Exceptional Opportunities in Biomedical Research

Council of Councils Meeting

January 29, 2016

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Principal Deputy Director, NIH
Department of Health and Human Services
NIH Priorities and Initiatives

Topics

- Budgetary context
- NIH-Wide Strategic Plan
- Environmental Influences on Child Health Outcomes
NIH Priorities and Initiatives

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- Budgetary context
- NIH-Wide Strategic Plan
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Goals of the NIH-Wide Strategic Plan

- The strategic plan clearly articulates the highest trans-NIH priorities and how to achieve them.
- The strategic plan is a living document that will require refinement throughout its lifecycle.
- The strategic plan does not describe all the many important things that NIH does and will do in the future.
- The strategic plan does not address priorities of the individual ICOs, since each has its own strategic plan.
Development Process

- Extensive consultation with NIH Leadership
  - NIH Director and his Deputies
  - Institute, Center, and Office (ICO) Directors
- Formation of NIH working group with ICO representatives
- Public presentations to and feedback from the Advisory Council to the NIH Director (ACD)
Outreach and Public Feedback

- Solicited feedback through an RFI [NOT-OD-15-118]
- Conducted 3 interactive webinars with ACD members
- Presentations to and feedback from HHS, and 20 National Institute and Center Advisory Councils
- NIH webportal to share information
- Final presentation to the ACD – December 10th
- Plan transmitted to Congress and released to the public – December 15th and 16th

http://www.nih.gov/about/strategic-plan
NIH-Wide Strategic Plan Framework

Overview
- Mission of NIH
- Unique moment of opportunity in biomedical research
- Current NIH-supported research landscape
- Constraints confronting the community in the face of lost purchasing power

Objective 1: Advance Opportunities in Biomedical Research

Fundamental Science
- Foundation for progress
- Consequences often unpredictable
- Technology leaps catalyze advances
- Data science increases impact/efficiency

Health Promotion/Disease Prevention
- Importance of studying healthy individuals
- Advances in early diagnosis/detection
- Evidence-based reduction of health disparities

Treatments/Cures
- Opportunities based on molecular knowledge
- Breakdown of traditional disease boundaries
- Breakthroughs need partnerships, often come from unexpected directions
- Advances in clinical methods stimulate progress

Objective 2: Set Priorities
- Incorporate disease burden as important, but not sole factor
- Foster scientific opportunity; need for nimbleness
- Advance research opportunities presented by rare diseases
- Consider value of permanently eradicating a pandemic risk

Objective 3: Enhance Stewardship
- Recruit/retain outstanding research workforce
- Enhance workforce diversity
- Encourage innovation
- Optimize approaches to inform funding decisions
- Enhance impact through partnerships
- Ensure rigor and reproducibility
- Reduce administrative burden

Objective 4: Excel as a Federal Science Agency by Managing for Results
NIH-Wide Strategic Plan: Overview

Overview

• Mission of NIH
• Unique moment of opportunity in biomedical research
• Current NIH-supported research landscape
• Constraints confronting the community in the face of lost purchasing power
A Unique Moment of Opportunity in Biomedical Research: Fueled by Advances in Technology, Increased Molecular Knowledge, and Interdisciplinary Approaches to Problem Solving
Objective 1: Advance Opportunities in Biomedical Research

**Fundamental Science**
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**Health Promotion/Disease Prevention**
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**Treatments/Cures**
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Advance Opportunities in Biomedical Research: Select Examples

The Precision Medicine Initiative® Cohort
- Will enroll 1 million or more U.S. volunteers
- Will represent the nation’s rich diversity
- Will build the knowledge base needed to advance precision medicine
- Will engage participants and protect privacy at every step

Universal Flu Vaccine
- Up to 50,000 U.S. deaths associated with flu annually
- $87 billion in economic costs
- Protection currently involves getting a flu shot every year
- Vaccine manufacture takes 6 months; requires predicting this year’s flu strain before production

Therapeutic Development Pipeline

Drug Discovery Pre-Clinical Clinical Trials FDA Review Clinic

- 10,000 Compounds
- 250 Compounds
- 5 Compounds

6.5 years 6 years 1.5 years
### NIH-Wide Strategic Plan: Set Priorities and Enhance Stewardship

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<tr>
<th>Objective 2</th>
<th>Objective 3</th>
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<td>• Employ risk management strategies</td>
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Set Priorities and Enhance Stewardship: Select Examples

**HIV/AIDS Research Priorities**
- Reduce incidence, including vaccines
- Safer, easier-to-use therapies
- Work toward a cure
- HIV-associated comorbidities, co-infections
- Cross-cutting areas: Basic research, health disparities, training

**Clinical Trials Data Sharing**
- Provide a way for patients and the public to find trials of interest to them
- Inform future research, improve study design, enhance the evidence base, and prevent duplication of unsafe or unsuccessful trials
- Fulfill an ethical responsibility to people who volunteer to participate in research
- Affirm public trust in clinical research
Objective 4

Excel as a Federal Science Agency by Managing for Results
Manage for Results: Select Examples
A Few (Select) Bold Predictions for 2020

- Many thousands of cancer patients will experience enhanced survival from application of precision medicine.
- NIH-supported research will identify effective tailored behavioral and social interventions to promote health and prevent illness in populations that experience health disparities.
- NIH-supported clinical trials will show that at least a half-dozen interventions thought to be clinically beneficial actually have no value.
- Application of certain mobile health (mHealth) technologies will provide rigorous evidence for their use in enhancing health promotion and disease prevention.
- NIH will be known as the model agency for applying the scientific method to itself—for learning and implementing, in a rigorous way, how best to support biomedical research.
NIH Priorities and Initiatives

Topics

- Budgetary context
- NIH-Wide Strategic Plan
- Environmental Influences on Child Health Outcomes
ECHO Program: Overview

- **Overarching Goal**
  - Investigate the longitudinal impact of pre-, peri-, and postnatal environmental exposures on pediatric development and health outcomes with high public health impact through leverage of extant cohorts and other available resources.

- **Core Elements to be Collected From all Participants**
  - Demographics
  - Typical early health and development descriptors
    - Optional Sub-Element: Microbiome
  - Genetic influences on early childhood health and development
    - Optional Sub-Element: Epigenetics
  - Environmental exposures (e.g., behavioral, biological, chemical, social)
  - Patient/Person (parent and child) Reported Outcomes (PROs)
ECHO Plan: Overview (cont’d)

- **Pediatric Health Outcome Focus Areas**
  - Upper and lower airway
  - Obesity
  - Pre-, peri-, and postnatal outcomes
  - Neurodevelopment

- **Additional Opportunity**
  - Create an IDeA States Pediatric Clinical Trials Network
    - Address access gaps for rural children through a national network for pediatric research embedded at IDeA locations
    - Link existing IDeA state centers with experts in clinical trials
ECHO Plan: Potential Research Questions that Could be Addressed

- What are the specific relative contributions of genetic and environmental (behavioral, biological, chemical, social, etc.) influences on child health?
- What factors render individuals or populations subjected to the same exposures as resilient or susceptible to disease? Do these differ over time, and by sex/gender, race/ethnicity, and/or SES?
- What are the inflection points at which the body’s normal physiologic homeostasis becomes dysregulated, leading chronic disease(s)?
- What are the molecular and behavioral mechanisms involved in maintaining a healthy weight across the lifespan?
- What are the genetic, biomarker, and environmental predictors of risk for the key focus areas of childhood outcomes?
ECHO Program Elements

- Extant Pediatric Cohorts
- Coordinating Center (CC)
- Data Analysis Center (DAC)
- PRO Core – leveraging PEPR (started in FY15 with NCS funds)
- CHEAR Core – leveraging CHEAR (started in FY15 with NCS funds)
- Genetics Core

- IDeA States Pediatric Clinical Trials Network
  - IDeA Clinical Sites
  - IDeA Data Coordinating and Operations Center (DCOC)

FOAs released on December 7, 2015
ECHO Program Element: Extant Cohorts [RFA-OD-16-004]

- Characteristics of cohorts (not limited to):
  - Cohorts initiated in pregnancy or post-partum that continue to follow offspring outcomes
  - Cohorts that ended data collection on pregnant women and offspring, but can demonstrate the capability to recontact
  - Cohorts that are currently recruiting and/or assessing pregnant or post-partum women and their offspring

- Additional items that may be considered by applicants:
  - EHRs are encouraged, but not required
  - Basic mechanistic studies that can only be done using human cohorts are encouraged

- Two phases: UG3/UH3

- Anticipated Combined Cohort Size: ~50,000
ECHO Program Element: Coordinating Center [RFA-OD-16-006]

- Responsible for:
  - Administrative coordination, training, and communication
  - Developing standard Core Elements
  - Coordinating statistical analysis with DAC/CHEAR/PRO Cores
  - Assisting DAC administratively
  - Developing and implementing policies (e.g., data sharing)
  - Coordinating with existing bio-repositories
  - Administering the Opportunities and Infrastructure Fund
  - Coordinating the functions of the Steering Committee and the External Scientific Board

- 4 Components

- Applicants are encouraged to apply for the CC and DAC
ECHO Program Element: Data Analysis Center [RFA-OD-16-005]

- Responsible for:
  - Developing and applying novel analytic methods for combining and analyzing existing and new longitudinal data from disparate extant cohorts
  - Data quality control and assurance, and validation
  - Conducting multi-level analyses on pooled consortium data
  - Bioinformatics and statistical analysis with the help of the CC to coordinate with the CHEAR, PRO, and Genetics Cores
  - Building and maintaining data dictionaries and databases
  - Developing a data sharing, security, and dissemination plan

Applicants are encouraged to apply for the CC and DAC
ECHO Program Element: PRO Core [RFA-OD-16-003]

- Responsible for:
  - Providing expertise in selecting, developing, and validating child Patient Reported Outcomes (cPROs)
  - Updating existing and validating emerging cPROs
  - Assisting with the incorporation of cPROs into study design (i.e., Core Elements)
  - Coordinating the mode of administration
  - Performing initial quality control and assessment of cPRO data
  - Assisting the DAC with cPRO data analysis, where applicable
  - Integrating Validation of Pediatric Patient Reported Outcomes in Chronic Diseases (PEPR) derived knowledge and resources with the ECHO PRO Core
ECHO Program Element: CHEAR Core
[PA-16-046]

- Expand upon an existing resource – Children’s Health Exposure Analysis Resource (CHEAR)
  - Network of laboratory hubs supporting comprehensive exposure analysis of biological samples

- Responsible for:
  - Conducting targeted and untargeted analysis of stored and prospectively collected biological samples
  - Providing statistical and data flow support and coordination with the DAC
  - Assisting with the incorporation of exposure assessment into study design (i.e., Core Elements)
  - Coordinating workflow with the CC and DAC
ECHO Program Element: Genetics Core

- Responsible for:
  - Coordinating the standardized collection and measurement of genetic samples for SNP-chip analysis through state-of-the-art techniques
  - Collaborating with the CC and DAC on data workflow
  - To be released in FY17
ECHO Program Element: IDeA Clinical Sites and DCOC [RFA-OD-16-001/002]

IDeA Clinical Sites
- Expand pediatric clinical trials initiated by other entities
- Studies initiated within the Network are encouraged
- Local teams will receive training on conducting trials
- Open to organizations in IDeA states

IDeA DCOC
- Point of contact, and oversight and training responsibilities
- Function as an informatics, data coordinating, and operations center for clinical trial implementation
- Funding for capitation fees and expenses
- Steering Committee
- Open to organizations with a partner in an IDeA state
ECHO Program Elements: IDeA States Pediatric Clinical Trials Network

- Linkage to ECHO
  - Prioritize research investigating the four ECHO Focus Areas
  - Prospective data collection encouraged to address the ECHO Core Elements
  - Representatives on ECHO Steering Committee and subcommittees
Structure and Governance
Program Director/Office

- Interim Program Director – Larry Tabak, DDS, PhD
- Interim Associate Program Director – Tara Schwetz, PhD
- Recruiting a permanent ECHO Program Director
- Additional program staff (analysts)
ECHO External Scientific Board: A Working Group of the Council of Councils

- **Members**
  - To be determined after grant awards are made in September 2016

- **Functions:**
  - Council of Councils will perform concept clearance and secondary review for ECHO programs
  - ECHO External Scientific Board (ESB) will be a working group of the Council of Councils
    - ESB will provide recommendations for the Program Director
    - ESB reports will be reviewed by the Council, who may provide comments for the Program Director on the reports
# ECHO Program Timeline

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<th>Action</th>
<th>Timeframe</th>
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<tr>
<td>Call with HHS</td>
<td>July 10th</td>
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<tr>
<td>Meet with stakeholder groups to solicit input</td>
<td>July</td>
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<td>stakeholder Roundtables</td>
<td>July 14-15</td>
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<tr>
<td>Conduct webinars</td>
<td>July 22, 27, 29</td>
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<td>Craft and analyze RFI</td>
<td>July</td>
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<tr>
<td>Release/Publish RFI</td>
<td>July 13</td>
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<tr>
<td>Analyze RFI</td>
<td>Early August</td>
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<tr>
<td>Craft RFA concept/plan</td>
<td>By 9/1/15</td>
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<tr>
<td>Present concept for clearance by Council of Councils</td>
<td>9/1/2015</td>
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<tr>
<td>Craft FOAs</td>
<td>September - October 2015</td>
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<tr>
<td>All FOAs with OER for review</td>
<td>11/1/2015</td>
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<tr>
<td>Publish notices, if necessary</td>
<td>December-15</td>
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<td>RFAs published in the Guide</td>
<td>December 2015</td>
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<td>Applications due</td>
<td>4/15/2016</td>
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<tr>
<td>Peer review of applications</td>
<td>Summer 2016</td>
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<tr>
<td>Council review of applications completed</td>
<td>9/30/2016</td>
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NIH...

Turning Discovery Into Health

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