ExO: An Ontology for Exposure Science

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An ontology is a formal representation of knowledge within a domain and typically consists of classes, the properties of those classes, and the relationships between them. Ontologies are critically important for specifying data of interest in a consistent manner, thereby enabling data aggregation, analysis and exchange. An exposure ontology, consistent with those being used in toxicology and other health sciences, is required to formally represent exposure concepts, the relationships between these concepts and most important, the relationships between exposure, susceptibility, and toxicology information. A successful exposure ontology must facilitate the semantic retrieval of exposure data in the context of environmental health science, medical surveillance, disease control, health tracking, risk assessment, and other public health and environmental science endeavors. To address this need, an Exposure Ontology, ExO, was designed and a prototype developed to provide the foundation for exposure data centralization and integration. The root classes forming the basis for the ontology are 'exposure event' 'exposure stressor', 'exposure receptor', and 'exposure outcome'. Although the initial development of ExO was focused on human exposure to chemicals, the ultimate intent is to provide domains that can be extended to address exposures to the full suite of environmental stressors. [*This abstract does not necessarily reflect U.S. EPA policy.]*