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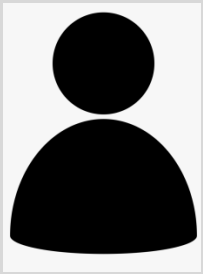

Inflammation and Nutritional Science for Programs/Policies and Interpretation of Research Evidence (INSPIRE)

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Abstract: (Limit 600 words)

An increasing recognition has emerged of the complexities of the global health agenda—specifically, the collision of infections and noncommunicable diseases and the dual burden of over- and undernutrition. Of particular practical concern are both 1) the need for a better understanding of the bidirectional relations between nutritional status and the development and function of the immune and inflammatory response and 2) the specific impact of the inflammatory response on the selection, use, and interpretation of nutrient biomarkers. The goal of the Inflammation and Nutritional Science for Programs/Policies and Interpretation of Research Evidence (INSPIRE) is to provide guidance for those users represented by the global food and nutrition enterprise. These include researchers (bench and clinical), clinicians providing care/treatment, those developing and evaluating programs/interventions at scale, and those responsible for generating evidence-based policy. The INSPIRE process included convening 5 thematic working groups (WGs) charged with developing summary reports around the following issues: 1) basic overview of the interactions between nutrition, immune function, and the inflammatory response; 2) examination of the evidence regarding the impact of nutrition on immune function and inflammation; 3) evaluation of the impact of inflammation and clinical conditions (acute and chronic) on nutrition; 4) examination of existing and potential new approaches to account for the impact of inflammation on biomarker interpretation and use; and 5) the presentation of new approaches to the study of these relations. Each WG was tasked with synthesizing a summary of the evidence for each of these topics and delineating the remaining gaps in our knowledge. This review consists of a summary of the INSPIRE workshop and the WG deliberations.

Biography: (Limit 200 words)

Daniel J Raiten developed his research work in Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, Bethesda, MD; Fayrouz A Sakr Ashour developed his research work in Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, Bethesda, MD; A Catharine Ross also developed his research work in Departments of Nutritional Sciences and Veterinary and Biomedical Science and Center for Molecular Immunology and Infectious Disease, Pennsylvania State University, University Park, PA;

About University: (Limit 200 words)

University Park is Penn State University's main campus, where thousands of undergraduates live in well-equipped residence hall complexes. The iconic Old Main building and its clock tower sit behind a huge lawn with walking paths. Beaver Stadium is Penn State Football's home, while the Bryce Jordan Center hosts concerts and basketball games. The 1860s Berkey Creamery offers dozens of ice cream flavors

Importance of Research: (Limit 200 words)

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Considerable progress has been made toward understanding the mechanistic roles of specific nutrients in the function of leukocytes of rodent models and in human cell lines. In particular, the discovery of cell signaling networks by which nutrients regulate the differentiation and phenotype of regulatory leukocytes has been an important development. The translation of these mechanistic results in ways that improve outcomes in human diseases has been limited. Aside from the obvious inability to control the experimental environment, the complex nutritional context of at-risk human populations presents a daunting challenge. For example, although research with rodents typically examines deficiencies of a single nutrient in a diet in which all other nutrient amounts are optimal, human diets may commonly be lacking in multiple nutrients and simultaneously have certain nutrient excesses. Consequently, a key research priority is the need to examine interactions between essential nutrients with the immune and related systems to determine if they have additive, synergistic, facilitating, or unpredictable effects relative to an individual's nutritional status.In human populations, genetic and epigenetic differences likely account for important variations in the response of the immune system to nutrient fortification. Reliance on inbred mouse species housed in highly controlled environments may not be the most relevant model for understanding the implication of these genetic interactions in humans. New approaches for model systems that more closely duplicate the dietary, genetic, and hygienic realities of human populations should be considered.

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