NSF-funded Biomedical Engineering Social Sciences Training (BEST) program



The **BEST** vision

Our vision is to create a novel training program for graduate students in biomedical engineering and social sciences that will provide convergent, interdisciplinary training and develop the next generation of scientists and engineers working at the intersection of cardiovascular health, technology, and race, sex, gender, and other aspects of identity.

Research themes

- Theme 1: The psycho-physio-biological root causes of cardiovascular health inequities
- Theme 2: Accurate, unbiased, and accessible health technology design and innovation
- Theme 3: Social, behavioral, and economic influences on technology for cardiovascular health care.

Training



Governmental: Federal, state, local policies

Environmental: Community norms, Innovation ecosystem

Organizational: Hospitals, Insurers, Medical device companies

Interpersonal: Providers, family, Community members

> Individual: Identity, Health



Theme 2 CCCC CCCC CCCCC





THEME 1: Psycho-physio-biological root causes of cardiovascular health inequities

- Population studies: Correlations between adverse social determinants of health and cardiovascular disease outcomes
- Clinical studies: Impact of microaggressions on heart rate variability and inflammation
- Preclinical studies: Impact of early life adversity on cardiovascular reactivity

THEME 2: Accurate, unbiased, and accessible health technology design and innovation

- Machine learning protocols for screening patients for pre-diabetes follow up care
- Device design to provide objective measures of pain
- Novel wearables for pulse oximetry that are accurate for a wide range of skin melanin content

THEME 3: Social, behavioral, and economic influences on cardiovascular health care technology

- Insurance benefit coverage and cost sharing for specific devices and technologies
- Uptake of and adherence to devices and technologies by health care providers and their patients
- Addressing social needs and improving health through technology

Trainee eligibility and benefits

• For participation,

- Interest in using technology to address cardiovascular health disparities
- Graduate student (MS or PhD) in good standing at UCI in BME, Health, Society, and Behavior, Psychological Science, or another social science discipline
- Commitment to participate in all training activities
- For funding, the above plus,
 - US citizen or Green card holder
 - Enrolled in a doctoral program (not MS)
 - Being supervised by a participating BEST faculty mentor (letter of commitment on file)

Training activities



Training activities

- 1. 6-week summer bootcamp: principles of design thinking, universal design, and social identity theory;
- 2. Hexads—teams of six Trainees with both engineering and social science Trainees—that meet weekly to build community and support interdisciplinary training;
- 3. Specialized coursework at the intersection of biomedical engineering and social sciences;
- 4. Participation in Rebootcamp and community-engaged research;
- 5. Supervised undergraduate mentoring; and
- 6. Presentations at a Cardiovascular Health Inequities Conference

Team Science to Facilitate Interdisciplinarity

Challenge: A breadth of knowledge can create gaps in mutual understanding and make it difficult to communicate across disciplinary boundaries.



Opportunity: A breadth of knowledge can create opportunities to identify novel connections between diverse perspectives, tools, approaches, and ideas.

PI eligibility and benefits

- Complete culturally aware mentoring curriculum
- Supervise Hexads as needed
- Serve as co-mentor on relevant dissertation projects
- Complete surveys, assessments, etc.
- Two years of GSR funding for eligible mentee
- US Citizen, non-citizen national, or legal permanent residents
- Non-funded students encouraged

Timeline

- Today: Initial program announcement and faculty orientation
- Mid-January: Call for applications
- April 1, 2025: Applications due
- Mid-May: Funding announcements
- Mid-June to end of July: BEST bootcamp
- 2025-2026 AY: Hexads, Coursework, Cardiovascular Health Disparities Conference
- Summer 2026: ReBootcamp and community-engaged research internship

Convergence with CIRC

- Cardiovascular Device Design competition (yearly)
- Seminars (Heart2Heart) monthly
- Undergraduate research program (EQUITI) yearly
- Industry tours

Opportunities to get involved

- Education committee
- Three research committees
 - Theme 1 root causes
 - Theme 2 devices
 - Theme 3 policy
- Community engagement

Questions/Discussion

Please respond to our survey!