analyses and shared FTO among alliance members ✓ Emphasis on understanding disease mechanisms ✓ Spectrum of data-sharing possibilities



Aligned scientific and strategic objectives for HFpEF disease understanding and drug development resonate with industry needs

Key Objectives	Potential impact for Industry
Population stratification based on disease mechanisms and molecular phenotypes	Greater treatment benefit, greater PoS, and cost savings from leaner trial design matching drug mechanisms to stratified patients
Diagnostic HFpEF biomarkers leveraging molecular features and novel imaging	
Prognostic markers for enrolment of patients with higher event rates or surrogate biomarkers for progression	Health authority engagement and trial design collaboration
Testing of novel candidate causal disease pathways	Deeper understanding of HFpEF at the molecular level, redefining HFpEF into endophenotypes
Identification of new targets and disease mechanisms thorough multi-omic, advanced analytic, hypothesis-free approaches	Potential for novel therapeutics matched to robust therapeutic hypotheses and to patients defined by molecular disease mechanisms





Lothar Roessig



Karen Paraschin



About Bayer

Company at a glance

- // Bayer is a global enterprise with core competencies in the life science fields of health care and nutrition.
- // Its products and services are designed to help people and planet thrive by supporting efforts to master the major challenges presented by a growing and aging global population.
- // Bayer is committed to drive sustainable development and generate a positive impact with its businesses. At the same time, the Group aims to increase its earning power and create value through innovation and growth.
- // The Bayer brand stands for trust, reliability and quality throughout the world. In fiscal 2020, the Group employed around 100,000 people and had sales of 41.4 billion euros. R&D expenses before special items amounted to 4.9 billion euros. For more information, go to www.bayer.com.



Why investing in the heart failure space and in this partnership is important to Bayer

About Cardiology at Bayer

- // Bayer is an innovation leader in the area of cardiovascular diseases, with a long-standing commitment to delivering science for a better life by advancing a portfolio of innovative treatments.
- // The heart and the kidneys are closely linked in health and disease, and Bayer is working in a wide range of therapeutic areas on new treatment approaches for cardiovascular and kidney diseases with high unmet medical needs.
- // The cardiology franchise at Bayer already includes a number of products and several other compounds are in various stages of preclinical and clinical development. Together, these products reflect the company's approach to research, which prioritizes targets and pathways with the potential to impact the way that cardiovascular diseases are treated.

3

// FNH AMP inaugural meeting partner introduction // Sep 29, 2022



How Bayer's mission align with AMP core values in public-private partnerships, patient-centric precision medicine approach and having an equity lens

Bayer's purpose: Science for a Better Life

- // Bayer's R&D focuses on promising trends with great potential for improving patient well-being. Among a selection of current research topics at Bayer is 'Precision Medicine'
<https://www.bayer.com/en/pharma/precision-medicine>.
- // Bayer advances a culture of Inclusion and Diversity to drive innovative solutions. Inclusion & Diversity plays an important role in meeting and anticipating the needs of our customers and achieving our overall vision: Health for all, Hunger for none
<https://www.bayer.com/en/commitments/inclusion-diversity-at-bayer>.



4

// FNH AMP inaugural meeting partner introduction // Sep 29, 2022



Why this partnership is important for Bayer

<https://www.bayer.com/en/pharma/forms-collaboration>



- // Strong partnerships have the power to spark innovation that one organization could not create on its own: Complementing our comprehensive in-house expertise with the know-how of excellent partners from academia and industry is therefore integral to our innovation strategy at Bayer.
- // Bayer's focus has been—and will continue to be—patients and their medical needs. We believe that everyone should be able to benefit from scientific innovation. Therefore, we need to envision, live, and leverage the science of tomorrow.
- // The ongoing revolutions in life sciences and technologies are changing the way we think about health and enabling us to tackle some of humanity's biggest challenges. But no single player will be able to do this alone.
- // We are agnostic to treatment modalities and open for innovative partnerships, including but not limited to cell and gene therapies, data analytics, artificial intelligence (AI) for stratification and digital systems care from early research to commercialization.

5

/// FNH AMP inaugural meeting partner introduction /// Sep 29, 2022



Value of the collaboration to drug development and patient care

<https://www.bayer.com/en/pharma/heart-failure>

- // Despite advances in therapy and prevention efforts, heart failure remains as malignant as some common cancers. For many patients living with heart failure, symptoms continue to progress despite receiving guideline-recommended therapies.
- // Multi-omics intend at identifying pathways that drive modifiable risk. Phenomapping will help to match novel drug candidates with patients who are likely to benefit.
- // Patients at remaining high risk of unfavorable outcomes will be characterized to define the focus of future drug development.
- // We will gain better disease understanding. This will provide the basis for developing precision medicine to improve the lives of patients with HFpEF.



6

/// FNH AMP inaugural meeting partner introduction /// Sep 29, 2022



Stephen Heitner



Fady Malik

Fady Malik, M.D., Ph.D., EVP, Research & Development

Fady has led Research and Development at Cytokinetics since 2014 and been with the company since its inception in 1998 when he joined its founders to participate in the launch of the company. Early on, Fady recognized the potential therapeutic utility of modulating the sarcomere of cardiac and skeletal muscle and led discovery and development efforts giving rise to Cytokinetics' current portfolio of early- to late-stage development programs targeting muscle contractility for the treatment of cardiovascular and neuromuscular diseases.

Fady is an internationally recognized cardiovascular physician-scientist, an inventor on more than 20 issued patents, and has authored or co-authored over 60 publications appearing in prominent journals such as Science, Nature Medicine, the Lancet, and the New England Journal of Medicine. He currently holds an appointment in the Cardiology Division of the University of California, San Francisco, as a Clinical Professor of Medicine and until 2019 was an Attending Interventional Cardiologist at the San Francisco Veterans Administration and UCSF Medical Centers.

Fady serves on the Board of Directors for Rocket Pharmaceuticals, Inc.

Fady received a B.S. in bioengineering from the University of California at Berkeley, and a M.D./Ph.D. from the University of California at San Francisco where he also completed an internal medicine residency and fellowship in cardiology.

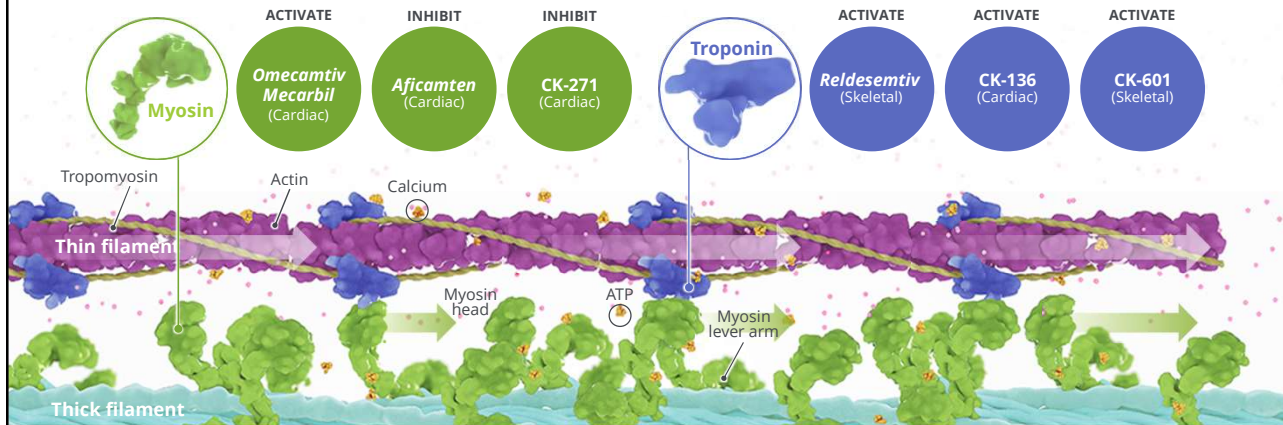


Fady Malik, M.D., Ph.D.
EVP, Research & Development

Cytokinetics: Empowering Muscle Empowering Lives

Our mission is to bring forward new medicines to improve the healthspan of people with devastating cardiovascular and neuromuscular diseases of impaired muscle function.

The sarcomere is the fundamental unit of muscle contractility. It is a molecular structure found in skeletal and cardiac muscle that enables myocytes to contract and generate force



Bringing Sarcomere-Directed Therapies to Patients

Patients are our North Star

- We have a long history of engaging patients throughout research and clinical development. We champion diversity among patients and helps raise awareness and elevate the voices of patients with rare diseases.
- We have been focused on a targeted approach to therapeutics in heart failure, with our entire development pipeline following this philosophy. FNIH and Cytokinetics appear to be completely aligned with regards to the pursuit of precision therapies.
- Residual risk remains unacceptably high in patients with heart failure.
- While there have been important improvements in reducing clinical endpoints with the treatment of patients with heart failure with reduced ejection fraction, this has largely been achieved through impacting the neurohormonal axis.
- Approximately half of people heart failure have normal ejection fraction, and despite a similar burden of disease, there has been a more limited impact, only recently, in addressing some of this burden (ARNi and SGLT2i). These recent successes were preceded by many more failures, stressing the need to think about HFpEF differently.

Long History of Collaborations in Basic and Clinical Development

- We have a track record of successful collaborations other biopharma companies, as well as a staff that has their roots in academic cardiology.
- Leveraging the knowledge and learnings from prior experiences as well as directing current/future endeavors is the most efficient mechanism for addressing the clinical needs.
- Understanding the etiologies and interplay of comorbidities in patients with HFpEF is critical for targeted drug development.
 - We are aligned with FNIH in our belief that in order to improve therapeutic options for these patients, we should evaluate the entire population from multiple viewpoints.
 - Collaboration between academics, the FDA, NIH and several drug development institutions, we will help accelerate achievement of this goal.
- Cytokinetics was part of the development phase of this FNIH AMP and is excited increase our contributions in this next phase.

Ionis Team



Adam Mullick, PhD

Vice President of Cardiovascular and Renal Drug Discovery

Dr. Mullick contributed to the early development of Kynamro®, WAYLIVRA®, Otezarsen, Vupanorsen, Pelacarsen and led the research efforts for IONIS-AGT-LRx currently in clinical development for treatment-resistant hypertension. His current research efforts include preclinical development of targets for heart failure and renal disease in addition to leading the efforts to identify methods to enhance heart oligonucleotide delivery. Dr. Mullick earned his Ph.D. in Molecular, Cellular & Integrative Physiology from UC Davis and was a postdoctoral fellow in the Department of Immunology at The Scripps Research Institute before joining Ionis Pharmaceuticals in 2007



Michela Brambatti, MD, MSc

Dr. Brambatti is a board-certified cardiologist and currently director in the Clinical Development department at Ionis Pharmaceuticals. Her work focuses on early and late phase drug development for cardiac amyloidosis, HFpEF, and HFpEF. Before joining Ionis, Dr. Brambatti worked in the Department of Medicine at the University of California San Diego where she made significant contributions in natural history studies and the early development of gene therapy for Danon Disease. She completed medical school and cardiology fellowship at the Marche Polytechnic University (Italy), a research fellowship in cardiovascular epidemiology at McMaster University (Canada), and an MS degree at the University of California, San Diego.



Jason Duran, MD, PhD

Dr. Duran is an advanced heart failure-trained cardiologist and Associate Director of Clinical Development at Ionis Pharmaceuticals. Dr. Duran completed his dual MD/PhD at Temple University in Philadelphia and then completed his clinical and postdoctoral training at UC San Diego. His past research focused on cardiac regeneration, targeted gene therapies for cardiomyopathy, and the effects of COVID-19 infection on the heart. Dr. Duran led the cardiovascular biobank at UC San Diego and founded the COVID-19 human tissue biobank for advanced genomics research at the start of the pandemic.



Ionis Pharmaceuticals, Inc.

The Leader in RNA-Targeted Therapeutics

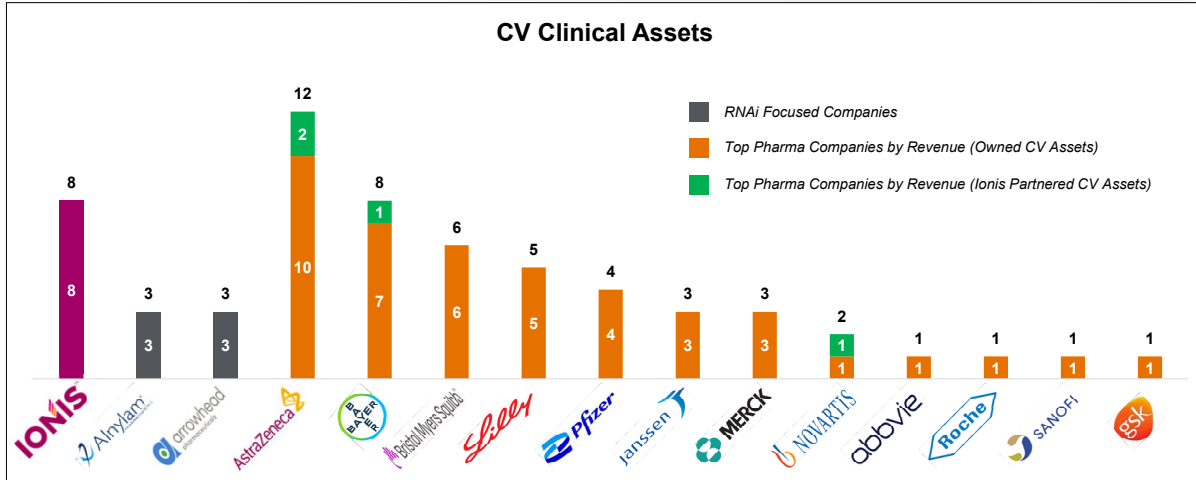


- Founded: 1989 to develop a new platform for drug discovery and development based on RNA targeted therapeutics (all mechanisms, e.g. ASO, splicing, siRNA)
- ~40 active programs in development with Cardiovascular and Neurology key therapeutic areas
- Approved drugs* to date: Vitravene®, Kynamro®, Spinraza®, Tegsedi™ and Waylivra®
- 800+ Employees spanning research, development, manufacturing, commercialization and G&A
- Partnerships (academic, clinical and commercial) are essential to unlock full the potential of our technology and medicines
- Collaboration with 8 out of top 10 global pharma companies



*Not available in all geographies; Spinraza is a registered trademark of Biogen; Tegsedi and Waylivra are registered trademarks of Akcea Therapeutics

Ionis: A Leading Biopharma CV Pipeline



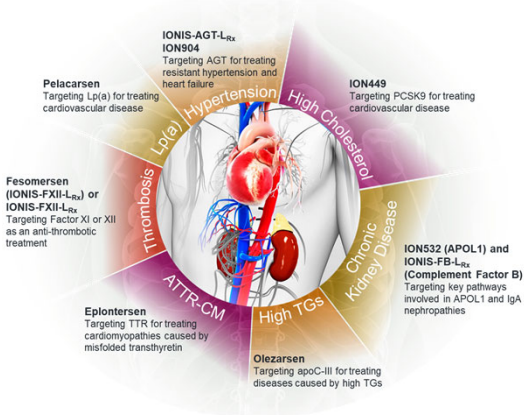
IONIS™

Ionis Cardiovascular and Renal Pipeline

MEDICINES	INDICATION	TARGET	PARTNER	PHASE 1	PHASE 2	PHASE 3
Pelacarsen	CVD	Lp(a)	NOVARTIS	▶	▶	▶
Olezarsen	FCS and SHTG	ApoC-III	IONIS™	▶	▶	▶
Eplontersen	ATTR Cardiomyopathy	TTR	IONIS™ AstraZeneca	▶	▶	▶
ION449/AZD8233	LDL-C/CVD	PCSK9	AstraZeneca	▶	▶	▶
Fesomersen	Clotting disorders	FXI	BAYER	▶	▶	▶
IONIS-FB-LRx	IgA Nephropathy	CFB	Roche	▶	▶	▶
IONIS-AGT-LRx	HTN and Heart failure	AGT	IONIS™	▶	▶	▶
ION904	HTN and Heart failure	AGT	IONIS™	▶	▶	▶
ION547	Thrombotic disorders	FXII	IONIS™	▶	▶	▶
ION532	Chronic Kidney Disease	APOL1	AstraZeneca	▶	▶	▶

Why is investing in the heart failure space important to your organization/ or the need for this partnership?

A Leading Cardio-Renal Development Pipeline



IONIS™

- ❑ Ionis mission is to become the leader in genetic medicines with Cardiovascular as one of our core areas
 - We value working closely with academic and industry partners to advance the understanding of complex diseases and develop precision medicine therapies
- ❑ Development and discovery efforts are focused on the development of precision medicine therapies for the prevention and treatment of specific cardiomyopathies and heart failure
- ❑ HFpEF has emerged as a major public health problem that requires a better understanding of disease subtypes and mechanisms
 - Precision medicine approaches will be key for success
 - AMP HF initiative is well-positioned to make such advances

IONIS™

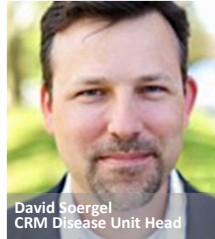
A Force for Life

Novartis Cardio-Renal-Metabolism at a glance

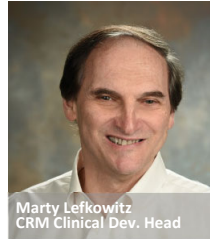


NOVARTIS

Cardiovascular Renal and Metabolism



David Soergel
CRM Disease Unit Head



Marty Lefkowitz
CRM Clinical Dev. Head



Claudio Gimpelewicz
Sr. Program Clin. Head

Novartis Institute of Biomedical Research (NIBR)

Cardiovascular and Metabolic Research (CVM) and Translational Medicine (CVM-TM)



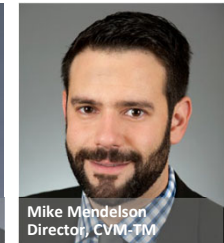
Shaun Coughlin
Global Head, CVM



William Chutkow
Executive Director, CVM



Chris O'Donnell
Global Head, CVM-TM



Mike Mendelson
Director, CVM-TM



Why is investing in the heart failure space important to Novartis or the need for this partnership?

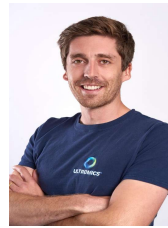
- Novartis has an abiding commitment to address the persistent high burden of heart failure. People with HFpEF have substantial residual cardiovascular morbidity and mortality and limited treatment options
- Addressing complexities and gaps in our understanding of HFpEF disease pathology exceeds any one organization. Accelerating disease understanding to the point of effective drug discovery will require collective expertise and shared resources
- The AMP-HF objectives are aligned with Novartis's investments across the development pathway for HF 'big data' discovery and to Novartis's strategic pipeline focus in heart failure



Value of the collaboration to Novartis for drug development and patient care

- Consortium data and analyses will contribute to public good larger than any one company or lab, hastening research in the heart failure field to benefit patients and families
- Cost-effective access to existent datasets suitable to make/replicate meaningful discoveries that would not be possible without the enormous effort of centralizing and harmonizing, paired to strong scientific objectives addressing key scientific questions in HF drug development
- Unique deeply-phenotyped cohort that will address a number of mechanistic questions and is prohibitive to develop internally
- Application of innovative statistical & machine learning methods and experience in data analysis and expand analytic capacity from limited inhouse Data Science resources
- Engagement with FDA, Pharma, Academic and NIH leadership throughout implementation will provide impactful progress for patients and their families





Ross Upton



Gary Woodward



Andrew Reeve



Transforming the Detection of Heart Failure

AI that brings precision to Echo



Ultramics is the AI Leader in Echocardiography

Bringing Precision to Echo...Finally!

Transforming the detection of heart failure using artificial intelligence to improve outcomes for all patients, while reducing costs.



Proven

Globally validated outcomes data



Approved

FDA-cleared for clinical use



Trusted

10 years of outcome science

In collaboration with



MAYO CLINIC



UNIVERSITY OF OXFORD



The only AI built on outcomes in echo



© Ultramics Limited 2022

Investors



Over **\$50 million** raised capital, supporting continued innovation.

Partners



+ more

Customers

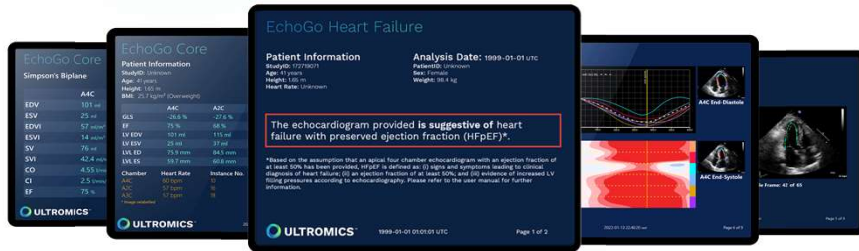


+ more



© Ultramics Limited 2022

A New Era of Precision with EchoGo HF Lab



Cloud-based
No hardware or software needed



Vendor Neutral
Any system, anywhere



Accurate
Superior to human analysis



Zero Variability
No subjectivity or manual errors



Efficient
No training, no clicks



Seamless
Simple, secure integration

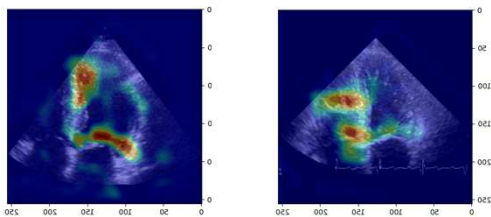


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Precision Detection for Heart Failure



EchoGo Heart Failure increases HFpEF detection to 96% accuracy from a single Apical 4-chamber view, using AI



✓ Improves HF detection

✓ Decreases hospitalizations



EchoGo Heart Failure

96% accuracy

Patient Information StudyID: 172735071 Age: 41 years Height: 1.65 m Heart Rate: Unknown	Analysis Date: 1999-01-01 PatientID: Unknown Sex: Female Weight: 88.4 kg
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The echocardiogram provided is **suggestive of heart failure with preserved ejection fraction (HFpEF)***.

*Based on the assumption that an apical four chamber echocardiogram with an ejection fraction of at least 50% has been provided. HFpEF is defined as: (i) signs and symptoms leading to clinical diagnosis of heart failure; (ii) an ejection fraction of at least 50%; and (iii) evidence of increased LV filling pressures according to echocardiography. Please refer to the user manual for further information.

ULTRONICS 1999-01-01 01:01:01 UTC Page 1 of 2

FDA breakthrough

© Ultrasonics Limited 2022

Precision LV Analysis

GLS is the single best predictor for Stage B HF hospitalizations¹. Ultromics provides best in class GLS with zero variability

- Left ventricular ejection fraction
- Left ventricular volumes
- Global longitudinal strain
- Regional strain

Strain Reimbursement via +93356



1. Haji K, et al. JACC Cardiovascular Imaging. 2022;15:1380-1387

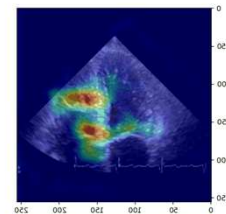
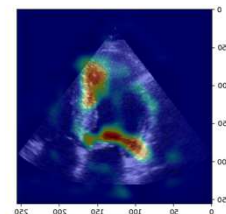
Ultromics participation in AMP HF

Our Interests:

- Developing a more phenotyped HF product
- Matching phenotypes within our device to therapies
- Stopping missed diagnosis of HFpEF
- Developing novel features that help detect increased filling pressures reducing the need for invasive testing
- Simplifying the diastolic work-up of patients
- Moving diagnosis of HF earlier in the patient pathway
- An RCT

How we can help:

- Apply our AI and AI visualization to support deeper phenotyping of HFpEF
- Support the AMP HF echo-based Core Labs with automated analysis of echo studies
 - HFpEF Detection Algorithm
 - GradCam Color map
 - LV Function and Strain measurements
- Leveraging our SaaS infrastructure for the routing of echo images from hospitals to centralized locations
- Leverage our team of AI engineers and clinical scientists
- Contribute to the data pool



1. Haji K, et al. JACC Cardiovascular Imaging. 2022;15:1380-1387

Thank you



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[Linkedin.com/company/ultromics](https://www.linkedin.com/company/ultromics)



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sales@ultromics.com



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**American
Heart
Association®**



Mariell Jessup



Jennifer Hall



American Heart Association

A very brief introduction

Mariell Jessup MD, FAHA
Emeritus Professor of Medicine, University of Pennsylvania
Chief Science and Medical Officer, American Heart Association



OUR MISSION

— *Why do we exist?* —

To be a **relentless force** for a world of longer, healthier lives.

GUIDING VALUES

— *Who are we?* —



STRATEGIC VALUE PROPOSITION

— *How will we make an impact?* —

The AHA is a **catalyst** to achieving maximum impact in equitable health and well-being.

2024 IMPACT GOAL

— *What impact will we make?* —

Every person deserves the opportunity for a full, healthy life. **As champions for health equity**, by 2024, the American Heart Association will advance cardiovascular health for all, including identifying and removing barriers to health care access and quality.



What Sets AHA Apart...

BRAND



SCIENCE



GRASSROOTS



Pillars of our Work



Research

THE FOUNDATION OF OUR WORK

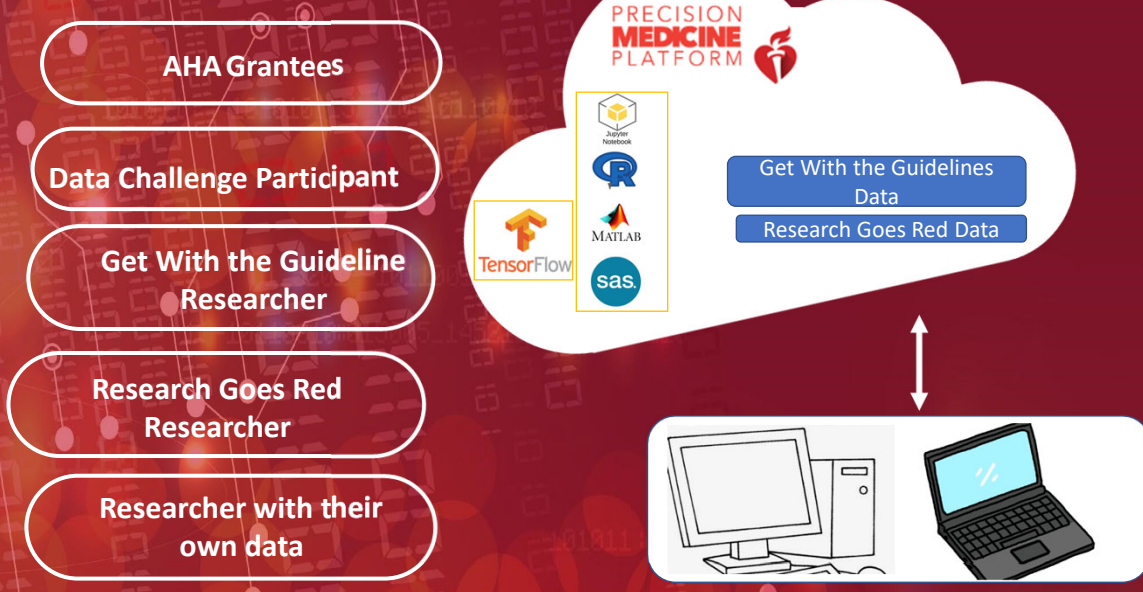
\$5 billion since 1949

1,300+ active awards

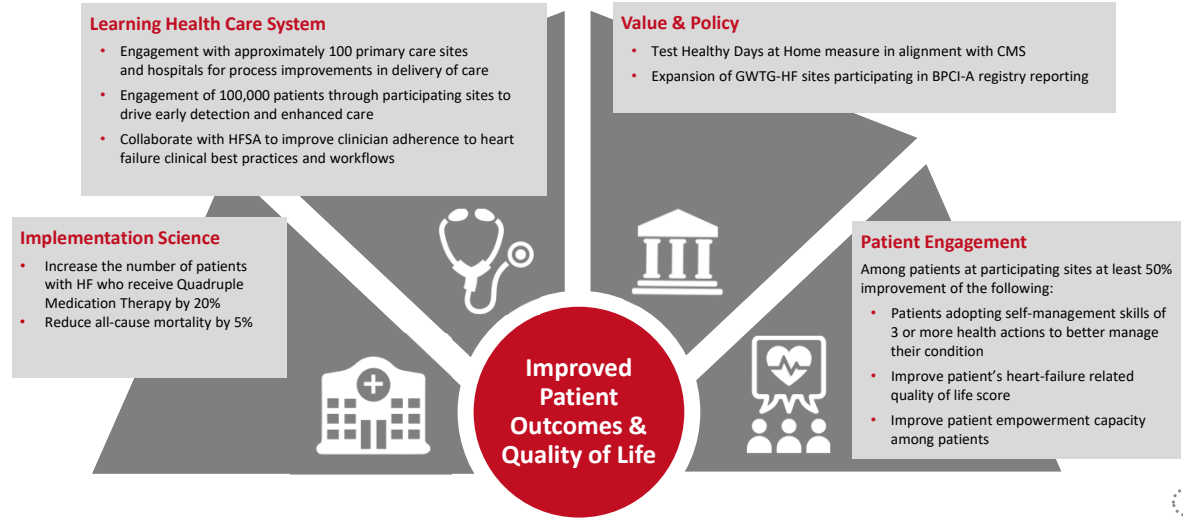
\$436 million committed

1,800+ volunteers reviewed
3,100 proposals in FY 21-22

Access for all



Metrics by Strategic Focus



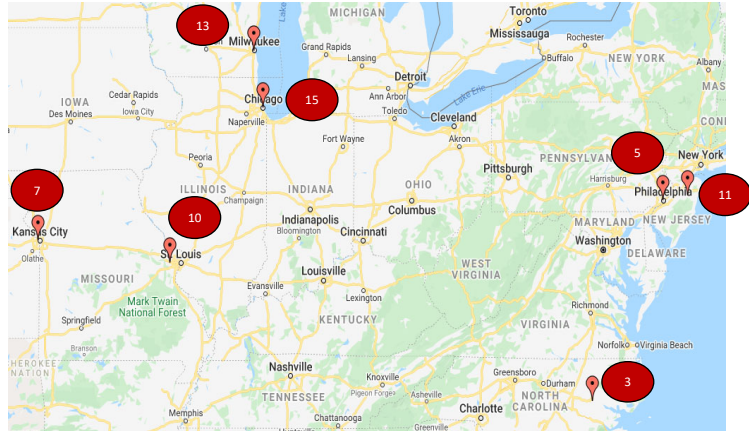
QUARTERLY HIGHLIGHTS

Progress June 2022 – August 2022

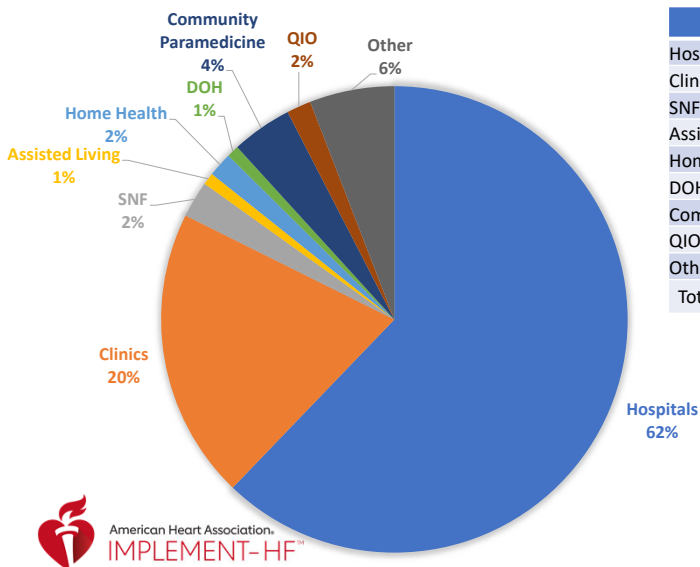


IMPLEMENTATION SCIENCE

- Site recruitment and execution of participation agreements
 - **65** inpatient sites (19 in contract review)
 - **13** outpatient sites (14 sites in contract review)
 - Total of **78** sites
 - IHF Participating Hospital Annual HF Discharges: **47,093***
- (* Definitive Healthcare File 2019 as of 8/10/22)



IMPLEMENT-HF Enhanced Reach



Organization Type	#
Hospitals	74
Clinics	24
SNF	3
Assisted Living	1
Home Health	2
DOH	1
Community Paramedicine	5
QIO	2
Other	7
Total	119



Machine Learning–Based Models Incorporating Social Determinants of Health vs Traditional Models for Predicting In-Hospital Mortality in Patients With Heart Failure

Matthew W. Segar, MD, MS; Jennifer L. Hall, PhD; Pardeep S. Jhund, MBChB, MSc, PhD; Tiffany M. Powell-Wiley, MD, MPH; Alanna A. Morris, MD, MSc; David Kao, MD; Gregg C. Fonarow, MD; Rosalba Hernandez, PhD; Nasrien E. Ibrahim, MD; Christine Rutan, BS; Ann Marie Navar, MD, PhD; Laura M. Stevens, PhD; Ambarish Pandey, MD, MSc



- ML models developed in the GWTG-HF registry were associated with an improvement in the prediction of in-hospital mortality for HF compared with the existing and rederived logistic regression models
- The addition of SDOH improved performance and prognostic utility of the ML models in Black patients

ORIGINAL ARTICLE

Circulation: Heart Failure

Race, Social Determinants of Health, and Length of Stay Among Hospitalized Patients With Heart Failure: An Analysis From the Get With The Guidelines–Heart Failure Registry

Matthew W. Segar¹, MD, MS¹; Neil Keshvani², MD²; Shreya Rao, MD, MPH; Gregg C. Fonarow¹, MD; Sandeep R. Das³, MD, MPH, MBA; Ambarish Pandey⁴, MD, MSc



- Among patients with HF, neighborhood-level SDOH factors were independently associated with length of stay (LOS)
- The association of different SDOH factors with LOS varied by the specific SDOH domain
- The contribution of SDOH to prolonged LOS was significantly greater among hospitalized heart failure patients of self-reported Black race.

Leveraging Aggregated Data from open sources in Acute Heart Failure (LEAD-AHF)

Awardees:

David Kao, MD – University of Colorado

Pardeep Jhund, MBChB PhD – University of Glasgow

Jennifer Hall, PhD – American Heart Association



COLORADO CENTER FOR PERSONALIZED MEDICINE

LEAD-AHF goals

- **Enable user-directed phenotyping analysis of acute heart failure (AHF) using BioLINCC-available data**
 - Leverage multiple data sources with minimal-no data harmonization
 - Accommodate incorporation of additional datasets and methods.
 - Perform cluster-based phenotyping with minimal-no coding expertise
 - Produce outputs to facilitate clinical interpretation reproducible research
 - Use a cloud-based platform to maximize access to tools
 - Promote adherence to FAIR research principles



Judy Hung



Andrea Van Hoever



Devon Weaver



About ASE

The American Society of Echocardiography (ASE) is the Society for Cardiovascular Ultrasound Professionals™. ASE is the largest global organization for cardiovascular ultrasound imaging serving physicians, sonographers, nurses, veterinarians, and scientists and as such is the leader and advocate, setting practice standards and guidelines for the field. Since 1975, the Society has been committed to advancing cardiovascular ultrasound to improve lives.

16,579 members representing 115 countries
79% U.S.-based members
21% Members outside the U.S.



About ASE Continued

ASE's Mission

To advance cardiovascular ultrasound and improve lives through excellence in education, research, innovation, advocacy, and service to the profession and the public.

ASE's Core Values

- Ethical Behavior
- Professionalism
- Excellence
- Advancing Knowledge
- Diversity
- Caring Community



ASE 2022-2023 Executive Committee



President
Stephen Little, MD, FASE
Houston Methodist



Secretary
Kelly Thorson, DHSc, MSRS, ACS, RDCS,
RCCS, CIIP, FASE



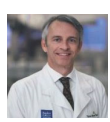
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Immediate Past President
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Texas Heart Institute, Baylor St. Luke's
Medical Center



Treasurer
Cynthia Taub, MD, FASE
Dartmouth Hitchcock



Chief Executive Officer
Robin Wiegerink, MNPL
ASE



Judy Hung, MD, FASE

- ASE's AMP Heart Failure Steering Committee Representative
- Director of the Echocardiography Section, Massachusetts General Hospital
- Director of the Division of Clinical Research, Massachusetts General Hospital
- Past President of ASE 2020 - 2021



Why is investing in the heart failure space important to your organization?

- Echocardiography is the primary diagnostic modality to assess Heart Failure with preserved and reduced Ejection Fraction
- Echocardiography provides prognostic information and monitoring of therapy



How does your mission align with AMP core values in public-private partnerships, patient-centric precision medicine approach and having an equity lens?

- ASE strongly endorses patient-centered and personalized imaging. Rather than an automatic testing default, a personalized approach to testing based on clinical information is better and benefits the patient. Every clinical presentation should be evaluated individually to determine which imaging test is appropriate.
- Factoring in technical local expertise, quality and availability of equipment, likelihood of cardiovascular disease, and patient preference are all extremely important in deciding the optimal approach. We believe a multi-disciplinary team is best and the patient, patient advocate and their family's viewpoints are important contributors for shared decision-making.
- A patient-centered approach may reduce administrative burden, avoid care delays, and support the unique role of the physician/patient interaction. In alignment with personalized imaging, ASE also believes in high-quality testing.



What is the value of the collaboration to drug development and patient care?

- Echocardiography and ASE plays a critical role in accurate diagnosis, prognosis and monitoring of treatment for Heart Failure



AMP Heart Failure Inaugural Meeting Stakeholders

September 29, 2022



Faraz Ahmad, M.D., M.S.

Assistant Professor of Medicine (Cardiology) and Preventive Medicine (Health and Biomedical Informatics), Northwestern University

HeartShare Co-investigator, Data Translation Center

Dr. Faraz Ahmad is an Assistant Professor of Medicine-Cardiology and Preventive Medicine-Health and Biomedical Informatics and the Associate Director of the Bluhm Cardiovascular Institute Center for Artificial Intelligence at Northwestern Medicine. Dr. Ahmad's research interests are in the application of data science and digital health technologies to improve quality of care and patient-centered outcomes for patients with heart failure and other cardiovascular diseases. His work has received support from multiple organizations, including the National Heart, Lung, and Blood Institute, the American Heart Association, the Patient-Centered Outcomes Research Institute, the Heart Failure Society of America, and the Centers for Disease Control and Prevention. Dr. Ahmad is a practicing heart failure cardiologist who cares for patients across the spectrum of heart failure. He has a particular clinical interest in the diagnosis and management of patients with heart failure with preserved ejection fraction and with cardiac amyloidosis.



Aimee Ahmed

Director of Development, FNIH

Aimee Ahmed is a Director for Strategic Alliance and Advancement at the FNIH. With primary responsibility for the Cancer and Metabolic Disorders portfolio, she facilitates the public private partnerships that move research programs forward within the organization. She serves as the relationship manager for multiple funding partners who support activities at the FNIH. Her career has primarily focused on building relationships with and driving investment from private and philanthropic organizations and individuals to create, grow and sustain health programs. She has also spent time representing higher educational institutions to secure funding to support learners and faculty researchers. She joined the FNIH in 2021, after relocating to the greater Washington, DC area from Atlanta, GA, where she worked most recently with the Morehouse School of Medicine, after years of service to both the School of Public Health at Georgia State University and the CDC Foundation. Her experience has led her to be a strong advocate for health equity and an ally in efforts to diversify the health research workforce.



Lauren Balmert-Bonner, Ph.D.

**Assistant Professor of Preventive Medicine (Biostatistics) and Pediatrics, Northwestern University
HeartShare Core Leader, Data Management Core**

Dr. Lauren Balmert-Bonner is an Assistant Professor in the Department of Preventive Medicine, Division of Biostatistics, whose research interests lie in clinical trial design and analysis, connecting methodological developments with clinical applications. As a member of the Biostatistics Collaboration Center (BCC) and Northwestern University Data Analysis and Coordinating Center (NUACC), she facilitates and promotes scientific research as a collaborative biostatistician across a range of clinical fields including HIV maternal child health, gastroenterology, and pediatric medicine. She currently serves as the lead biostatistician for several studies: a cluster randomized trial assessing the effectiveness of a walking intervention on reducing frailty; a phase II pharmacodynamic study in patients with critical COVID19 pneumonia; and two concurrent trials comparing interventions for pediatric arm fractures. For the HeartShare Network, she serves as Data Management Core PI within the Data Translation Center.



Alain Bertoni, M.D., M.P.H.

**Professor, Epidemiology and Prevention, Wake Forest University
HeartShare Co-PI, Wake Forest Clinical Center**

Dr. Alain Bertoni trained at Johns Hopkins for his MD and MPH. He completed internal medicine residency at the Johns Hopkins Hospital. He is a board-certified general internist and epidemiologist whose primary research interests are in the areas of type 2 diabetes, metabolism, and obesity and their relationship to cardiovascular diseases, including heart failure. He has been at Wake Forest School of Medicine since 2001 and currently is Professor and Associate Director of Public Health Sciences. He has experience working on cohort studies (ARIC, Jackson Heart Study, and the Multi-Ethnic Study of Atherosclerosis (MESA)) as well as clinical trials. He is the current field center PI for MESA, and is a co-investigator for HeartShare, and the REHAB-HFpEF randomized trial.



Heidi Blythe, M.P.A.

Director of Development, FNIH

Heidi Blythe is a Director of Development in the FNIH's Strategic Alliance and Advancement Team. She joined the FNIH in 2019 and facilitates private partner engagement in FNIH team science and consortia efforts with a primary focus on opportunities in the Inflammation and Immunity and Neuroscience therapeutic areas, among other topics. With over two decades of experience in program creation, management and fundraising, she has worked for local, regional and national organizations in forging public-private partnerships.



Barry Borlaug, M.D.
Professor of Medicine and Director of Circulatory Failure Research, Mayo Clinic
HeartShare PI, Mayo Clinical Center

Dr. Barry Borlaug is Professor of Medicine and Director of Circulatory Failure Research in the Department of Cardiovascular Medicine at Mayo Clinic in Rochester, MN. He is an active clinical investigator interested in the fields of heart failure and pulmonary hypertension, with particular interest on the hemodynamic underpinnings of cardiac disease and exercise physiology. He is currently working to better understand the causes and mechanisms of heart failure and pulmonary vascular disease, and is active in a number of clinical trials developing and testing novel medical and device based therapies to improve outcomes for people with heart failure.



Michela Brambatti, M.D., M.Sc.
Director, Clinical Development, Ionis Pharmaceuticals, Inc.

Dr. Brambatti is a board-certified cardiologist and currently director in the Clinical Development department at Ionis Pharmaceuticals. Her work focuses on early and late phase drug development for cardiac amyloidosis, HF_rEF, and HF_pEF. Before joining Ionis, Dr. Brambatti worked in the Department of Medicine at the University of California San Diego where she made significant contributions in natural history studies and the early development of gene therapy for Danon Disease. She completed medical school and cardiology fellowship at the Marche Polytechnic University (Italy), a research fellowship in cardiovascular epidemiology at McMaster University (Canada), and an MS degree at the University of California, San Diego.



Javed Butler, M.D., M.P.H., M.B.A
Senior Vice President, Baylor Scott and White Health
Distinguished Professor of Medicine, University of Mississippi
HeartShare Steering Committee Co-chair

Dr. Butler is the President of the Baylor Scott and White Research Institute and Senior Vice President for the Baylor Scott and White Health. He is also the Distinguished Professor of Medicine at University of Mississippi in Jackson, MS. Prior to joining Baylor Scott and White Health, he served as the Patrick H. Lehan Chair in Cardiovascular Research, and Professor and Chairman of the Department of Medicine at the University of Mississippi, where he was also Professor of Physiology. Prior to joining the University of Mississippi, he was Charles A. Gargano Professor and Director of the Division of Cardiovascular Medicine and Co-Director of the Heart Institute at Stony Brook University, New York. He had served as the director for heart failure research at Emory University and director of the heart and heart-lung transplant programs at Vanderbilt University prior to that. He received his medical degree from the Aga Khan University and then completed residency training at Yale University, cardiology fellowship and advanced heart failure and transplant fellowships at Vanderbilt University, and cardiac imaging fellowship at the Massachusetts General

Hospital at the Harvard Medical School. He has completed Master of Public Health degree from Harvard University and a Master in Business Administration from the Emory University.

Dr. Butler is board certified in cardiovascular medicine and advanced heart failure and transplant medicine. His research interests focus on clinical trials in patients with heart failure. He serves on several national committees for the American College of Cardiology, American Heart Association, National Institutes of Health, and the Heart Failure Society of America. He is the recipient of the Simon Dack Award by the American College of Cardiology as well as the Time, Feeling, and Focus Award by the American Heart Association.

Dr. Butler has authored more than 900 peer-reviewed publications. He serves on the editorial board of several peer reviewed cardiovascular journals. He has been cited numerous times in America's Best Doctors list.



Cynthia Chauhan

Patient representative, Mayo Clinic

I am a fairly typical HFpEF patient: an older female with multiple comorbidities, some more debilitating and serious than others including stage IV kidney failure. My own extensive history of health issues gives me a deep understanding of the challenges patients face. I have been an active research advocate for twenty-two years and was an active support advocate for about fifteen years. I bring the patient voice and perspective to the research table and the research activity and agenda

to patients.

Heart failure can certainly be challenging and definitely impacts my other health issues.

To manage my condition, I am followed by a HFpEF specialist and his team and have implemented lifestyle changes including monitoring my fluid intake, weighing daily, eating a low sodium diet. I have participated in 11 clinical trials, most in heart failure, including a pericardiectomy and am currently considering my next trial.

Continuous research is important for those of us with heart failure so that we can live longer healthy lives. The way to move treatments forward is through clinical trials. Not all trials are successful, but all clinical trials move us down a path to success. In the U.S., heart failure affects more than 6 million people –slightly more than half of those people are living with HFpEF and currently have limited treatment options available to us. ,

And that all brings me to HeartShare which is an exciting new approach to research that will increase our understanding of the many faces of HFpEF, that chameleon condition that mimics others but has its own special deadly venom, and lead us to effective interventions. In contrast to how HFpEF collaborates with my comorbidities to limit and try to destroy me, HeartShare members collaborate to understand the phenotypes of HFpEF moving forward to targeted therapies with the understanding that in HFpEF one size does not fit all. With increased knowledge will come efficacious treatments.



Julio Chirinos, M.D., Ph.D.

**Associate Professor of Medicine, University of Pennsylvania
HeartShare PI, Penn Clinical Center**

Dr. Julio A. Chirinos is the Director of the Core Laboratory and an Associate Professor of Medicine at the University of Pennsylvania Perelman School of Medicine. Dr. Chirinos directs an established extramurally funded research program at Penn, focused on the non-invasive assessment of cardiac and arterial structure and function using a combination of imaging modalities (including echocardiography and cardiac MRI), in patients with or at risk for heart failure. The lab has particular expertise in assessing arterial stiffness and its impact on target organs, particularly the left ventricle. Dr. Chirinos also studies the effects of interventions to attenuate left ventricular hypertrophy, fibrosis and dysfunction. We have particular interest/experience in assessing the mechanistic effects of novel treatments for Heart Failure with Preserved Ejection Fraction. Dr. Chirinos has published over 150 scientific papers, chapters, reviews, and editorials. He has also participated in various working groups and guideline Committees for the American Heart Association, the European Society of Cardiology, the American Society of Hypertension, the American Society of Echocardiography, and the European Association of Cardiovascular Imaging.



Will Chutkow, M.D., Ph.D.

**Executive Director of Heart Failure Drug Discovery, Novartis
Institute for Biomedical Research**

Dr. William Chutkow is the Executive Director of Heart Failure Drug Discovery at the Novartis Institute for Biomedical Research, in the division of Cardiovascular Renal and Metabolism. Dr. Chutkow received his MD ('01) and PhD ('98) degrees from the University of Chicago, with a doctorate in Molecular Genetics and Cellular Biology. He completed clinical training in Cardiovascular Diseases at Brigham and Women's Hospital and joined the BWH and Veterans Health Care Systems clinical faculties in 2008 with academic appointments at the Harvard School of Medicine and Boston University School of Medicine. He joined NIBR in 2012 and has established expertise in all modalities of drug development, with an emphasis on nucleic acid therapies and the intersection between metabolic and cardiovascular diseases. He has maintained his clinical practice in cardiology at the West Roxbury VA hospital.



Jordana Cohen, M.D., M.S.C.E.

**Assistant Professor of Medicine and Epidemiology, University of
Pennsylvania
HeartShare Research Skills Committee Co-chair**

Dr. Jordana Cohen is an Assistant Professor of Medicine and Epidemiology in the Renal-Electrolyte and Hypertension Division and Department of Biostatistics, Epidemiology, and Informatics at the University of Pennsylvania, Perelman School of Medicine. She went to

medical school at Rutgers and completed her Internal Medicine residency at Boston University and her Nephrology fellowship at the University of Pennsylvania. She is the principal investigator of multiple NIH grants in which she leads translational studies evaluating the pharmacologic management and physiologic characteristics of hypertension in multimorbid patients. In addition to her role in HeartShare, she currently serves as Vice Chair of the American Heart Association Hypertension Science Committee, Co-Chair of the CRIC Study Blood Pressure Working Group, and Co-Chair of the American Medical Association's Blood Pressure Validated Device Listing.



Jason Duran, M.D., Ph.D.
**Associate Director of Clinical Development, Ionis
Pharmaceuticals, Inc.**

Dr. Duran is an advanced heart failure-trained cardiologist and Associate Director of Clinical Development at Ionis Pharmaceuticals. Dr. Duran completed his dual MD/PhD at Temple University in Philadelphia and then completed his clinical and postdoctoral training at UC San Diego. His past research focused on cardiac regeneration, targeted gene therapies for cardiomyopathy, and the effects of COVID-19 infection on the heart. Dr. Duran led the cardiovascular biobank at

UC San Diego and founded the COVID-19 human tissue biobank for advanced genomics research at the start of the pandemic.



Akshay Desai, M.D., M.P.H.
**Medical Director, Cardiomyopathy and Heart Failure Program,
Advanced Heart Disease Section, Brigham and Women's
Hospital, and Associate Professor, Harvard Medical School
HeartShare Co-PI, Mass General Brigham Clinical Center**

Dr. Akshay Desai is the Director of the Cardiomyopathy and Heart Failure Program in the Advanced Heart Disease Section of the Cardiovascular Division, Brigham and Women's Hospital and an

Associate Professor of Medicine at Harvard Medical School (both in Boston, Massachusetts). He received his undergraduate education at Princeton University, where he graduated Summa Cum Laude in 1992 with an A.B. in Public and International Affairs. He was subsequently awarded a Rhodes Scholarship for study at Oxford University, where he completed an M. Phil. in European Politics and Society at Balliol College in 1994. Following on this, he began his medical training at Harvard Medical School where he was awarded the M.D. degree in 1998. He completed his internship and residency in Internal Medicine at Brigham and Women's Hospital in 2001 and subsequently elected to pursue fellowship training in Cardiovascular Medicine at the same institution. During the final years of subspecialty training in cardiology, he completed additional fellowship training in Heart Failure and Transplantation under the direction of Dr. Lynne Stevenson. Concurrently, he conducted translational research in vascular medicine and diastolic heart failure under the supervision of Dr. Mark Creager. He was awarded an M.P.H. in 2004 from the Harvard School of Public Health. He currently divides his time between clinical care of patients with advanced heart disease and clinical research in cardiovascular clinical trials, with an emphasis on

the pathophysiology, pharmacologic treatment, and ambulatory management of patients with heart failure.



Ahmed Fayyaz, M.D.
Postdoctoral Fellow, Mayo Clinic
HeartShare Research Skills Trainee

Dr. Ahmed U. Fayyaz is a postdoctoral fellow in Dr. Margaret M. Redfield's laboratory, and a second-year Ph.D. student in Clinical and Translational Science, with a particular focus on contemporary biology and machine-learning tools, at Mayo Clinic, Rochester MN. Immediately after graduating from medical school in his native Pakistan, Dr. Fayyaz came to Mayo Clinic as research trainee in cardiovascular pathology division and learned basic cardiovascular and autopsy pathology from distinguished Mayo cardiovascular pathologists, Drs. William D. Edwards, and Joseph J. Maleszewski. At the completion of this appointment, Dr. Redfield hired Dr. Fayyaz to head a collaborative project regarding human pulmonary vascular remodeling in pulmonary hypertension related to heart failure. During his postdoctoral training at Dr. Redfield's lab and collaborating with Dr. Barry A. Borlaug and Dr. Surendra Dasari, Dr. Fayyaz continues to learn and gain expertise in tissue research, spatial omics technologies, bioinformatics and computational biology, machine-learning, generating translational large animal models, and circulatory hemodynamics. His work has resulted in publications related to pulmonary hypertension, cardiac amyloidosis and HFpEF in peer-reviewed journals: *Circulation*, *JAMA Cardiology* and *Cardiovascular Research* etc. Currently Dr. Fayyaz is working on delineating the pathobiology of development of HFpEF and pulmonary vascular remodeling secondary to pulmonary hypertension due to left heart diseased using both human cardiopulmonary tissue and experimental translational animal models through spatial multi-omics technologies and hopes to find therapeutic targets for further translational research.



Mark Drazner, M.D., M.Sc., FHFSA
President, HFSA
Clinical Chief of Cardiology, University of Texas Southwestern Medical Center

Mark H. Drazner, MD, MSc is the Clinical Chief of Cardiology and holds the James M. Wooten Chair in Cardiology at University of Texas Southwestern Medical Center. His research interests include the utility of the clinical examination in heart failure and the progression from cardiac hypertrophy to failure. He currently serves on the Heart Failure Society of America Board of Directors and Executive Committee. He was the inaugural recipient of the L. David Hillis Award for Excellence in Teaching from the UT Southwestern Cardiology Fellowship program. In 2018, he received the Laennec Master Clinician Award from the AHA.



Hanna Gaggin, M.D., M.P.H.

**Assistant Professor of Medicine, Massachusetts General Hospital
HeartShare Research Skills Trainee**

Dr. Hanna Gaggin is a general cardiologist, educator and clinical investigator at Massachusetts General Hospital and Harvard Medical School. She is interested in single and multi-center clinical trials to evaluate heart failure with a focus on heart failure with preserved ejection fraction and cardiac amyloidosis phenotypes. She is a member of the Cardiovascular Medicine Section Leadership Council in the Cardiology Division and the Subspecialty Core Educator for the Internal Medicine residency at Massachusetts General Hospital. Dr. Gaggin graduated from the Eastern Virginia Medical School in 2003. She completed her Internal Medicine residency at the University of Virginia Health System, followed by an MPH at Harvard School of Public Health with a concentration in Quantitative Methods in 2007. She completed her clinical cardiology fellowship at the University of Pittsburgh Medical Center and clinical research fellowship at MGH and joined the faculty at Massachusetts General Hospital and Harvard Medical School in 2012.



Julie Louise Gerberding, M.D., M.P.H.

Chief Executive Officer, FNIH

Dr. Julie Louise Gerberding is the Chief Executive Officer of the Foundation for the National Institutes of Health (FNIH). The FNIH creates and manages research alliances with public and private institutions in support of the mission of the NIH to enhance health, lengthen life, and reduce illness and disability. The FNIH works with its partners to accelerate biomedical research that addresses some of the most pressing health challenges in the United States and across the globe.

Formerly, Dr. Gerberding was Executive Vice President and Chief Patient Officer at Merck & Co., Inc., where she was responsible for patient engagement, strategic communications, global public policy, population health, and corporate responsibility. She joined Merck in 2010 as President of Merck Vaccines to help increase global access to important vaccines among those who need them most.

Dr. Gerberding was Director of the United States CDC from 2002-2009, where she led the agency through more than 40 emergency responses to public health crises, including SARS in 2003. She currently co-chairs the CSIS Commission on Strengthening America's Health Security and is a board trustee at Mayo Clinic and Case Western Reserve University and serves as a board director for HilleVax, Afternext Health Tech, and SummerBio.

Dr. Gerberding has received more than 50 awards and honors, including the United States Department of Health and Human Services (DHHS) Distinguished Service Award for her leadership in responses to anthrax bioterrorism and the September 11, 2001 attacks. In 2018, she was selected as the Healthcare Businesswomen Association's Woman of the Year.

Dr. Gerberding received her undergraduate and M.D. degrees from Case Western Reserve University (CWRU). She completed her internship and residency in Internal Medicine and

fellowship in Clinical Pharmacology and Infectious Diseases at the University of California, San Francisco (UCSF) and is board certified in Internal Medicine and Infectious Diseases. She served as a tenured member of the infectious diseases faculty at UCSF and the hospital epidemiologist at San Francisco General Hospital and is currently an Adjunct Associate Professor of Medicine at UCSF and an Adjunct Professor of Medicine at CWRU. Dr. Gerberding received a Masters of Public Health at the University of California, Berkeley. She is a member of the National Academy of Medicine, a member of the Council on Foreign Relations, and a fellow of the Infectious Diseases Society of America and the American College of Physicians.



Gary H. Gibbons, M.D.
Director, NHLBI

Gary H. Gibbons, M.D., is Director of the National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health (NIH), where he oversees the third largest institute at the NIH, with an annual budget of approximately \$3 billion and a staff of nearly 2,100 federal employees, contractors, and volunteers. NHLBI provides global leadership for research, training, and education programs to promote the prevention and treatment of heart, lung, and blood diseases and

enhance the health of all individuals so that they can live longer and more fulfilling lives.

Since being named Director of the NHLBI, Dr. Gibbons has enhanced the NHLBI investment in fundamental discovery science, steadily increasing the payline and number of awards for established and early stage investigators. His commitment to nurturing the next generation of scientists is manifest in expanded funding for career development and loan repayment awards as well as initiatives to facilitate the transition to independent research awards.

Dr. Gibbons provides leadership to advance several NIH initiatives and has made many scientific contributions in the fields of vascular biology, genomic medicine, and the pathogenesis of vascular diseases. His research focuses on investigating the relationships between clinical phenotypes, behavior, molecular interactions, and social determinants on gene expression and their contribution to cardiovascular disease. Dr. Gibbons has received several patents for innovations derived from his research in the fields of vascular biology and the pathogenesis of vascular diseases.

Dr. Gibbons earned his undergraduate degree from Princeton University in Princeton, N.J., and graduated magna cum laude from Harvard Medical School in Boston. He completed his residency and cardiology fellowship at the Harvard-affiliated Brigham and Women's Hospital in Boston. Dr. Gibbons was a member of the faculty at Stanford University in Stanford, CA, from 1990-1996, and at Harvard Medical School from 1996-1999. He joined the Morehouse School of Medicine in 1999, where he served as the founding director of the Cardiovascular Research Institute, chairperson of the Department of Physiology, and professor of physiology and medicine at the Morehouse School of Medicine, in Atlanta. While at Morehouse School of Medicine, Dr. Gibbons served as a member of the National Heart, Lung, and Blood Advisory Council from 2009-2012.

Throughout his career, Dr. Gibbons has received numerous honors, including election to the Institute of Medicine of the National Academies of Sciences; selection as a Robert Wood Johnson

Foundation Minority Faculty Development Awardee; selection as a Pew Foundation Biomedical Scholar; and recognition as an Established Investigator of the American Heart Association (AHA).



Claudio Gimpelewicz, M.D.

Senior Global Program Clinical Head, CRVM, Novartis AG

Dr Claudio Gimpelewicz is Sr Global Program Clinical Head at the CVRM (cardiovascular renal and metabolism) Development Unit at Novartis Pharma Clinical Global Drug Development (GDD) department.

He received his MD “Honor” diploma at Buenos Aires University, Argentina (1985) and completed his cardiology residence at the Cardiology Department of the Argerich Hospital in Buenos Aires where he also served as instructor of residents (1985-991). He is a certified cardiologist (Argentine Society of Cardiology) and completed a postgraduate course in marketing at San Andres University Buenos Aires (Argentina).

Prior to joining Novartis, he took different positions at the Medical Department in Pfizer Argentina and Pfizer LATAM (1995-2001) where he led several medical initiatives. He joined Novartis Global in Basel Switzerland in 2002 where he assumed positions of increasing responsibility in the CVRM DU, including the completion of outcomes trials in the CV filed (e.g LIPS, ALERT) and submission activities (fluvastatin indications extension and vildagliptin-metformin combination).

Since 2008 he has been responsible of several outcome studies in the heart failure field (e.g aliskiren program ATMOSPHERE and ASTRONAUT). From 2013-2017 he lead the design, execution and reporting of the RLX AHF 2 trial.

Since 2017 he works as medical representative in the CVRM area at the Early Development Global Project Team focus on heart failure and arrhythmias initiatives; in close collaboration with early development project teams at Novartis Institute of Biomedical Research (NIBR). He has represented Novartis AG in different regulatory interactions, participated in several multidisciplinary CV initiatives and is co-author of several papers published in peer review journals.



David Calvin Goff Jr., M.D., Ph.D., FACP, FAHA

Director, Division of Cardiovascular Sciences, NHLBI

David C. Goff, Jr., M.D., Ph.D., is Director, Division of Cardiovascular Sciences, National Heart, Lung, and Blood Institute, National Institutes of Health. In this role, he leads a diverse team of scientists and administrators committed to turning discovery into cardiovascular health. Prior to joining the NHLBI, he served as Dean and Professor of Epidemiology in the Colorado School of Public Health and as Chair of the Department of Epidemiology and Prevention at the Wake Forest School of Medicine. He received an MD from the University of North Carolina and a PhD in epidemiology from the University of Texas-Houston School of Public Health. He trained in internal medicine at Baylor College of Medicine in Houston. He is an elected member of the American Epidemiological Society, and a Fellow of the American College of Physicians and

the American Heart Association. He has published over 300 manuscripts, book chapters, and other scientific reports. The major focus of his research has been on developing, testing, and implementing better strategies for promoting cardiovascular health and preventing CVD.



Bret Goodpaster, Ph.D.
**Senior Investigator and Scientific Director, AdventHealth
Translational Research Institute**
HeartShare Biopsy Core Lab Co-PI

Dr. Bret Goodpaster is a Senior Investigator and Scientific Director at the AdventHealth Translational Research Institute (TRI). Dr. Goodpaster's primary research is in the pathophysiology of human obesity, insulin resistance, and diabetes, and to help decipher biological mechanisms underlying the health benefits of exercise. He has received a number of awards and honors for his work, including the Nathan Shock Award from the National Institute of Aging in 2008, for his work investigating the role of muscle fat infiltration in aging and muscle quality. He is particularly well known for "the athlete's paradox" which has shifted the paradigm in Type 2 diabetes research to investigate, how and why does fat accumulation in muscle cause insulin resistance in some subjects but not others? Dr. Goodpaster has published over 270 peer-reviewed papers, review articles and book chapters, and his papers have received more than 34,000 citations (h-index 91). He has served on Editorial Boards for Diabetes, the American Journal of Physiology, and the Journals of Gerontology, and served as Associate Editor for both Obesity and Diabetologia. He has also served on several NIH grant review panels as well as the American Diabetes Association. Dr. Goodpaster obtained a B.S. in Biology from Purdue, and after completing a Pre-doctoral Fellowship at Maastricht University in the Netherlands, received his Ph.D. in Human Bioenergetics from Ball State University in 1995.



Philip Greenland, M.D.
**Harry W. Dingman Professor of Cardiology and Professor of
Preventive Medicine, Northwestern University**
HeartShare Research Skills Committee Co-chair

Dr. Phil Greenland is the Harry W. Dingman Professor of Cardiology and Professor of Preventive Medicine at Northwestern University's Feinberg School of Medicine and a Senior Editor for JAMA. He held previous positions as Department Chair of Preventive Medicine at Northwestern, Executive Associate Dean for Clinical and Translational Research, and Director of Northwestern's Clinical and Translational Sciences Institute. He has been actively engaged as a cardiovascular epidemiologist in the MESA Study, the CARDIA Study, the Women's Health Initiative, the Chicago Heart Association Detection Project in Industry, and the Chicago Western Electric Study. He is a longstanding member of the NHLBI Observational Study Monitoring Board for the Framingham Heart Study and was a long-term member of the Board of External Experts of the NHLBI. Dr. Greenland's research has helped to shape cardiovascular care guidelines around the world. His work, which has been cited thousands of times, was among the first to reveal that women are more likely to die from heart attacks than men, and his studies illustrated that major risk factors almost always precede heart attacks, overcoming the "50% myth." He has also contributed to enhanced diagnostic and preventive care, showing the importance of coronary calcium scanning for cardiovascular disease risk prediction. He has been

recognized multiple times as a Thomson Reuters Highly Cited Researcher in clinical medicine. He is an elected member of the Association of American Physicians and an elected Fellow of the Royal College of Physicians (London). He is also an elected Fellow of the American Heart Association, the American College of Cardiology, and the European Society of Cardiology. He has received distinguished national awards for his research, his teaching, and his mentoring from the Association of American Medical Colleges, American College of Physicians, National Institutes of Health, Society for Cardiovascular Computed Tomography, American Society for Preventive Cardiology, and the American Heart Association.



Jennifer Hall, Ph.D., FAHA
Chief of Data Science and Analytics

Dr. Jennifer Hall is the Chief of Data Science and Analytics at the American Heart Association. She leads the Association's groundbreaking initiatives in cardiovascular medicine by leveraging data analysis, new technologies and strategic alliances that integrates real-world data and accelerates the development of innovative solutions to prevent or mitigate the impact of chronic diseases.

Dr. Hall leads a highly diversified team of experts in data science, health research, metrics and evaluation, health technology and products. These powerful factors come together to drive new evolutions in science through the Association's Precision Medicine Platform, a cloud-based technology solution that empowers the global medical research community to accelerate breakthroughs in cardiovascular and brain diseases. Dr. Hall also directs the open data initiative of AHA data including the Get With the Guideline Registry data and Research Goes Red initiative, which calls on women throughout the U.S. to contribute to health research. Dr. Hall oversees a diversified research grant portfolio focused on funding impactful and groundbreaking areas of health research. Since 2013, the Institute has invested more than \$35 million and over 100 grant awardees ranging from collaborative teams of geneticists and engineers to data scientists and imaging experts.

Dr. Hall is an adjunct professor at the University of Minnesota and has served on numerous national and international committees. She is the past Chair of the Functional Genomics and Translational Biology Council of the American Heart Association and was the founding editor-in-chief of the Journal of Cardiovascular Translational Research.



Anna Hemnes, M.D.
Associate Professor of Medicine, Division of Allergy, Pulmonary, and Critical Care Medicine, Vanderbilt University

Dr. Anna Hemnes is a translational physician-scientist with a research focus on the role of altered metabolism in pulmonary vascular disease. Her basic research is on the effect of BMPR2 mutation on insulin-mediated intracellular signaling in the pulmonary vasculature and the right ventricle. Her clinical research interests include the role of insulin resistance and metabolic syndrome in human pulmonary vascular

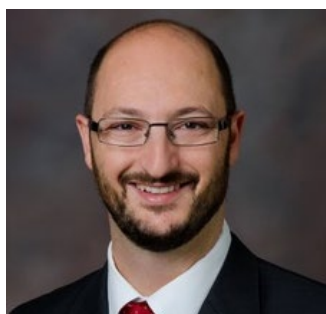
disease with a focus on genetic susceptibility to these conditions, and deep molecular phenotyping of pulmonary vascular disease. This interest in molecular phenotypes of pulmonary vascular disease has led to her prior work demonstrating an Omic signature of vasodilator-responsive pulmonary arterial hypertension, one of the earliest publications demonstrating the feasibility of precision medicine in an ultra-rare pulmonary vascular disease. Dr. Hemnes' lab is now actively investigating novel blood-based Omic predictive strategies for FDA-approved therapies for pulmonary arterial hypertension. She actively sees patients in the Vanderbilt Center for Pulmonary Vascular Disease and have effectively worked with this population to recruit into clinical studies for pulmonary vascular disease, including the treatment of pulmonary hypertension, diagnostic modalities in pulmonary vascular disease and novel classification of pulmonary vascular disease. Her lab has a unique and powerful capacity to study molecular mechanisms of pulmonary vascular disease and right heart dysfunction in studies spanning cell culture and rodent models through human translational studies and clinical trials.



Leighton T. Izu, Ph.D.

Professor of Pharmacology, University of California, Davis

Dr. Leighton T. Izu was born and raised on a coffee farm in Hawaii and studied hard to avoid needing to pick coffee for the rest of his life. He is now Professor of Pharmacology at UC Davis and Faculty in the Graduate Group in Applied Mathematics. He now picks coffee only when he chooses to. He became interested in human behavior in high school so he majored in psychology and math at the University of Hawaii. There he used linear algebra to decompose behavior into simpler components, the eigenbehaviors. In graduate school at SUNY Buffalo he realized humans were too complex so he worked on something simpler, the heart. Dr. Izu's research has been primarily on understanding the calcium control system of the heart first in isolation and more recently when it interacts with the contractile system. While preparing math lectures on the singular value decomposition (SVD) he realized how he can use it to understand how parts are coordinated in a complex system such as hearts, wines, and human diseases. The Functional Connectome, which grew out of these lectures, will be used to analyze data from HeartShare to answer the question: How do subclasses of HFpEF differ? The Functional Connectome is eerily similar to Dr. Izu's analysis of human behavior done as an undergraduate.



Stephen B. Heitner, M.D., FACC, FASE

Vice President of Clinical Research and Therapeutic Area Lead, Cytokinetics, Inc.

Stephen B. Heitner, M.D, is the Vice President of Clinical Research and Therapeutic Area Lead in Cardiovascular Medicine at Cytokinetics, a biotechnology company based in South San Francisco. Dr. Heitner joined Cytokinetics in March 2020 with his primary responsibility being the development of *omecamtiv mecarbil* for the treatment of heart failure with reduced ejection fraction, and *aficamten* for the treatment of hypertrophic cardiomyopathy. As part of his duties, he also oversees the early development pipeline with candidate molecules that target heart failure with preserved ejection fraction as well as other forms of cardiomyopathies. Prior to joining Cytokinetics, Dr. Heitner served as an Associate Professor of Medicine at the Oregon Health & Sciences University in Portland OR for 9 years. It was here where

he developed a passion for treating patients with hypertrophic cardiomyopathy and cardiac amyloidosis, as well as striving to develop novel therapies to help treat these devastating diseases. He pioneered the first multidisciplinary clinics for both hypertrophic cardiomyopathy and cardiac amyloidosis, as subsequently formed a clinical research initiative to bring novel therapies to his patients. Dr. Heitner received his MBCh from the University of Witwatersrand in Johannesburg South Africa, prior to completing his residency at Albert Einstein Medical Center, and his fellowship at the University of Medicine and Dentistry, New Jersey (Cooper University Hospital).



Judy Hung, M.D., FASE

**Director of the Echocardiography Section, Division of Cardiology
Director of the Division of Clinical Research, Massachusetts
General Hospital**

Dr. Judy Hung is Director of the Echocardiography Section within the Division of Cardiology and Director of the Division of Clinical Research at Massachusetts General Hospital, Boston, MA. She is a Professor of Medicine at Harvard Medical School. A graduate of Tufts Medical school, she completed general cardiology and advanced echocardiography fellowship at Massachusetts General Hospital and became a staff faculty within the Division of Cardiology at MGH since 1998. Her research focus is on understanding mechanisms of valvular heart disease using noninvasive imaging tools such as 3D echocardiography, strain imaging and flow convergence quantitative methods. She is on the Steering Committee and directs the echocardiographic core laboratory for the NIH/NHLBI Cardiothoracic Surgical Network PRIMARY clinical trial (<https://clinicaltrials.gov/ct2/show/NCT05051033>) and is a Past President of the American Society of Echocardiography. She has published extensively on cardiovascular mechanisms of disease and has received research funding from NIH, Foundations and Industry.



Mariell Jessup M.D., FACC, FAHA, FESC

**Chief Science and Medical Officer, American Heart Association®,
AHA
Emeritus Professor of Medicine, University of Pennsylvania
School of Medicine**

Dr. Jessup is Chief Science and Medical Officer of the American Heart Association and an Emeritus Professor of Medicine at the University of Pennsylvania School of Medicine. She has spent her career in the investigation and management of patients with heart failure before coming to the AHA.

Dr. Jessup served as a member of the committee for ACC/AHA Guidelines for the Management of Heart Failure from 2001-2017. She served on the European Society of Cardiology's Heart Failure Guideline writing committee as well. She has served as the Chair of the American Board of Internal Medicine's (ABIM) Cardiovascular Board; for two years as the Chair of the Committee for Scientific Sessions Program of the AHA; completed a 4-year term on the Residency Review Committee-Internal Medicine of the ACGME, and a 6-year term on the ABIM's Cardiovascular

Board. She joined the Board of the Advanced Heart Failure and Transplant cardiology secondary subspecialty, and became Chair for two years.

She was a member of the Board of Directors of the national AHA, and President from 2013-2014. She was the inaugural Chief Scientific Officer of the Leducq Foundation from January 2017 through August of 2018, before moving to the American Heart Association role.



Jamie Justice, Ph.D.

**Assistant Professor, Gerontology and Geriatric Medicine, Wake Forest University
HeartShare Biopsy Core Lab Co-PI**

Dr. Jamie Justice is an Assistant Professor in Internal Medicine Section on Gerontology and Geriatrics at Wake Forest University School of Medicine, Sticht Center for Healthy Aging and Alzheimer's Prevention, and Leader of the NIA-supported WF Pepper Center's Integrative Biology Core. Dr. Justice obtained a M.S. and Ph.D. in Integrative Physiology at University of Colorado Boulder (UCB), a postdoctoral fellowship at UCB in Integrative Physiology of Aging with Dr. Douglas Seals, and a second fellowship at Wake Forest with Drs. Stephen Kritchevsky and Barbara Nicklas, before transitioning to faculty. Jamie's research is within the emerging field of geroscience, and she works to evaluate the functional role of biological processes underlying human aging. This includes: 1) developing a biomarker framework for geroscience trials, including the NIA-supported Healthy Aging and Late-Life Outcomes planning grant (HALLO-P), and the proposed trial Targeting Aging with METformin (TAME); and 2) investigating the functional consequences and therapeutic potential of cellular senescence in aging and age-related chronic disease. The latter includes multisite research and deep phenotyping of skeletal muscle and adipose tissue to evaluate biological aging hallmarks like cellular senescence as an investigator on the NIA-funded Study of Muscle Mobility and Aging (SOMMA), the SOMMA adipose tissue ancillary, and the NIH Common Fund Cellular Senescence Network (SenNet)'s Tissue Mapping Center for skeletal muscle. She serves on the Editorial Boards for Journals of Gerontology, GerioScience, and eLIFE. Jamie's work is funded through the NIA and American Federation for Aging Research. She is recipient of the Jarrahi Research Scholars Fund in Geroscience Innovation, the 2022 Vincent Cristofalo Rising Star in Aging Research Award, and the 2022 NIA Nathan Shock New Investigators Award.



Tania Kamphaus, M.Sc., Ph.D.

Director, Metabolic Disorders Portfolio of Research Partnerships, FNIH

In her role, Dr. Kamphaus is responsible for developing new multi-stakeholder public-private partnerships in metabolic disorders that include stakeholders at NIH, FDA, non-profits and biopharmaceutical industry. Dr. Kamphaus oversees the Metabolic Disorders Research Partnerships at FNIH, including target validation programs within Accelerating Medicines Partnerships in Common Metabolic Diseases (AMP CMD), Heart Failure (AMP HF), and Type 2 Diabetes (AMP T2D, recently closed). She also oversees the projects under the Metabolic Disorders Biomarkers Consortium (MDSC) including biomarker qualification efforts in nonalcoholic steatohepatitis (NASH), bone quality, heart failure, cachexia and emerging programs in reproductive health and digital biomarkers. Dr. Kamphaus is

trained in molecular genetics, molecular and cell biology and skilled in strategic planning and collaborative program development across basic, translational and clinical research. Prior to joining the FNIH, Dr. Kamphaus was the Director of the Office of Clinical Protocol Development at the University of Wisconsin-Madison, where she supported development of large clinical trial protocols ranging from interventional and observational studies to implementation and dissemination studies. Before her work in clinical trials, Dr. Kamphaus was the Director of Collaborative Research at the Crohn's and Colitis Foundation where she was responsible for developing flagship programs like IBD Plexus, Gut Microbiome, and the IBD Genetics Initiative. Dr. Kamphaus conducted her postdoctoral fellowship at Columbia University at the department of Pathology and Cell Biology. She earned her PhD in Molecular Genetics from The Ohio State University and her Master in Biotechnology from Madurai Kamaraj University, India.



Sadiya Khan, M.D., M.Sc.

**Assistant Professor of Medicine (Cardiology) and Preventive Medicine (Epidemiology), Northwestern University
HeartShare PI, Northwestern Clinical Center**

Dr. Sadiya Khan received her medical degree from the Feinberg School of Medicine at Northwestern University in 2009 as part of the Honors Program in Medical Education. She completed her internship and residency in Internal Medicine at Northwestern University Feinberg School of Medicine in Chicago, IL in 2012 and then served as Chief Medical Resident from 2012-2013. She also obtained her master's degree in Clinical Investigation from the Northwestern University Graduate School in 2014. Dr. Khan completed her fellowship in cardiovascular diseases at Northwestern in 2016 followed by a post-doctoral fellowship in cardiovascular epidemiology in 2017 before joining the Northwestern faculty. She has received multiple awards for excellence in research, teaching, and patient care.



Abel Kho, M.D.

**Director, Institute for Public Health and Medicine - Center for Health Information Partnerships; Director, Institute for Augmented Intelligence in Medicine; Professor of Medicine and Preventive Medicine, Northwestern University
HeartShare Co-PI, Data Translation Center**

Dr. Abel Kho is an Internist and Professor of Medicine and Preventive Medicine in the Northwestern University Feinberg School of Medicine where he is the Founding Director of both the Center for Health Information Partnerships (2015) and the Institute for Augmented Intelligence in Medicine (2020). His research focuses on developing regional Electronic Health Record (EHR) enabled data sharing platforms for a range of health applications including high throughput phenotyping, cohort discovery, estimating population level disease burden, and quality improvement. He has served as Principal Investigator for over \$80M in external funding, published over 100 manuscripts, and mentored numerous students and trainees. He is an internationally recognized expert in privacy preserving record linkage, having published the first large scale real-world application of this method for which he was assigned a patent, and co-founded a startup which was subsequently

acquired by Datavant. He is an elected Fellow of the American College of Medical Informatics and recipient of the Donald A.B. Lindbergh Award for Innovation in Informatics.



Dalane Kitzman, M.D.
Professor of Cardiovascular Medicine and
Geriatrics/Gerontology, Wake Forest University
HeartShare Co-PI, Wake Forest Clinical Center

Dr. Dalane W. Kitzman is a Professor of Cardiovascular Medicine and Geriatrics/Gerontology at Wake Forest School of Medicine, and the Kermit G. Phillips II Endowed Chair in Cardiovascular Medicine. His career focus is understanding and treating the severe physical dysfunction associated with cardiovascular disease in older persons, particularly heart failure with preserved ejection fraction (HFpEF). He published one of the earliest descriptions of HFpEF and one of the first mechanistic phenotyping studies in the disorder. His work has contributed significantly to advancing our understanding of the pathophysiology and treatment of HFpEF, particularly the pivotal outcome of the severe exercise intolerance experienced by these patients. His team reported the first randomized controlled trials of exercise training and dietary weight loss in HFpEF, which remain among the few proven interventions for exercise intolerance in HFpEF.

Dr. Kitzman has received many awards for his original research, including the prestigious MERIT award from NIH, and the Michael L. Pollack Established Investigator Award from AACVPR. He has served in key/leadership positions for >30 clinical trials, most of them focussed on HF, contributed to 5 large, NIH-funded population studies, and served on and chaired many NIH and other national committees. Dr. Kitzman is Associate Editor for JAGS and Consulting Editor for JACC:HF, has authored nearly 500 peer-reviewed publications, and successfully mentored ~30 early career investigators toward independence.



Adrienne Kline, M.D., Ph.D.
Postdoctoral Scholar, Northwestern University
HeartShare Research Skills Trainee

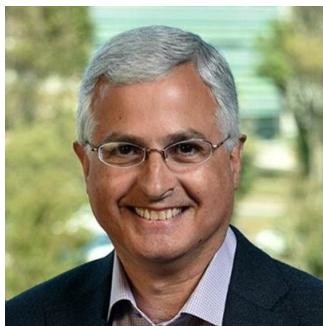
Dr. Adrienne Kline is a postdoctoral fellow in the Department of Preventative medicine at Northwestern University. Prior to this, she completed her Ph.D. in biomedical engineering, an M.D. in medicine, preceded by a B.Sc. in electrical engineering. Her interests lie at the intersection of medicine and engineering, specifically in leveraging algorithmic decision-making (machine learning/artificial intelligence) support for translational applications to medicine. Her work has led to the development of novel methods for handling missing data, innovative metrics for evaluating the reliability of machine learning predictions, and information fusion of multimodal data streams. With an emphasis on structural data, computer vision, reinforcement learning and generative algorithms, she hopes to change the efficiency and reliability with which medicine is practiced.



Yuan Luo, Ph.D.

**Associate Professor of Preventive Medicine (Health and Biomedical Informatics), Northwestern University
HeartShare Co-PI, Data Translation Center**

Dr. Yuan Luo is currently Associate Professor at Department of Preventive Medicine, at Feinberg School of Medicine in Northwestern University. He is Chief AI Officer at Clinical and Translational Sciences Institute (NUCATS) and Institute for Augmented Intelligence in Medicine. Dr. Luo earned his PhD degree from MIT EECS with a math minor. He is a Fellow of American Medical Informatics Association (AMIA). He won the American Medical Informatics Association (AMIA) New Investigator Award in 2020. Dr. Luo has been developing a novel suite of accurate, interpretable and generalizable models to integrate multi-modal health data (e.g., clinical and insurance claims data) for improving health care practice and advancing medical knowledge. He has been leading major research initiatives with >\$10M in grant support, and has published over 100 peer-reviewed papers. His publications appear in leading journals including Nature Medicine, JAMA, AJRCCM, Circulation: Heart Failure, JAMIA, JBI etc. He has published in and/or served as PC members for top AI and informatics conferences including AAAI, KDD, CVPR, ACL etc. He has also been invited to give more than 50 keynotes and guest lectures at many top universities, think tanks, societies, industry labs.



Fady Malik M.D., Ph.D., FACC, FHFA

**Executive Vice President of Research and Development,
Cytokinetics, Inc.**

Fady I. Malik, M.D., Ph.D., is the Executive Vice President of Research and Development at Cytokinetics, a biotechnology company based in South San Francisco. Dr. Malik has been with Cytokinetics since its inception in 1998, in a variety of roles, including Vice President, Biology and Therapeutics, all focused towards building the company's cardiovascular and muscle therapeutic programs. Since 2000, Dr. Malik has held an appointment in the Cardiology Division of the University of California, San Francisco, where he is currently a Clinical Professor of Medicine and formerly was an Attending Interventional Cardiologist at the San Francisco Veterans Administration and UCSF Medical Centers. Dr. Malik received a B.S. in bioengineering from the University of California at Berkeley, and a M.D./Ph.D. from the University of California at San Francisco where he also completed an internal medicine residency and fellowship in cardiology.



Mike Mendelson, M.D., Sc.M.

Director, Translational Medicine and Data Science, Novartis Institutes for Biomedical Research

Michael Mendelson, MD, ScM, is a physician - data scientist in the Translational Medicine, Cardiovascular Disease and Metabolism program at the Novartis Institutes of Biomedical Research. Dr. Mendelson is a pediatric cardiologist, formerly in the Preventive Cardiology Program at Boston Children's Hospital, Harvard Medical School. He obtained his medical degree from the University of Manitoba medical school, followed by a pediatrics residency at the Montreal Children's Hospital, McGill University, and a cardiology fellowship at SickKids Hospital, University of Toronto. He then completed a preventive cardiology senior fellowship at Boston Children's Hospital, Harvard Medical School and completed a Master of Science degree in Epidemiology from the Harvard School of Public Health. This was followed by a research fellowship with the Framingham Heart Study, Boston University in cardiovascular epidemiology and a subsequent research fellowship in molecular epidemiology with the intramural research program of the National Heart, Lung, and Blood Institute.



Joseph P. Menetski, Ph.D.

Vice President of Research Partnerships, FNIH

Dr. Menetski received his Ph.D. from Northwestern University Medical School with Dr. Stephen Kowalczykowski and completed his post-doctoral training at the Laboratory of Molecular Biology, National Institutes of Health (NIH/NIDDK) with Dr. Martin Gellert. He then started his career in industry in 1993 in the Immunopathology Department at Parke-Davis (later Pfizer), where he established a discovery research program in cellular inflammation that eventually transitioned to the molecular study of osteoarthritis. Joseph moved to Merck in 2004. While at Merck he has been a member of the Department of Immunology, the Molecular Profiling group, the Knowledge Discovery and Knowledge Management group and finally Director in Global Competitive Intelligence. Currently, Joseph manages several of the Research Partnerships within the group (including the Alzheimer's Disease Neuroimaging Initiative, the Biomarkers Consortium and the Accelerating Medicines Partnership).



Sam Mooney

Communications Officer, FNIH

As a communications and multimedia professional, Sam anticipates, and project manages the communications needs of his FNIH colleagues. Supporting all of the Accelerating Medicines Partnership® (AMP®) programs, as well as the Cancer and Inflammation & Immunity teams, Sam works with both colleagues and external contractors alike to navigate the communications goals for the projects under those programs – social media, press releases, email newsletters, webpages, etc. For AMP® Heart Failure, Sam drafted both the press release and webpage for the program,

supported the creation of the refurbished amphf.org, and continues to assist with social media and email outreach.

Sam holds a BA in Journalism from Indiana University, has extensive communications and regulatory knowledge working for companies like Charles River Laboratories, Eli Lilly and CNBC, and has experience interacting with government agencies such as the FDA, MHRA, EMA, USDA and Health Canada. While at Charles River Laboratories, Sam was honored in 2021 with the Charles River Value Award for the development and publication of interactive newsletters on the topics of Cell & Gene Therapy and Predictive Toxicology.



Adam Mullick, Ph.D.

Vice President of Cardiovascular and Renal Drug Discovery, Ionis Pharmaceuticals, Inc.

Dr. Mullick contributed to the early development of Kynamro®, WAYLIVRA®, Olezarsen, Vupanorsen, Pelacarsen and led the research efforts for IONIS-AGT-LRx currently in clinical development for treatment-resistant hypertension. His current research efforts include preclinical development of targets for heart failure and renal disease in addition to leading the efforts to identify methods to enhance

heart oligonucleotide delivery. Dr. Mullick earned his Ph.D. in Molecular, Cellular & Integrative Physiology from UC Davis and was a postdoctoral fellow in the Department of Immunology at The Scripps Research Institute before joining Ionis Pharmaceuticals in 2007



Praneet Mylavarapu, M.D.

**Postdoctoral Scholar, Northwestern University
HeartShare Research Skills Trainee**

Dr. Praneet Mylavarapu is a current HeartShare fellow and M.S. in Artificial Intelligence candidate at Northwestern University as a member of Northwestern's Bluhm Cardiovascular Institute Fellowship Program in Artificial Intelligence in Cardiovascular Disease. He recently graduated from internal medicine residency at the University of California, San Diego and plans to enter a cardiology fellowship upon completion of his HeartShare fellowship. He is interested in applying machine learning and artificial intelligence for cardiovascular disease classification and treatment. His project on using machine learning to predict atrial fibrillation ablation outcomes earned the Young Investigator Award at Heart Rhythm Society 2021. Currently, he is working on computer vision for echocardiography and ECG analysis to better understand HFpEF.



Lynette Nguyen, Ph.D., PMP

Senior Scientific Project Manager, Metabolic Disorders Portfolio of Research Partnerships, FNIH

Lynette Nguyen is a Senior Scientific Project Manager for Metabolic Disorders programs at the FNIH. In her role, she collaborates with NIH, FDA, industry leaders, clinical and research scientists, and non-profit organizations to support the Accelerating Medicines Partnership® (AMP®) program in Common Metabolic Diseases (AMP CMD), Type 2 Diabetes (AMP T2D; this program has completed its goals and closed in November 2021), and AMP Heart Failure (AMP HF) that launches on September 29, 2022. She works with project leadership to develop and maintain project milestones throughout the full life cycle by participating in the planning, development, design, and implementation phases. Prior to joining the FNIH, she was a project manager at the United States Pharmacopeia, managing the compendial work of expert committees for small molecules. Lynette received her Ph.D. from the Medical College of Virginia in neuroanatomy and completed her postdoctoral training at the Smith Kettlewell Eye Research Institute in San Francisco, California.



Jeff Olgin, M.D.

Chief of Cardiology and the Gallo-Chatterjee Distinguished Professor of Medicine, University of California San Francisco HeartShare PI, Eureka Platform

Dr. Jeff Olgin is Chief of Cardiology and the Gallo-Chatterjee Distinguished Professor of Medicine at UCSF. He is a practicing electrophysiologist and cardiologist and a cardiovascular researcher. He has been involved in leading clinical trials and clinical research for over 30 years. He is one of the Principal Investigator of the Health eHeart Study and one of the creators and Principal Investigator of the Eureka Research Platform. In addition to basic research and clinical trials focused on arrhythmia mechanisms, prediction, detection and prevention, he has a robust research program in digital health and developing novel technology for digitally-enabled clinical research and trials.



Karen Paraschin, M.D., Ph.D.

Global Clinical Leader, Research & Development, Therapeutic Area Cardiology & Nephrology, Bayer AG

Karen Paraschin is a board-certified Cardiologist. Her current position is Global Clinical Leader, Research & Development, Therapeutic Area Cardiology & Nephrology at Bayer. Karen studied medicine at the State University of Campinas, Brazil and she was board-certified as Cardiology Specialist in 2003 with sub-specialization in Cardiac magnetic resonance imaging (MRI) and computerized tomography (CT) coronary angiogram at the Heart Institute -University of São Paulo (2004). In 2010 she graduated as PhD from the University of São Paulo with research focus in drug abuse (cocaine) and its effects on the heart. Prior to joining Bayer Karen practiced as

cardiologist in the ER and telemedicine departments and she was researcher in the Behavioral Cardiology group at Hospital Israelita Albert Einstein, São Paulo, Brazil. She joined Bayer in 2016 and since then she has been working in Research and Development (holding different positions) with focus on Clinical Trials in the areas of Cardiovascular and Coagulation, Nephrology and Pulmonology indications.



Harina Raja, M.S.

Scientific Project Manager, Metabolic Disorders Portfolio of Research Partnerships, FNIH

Harina Raja is a Scientific Project Manager for Metabolic Disorders team at FNIH. In her role, she collaborates with key opinion leaders from NHLBI, FDA, non-profit organizations, industry; clinicians and research scientists to support the Accelerating Medicines Partnership® (AMP®) program in Heart Failure that launches on September 29, 2022. Prior to joining FNIH, she led translational, tendon and muscle biomaterial research projects in the department of orthopedic surgery

at University of Pennsylvania. Harina holds a M.S. degree from Drexel University College of Medicine.



Laura Rasmussen-Torvik, PhD, M.P.H.

**Chief of Epidemiology and Associate Professor of Preventive Medicine (Epidemiology), Northwestern University
HeartShare Co-PI, Northwestern Clinical Center**

Dr. Laura Rasmussen-Torvik is a genetic epidemiologist interested in the identification of genetic risk factors for chronic diseases and the implementation of genomics into clinical care. She is also interested in the use of electronic health records in clinical and epidemiological research. She has worked extensively with multiple large observational cohort studies including MESA and CARDIA. She is one of the PI of the Northwestern center of the NHGRI-funded eMERGE network which conducts genetic discovery and implementation research using biorepositories linked to electronic health record data.



Margaret Redfield, M.D.

**Professor of Medicine, Mayo Clinic
HeartShare Co-PI, Mayo Clinical Center**

Dr. Margaret Redfield is a heart failure cardiologist and has devoted her research career to the study of HFpEF epidemiology, pathophysiology and therapeutics in human subjects and animal models. She has performed large scale, prospectively enrolled, mechanistic cohort studies. Dr. Redfield designed and served as national PI on randomized clinical trials of therapy in HFpEF. Under her leadership, Mayo led enrollment in both funding cycles (12 years) of the NIH-sponsored Heart Failure Clinical Research Network and proposed and led 5 of the trials (3 in HFpEF) performed in the Network. She has

served on the scientific advisory board/steering committees for large industry-sponsored trials in HFpEF (PARAGON, CAPACITY). She has performed extensive studies of biomarkers in community and HF cohorts, studied inflammatory mediators in HFpEF, analyzed large complex data sets and used artificial intelligence to discover HFpEF phenogroups. She has unique expertise in pathological studies on human and animal HFpEF tissues. More recently, Dr. Redfield has used mass spectroscopy-based proteomics and bioinformatics approaches to study mechanisms underpinning pulmonary arterial and pulmonary venous remodeling in HFpEF with pulmonary hypertension. She has served on the major HFpEF working groups, including the most recent NIH working group identifying the key research priorities in HFpEF.



Lothar Roessig, M.D., FESC

Vice President, Head of Clinical Development in Therapeutic Area Cardio-Renal, Bayer AG

Lothar Roessig is a board certified Cardiologist. In 2009 he joined Bayer. His current position is Vice President, Head of Clinical Development in the Therapeutic Area Cardio-Renal. Lothar received his MD from the Hannover Medical School, Germany. He trained as cardiologist and in internal medicine at the Department of Medicine at the Goethe University of Frankfurt, Germany, where he conducted bench research on endothelial cell function and became member of the faculty in 2006. Prior to joining Bayer, Lothar held positions in the

Medical Affairs and Drug Safety department at the clinical research organization ICON plc. In his first role at Bayer he led the clinical development of riociguat in Pulmonary Hypertension associated with Left Ventricular Dysfunction. Subsequently, he was appointed as Global Clinical Leader for vericiguat, which he led through clinical development and to approval in Heart Failure.



Vandana Sachdev, M.D.

Senior Research Clinician, Director of the Echocardiography Laboratory, Division of Intramural Research, NHLBI Co-Chair for AMP HF

Dr. Sachdev is a Senior Research Clinician and Director of the Echocardiography Laboratory in the Division of Intramural Research, NHLBI. Her research areas of interest include applications of cardiac imaging to rare diseases, sickle cell disease, and machine learning/artificial intelligence. For the last 5 years, she has been on a recurring detail in the Heart Failure Branch within the extramural NHLBI's Division of Cardiovascular Sciences. She is currently the Scientific Lead for NHLBI's HeartShare program and co-chair of the AMP HF program.



Oday Salman, M.D.

**Postdoctoral Research Fellow, University of Pennsylvania
HeartShare Research Skills Trainee**

Dr. Oday Salman received his BS degree with distinction in biology from the American University of Beirut (AUB) in 2016, followed by his MD in 2020. Following graduation, he worked for 2 years at AUB medical center, one of the largest and most capable tertiary care facilities in the Middle East – North Africa region, in the emergency department as a research scholar and moonlighter. He subsequently joined Dr. Julio Chirinos's core lab in March 2022 at the University of Pennsylvania as a postdoctoral research fellow where he started working on multiple projects involving proteomics and genomics. He plans to hone his skills in machine learning in hopes of leading an impactful HFpEF-related research project that integrates machine learning models as part of the HeartShare fellowship curriculum.



Steffen Schaper, Ph.D., M.S.

**Expert Systems Pharmacology, Systems Pharmacology &
Medicine, Bayer AG**



Denise Scholtens, Ph.D.

**Director, Northwestern University Data Analysis and
Coordinating Center; Chief of Biostatistics in the Department of
Preventive Medicine; Professor of Preventive Medicine
(Biostatistics) and Neurological Surgery, Northwestern
University
HeartShare Co-PI, Data Translation Center**

Dr. Denise Scholtens is Chief of the Division of Biostatistics and Director of Northwestern University Data Analysis and Coordinating Center (NUACC). She is interested in the design and conduct of multicenter, prospective observational studies and clinical trials and serves as the data coordinating center director and lead statistician for multiple large-scale, ongoing studies. She is particularly interested in the integration of high-dimensional data analyses into these settings.



Sanjiv J. Shah, M.D.

**Stone Endowed Professor of Medicine, Director of Research,
Bluhm Cardiovascular Institute, Northwestern University
HeartShare Contact Primary Investigator**

Dr. Sanjiv J. Shah is the Stone Endowed Professor; Director of Research for the Bluhm Cardiovascular Institute; Director, Center for Deep Phenotyping and Precision Medicine in the Institute for Augmented Intelligence in Medicine; and Director of the HFpEF Program at Northwestern University Feinberg School of Medicine. Dr.

Shah's clinical expertise and research program are focused HFpEF, and in 2007, he started the world's first dedicated HFpEF program at Northwestern University; this program has served as a model for several other similar programs in the United States and throughout the world. Dr. Shah has been continuously funded by grants from the AHA and the NIH since 2008. He directs a laboratory that investigates the pathogenesis of HFpEF; conducts multicenter clinical trials of novel therapeutics for heart failure, pulmonary hypertension, and cardiac amyloidosis; and develops novel techniques for machine learning and AI for the classification, diagnosis, and tracking of cardiovascular diseases. His research, which has spans basic research in animal models, clinical physiologic studies, human clinical trials, and population-based epidemiology studies, has highlighted the heterogeneity of the HFpEF syndrome, and has improved the understanding of the risk factors, pathogenesis, and pathophysiology of HFpEF. Dr. Shah has served as the international principal investigator, executive committee member, or steering committee member for >35 multicenter randomized clinical trials and studies in heart failure. He has published >450 peer-reviewed scientific publications, a textbook on cardiovascular genetics, and handbooks on internal medicine and cardiovascular disease.



Svati H. Shah, M.D., M.H.S.

**Professor of Medicine, Division of Cardiology, Associate Dean
for Genomics, Duke University School of Medicine
HeartShare Steering Committee Co-chair**

Dr. Svati H. Shah is a physician scientist and Associate Dean of Genomics and Director of Precision Genomics Collaboratory in the Duke School of Medicine; Vice-Chief of Translational Research and Director of the Adult Cardiovascular Genetics Clinic in the Division of Cardiology, Department of Medicine; Co-Director of Translational

Research in the Duke Molecular Physiology Institute (DMPI); and a faculty member in the Duke Clinical Research Institute (DCRI). Her research focus is on metabolic and genetic pathways of cardiometabolic diseases, integrating diverse genomic, metabolomic and proteomic techniques for identification of novel mechanisms of disease and biomarkers. Her multi-disciplinary molecular epidemiology lab within the DMPI has quantitative and molecular components and leverages large biorepositories on to perform discovery studies using omics technologies, with subsequent functional validation for mechanistic insight.



Courtney Silverthorn, Ph.D.

Associate Vice President, Research Partnerships, FNIH

Dr. Courtney Silverthorn is an Associate Vice President for Research Partnerships at the Foundation for the National Institutes of Health (FNIH). With extensive experience in public-private partnerships and federal technology transfer policy, she serves as the Director of the Accelerating Medicines Partnership® (AMP®) program and is responsible for new business development in cross-cutting platform areas and the program's Bespoke Gene Therapy Consortium, a multi-year public-private partnership to advance manufacturing and regulatory frameworks for gene therapy treatments for rare diseases.

Prior to joining the FNIH, Courtney was the Acting Director of the Technology Partnerships Office at the National Institute of Standards and Technology (NIST), where she led technology transfer activities at the agency and was central to the interagency Lab-to-Market initiative. She also held tech transfer and policy roles at the Office of Science and Technology Policy, the Frederick National Laboratory for Cancer Research, and the National Cancer Institute.

Dr. Silverthorn earned a Ph.D. in Pharmacology from The Johns Hopkins University School of Medicine, a M.S. in Leadership from Washington University in St. Louis, and a B.S. in Biochemistry and Molecular Biology from Sweet Briar College.



Matt Slater

Development Officer, FNIH

Mathew Slater is a Development Officer for the Foundation for the National Institutes of Health (FNIH). Matt joined the FNIH in September 2021, and in addition to supporting the FNIH's efforts in the Neuroscience and Inflammation & Immunity therapeutic areas, serves as a business liaison to organizations that are engaged with, or entering, public-private partnerships that support the FNIH's efforts to advance breakthrough biomedical discoveries and improve the quality of people's lives. Matt has spent his career developing and implementing mission-based public-private partnerships in the corporate and non-profit sectors, including serving as a member of the Senior Management Team for the Partnership for a Healthier America, the private sector partner to First Lady Michelle Obama's *Lets Move!* initiative. Matt has served in a similar capacity for Discovery Education and the Juvenile Diabetes Research Foundation (JDRF), where he worked with partners in support of JDRF's type 1 diabetes research efforts. Matt received his Bachelor of Arts degree in American Government from Clark University in Worcester, MA.



Norman Stockbridge, M.D., Ph.D.
Director, OCHEN-DCN, FDA

Dr. Norman Stockbridge, MD, PhD has been a medical officer since 1991 in the Division of Cardiology and Nephrology in FDA's Center for Drug Evaluation and Research. He has served as Division Director since 2004.



Scott Solomon, M.D.
Director, Clinical Trials Outcomes Center
Edward D. Frohlich Distinguished Chair, Professor of Medicine,
Harvard Medical School and Brigham and Women's Hospital
HeartShare Co-PI, Mass General Brigham Clinical Center

Dr. Scott D. Solomon is the Edward D. Frohlich Distinguished Chair, Professor of Medicine at Harvard Medical School and Brigham and Women's Hospital, where he directs the Clinical Trials Outcomes Center and the Cardiac Imaging Core Laboratory. His research interests have focused on cardiac structure and function following myocardial injury and heart failure, modifiers of risk and outcomes in heart failure, and cardiovascular imaging. He is a world-renowned clinical trialist, having led numerous phase 2 and phase 3 clinical trials in heart failure, including the PARAGON-HF and DELIVER trials in heart failure with mildly reduced and preserved ejection fraction. He has published more than 950 peer-reviewed articles, three textbooks of echocardiography, and serves as Editor for *Braunwald's Heart Disease*.



Lauren Sparks, Ph.D.
Associate Investigator at the Translational Research Institute for
Metabolism and Diabetes, AdventHealth Research Institute
HeartShare Biopsy Core Lab Co-PI

Dr. Lauren M. Sparks is an Associate Investigator at the AdventHealth Translational Research Institute in Orlando, Florida. Dr. Sparks pursues translational investigations on the epigenomic regulation of exercise response variation in clinical outcomes relevant to metabolic disease and aging. She aims to advance the field of exercise and type 2 diabetes and potentially shift the paradigm, allowing interventions to be targeted to those individuals most likely to benefit as well as identify novel approaches to treat those who do not. Dr. Sparks also investigates the bi-directional communication between muscle and adipose tissues in obesity and aging. Dr. Sparks has been awarded the "Rising Star in Metabolic Physiology" by the Danish Diabetes Academy August Krogh Club in 2019 for her contributions to the field of exercise and diabetes. In addition to her roles on the Editorial Board for Diabetes and Co-Chair of the Integrative Physiology Track for The Obesity Society's Program Committee, she has been instrumental in developing MOPs, centralized

trainings and related biospecimen collections and processing for adipose and skeletal muscle biopsies through her roles as Co-Chair of the Biospecimens Working Group and Chair of the Single Cell Committee for the MoTrPAC Consortium.

Prior to joining the TRI, Dr. Sparks was a postdoctoral fellow at Maastricht University in the Netherlands. Dr. Sparks was born in Patterson, Louisiana. She earned a B.S. in Zoology and a B.A. in Spanish in 2002 and continued on to earn her PhD in Molecular Biology in 2006 from Louisiana State University while executing her dissertation work at Pennington Biomedical Research Center.



Katherine Thompson
Director of Communications. FNIH

Katherine Potter Thompson has led marketing, communications, and project initiatives over a wide spectrum of national organizations, including National Geographic, the United States China Business Council, and the Association of Performing Arts Presenters. She has served as an independent consultant in program management and talent development for the Natural Resources Defense Council, the National Park Foundation, and Sony Electronics. At the FNIH, Katherine leads the communications team in communications, marketing, public relations, content development, and media engagement.



Ross Upton, Ph.D.
CEO and founder, Ultromics

Dr Ross Upton is the CEO and founder of Ultromics, a global health technology company that is transforming the way we detect and phenotype Heart Failure with its Artificial Intelligence based software as a platform; EchoGo.

By leveraging AI, EchoGo brings unparalleled precision to echocardiography and is designed to improve clinical outcomes in patients and reduce cost expenditure for healthcare systems via algorithms that leverage billions of data points within an echo image, to enable detection of Heart Failure with more accuracy and precision.

Upton has a broad scientific background having undertaken 4 degrees in the clinical sciences. He went on to complete two masters, one in Clinical Biochemistry and one in Cardiovascular Imaging, before completing his PhD in Cardiovascular Medicine at the University of Oxford. Upton continues to be a well-published and thought-leading academic in the area of Artificial Intelligence and Cardiovascular Medicine.

Upton trained as a sonographer within the NHS while doing his studies, performing echocardiograms and analysing images whilst also studying the data science that underpins Ultromics' technology. During his PhD, Upton set out to tackle the problems associated with missed

diagnosis from echocardiograms and together with his Professor at the time, Prof. Paul Leeson (and co-founder of Ultromics), designed an algorithm that could improve on the current clinical standard. This was the underlying technology that Ultromics was founded on. Ultromics was officially founded in 2017 and spun-out of the University of Oxford.

Over the last 5 years, Upton has built Ultromics to be one of the most prominent companies in healthcare AI, leading the creation of its first product – EchoGo - that is now award-winning, CE-marked and FDA-cleared, and is supported by the NHS England and world-renowned sites such as Mayo Clinic. In this time, Upton has successfully raised multiple rounds of funding and was named on the 2019 Forbes 30 under 30 lists for science and healthcare.



Firas Wehbe, M.D., Ph.D.

**Medical Director, Center for Artificial Intelligence in the Bluhm Cardiovascular Institute, Northwestern University
HeartShare Core Lead, Data Portal Core**

Dr. Firas Wehbe is the Medical Director of the Center for AI in Bluhm Cardiovascular Institute at Northwestern Medicine, specializing in building, deploying, and evaluating AI-enabled infrastructure and systems in support of cardiovascular research and care. He is a co-investigator of the HeartShare DTC primarily involved in the Data Portal Committee. His prior roles include associate professor of preventive medicine, division of health and biomedical informatics and of pathology, and Chief Research Informatics Office at the Feinberg School of Medicine at Northwestern University. He received his medical doctorate from the American University of Beirut and his PhD in biomedical informatics from Vanderbilt University. He has been co-investigator with core leadership roles on multiple large NIH-funded initiative including the International Epidemiological Databases to Evaluate AIDS (IeDEA) [NIAID], Electronic Medical Records and Genomics (eMERGE) [NHGRI], Northwestern's Alzheimer's Disease Core Center [NIA], the Robert H. Lurie Comprehensive Cancer Center [NCI], the All of Us Research Program [NIH], the Vanderbilt Institute for Clinical and Translational Research (VICTR) [NCATS], the Northwestern University Clinical and Translational Science Institute (NUCATS) [NCATS].



David Wholley, M.Phil.

Executive Vice-President, Strategy and Business Development, FNIH

David Wholley manages the Research Partnerships Division of the Foundation, which is responsible for major research collaborations including the Accelerating Medicines Partnership (AMP), the Biomarkers Consortium, the Partnership for Accelerating Cancer Therapies (PACT), the LungMAP precision medicine trial in lung cancer, and the Alzheimer's Disease Neuroimaging Initiative (ADNI). Mr. Wholley has also served as Director of the Genetic Association Information Network (GAIN), a public-private partnership dedicated to helping discover the genetic basis of common diseases, and led the development of a major public-private partnership in drug

safety with the biopharmaceutical industry and FDA. Prior to joining the Foundation in 2006, Mr. Wholley's career spanned nearly 25 years in healthcare technology business management, including extensive experience in product development, sales, marketing, corporate strategy and partnership and project development. Mr. Wholley has held senior management roles in several venture-funded technology startup companies, including head of Global Marketing and Development for First Genetic Trust, Inc., which developed software for large-scale collaborative genetic research and personalized medicine. During a 16-year career at IBM, he co-led the corporate strategy team that guided IBM's formation of its Life Sciences industry organization. Mr. Wholley holds an M.Phil from Rutgers University and a Certificate in Business Administration from the Stern School of Business at New York University.



Gary Woodward, Ph.D.
Chief Technical Officer, Ultromics

As Chief Technical Officer of Ultromics, Gary Woodward manages the company's technical strategy to ensure rapid and flexible product exploitation in an increasingly dynamic marketplace with over 15 years of experience in medical diagnostics development as a clinician and technologist.

Before being named CTO, Gary was Ultromics' Head of Research and Development responsible for all global RnD activities, including end-to-end management of technology development, transfer, and IP.

As an academic, Gary maintains an honorary lectureship in diagnostics at University College London and Honorary Clinical Scientist roles within the NHS with continued clinical state registration. He is also a member of the Royal College of Pathologists and has over 50 academic publications, one book, 3 patents and over £3.5 million in independent grant funding in the cardiac, endocrine, hepatic, and metabolic disciplines.

Prior to joining Ultromics, Gary led on the innovation of biliary disease products at Perspectum Diagnostics Ltd, bringing two novel AI products to market entry and facilitating research and partnering activities. Gary has also held senior scientific positions within the Healthcare (inc. Oxford University Hospitals) and Pharmaceutical sectors (inc GlaxoSmithKline) where he has brought numerous diagnostic solutions to the market.



Renee Wong, Ph.D.
Chief of the Heart Failure and Arrhythmias Branch, Division of Cardiovascular Sciences, NHLBI

Dr. Renee Wong is Chief of the Heart Failure and Arrhythmias Branch in the Adult and Pediatric Cardiac Research Program within the Division of Cardiovascular Sciences (DCVS) at the National Heart, Lung, and Blood Institute (NHLBI). Renee completed her B.S. in Chemistry from Cornell University and her Ph.D. in Biomedical Sciences from the Medical University of South Carolina. In 2006, she joined NHLBI as a

Postdoctoral Fellow in the Cardiac Physiology section within the NHLBI Division of Intramural Research and came to DCVS in 2010 as an Extramural Research Fellow. Shortly thereafter, Renee held responsibilities as a Health Science Administrator/Program Director. She also held the role of the NHLBI Deputy AIDS Coordinator from 2015-2017. Renee served as the Deputy Branch Chief from 2016-2018 and Acting Branch Chief from 2017-2018. Her expertise includes ischemic heart disease, myocardial preconditioning, myocardial protection, cardiac mitochondria and bioenergetics, HIV-related cardiovascular disease, stem cells, proteomics, mass spectrometry, and organic chemistry.



Jackie Wright, Dr.PH., FAHA
Health Scientist Administrator, NHLBI

Dr. Jackie Wright joined the Epidemiology Branch of the Division of Cardiovascular Sciences at the National Heart, Lung and Blood Institute in 2010 and in her role as Health Scientist Administrator for Aging Populomics, she serves as Project Officer on the Atherosclerosis Risk in Communities (ARIC) Study, Epidemiology Branch liaison to the HeartShare program, and as program official on grants and cooperative agreements within the Epidemiology program. Previously she worked for 19 years as an epidemiologist with the Centers for Disease Control and Prevention's National Center for Health Statistics on the National Health and Nutrition Examination Survey program, conducting research and analysis, planning and coordinating methodology workshops and interagency meetings in nutrition monitoring. Her research interests include hypertension, heart failure, prevalence of cardiovascular disease (CVD) risk factors, CVD surveillance, dietary intake, and nutrition status.

Jackie has a Doctor of Public Health degree in Epidemiology from the School of Public Health at the University of North Carolina at Chapel Hill, a Master of Public Health degree in Human Nutrition and Epidemiology from the School of Public Health at the University of Michigan, and a Bachelor of Science degree in Biology and Biological Anthropology from Emory University.