Endocrine Society comments in response to NOT-ES-23-005, "Request for Information (RFI): Input for developing the 2024-2028 National Institute of Environmental Health Sciences Strategic Plan."

Response was informed by members of the Research Affairs Core Committee (RACC) and members of the Endocrine Disrupting Chemicals (EDC) Task Force

Comments submitted electronically via online submission form on April 20, 2023.

General comments regarding overall needs and priorities in environmental health sciences for the next five years. What should NIEHS consider as we revise our Strategic Plan?

The Endocrine Society appreciates the opportunity to comment on the National Institutes of Environmental Health Sciences (NIEHS) Strategic Plan for 2024 – 2028.

Founded in 1916, the Endocrine Society is the world's oldest, largest, and most active organization devoted to research on hormones and the clinical practice of endocrinology. The Society's membership consists of over 18,000 scientists, physicians, educators, nurses, and students from more than 120 countries. Many of our members conduct NIEHS-supported research on the health effects of environmental exposures, including endocrine-disrupting chemicals (EDCs).

We strongly support NIEHS' goal to conduct and support the best science while aligning the science with real-world public health needs and translation of findings to individual and public health outcomes. In our comments, we identify several themes and emerging research areas we believe would help achieve NIEHS' strategic objectives.

We look forward to opportunities to work together at the intersection of endocrinology and environmental health sciences. Thank you for considering the Endocrine Society's comments. If we can be of further assistance, please contact Alyssa Scott, PhD, Manager of Science Policy and Research Affairs, at ascott@endocrine.org.

Theme 1: Advancing Environmental Health Sciences

A continued emphasis on addressing health disparities and environmental justice are critical to include in the upcoming strategic plan. NIEHS-funded studies have outlined health disparities such as the severity of air pollution tracking with higher shares of people of color. Continuing to understand the health disparities that exist is the first step in enacting more equitable policies that can save lives. This focus area would also be strengthened by including an emphasis on geocoding, or an explicit reference to the need to study high-exposure hotspots

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and build capacity for exposure monitoring at multiple levels within subpopulations or communities. Additionally, as the impacts of climate change continue to unfold over the next 4 years, it will be important to assess and predict how it may be disproportionately impacting certain communities.

Due in part to its prioritization in the previous strategic plan, we are advancing our understanding of how early life exposures can result in later-life disease risk. Studies have shown that the endocrine system is particularly susceptible to stressors during early life; exposure to EDCs, for example, have demonstrated health consequences decades post-exposure, leading to diseases such as diabetes, metabolic disease, reproductive health complications, respiratory disease, cancer, and others. We encourage the inclusion of early life exposures in the revised 2024-2028 Strategic Plan, but suggest expanding this topic to be inclusive of other vulnerable periods of life and development, such as puberty, pregnancy, and menopause. These are vulnerable developmental windows for many environmental exposures, but more research is needed to fully understand their risks and long-term consequences on human health.

In the theme of advancing environmental health sciences, we encourage NIEHS to explicitly include support for animal models of disease in the Strategic Plan. There has been a lot of progress made in using non-animal models in research. However, technology has not developed yet to completely replicate the unique information that animal models provide. Therefore, while we appreciate the inclusion of animal research in Goal 6: Predictive Toxicology of the previous strategic plan, there are other important opportunities to engage with the animal research community that would advance environmental health research. For example, companion animals and pets are exposed to many of the same environmental factors as their human caretakers, making them a useful proxy when researching the unique co-exposures of a particular location. Livestock can also be useful in providing baseline measurements of exposures to common chemicals used by farm workers. In these and other cases, animals serve as sentinel species for human diseases. We encourage NIEHS to explore opportunities to work with comparative endocrinologists to monitor environmental exposures and the incidence of endocrine disease in companion animals.

Continuing to emphasize research on co-exposures will be important in the upcoming strategic plan. However, this can be broadened from co-exposures to different chemicals to other exposure scenarios. For example, co-exposures could be reinterpreted to include chemical influences on the long-term impacts of Covid-19 or other diseases, and how those cumulative co-exposures affect the endocrine system. Additionally, it is important to note that the “exposome” is shifting rapidly due to climate change; the range of many disease-carrying species like mosquitos and ticks, for example, has led to an increase in West Nile, Lyme, and other vector-borne diseases in populations that weren’t previously at risk. Since climate change will impact our totality of exposures, it should have a primary role in the strategic plan.

Theme 2: Promoting Translation- Data to Knowledge to Action

Clinical studies involving humans are an essential part of the translation of data to knowledge to action. The strategic plan should emphasize the utility of these studies to better understand individual and population-level impacts of environmental exposures.

Additionally, data assessing human health impacts need to be expanded upon; most impact reports assess pre-term birth and cardiac outcomes. However, there are myriad other health outcomes from environmental exposures, such as premature menopause and accelerated reproductive aging, that have significant impacts on human health and capturing a wider net of health outcomes should be prioritized in future NIEHS-funded studies.

Another key to promoting translation is advancing the adoption of data repositories that are easier to access and use by a variety of research teams. This will enable researchers, regardless of grant funding status or location, to validate findings and analyze existing data in new ways. We also support the adoption of systematic reviews, also in the context of the National Toxicology Program, to support validation efforts and synthesize the steps needed to translate existing data into action.

Theme 3: Goals for enhancing environmental health sciences through stewardship and support

A way to provide stewardship of environmental health sciences and NIEHS priorities is through strengthening the training pipeline for basic, translational, and clinical researchers. Recent studies have shown that Americans rank their primary care physician in the top 3 sources they trust about information on climate change. However, the role of climate change in impacting human health is currently not a foundational part of medical school curriculums or commonly practiced post-graduation. As the health effects of climate change will only become more prevalent, NIEHS should strengthen their relationship with physicians at all stages of the pipeline to communicate the importance of considering environmental factors while treating patients.

NIEHS can also be a steward by providing mechanisms or supplemental funding for researchers to share biological samples, such as comprehensively defined animal tissues and physical samples, in a centralized repository. A centralized repository that could be accessed by researchers and utilized to build longitudinal data sets would result in tremendous cost savings and improved comparability between studies in different labs.