

What is the



GLOBAL EXPOSOME FORUM ?

A globally coordinated effort to link environmental exposures and health outcomes by leverage the collective power of an international member cohort.

The exposome holds unparalleled promise for human health and disease detection and prevention. Efforts to link environmental exposure to disease have previously been unsuccessful due to the global deficit in rich and reproducible health and environmental data. The Global Exposome Forum hopes to help overcome this barrier by standardizing data collection and facilitating a shared data research ecosystem to realize the full promise of the exposome and exposomics.

Here's how we arrived at this breakthrough moment an how we plan to move this effort forward:

1 Exposome Moonshot Forum

In May 2025 over **400 global leaders** in science, medicine, business, and policy convened in Washington, D.C. for the Exposome Moonshot Forum. The inaugural event took place at the state-of-the-art **Hopkins Bloomberg Center**; the event was convened by leaders Johns Hopkins University in collaboration the Network for Exposomics in the United States (NEXUS), the National Institutes of Environmental Health (NIH), the International Human Exposome Network (IHEN), European InfrastRucturE for humaN Exposome (EIRENE), and other international academic and health agency institutional partners.

2 Context: The Human Exposome Project

Long envisioned as a counterpart to the **Human Genome Project**, the Human Exposome Project seeks to systematically characterize compilation of all physical, chemical, biological, and psychosocial influences that impact biology and health across the lifespan. Efforts to formalize a Human Exposome Project started after the term was coined by **Christopher Wild in 2005**. What set this effort apart is its truly international, bottom-up approach. A central aim of the 2025 meeting was to engage a truly international cohort, spanning nations, states, cities, by connecting with decision makers at every level of government.

3 GEF: Proof of Concept

GEF is partnering with **UNESCO** and the **Human Cell Atlas** to bring targeted virtual town halls, spanning single cell analysis, genomics, exposomics, and science policy, to an international audience. GEF Executive Committee members at Harvard University recently published a groundbreaking new study placing genomics in direct conversation with exposomics, showing how the two field are poised to dramatically reshape human health and health profiles when they work in-step: **The architecture of exposome-phenome associations**. GEF has already begun organizing regional chapters, leading with the **Pan-African Chapter** and the **European Chapter**.

4 GEF: Vision & Mission

Create a research framework and coordinated approach to exposomics that combines emerging technologies, big data, and artificial intelligence to: Map environmental exposures comprehensively; Region-specific data generation, standardizing and sharing; Understand exposure-disease relationships by understanding regional variation; Enable precision prevention and treatment, benefit healthcare quality and affordability; Inform evidence-based policy and build lasting relationships with key policy and decision makers to streamline evidence to policy change timeline.

5 GEF: Scale & Ambition, Harmonizing Tech

- Initial target: 100,000 participants for comprehensive mapping
- Global scope: Participants from 30 countries across 6 continents
- Investment parallel: The Human Genome Project's \$3.8 billion investment yielded nearly \$1 trillion in economic activity (1988-2010)
- **Harmonizing Technologies: Mass spectrometry:** Can now detect 100,000+ chemical peaks from a single blood sample; **AI & Machine Learning:** Essential for processing vast, heterogeneous data streams; **Microphysiological Systems (MPS):** Human organ-on-chip models bridging epidemiological observations with mechanistic biology

Resources and Contact

Website: Global Exposome Forum: www.globalexposomeforum.org

Primary Contact: Global Exposome Forum: globalexposomeforum@jh.edu