Government Funding for Down Syndrome Research Triples – What This Could Mean for Children & Adults with Down Syndrome and How You Can Help

Melissa Parisi, MD, PhD
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What if researchers studied…

• ...why some babies with Down syndrome get leukemia?
• ...the ways children with Down syndrome communicate, learn and develop?
• ...the best strategies for kids with Down syndrome to get the right eyeglass prescription?
• ...treatments for skin disorders in adults with Down syndrome?
• ...how best to measure sleep apnea in a home setting rather than going to a hospital or clinic?

They are! These and other studies are being funded through…
New NIH grant awards boost funding for research on Down syndrome

INCLUDE project aims to address conditions of Down syndrome and apply knowledge to larger population.

The National Institutes of Health has awarded approximately $35 million in new grants in fiscal year (FY) 2019 to advance research on Down syndrome through the Investigation of Co-occurring Conditions Across the Lifespan to Understand Down Syndrome (INCLUDEx) project. These awards bolster total funding for Down syndrome research in FY 2019 to an estimated $77 million. INCLUDEx is a trans-NIH effort with participation from many NIH institutes and centers. Research funded by INCLUDEx will investigate critical health and quality-of-life needs for individuals with Down syndrome, while at the same time explore co-occurring conditions with individuals who do not have Down syndrome.
Outline

• National Institutes of Health (NIH)

• The INCLUDE Research Initiative
  • History
  • Research being funded this year

• NIH resources for Down syndrome
  • Down Syndrome Research Plan
  • DS-Connect®: The Down Syndrome Registry
Why is research important?

- People with Down syndrome are living longer, largely due to improved medical treatments.

In 1959, the life expectancy of a person with DS in the US was 9 years.
In 1983, the life expectancy of a person with DS was 25 years.
In 2007, the life expectancy of a person with DS was 50+ years—a
can increase of >450% from 1959!
What is the National Institutes of Health (NIH)?

• The U.S.’s national medical research agency
• The world’s largest funder of biomedical research
• Made up of 27 separate research institutes and centers
• Director since 2009: Dr. Francis Collins
• 85% of funds go to university research institutions based on peer review of grant applications
NIH leads the Down Syndrome Consortium

Self-advocates
New Congressional Directive for DS

• In the 2018 budget legislation for NIH:
  • Develop a new trans-NIH initiative to study trisomy 21, with the aim of yielding scientific discoveries to improve the health and neurodevelopment of individuals with Down syndrome and typical individuals at risk for:
    • Alzheimer's disease
    • Leukemia
    • Heart defects
    • Immune system dysregulation
    • Autism
    • and other conditions
  Protected from:
    • Many cancers
    • Heart disease and heart attacks

• Congress provided ~$23 in additional research money in 2018 for a new trans-NIH research initiative
What does it mean to be a “trans-NIH” initiative?

18 different institutes are involved in the INCLUDE Project, and they cover all the major co-occurring conditions in DS.
INCLUDE (INvestigation of Co-occurring conditions across the Lifespan to Understand Down syndrome)

3 components:

1. Conduct targeted, high-risk, high-reward basic science studies on chromosome 21.

2. Assemble a large study population of individuals with Down syndrome across the lifespan.

3. Include individuals with Down syndrome in existing and future clinical trials.
2018 INCLUDE Funding for DS

• ~$23 M supported 49 supplements to existing projects
• All 3 components addressed
• **General areas:**
  • Leukemia and immune system
  • Language
  • Development
  • Pulmonary function
  • Sleep
  • Genomics
  • Aging and Dementia
2019 INCLUDE Funding for DS

• ~$35 M supporting 43 projects

  • Basic science:
    • Silencing genes on chromosome 21 to understand brain development
    • Studies to understand why ~\(\frac{1}{2}\) of infants have a heart defect

  • Cohort development:
    • Cognitive and developmental tests for future clinical trials
    • Effects of chemotherapy used to treat leukemia on the heart
    • Hearing in a noisy environment
    • Strategies to recruit underrepresented minorities into research

  • Clinical trials:
    • Medications for ADHD in children with attention problems
    • Medications to treat sleep apnea in children
    • A medication for Alzheimer’s disease in adults

  • Training: support for up to 18 trainees and junior researchers

URL: [https://www.nih.gov/include-project](https://www.nih.gov/include-project)
Total NIH Funding for Research on Down Syndrome
2008 – 2019

FY2020 Appropriation: $60 M for INCLUDE

Total NIH Funding for Research on Down Syndrome

2008 – 2019

Award Amount in U.S. Dollars (millions)

$0 $10 $20 $30 $40 $50 $60 $70 $80 $90


Fiscal Year

~$35 M in 2019
~$23 M in 2018

FY2020 Appropriation: $60 M for INCLUDE

INCLUDE funding

$77.0 (est.)
Building a large cohort for natural history and biomarker studies

• Several projects: Genomic predictors of heart defects, leukemia, and other features in individuals with Down syndrome

• Use DS-Connect®: The Down Syndrome Registry for recruitment

http://DSConnect.nih.gov
Alzheimer’s Disease in DS

• Many people with DS begin to show symptoms of Alzheimer’s disease (AD) in their 50s/60s

• Alzheimer’s Biomarkers Consortium of Down Syndrome (ABC-DS):
  • Funded by NIH (NIA and NICHD): ~$46 M over 5 years
  • > 500 volunteers who have Down syndrome, plus healthy siblings
  • Age >25 years
  • Studies of biomarkers that may help diagnose Alzheimer’s—even before symptoms appear:
    • Cognitive tests
    • Brain scans (amyloid, tau)
    • Genetic studies
    • Blood biomarkers

• INCLUDE projects to understand lifestyle factors and lay the groundwork for clinical trials of AD in DS

• New research in 2019:
  • Clinical trial to test preventive treatments for dementia in adults with DS
NICHD’s Pediatric Trials Network (PTN)

- Studies the formulation, dosing, efficacy, and safety of drugs and medical devices used in children
- Conducts clinical trials for many different conditions
- Supported by NICHD through the Best Pharmaceuticals for Children Act (BPCA), legislation that mandates drug studies in children to enable FDA labeling
- PTN clinical research sites are located at over 100 universities and children’s hospitals across the U.S.
- The PTN will partner with INCLUDE to support drug studies in individuals with Down syndrome
- Additional goal is to train investigators to conduct research involving people with DS

See www.Pediatrictrials.org
THE INCLUDE PROJECT

Coming up in 2020

• More funding opportunities!

• Clinical trials infrastructure/training for investigators

• Workshops:
  May 2020: Clinical Trials in DS
  Nov. 2020: Opportunities in Basic Science in DS

• Give us feedback!

URL: https://www.nih.gov/include-project
New Funding Opportunity Announcements (FOAs)

- The NIH has re-issued 3 Request for Applications (RFAs) in 2020:
  1. Transformative Research Award (Transformative R01)
  2. Clinical Trial Readiness Award (R21)
  3. Clinical Trials for Co-Occurring Conditions in Down Syndrome (R61/R33)

- **2 New** RFAs:
  4. Data Coordinating Center (U2C)
  5. Secondary Data Analysis (R03)

- **Other New** Notices of Special Interest (NOSIs):
  6. Mentored Fellowships and Career Development Awards
  7. Model organism development
  8. New grant applications (R01) and competitive supplements (R01) for DS research
  9. Administrative supplements to existing grants

For details: https://www.nih.gov/include-project/funding
NIH Research Plan on Down Syndrome: Down Syndrome Directions

- Goal: Develop research goals and objectives for NIH research
- Plan to update the 2014 plan for 2021
- 5 major Research areas:
  - Pathophysiology of Down Syndrome and Disease Progression
  - Screening, Diagnosis and Functional Measures
  - Treatment and Management
  - Research Infrastructure
  - Down Syndrome and Aging

Look for calls to provide public input through Requests for Information!
How you can help...

Sign up for DS-Connect® (http://DSConnect.nih.gov)

A secure, confidential, online survey tool to collect basic information about people with Down syndrome

DS-Connect® is a powerful resource where people with Down syndrome and their families can:

- Connect with researchers and health care providers.
- Express interest in participating in certain clinical studies on Down Syndrome, including studies of new medications and other treatments.
- Take confidential health-related surveys. These surveys are aimed at better understanding of the health of people with Down Syndrome across their lifespans.

Launched Sept. 6, 2013
A partnership with families…

- Access the health care provider list

Search the directory for your health care provider(s) by name, facility name, city or state (2 letter abbreviation). If your health care provider is not in the directory, use the Add a New Health Care Provider link to add them in the directory. Note that you will need to search for each physician individually before the Save button will be enabled.

Please note that this list of healthcare providers does not imply endorsement or recommendation of their services.

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialty</th>
<th>Sees Adults or Youth?</th>
<th>Institution</th>
<th>City</th>
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</table>

~764 now Listed!
A partnership with families…

Print out the participant’s medical history

Jane Smith

DOB: 2011-01-01
Gender: Female
Registered By: Melissa Parisi
Relationship: Biological Parent

Initial Health Questionnaire

Completed: 2013-09-25

Diagnosis

• What is the participant’s Down syndrome diagnosis?
  Complete trisomy 21

• How was the diagnosis of Down syndrome made? (Select all that apply.)
  Genetic testing in baby after birth (such as chromosome analysis, cytogenomic array, or fluorescence in situ hybridization (FISH))

• What was the participant’s age in years when the diagnosis of Down syndrome was made?
  At birth
A partnership with families…

- Access the healthcare recommendations
- Personalized for the age of the person with DS

Health Care Guidelines For Individuals With Down Syndrome

Children with Down Syndrome: Health Care Information for Families (AAP)

Age-Specific Health Care Checklist (AAP) (144 KB PDF)

Aging and Down Syndrome: A Health & Well-Being Guidebook (NDSS) (8 MB PDF)

Links to AAP checklists

- Regular well-care visits (check-ups)
  - These visits will assist in checking your child’s health, giving shots, and answering questions about your child’s health.

- Monitor growth
  - It is important to check growth at every visit. Measurements include height, weight, and body mass index (BMI). These measurements are very important to assessing the overall health of the child. Discuss diet, activity level, and growth. Your child’s doctor can help with questions about any need for vitamins or supplements.

Links to NDSS guidebook

Aging and Down Syndrome: A Health & Well-Being Guidebook
Plot and print your child’s growth charts and data

Growth Charts for Children with Down Syndrome 2 to 20 years: Girls Weight-for-age percentiles

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A partnership with families: Explore the data

Example: Sleep
Recently Launched: Medication Tracker

Medication and Supplement Tracker

Add
List

Select "Add" to add a new prescription or over-the-counter medicine, vitamin, or herbal supplement. Select "Edit" if you stopped taking or need to change information about an item that is already in the list.

Current Medications and Supplements

Add Medication or Supplement

Sujata Bardhan

To help inform research, DS-Connect is collecting information about medication and supplement use in people with Down syndrome.

Type the name of a medication, vitamin, or herbal supplement in the search box and select "Search" to find the item you want to add to your list.

What are you taking? *

- tylenol
- TYLENOL
- Acetaminophen
- Other
DS-Connect® Registrants: North America

3867 as of February 17, 2020
Portal for Professionals: Recruit for studies

• Professionals can apply to use DS-Connect to recruit for their studies
• If approved, they have no direct access to Registry participants
• Registry Coordinator will contact eligible families about the study or trial
• Participants can choose whether to contact investigators to join
What does it mean to be in a research study with DS-Connect®?

- Take a survey of your experiences
- Answer a questionnaire about health issues
- Record data from an activity tracker (e.g., Fitbit)
- Participate in a clinical study of an intervention
- Be in a clinical trial for a new drug or medication
- Participate in an “INCLUDE” study

☑️ Any of the above! It’s your choice
Recruitment Assistance from DS-Connect®

Dr. Amy Lewanda at Children’s National studying use of nutritional supplements in children with DS

Goal: 500 participants
Had 140 participants before DS-Connect® notification

Patterns of Dietary Supplement Use in Children with Down Syndrome

Amy Feldman Lewanda, MD, Margo Faust Gallegos, CGC, and Marshall Summar, MD

Conclusions Almost one-half of parents surveyed administer or have administered supplement(s) to their children with Down syndrome. Many of the supplements have concerning ingredient profiles and are given to children too young to articulate potential ill effects. Providers need to be aware of these products and question families about their use. (J Pediatr 2018;201:100-5).
Spread the word about DS-Connect

• Sign up!
• Electronic Toolkit available:
  • Video Testimonial-YouTube
  • Flyers
  • Facebook info-cards
  • Badges and Tweets
• Help us reach our goal:
  • 10,000 by Dec 31, 2020

Registration Goal

http://DSConnect.nih.gov
What is missing?

We need you!

New knowledge and treatments

Research ideas

NIH, Foundations

Researchers

Research participants
Q & A

• DS-Connect: http://DSConnect.nih.gov
• INCLUDE: https://www.nih.gov/include-project
• Contact us! DSConnect@nih.gov
  or parisima@mail.nih.gov

Melissa Parisi  Sujata Bardhan  Lisa Kaeser

On behalf of the entire NIH INCLUDE Team