NIH Strategic Plan and Roadmap to Accelerate Nutrition Research Over Next 10 years

Dietary Biomarker Symposium

Advances, Challenges, and Future Directions in Food Biomarker Research

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Padma Maruvada, Ph.D.

Program Director,

National Institute of Diabetes, and Digestive and Kidney Diseases

Padma.maruvada@nih.gov

National Institutes of Health

“Keeping our Eye on the Ball”

Cell
Leading Edge

Commentary

Biomedical Research Goes Viral: Dangers and Opportunities

Eleftheria Zeggini, Michael Baumann, Magdalena Gotz, Stephaan Herzig, Martin Hrabe de Angelis,[8] and Matthias H. Tschop[1,2,8,*]

doi.org/10.1016/j.cell.2020.05.014

Researchers around the globe have been mounting, accelerating, and redeploying efforts across disciplines and organizations to tackle the SARS-CoV-2 outbreak. However, humankind continues to be afflicted by numerous other devastating diseases in increasing numbers. Here, we outline considerations and opportunities toward striking a good balance between maintaining and redefining research priorities.

The Nutrition Research Task Force
Co-Chairs

NIH Director
Francis Collins, MD, PhD

NRTF Co-Chairs
NIDDK Director – Griffin P Rodgers, MD, MACP
NHLBI Director – Gary H Gibbons, MD
NCI Director Ned Sharpless, MD
NICHD Director – Diana W Bianchi, MD

Exec. Sec. – Christopher Lynch

Senior Leadership Group
NIDDK – Christopher Lynch, PhD
NHLBI – Charlotte Pratt, PhD, MS, RD
NCI – Jill Reedy, PhD, MPH, RD
NICHD – Andrew Bremer, MD, PhD

Implementation Work Groups
~50 intra and extramural scientist volunteers representing
CSR, FIC, NCI, NHGRI, NHLBI, NIA, NIAAA, NICHD, NIDA, NIDCR, NIDDK, NIEHS, NIMHD, NINR, OBSSR, ODP, ODS, OSC

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NIH Strategic Plan Development

- Taskforce formed in 2016
- Working group represented by various NIH ICs and Offices
- Lengthy and Systematic Process
- Engaged Nutrition Community
  - Request for Information
  - Crowd Sourcing
  - Thought Leader Panel
  - Consulted other federal agencies

Introducing the First Strategic Plan for NIH Nutrition Research

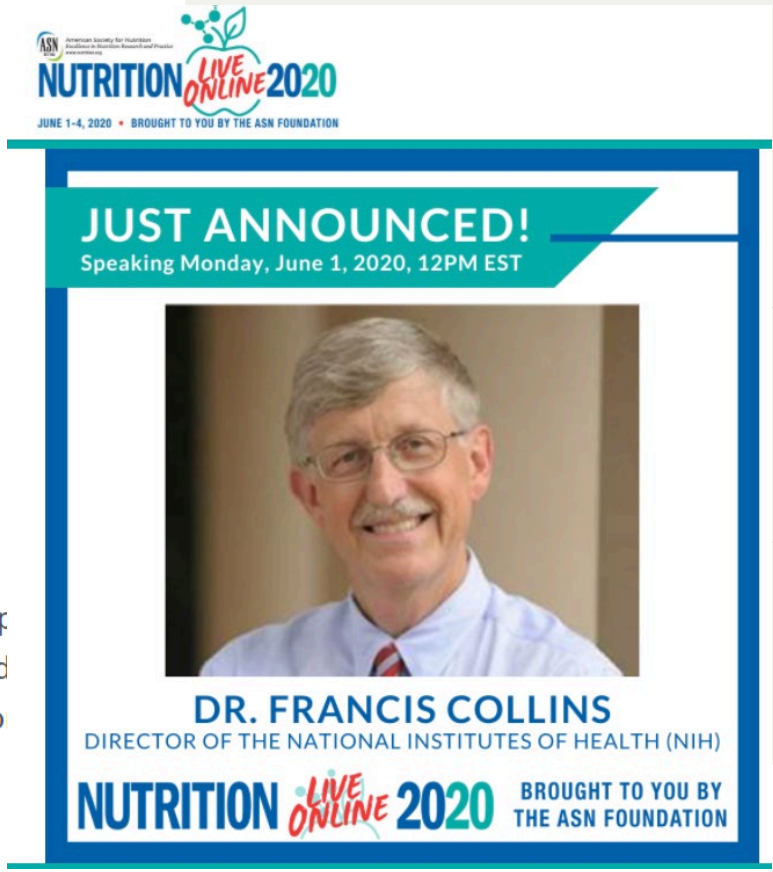
NEWS RELEASES

Media Advisory Wednesday, May 27, 2020

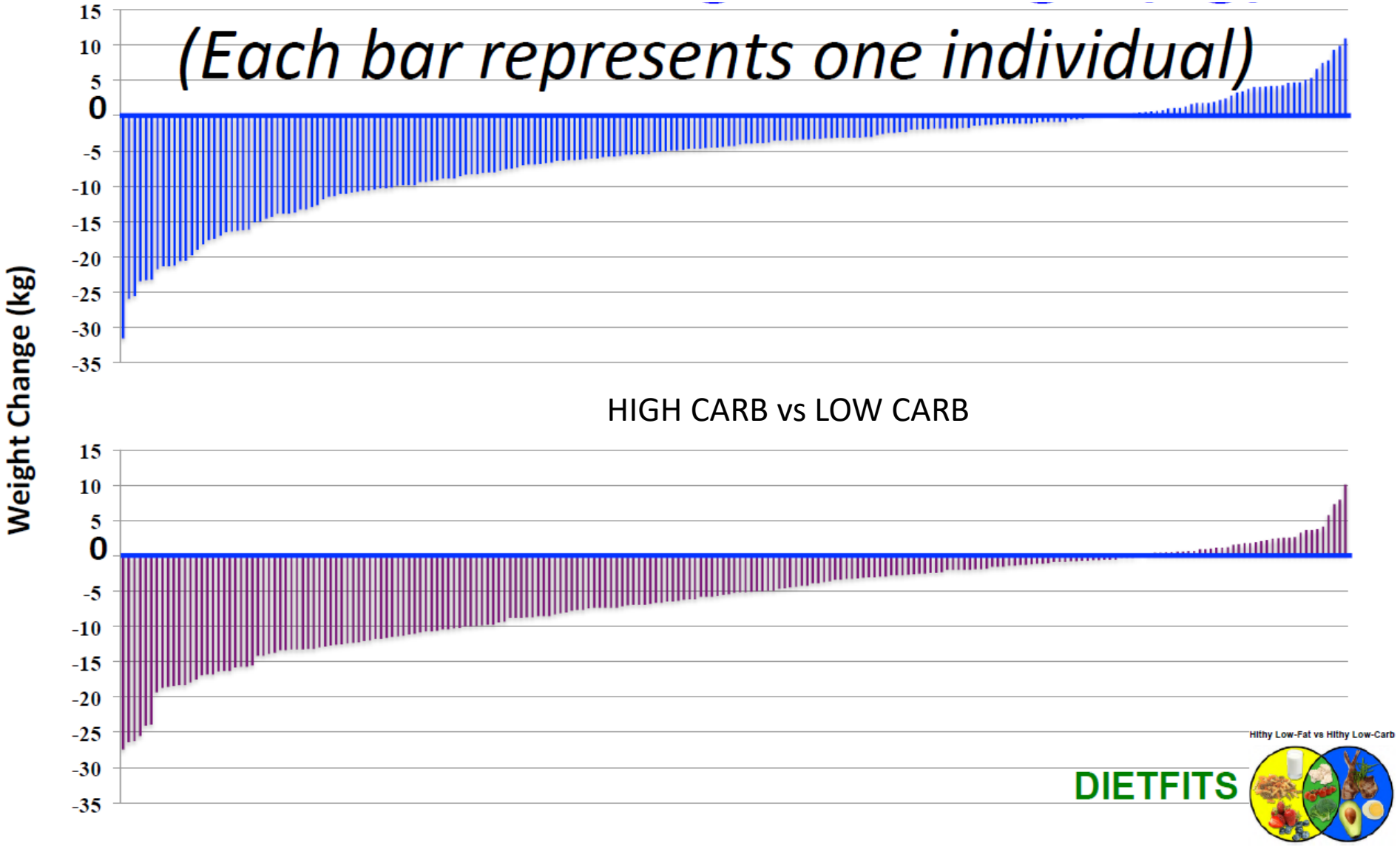
NIH releases strategic plan to accelerate nutrition research over next 10 years

What

What if each of us had individualized dietary recommendations that helped us decide what, when, why, and how to eat to op
our health and quality of life? This precision nutrition approach — developing targeted and effective diet interventions in a d
population — is among the ambitious goals set out by the 2020-2030 Strategic Plan for National Institutes of Health Nutritio
Research



Individual Variability in Dietary Responses



The DIETFITS Study, JAMA, 2018;319(7):667-679.

Potential of Precision Nutrition

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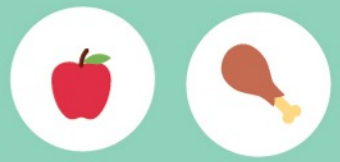
1. Maximize opportunities to observe inter-individual variability in a wide range of responses to diet interventions by studying diverse participants

CURRENT STATE:
Population-Based
Diet Recommendations

2. Research on Sources of Individual Variability in Diet-Health Relationships

GENETICS
MICROBIOME
HEALTH STATUS

PHYSIO-METABOLIC
NUTRITION RESPONSES



DIET CHOICES
NUTRITIONAL STATUS

3. Combine comprehensive linked datasets of diet, genetics, physio-metabolic, microbiome measures

NUTRITION MICROBIOME
GENETIC INTERPLAY

4. Artificial Intelligence is able to interpret all of the different types of data to help predict health outcomes

DATA TRANSLATION
ARTIFICIAL INTELLIGENCE (A.I.)

5. Custom plans to help individuals make better dietary choices

**INDIVIDUAL HEALTH
RECOMMENDATIONS**

What's Inside
The 2020-30 Strategic Plan for
NIH Nutrition Research?

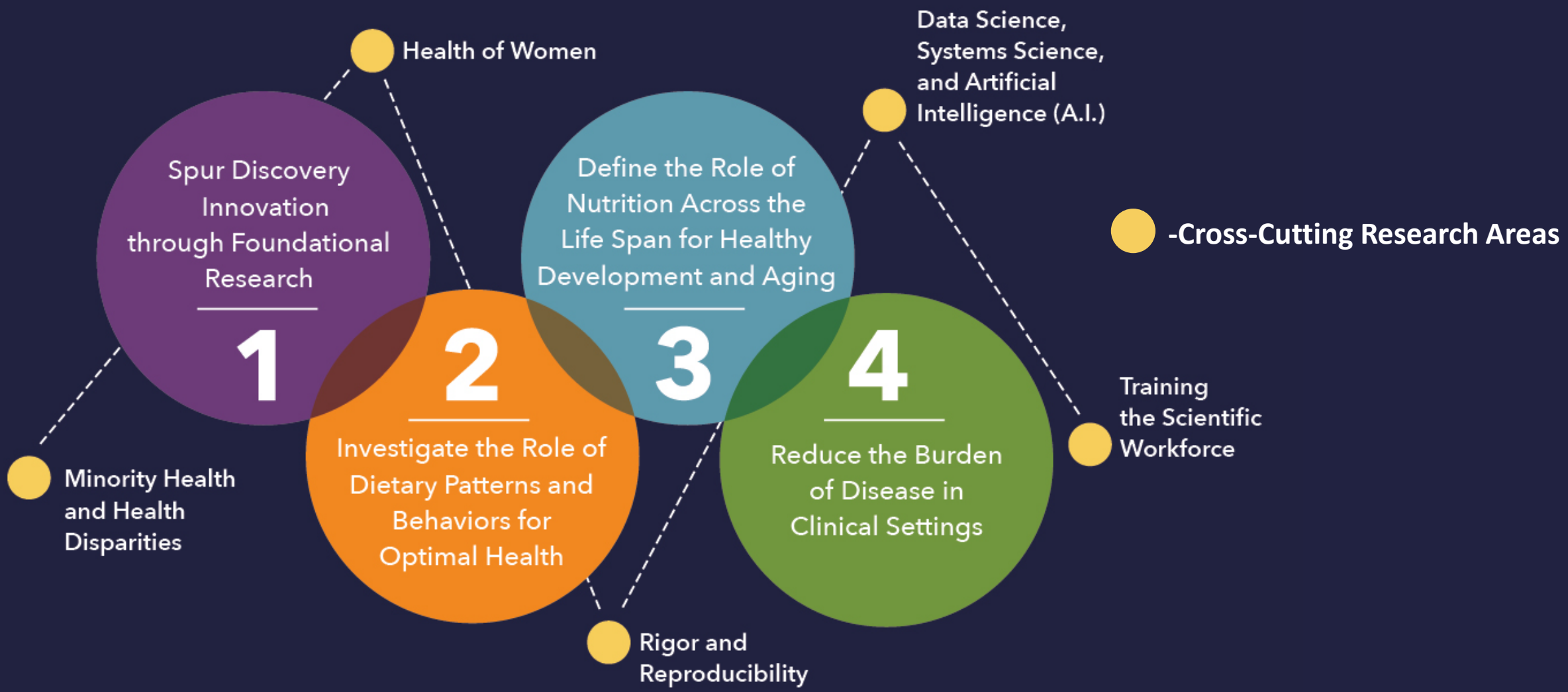
Unifying Vision:* *Precision Nutrition

National Institutes of Health
Turning Discovery Into Health

2020–2030 Strategic Plan for NIH Nutrition Research

A Report of the NIH Nutrition Research Task Force

Precision Nutrition *is the overarching theme with multiple Strategic Goals and Cross-cutting Research Areas*



Strategic Goals will Achieve Precision Nutrition Vision

1 Spur Discovery and Innovation through Foundational Research—*What do we eat and how does it affect us?*

2 Investigate the Role of Dietary Patterns and Behaviors for Optimal Health—*What and when should we eat?*

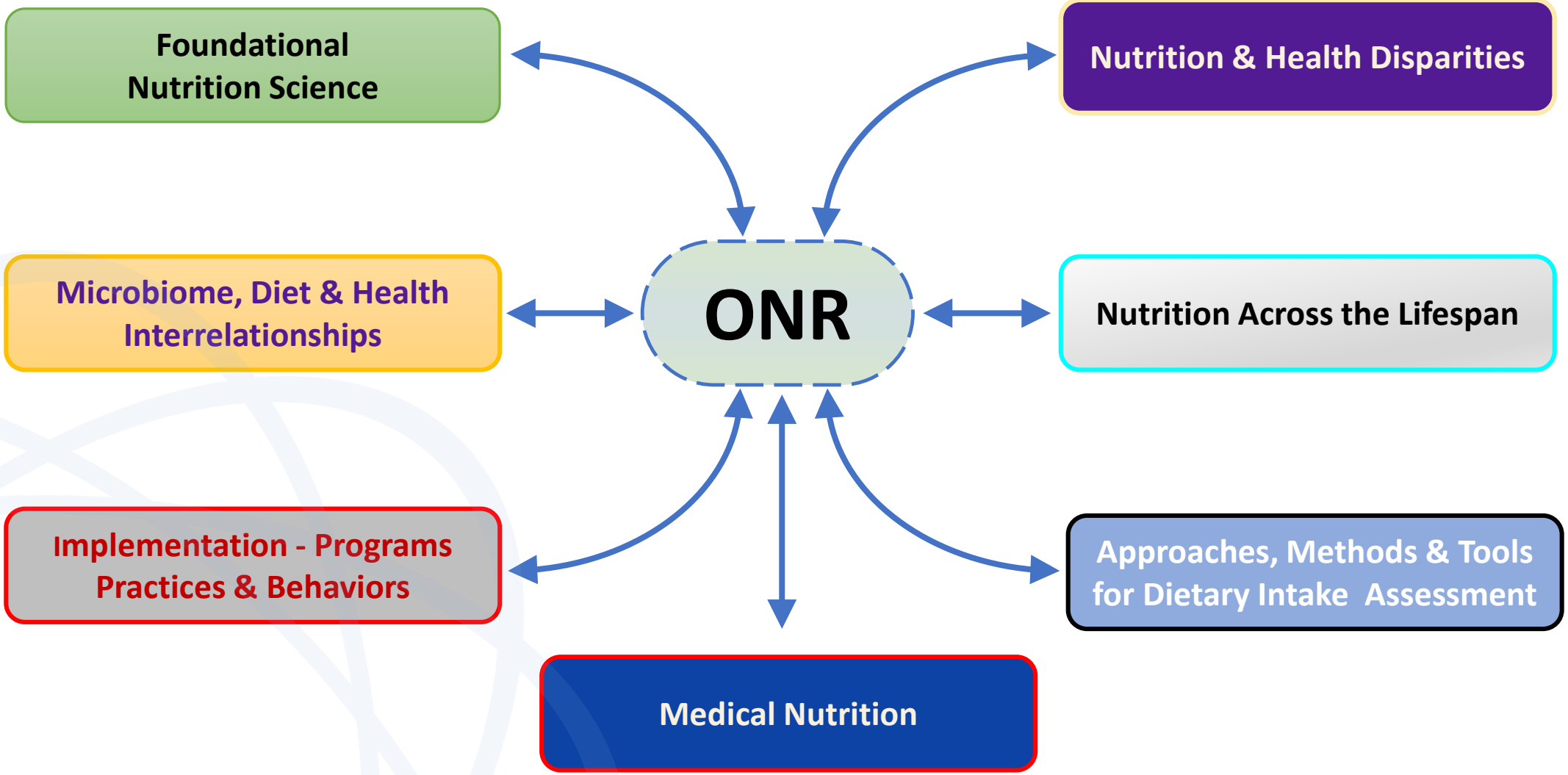
3 Define the Role of Nutrition Across the Lifespan—*How does what we eat promote health across our lifespan?*

4 Reduce the Burden of Disease in Clinical Settings—*How can we improve the use of food as medicine?*

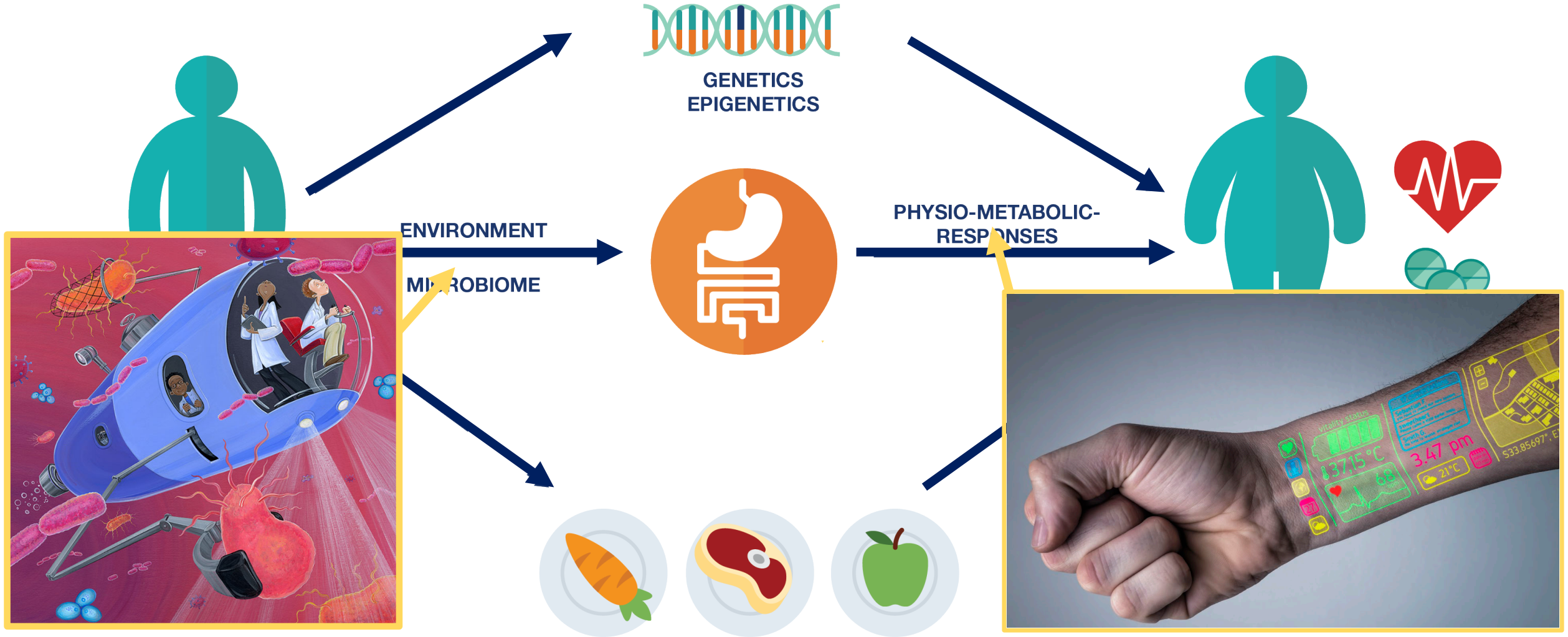
Implementation Workgroups

- Implementation Work Groups (IWGs) were formed last year and have been meeting around topic areas in the Strategic Plan
- **Goal is to implement the Strategic Plan by developing truly trans NIH activities and initiatives that are inspired by the Strategic Goals and Objectives in the Plan**
- The IWGs have:
  - Performed portfolio analyses with assistance from Office of Nutrition Research
  - Developed short- and long-term goals
  - Outlined workshop concepts, guidance for other IWGs, trans NIH initiatives, and/or Grand Challenges

NIH Strategic Plan for NIH Nutrition Research
Implementation Workgroups



New tools to move Precision Nutrition forward



GI & Microbiome Explorer (Smart Pill) Project
NOT-DK-19-021 & PAR-20-133

Continuous Analyte Monitors Project
NOT-DK-19-021 & PAR-20-134

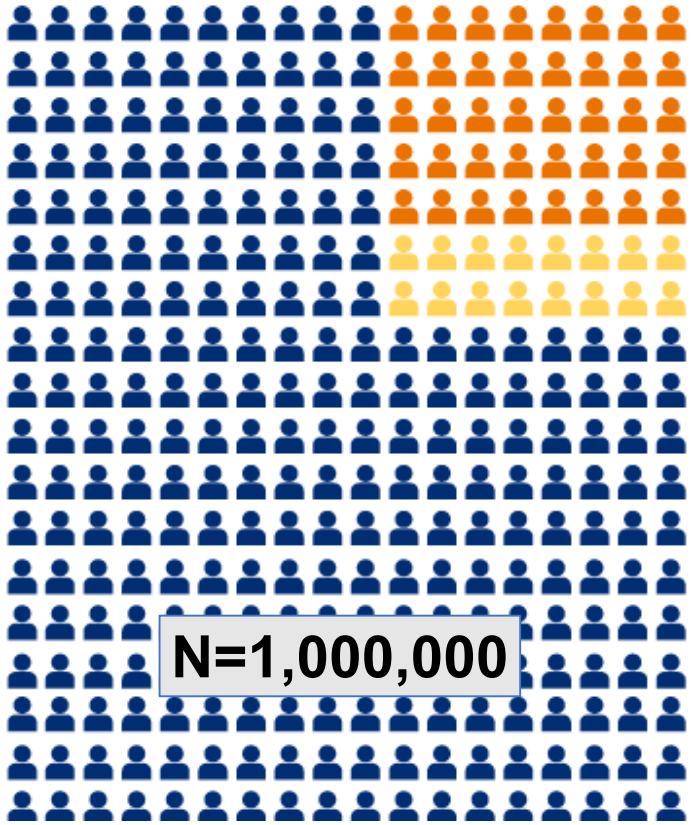
Nutrition for Precision Health, Powered by the *All of Us* Research Program

- In Sept, NIH cleared a Common Fund concept at the Sept. Council of Councils meeting: Nutrition for Precision Health, powered by the *All of Us* Research Program
- First NIH Common Fund program dedicated to nutrition
- First ancillary study nested in the *All of Us* Cohort
- The videocast presentation of the project can be viewed here (discussion begins at 1:54:00). Slides and a brief write-up are also available

Proposal Overview

Leverage existing NIH investments - including the *All of Us* Study - and emerging technologies and tools to make the critical discoveries to steer nutrition research toward personalized approaches.

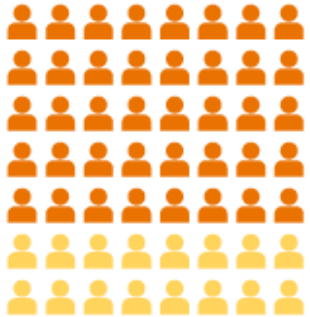
STUDY GROUP NESTED IN *ALL OF US*



1 MODULE 1
Examine usual diet with continuous glucose monitoring, followed by a mixed meal challenge, and micro-biome/metabolic phenotyping

n=10,000

USUAL DIET PARTICPANTS



2 weeks

2 MODULE 2
Randomized dietary interventions done at home as a subset of Module 1

n=1,500

LARGER FREE LIVING STUDY

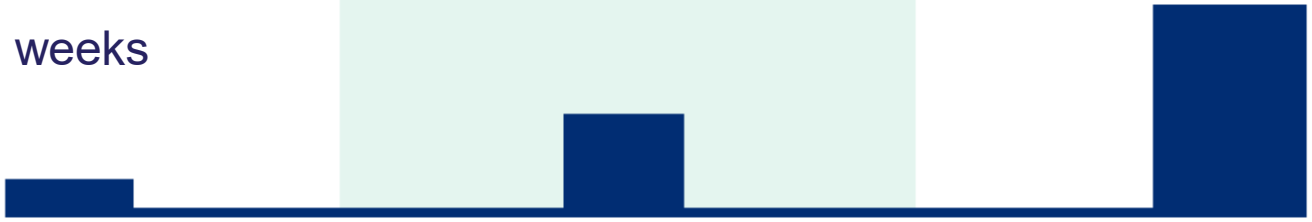
2 weeks x 3

3 MODULE 3
Randomized dietary interventions conducted in inpatient controlled feeding centers where precise nutritional intakes, microbiome ecology, and physio-metabolic data can be rigorously obtained

SMALLER CONTROLLED FEEDING CENTER

n=500

2 weeks x 3



LEVEL OF MICROBIOME, PHYSIO-METABOLIC AND DIET RESPONSE DATA AVAILABLE FROM PROPOSED MODULES

Deliverable: ALGORITHMS THAT PREDICT INDIVIDUAL RESPONSES TO DIETS

Why *All of Us?*

- Large, well-phenotyped cohort
- Commitment to diversity and inclusion
- Existing infrastructure, including Data and Research Center, Biobank, and Participant Technology Systems Center
- Availability of data, including genomics, electronic health records, mHealth data, and participant-provided information
- Data access and sharing policy, Researcher Workbench

Notices of Intent to Publish Funding Opportunity Announcements for Nutrition for Precision Health, powered by the All of Us Research Program

- Artificial Intelligence for Multimodal Data Modeling and Bioinformatics Center (U54 Clinical Trial Not Allowed) (NOT-RM-21-001)
- Metabolomics and Clinical Assays Center (U24 Clinical Trial Not Allowed) (NOT-RM-21-002)
- Microbiome and Metagenomics Center (U24 Clinical Trial Not Allowed) (NOT-RM-21-003)
- Dietary Assessment Center (U24 Clinical Trial Optional) (NOT-RM-21-006)
- Clinical Centers (UG1 Clinical Trial Required) (NOT-RM-21-007)
- Research Coordinating Center (U24 Clinical Trial Not Allowed) (NOT-RM-21-008)

Planning Process

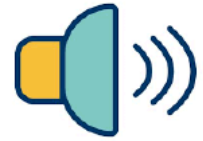
- Register for the workshop URL
- **Meeting Co-chairs:** José Ordovás, Ph.D., Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University; Elizabeth Parks, Ph.D., University of Missouri, and Bruce Y. Lee, M.D., MBA, City University of New York School of Public Health
- Poster sessions and awards available
- https://www.niddk.nih.gov/news/meetings-workshops/2021/precision-nutrition-workshop

Planning Process

- Request for Information: Data Science Challenges and Opportunities in the Field of Precision Nutrition
- **Notice Number:** NOT-RM-21-005
- **Response Date:** November 15, 2020
- Responses submitted electronically to nutritionresearch@nih.gov

We're listening

NIH Research on Nutrition Listening Sessions (NutRitioNaLS)



- Opportunities for the nutrition research community to engage ad hoc with NIH staff in person has been and will continue to will be limited in the next year
- Through our new **NutRitioNaLS** program, we're facilitating discussions between relevant NIH staff and nutrition research stakeholders (trainees, scientists or groups). Listening sessions topics may provide input on emerging opportunities, challenges/barriers and potential solutions that could:
  - Accelerate progress in foundational, preclinical and clinical nutrition research
  - Identify ways that NIH could better support nutrition research training, career development, and progression
  - Facilitate the development and application of tools, methods, or technologies that would advance nutrition research
  - Advance development and implementation of behavioral nutrition interventions

For More Information

NIH Nutrition Research Task Force webpage:
https://www.niddk.nih.gov/about-niddk/advisory-coordinating-committees/nih-nutrition-research-task-force

Subscribe to receive Task Force updates:
https://public.govdelivery.com/accounts/USNIDDK/subscriber/new?topic_id=USNIDDK_157

Contact us at: NutritionResearch@NIDDK.NIH.GOV

Thank you

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