Midwest Big Data Innovation Hub

Collaboration Cafe

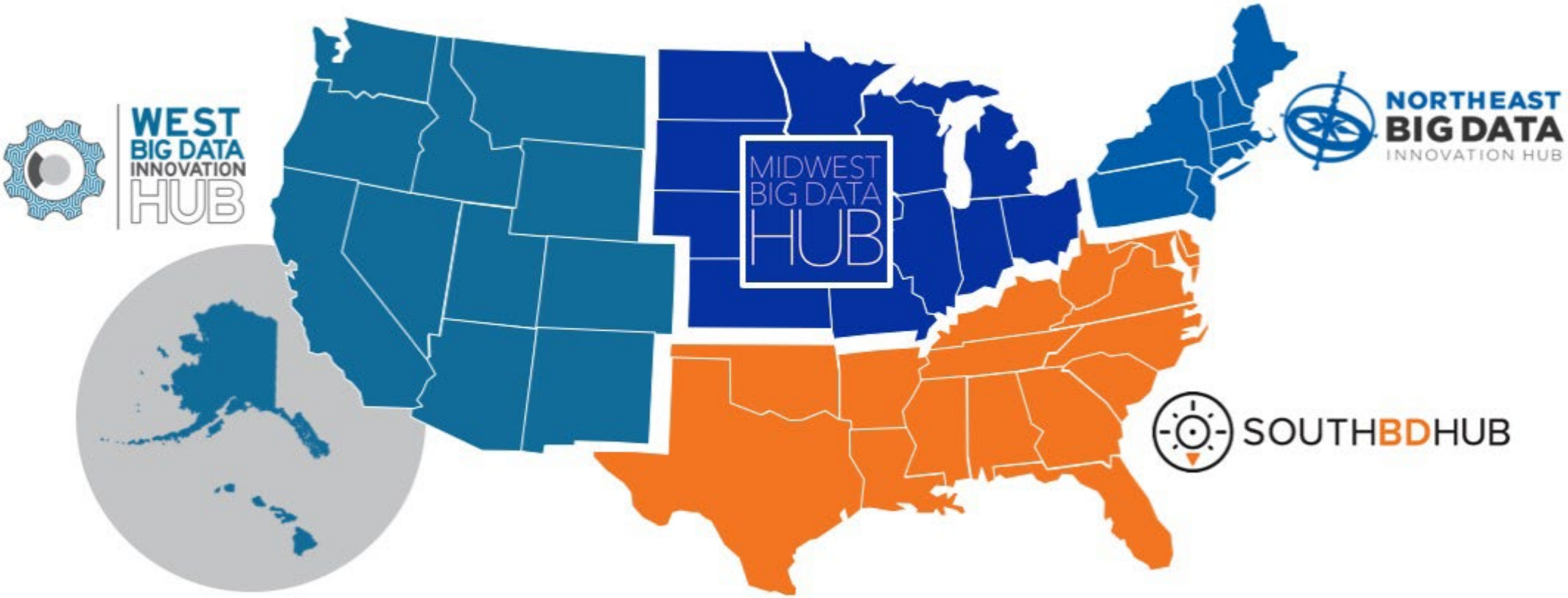
May 2024

Multidisciplinary Data Science in Health

NSF/NIH “Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science” (SCH) program

supported by NSF 1916613

Four Regional Hubs, One National Mission



What We Do Engage communities, share resources, and build partnerships that harness data science to address societal and scientific challenges.

BigDataHubs.org

Thank you

Agency Program Directors who participated on this webinar:

- **NSF:** Peter Atherton, Adrienne Dixson, Thomas Gulbransen, Juan Jenny Li (2x), Kimberly Littlefield, Deepankar (Deep) Medhi, Eleanor Sayre, Vishal Sharma, Ashok Srinivasan, Alan Sussman, Kevin Thompson
- **NIH:** Allison Dennis, Lucia Hindorff, Elizabeth Hoffman, Fenglou Mao, Yanli Wang, Dana Wolff-Hughes, Sandhya Xirasagar
- **USDA:** Ann Stapleton (2x)

Prior Awardee guests:

- Daniel Andresen, Christopher Bartlett, Kevin Brandt, Luiz Fernando Brito, Addison (Addy) Carroll, David (Eric) Chan-Tin, Rylan Chong, Chia-Fang (Christina) Chung, Katherine (Kay) Connelly, Cristina Connolly, David Crandall, Matt Daly, Gustavo De-Sousa-E-Silva, Ana Maria Estrada Gomez, Jessica Faul, Baskar Ganapathysubramanian, Malia Gehan, Jennifer Gleason, David Hudak, Deepak Khazanchi, Sandra Kübler, Daniel Lapine, Fengjun Li, Xiaoxia (Nina) Lin, Mei Liu, Chaoqun (Crystal) Lu, Raghu Machiraju, Andrew Margenot, Timothy Middelkoop, Annemarie (Krug) Mysonhimer, Paul Oladele, Ron Payne, Daniel Pemstein, Sagar Samtani, Grant Scott, Nadia Shakoor, Winona Snapp-Childs, Kimberly Marion Suiseeya, Maoyuan Sun, Elaina Sutley, Bhuwan Thapa, Karen Tomko (2x), Sara Tondini, Yang Wang, Jim Wilgenbusch, Murat Yildirim, Michael Zentner, Zhou Zhang

Co-Hosts, Guest Presenters, and Support Staff:

- Ashley Atkins, Franco Delogu, Ivo Dinov, J.D. Graham, Armgard Haken, Angie Raymond, Kimberly Zarecor

Collaboration Café

- Sept 2021 – May 2024
- 30 sessions
- 21 agency Program Director guests
- 49 Prior Awardee guests
- Video playlist
- Prior award lists
- Session notes

1550320
1916613

May Solicitation: NSF/NIH SCH program

"Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science"

NSF 23-614	Proposals due: October 3, 2024 [Program overview]
Program goals	• "Support the development of transformative high-risk, high-reward advances in computer and information science, engineering, mathematics, statistics, behavioral and/or cognitive research to address pressing questions in the biomedical and public health communities."
Size and duration (max)	• Up to $1,200,000 over 4 years ($300k/yr)
Number of awards (est)	• 10-16 per year
LOI/preproposal?	No, but consider contacting a Program Officer to discuss the expectations of the NSF Directorate or NIH Institute most aligned with your research (include 1-page overview)
Eligibility limits & other guidance	• Participation on no more than 2 proposals per 12-month period as Principal Investigator (PI), co-PI, Project Director (PD), Senior Personnel or Consultant • May not duplicate other pending NSF or NIH proposals, or those submitted to NIH in the past 37 months that are "essentially the same" (with some exceptions) • Open to IHEs + other non-profit, non-academic organizations

NSF Solicitation 23-614 NIH Notice NOT-OD-23-165

1550320
1916613

NSF/NIH SCH program guidance

- Multi-Directorate at NSF
- Multi-Institute at NIH
- "The work **must make fundamental scientific or engineering contributions to two or more disciplines**" to address the integrative, convergent, interdisciplinary approaches desired
- "Collaborations with researchers in the health application domains are required."

- Scope language:
  - "Traditional disease-centric medical, clinical, pharmacological, biological or physiological studies and evaluations are outside the scope of this solicitation."
  - "fundamental biological research with humans that also does not advance other fundamental science or engineering areas is out of scope for this program"
  - "proposals addressing health indirectly in the education or work environment are also out of scope"
  - Engagement with human participants is allowed, but randomized controlled trials (RCTs) are out of scope

1550320
1916613

NSF/NIH SCH proposal guidance (from the solicitation)

- Research themes of interest (but not restricted to):
  1) Fairness and Trustworthiness
  2) Transformative Analytics in Biomedical and Behavioral Research
  3) Next Generation Multimodal and Reconfigurable Sensing Systems
  4) Cyber-Physical Systems
  5) Robotics
  6) Biomedical Image Interpretation
  7) Unpacking Health Disparities and Health Equity

  - "a given project may address multiple themes", including or not including the above

Themes in 21-530 (prior solicitation):

1) Information Infrastructure
2) Transformative Data Science
3) Novel multimodal sensor system hardware
4) Effective Usability
5) Automating Health
6) Medical image interpretation
7) Unpacking health disparities

1550320
1916613

NSF/NIH SCH proposal elements

- Standard elements (Project Summary, Project Description, Budget, etc.)
- Supplementary Documents
  - "a Collaboration Plan is required for ALL proposals"
  - Human Subjects / Vertebrate Animals Protection plans (if needed), using the NIH Enrollment Table or Vertebrate Animals Plan
  - Data Management and Sharing Plan
  - Documentation of Collaborative Arrangements of Significance to the Proposal through Letters of Collaboration
    - Funded collaborators
    - Unfunded collaborators (PAPPG template LoCs vs letters of support)
  - List of Project Personnel and Partner Institutions
  - Mentoring Plan for postdocs/grad students (if applicable)
  - Collaborators and Other Affiliations document, using the NSF template spreadsheet

- Proposal Preparation Checklist – includes required information for the Project Description and other elements

- Proposals must be submitted via Research.gov or Grants.gov

1550320
1916613

NSF/NIH SCH review guidance (from the NSF solicitation)

- Standard NSF "Merit Review Principles and Criteria" section
- Additional Review Criteria for SRC proposals
  - Collaboration and Management: "The collaboration plan should demonstrate the extent to which the group is integrated, has a common focus and the quality of the plan for management and collaboration."
- Additional NIH Review Criteria (see full details in solicitation)
  - Overall Impact
  - Significance
  - Investigator(s)
  - Innovation
  - Approach
  - Environment
  - Protection for Human Subjects
  - Inclusion of Women, Minorities, and Individuals Across the Lifespan
  - Vertebrate Animals
  - Biohazards
  - Budget and Period of Support

1550320
1916613

NIH-NSF Smart Health Initiative

"Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science"

Solicitation: NSF 23-614 NIH Notice: NOT-OD-23-165
Application Due Date: October 3rd, 2024

NIH NATIONAL CANCER INSTITUTE

Smart Health Leadership Team

Dr. Goli Yamini,
Assistant Program Director,
Information and Intelligent Systems (IIS) Division,
NSF

Dr. Natalia Komissarova,
Scientific Review Officer,
Division of Translational and Clinical Sciences,
CSR/NIH

Dr. Yanli Wang,
Health Scientist Administrator,
Office of Data Science Strategy,
DPCPSI/NIH

Dr. Tom Martin,
Program Director,
Information and Intelligent Systems (IIS) Division,
NSF

Dr. Dana Wolff-Hughes,
Program Director,
Division of Cancer Control and Population Sciences,
NCI/NIH

Dr. David Zahavi,
AAAS STPF,
Division of Cancer Control and Population Sciences,
NCI/NIH

Overview of the Initiative

Goals

- To develop transformative high-risk, high-reward advances in **computer and information science, engineering, mathematics, statistics, behavioral and/or cognitive research** to address pressing questions in the **biomedical and public health** communities.
- To support **interdisciplinary teams,** with appropriate expertise, that develop novel methods to intuitively and intelligently collect, sense, connect, analyze and interpret data from individuals, devices and systems to enable discovery and optimize health.

Requirements

- Integrative projects that make fundamental contributions to 2+ disciplines
- Address a key health problem
- Expected to include several students and post-docs

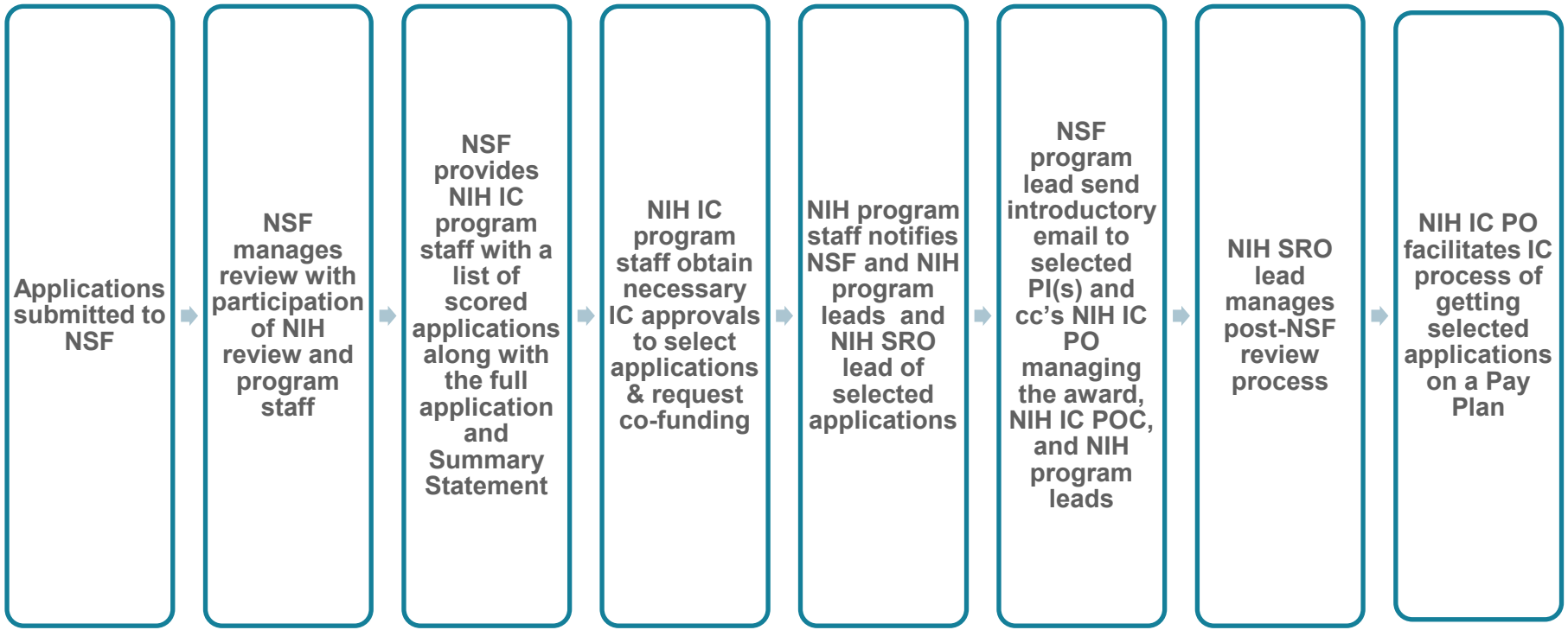
Budget

- $1.2M total cost per 4-year award (~$300k/yr)

Smart Health Research Areas

Fairness	• Approaches to advance causality and trustworthiness of AI/ML models • Develop human-AI systems for clinical decision support
Transformative Analytics	• Computational tools for fusion and analysis of multi-level and -scale data • Knowledge representations, visualizations and reasoning algorithms
Next Generation Multimodal Sensing	• Design & fabrication of novel multimodal sensor systems • Synthesis of new biorecognition elements
Cyber-Physical Systems	• Closed-loop or Human-in-the loop systems • Technology platforms for optimizing delivery of health interventions
Clinical Image Interpretation	• Determine how characteristics of human pattern recognition, visual search, perceptual learning can inform and improve image interpretation
Robotics *ODSS will not provide co-funding	• Next generation of robotic systems that are usable and effective • Robotic methods for context-dependent and human-robot interaction
Unpacking Health Disparities & Health Equity	• Develop holistic, data-driven or mathematical models to address the structural and/or social determinants of health

Smart Health Process



What proposals are not appropriate for this solicitation?

- Focus only on advancing biological, biomedical and/or public health research without new fundamental science or engineering.

- Propose an application of existing fundamental science to the biomedical domain.

- Focus on a topic that fits the mission of another agency.

Getting Feedback on Your Proposal

- Send a **one-page summary** to NSF SCH-Correspondence@NSF.gov of your idea that briefly describes:
  - The **Project**
  - The **Intellectual Merit** (specific advances you expect to make in fundamental science/engineering)
  - The **Broader Impacts** (health outcomes, outreach and education)
- **Do not** send an NIH Specific Aims page!
- Description of the one-page summary can be found at: https://new.nsf.gov/policies/pappg/23-1/ch-2-proposal-preparation#2D2b

www.cancer.gov

www.cancer.gov/espanol

Data Science Activities at NIH

Find it out

NIH Office of Data Science Strategy

datascience.nih.gov

A modernized, integrated, FAIR biomedical data ecosystem

@NIHDataScience

linkedin.com/showcase/nih-office-of-data-science-strategy

datascience@nih.gov

Lead and Coordinate Trans-NIH Data Science Programs

- Support artificial intelligence and machine learning (AI/ML) research: improve the AI/ML-readiness of data generated from NIH-funded research, address ethics & bias issues, develop biomedical data repositories and knowledgebases, and build data science workforce
- Exploratory cloud research: enable researchers to explore and test opportunities to enhance their research projects by incorporating cloud capabilities
- Software tools for open science: improve the quality and sustainability of research software
- AIM-AHEAD: establish networks and partnership, increase the participation and representation of researchers and communities underrepresented in the development of AI/ML models, and enhance the capabilities of the emerging technologies beginning with electronic health record (EHR) data
- NIH-NSF Smart Health Program (SCH): support multidisciplinary research focusing on key biomedical questions (SCH)

Welcome to ODSS/NIH Special Track at ISMB 2024

https://www.iscb.org/ismb2024/home

July 13, 2024, Montreal, Canada

One-day special conference track on NIH funded projects with three sessions focusing on:

Ethics and Equity for AI and Computational Research
Sustainable Research Software and Tools in the Cloud and Beyond
Preparing for the Future: AI Data Readiness and Smart Health Solutions

To convene awardees from multiple ODSS/NIH data science funding opportunities:

- AI/ML Readiness, Ethics, Bias, Transparency, Workforce (NOT-OD-21-094, NOT-OD-21-079, NOT-OD-22-065, NOT-OD-22-067, NOT-OD-23-082)
- AIM-AHEAD (OTA-21-017)
- Exploratory Cloud Research (NOT-OD-23-070)
- Software Tools for Open Science (NOT-OD-20-073, NOT-OD-21-091, NOT-OD-22-068, NOT-OD-23-073)
- NIH-NSF Smart Health Program (SCH) (NOT-OD-18-149, NOT-OD-21-011, NOT-OD-23-165)

The NIH Biomedical Data Repositories and Knowledgebases Program (DRKB)

(PAR-23-236 and PAR-23-237)

Program Objective

- Modernize NIH funded data resource ecosystem
- Develop FAIR data repositories and knowledgebases spanning biological scales
- Support compelling data resources at different stages of the development lifecycle
- Establish good data management practice

Pre-application Webinar:

- Time: June 26, 11AM-12PM, June 26, EST
- See details: NOT-OD-24-097
- Welcome to register

Notice of Special Interest (NOSI): Promoting Data Reuse for Health Research

NOT-OD-24-096

Program Objective

- Promote data reuse and secondary data analysis
- Drive advancements in biomedical, behavioral, clinical, or health-related research

Research Areas

- Innovative approaches to data reuse including novel methods of data analysis
- Develop strategies for leveraging data across different data resources or data types

Program details:

- Funding Mechanism: Competing Revision Supplement
- Eligibility Activity Code: R01, U01
- Frist available due date: July 3, 2024
- Budget: $275K direct cost, which can be used for up to two years

NIH Cloud Lab

- Try the NIH Cloud Lab, a 90-day program that enables researchers to explore the cloud at no cost in a secure, NIH-approved environment
- Participants receive $500 of Amazon Web Services, Google Cloud, or Microsoft Azure credits, access to curated bioinformatics tutorials, and support from NIH technical and bioinformatics experts
- Open to all NIH-affiliated researchers and all NIH staff, including those at institutions eligible for NIH funding but without an active award

Learn more here:
https://bit.ly/49R07EY

Notice of Special Interest (NOSI): Supporting the Exploration of Cloud in NIH-supported Research

NOT-OD-24-078

Program Purpose: This notice announces the availability of funds from the Office of Data Science Strategy (ODSS) to NIH-managed or NIH-majority-funded projects that may benefit from using the cloud. The purpose of this announcement is to explore and test potential opportunities for leveraging cloud solutions to enhance existing NIH activities. Projects already using cloud may apply to explore and test cloud capabilities not yet leveraged. This initiative is aligned with the NIH Strategic Plan for Data Science, which describes actions aimed at building a better data infrastructure and a modernized data ecosystem.

Program details:

- Funding Mechanism: Competing Revision Supplement
- Eligibility Activity Code: R01, R15, R25, R33, R35, R37, R61, RF1, U01 and U24
- Frist available due date: June 18, 2024
- Budget: up to $200K direct cost for one year

NOSI: Advance Data Science Approaches Through Secondary Data Analysis to Reveal Scientific Insights of COVID-19 Testing Technologies

(NOT-OD-24-026)

- Stimulating data science approaches related to COVID-19 testing technologies
- Advancing scientific inquiry through secondary analysis of existing data in the RADx DataHub
- Addressing questions and revealing insights through secondary analysis

- Focusing on utilizing existing data resources in the RADx DataHub
- Expiration Date: July 16, 2024

National Institutes of Health

Read the NOSI:
https://bit.ly/4a4oFf3

New Funding Opportunity: Collaborative Research Network

- Join ODSS in a collaborative research network to test preventive interventions for health disparities.
- Funding Opportunity: PAR-24-053 encourages multi-sectoral projects beyond individual health.
- Funding Opportunity: RFA-OD-24-006 seeks collaboration for technical assistance in community-focused projects.
- Application deadline: Aug. 5, 2024

Apply for PAR-24-053 here:
https://bit.ly/3ujn5pJ

Apply for RFA-OD-24-006 here:
https://bit.ly/3HMNz5X

Notice of Special Interest (NOSI): Validation of Digital Health and Artificial Intelligence/Machine Learning Tools for Improved Assessment in Biomedical and Behavioral Research

NOT-CA-24-031

Program Purpose: support for analytical and/or clinical validation of recently developed digital health and AI/ML technologies. Digital health and AI/ML technologies are defined broadly to include any health technology leveraging mobile health, health information technology, wearable devices, sensors, telehealth and telemedicine, internet of things (IoT), SaMD and/or related AI/ML algorithms and tools to monitor and manage health across the life course.

Program details:

- Participating ICOs: NCI, NHLBI, NIA, NIDA, NIMH, NINR, OBSSR, ODSS
- Check out IC specific requirement and NOFOs to be responsive
- Expiration date: July 06, 2025

Release of New Resource Related to Consent Language for Studies Using Digital Health Technologies Research

Blue and White Professional Modern Business Report Cover Page (nih.gov)

Developed by the NIH Office of Science Policy through an NIH-wide collaboration, the resource presents general points to consider, instructions for use, and optional sample language for the research community. This resource will best be used to inform research teams and Institutional Review Board (IRB) members who are planning, reviewing, or conducting research that studies or uses digital health technologies.

Learn more and get connected:

- Send inquiry to: SciencePolicy@od.nih.gov
- Subscribe listserv & sign up here
- Connect and follow on X @NIH_OSP and LinkedIn

Basic Data Science Training Resources Available From NCI

- New cancer data science training resources provide resources that cater to both newcomers and seasoned researchers in the field
- Encourages individuals to explore basic resources, free courses, tips, etc.
- Help leverage the power of data science for your cancer research

NIH NATIONAL CANCER INSTITUTE
Center for Biomedical Informatics & Information Technology

Check out the new resources here: https://bit.ly/46Jv3FJ

Thank you

yanli.wang@nih.gov