Seminar Talk Dr. Rance Nault

ToxDataCommons: Driving toxicology research forward through (meta)data sharing

URI Carother's library, Admin Suite (211) - room 203A on the second floor
31st of October 2025, 10:30a.m - 12:00p.m

zoom link:
https://uri-edu.zoom.us/j/96701452044?pwd=ydus27164uuFkQKLs1OD04693oiGW7.1

Abstract

Metadata are an essential component of any dataset, providing the contextual information necessary to interpret, integrate, and reuse data effectively. Nevertheless, publicly available toxicology datasets often lack consistent or complete metadata reporting, impeding discovery, integration, and reuse. To address these challenges, we aimed to develop and implement the technical infrastructure to better support robust metadata collection with an emphasis on reducing barriers to open metadata submission by researchers. From these efforts we introduce two resources, ToxDataCommons and SheetMATE, as components of a broad data ecosystem that facilitates the collection, sharing, and discovery of toxicology research datasets. ToxDataCommons is a Gen3-based data commons operating on a structured data model for reporting of investigation, study, and assay level metadata. Delivered though a web-based portal and application programming interface (API), the data commons leverages the data model to facilitate discovery, build cohorts, and encourage data reuse. Complementing ToxDataCommons, SheetMATE is our metadata templatization engine created to significantly reduce barriers for metadata collection in a familiar spreadsheet format while maintaining robust validation of controlled vocabularies and ontologies. Altogether, these resources advance our mission to enable the discovery and reuse of toxicology data, driving new insights into the biological impacts of environmental factors in an era where artificial intelligence methods will increasingly depend on existing datasets.

Bio

Dr. Rance Nault is an Assistant Professor of Pharmacology and Toxicology at Michigan State University. He is a pioneer in FAIR (Findable, Accessible, Interoperable, and Reusable) data practices and leads the development of ToxDataCommons (https://toxdatacommons.com/) and SheetMATE, two tools designed to promote consistent and transparent data sharing in environmental health research.
Dr. Nault's research aims to integrate innovative, emerging, and established methodologies to deepen our understanding of the spatially resolved and cell-specific impacts of chemicals and drugs in the onset and progression of liver disease. His laboratory combines cutting-edge experimental techniques with computational modeling to uncover the mechanistic effects of genetic and environmental factors in disease development, ultimately supporting the creation of personalized strategies to protect human health.

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