



A GLOBAL RESEARCH AGENDA FOR NUTRITION SCIENCE

ABSTRACTS FROM ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

The Sackler Institute for Nutrition Science, a program of the New York Academy of Sciences, in collaboration with the World Health Organization (WHO), led an initiative to identify global research gaps in nutrition science. The report, *A Global Research Agenda for Nutrition Science* (2013), is the culmination of a two-year process to accelerate global commitment, cooperative work, and funding to uncover scientific solutions to malnutrition.

The publication of five journal articles, in *Annals of the New York Academy of Sciences*, will provide a more in-depth analysis of the research needs highlighted across the three Focus Areas around which this *Agenda* is organized. Each article proposes to provide an overview of current evidence; illustrations of the research gaps; and, guidance for new research endeavors in the nutrition field. These articles will contribute to the ongoing efforts to enable a cohesive, transdisciplinary approach of nutrition research.

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THE SACKLER INSTITUTE
for NUTRITION SCIENCE

a program of



The New York
Academy of Sciences

Research Gaps on Environmental and Societal Trends Affecting Food and Nutrition

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ABSTRACT

Nutrition is multifactorial, affected by numerous environmental and societal causes. These environmental and societal factors, as well as their relative importance and interactions, have large implications for research, practice and policy related to food and nutrition, but are challenging to research and describe. This paper starts with a simple framework based on three domains: nutritional quality, environmental sustainability, and economic viability. It highlights limitations in the current understanding of how they influence one another and demonstrates the importance of an integrated approach toward research and actions that account for all three simultaneously. For an integrated approach to be developed, it would be helpful to identify and disseminate available modelling techniques and tools to researchers, practitioners, and policy-makers so that a systems approach becomes the norm in analyzing nutrition and food-security patterns. Such an approach will help clarify critical knowledge gaps and will guide researchers seeking to define and address specific research questions in nutrition in their wider socio-economic and environmental context.

Nutrition through the Lifecycle: Emerging Issues and Questions from Preconception to Early Childhood

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ABSTRACT

The Sackler Institute for Nutrition Science and the World Health Organization (WHO) partnered together to formulate a research agenda for nutrition science. This is the first in a series of three papers that examines gaps in our understanding of nutrition through the lifecycle, and focuses on early origins of undernutrition. Nutritional perturbations during pregnancy, fetal and early postnatal life can impact subsequent growth and development; accompanied by persistent changes in metabolic regulation and homeostasis. Intergenerational patterns of undernutrition are common and the preconception nutritional and physical health status of mothers is linked to positive pregnancy outcomes. The importance of early nutrition goes beyond understanding simple nutrient utilization and substrate storage to more complex relationships ranging from poverty and education to maternal health and wellbeing. Research areas identified include metabolic programming, maternal/fetal nutrient exchange, fetal growth, determination of intrauterine growth restriction and postnatal growth faltering, postnatal catch-up growth, stunting mechanisms, intergenerational effects of maternal stunting and obesity, the development of metabolic disorders, assessment of healthy growth and development, and optimal timing and duration of nutritional interventions.

Malnutrition, Infection, Developmental and Functional Outcomes and Their Interaction with Nutrition Interventions

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ABSTRACT

The Sackler Institute for Nutrition Science and the World Health Organization (WHO) worked together to formulate a research agenda for nutrition science. Undernutrition of children has profound effects on health, development and achievement of full human capacity. Undernutrition is not simply caused by a lack of food, but results from a complex interplay of intra- and intergenerational factors. Representative pre-clinical models and comprehensive well-controlled longitudinal clinical studies are needed to further understand the contributions and interrelationships between these factors and to develop interventions that are effective and durable. This paper summarizes work on mechanisms underlying the varied manifestations of childhood undernutrition, discusses current gaps in knowledge and challenges to our understanding of undernutrition and infection/immunity throughout the human lifecycle, focusing on early childhood growth. It proposes a series of basic and clinical studies to address this global health challenge.

Nutrition Through the Lifecycle: Moving from Single Nutrients to a Systems Biology Food-based Approach

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ABSTRACT

The Sackler Institute for Nutrition Science partnered together with the World Health Organization (WHO) to formulate a research agenda for nutrition science. This paper examines gaps in our understanding of nutrition through the lifecycle, focusing on a systems biology approach to addressing undernutrition and combinations of nutrients for achieving dietary balance. Nutrition requirements have traditionally been determined studying deficiency conditions. Rather than looking at deficiencies and nutrients in isolation, a more holistic approach is needed to synthesize knowledge using clinically relevant conditions and translating multiple nutrient requirements into food based dietary guidelines. Defining single nutrient requirements for specific populations and life stages remains a challenge and the development of biomarkers that reflect exposure, status and function are needed. Undernutrition offers opportunities to examine fatty acids, phosphorus, potassium, magnesium and choline during the perinatal period guided by an integrated systems biology approach.

Strengthening Implementation and Utilization of Nutrition Interventions Through Research: A Framework and Research Agenda

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ABSTRACT

Undernutrition among women and children contributes to nearly one half of the global burden of child mortality in developing countries. In recent years the impact of nutrition on development issues has highlighted the need for evidence-based solutions and yielded substantial global momentum. However, it is also recognized that impact of evidence-based interventions is limited by the lack of evidence on the best operational strategies for scaling up nutrition interventions. With the goal of encouraging greater engagement in the critical topic of delivery sciences in nutrition and generating evidence on delivery and utilization of nutrition interventions, this paper brings together a framework and a broad analysis of literature to frame and highlight the crucial importance of research on delivery and utilization of nutrition interventions. The paper draws on the deliberations of a high-level working group, an e-consultation, a conference and the published literature. It proposes a framework and areas of research that are most neglected, and yet, critical to address to enable better translation of global and national political momentum for nutrition into public health impact.

ABOUT US

The Sackler Institute for Nutrition Science

The New York Academy of Sciences, in partnership with The Mortimer D. Sackler Foundation, established The Sackler Institute for Nutrition Science to create a coordinated effort to support and disseminate nutrition science research. The Sackler Institute for Nutrition Science is dedicated to advancing nutrition science research and knowledge, mobilizing communities, and translating this work into the field. The Sackler Institute is generating a coordinated network across sectors, disciplines, and geographies that promotes open communication; encourages exchange of information and resources; nurtures the next generation of scientists; and affects community intervention design and public policy changes. Visit us online at www.nyas.org/nutrition.

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