

caNanoLab and Standards Development - 2021-06-24

The caNanoLab project is actively involved in a variety of efforts supporting the development of standards for representing nanomaterials and their characterizations as applied to the field of nanomedicine. The caNanoLab project participated in the [Nanotechnology Working Group \(Nano WG\)](#) which was chartered to integrate nanotechnology information and tools to aid discovery and clinical translation in the cancer research community leveraging infrastructure components. The primary objectives of the Nano WG were to:

- Define and prioritize development and governance needs for the cancer nanotechnology ontology
- Adopt and collect data sharing standards and protocols for cancer nanotechnology data
- Develop a vision for nanoinformatics enabling information exchange with nanotechnology resources leveraging data standards

The caNanoLab project participated in working group objectives by assisting in the development of nanotechnology standards and the application of these standards in the caNanoLab nanotechnology resource. Information on ICR Nano WG standards leveraged by caNanoLab is provided in the subsections that follow.

Nanotechnology Data Sharing Standards

The caNanoLab project worked with the Nano WG to develop a [Nanotechnology Data Sharing Standards document](#) which identifies common data elements leveraged across nanotechnology resources.

Nanotechnology Data Sharing Standards document includes support for:

- Nanomaterials and their Composition - Nanomaterials (for example, dendrimer) and their associated properties (for example, branch, generation) and composing elements (for example, core). Includes functionalizing entities (for example, small molecule, antibodies) associated with the nanomaterial that allow the material to function as a targeting, therapeutic, and/or diagnostic agent.
- Physico-Chemical Characterizations - Assay conditions and measurements associated with the physical (for example, size, molecular weight) and chemical (for example, surface chemistry) properties of nanomaterials.
- In Vitro Characterizations - Assay conditions and measurements that assess a nanomaterial's interaction with cellular components including cytotoxicity and blood contact properties.
- In Vivo Characterizations - Characterizations performed on nanomaterials to determine the safety, efficacy, pharmacokinetics, and toxicology properties of nanomaterials in animal models so that nanomaterials can be transitioned for use in clinical applications.
- (TBD: Will the Nanotechnology Data Sharing Standards document be updated to mention Synthesis?)

NanoParticle Ontology

caNanoLab consumes of and contributes to the [NanoParticle Ontology \(NPO\)](#) . Information on the NPO is available on the [Nano WG Ontology Development and Governance wiki](#).

ISA-TAB-Nano

nano-TAB is a tab-delimited spreadsheet type of format facilitating the submission and exchange of data pertaining to nanomaterial composition and their characterizations. The caNanoLab project participated on the NCI Nano WG sub-group supporting the development of ISA-TAB-Nano which leverages and extends the ISA-TAB standard.

Artifacts from the sub-group are available on the [ISA-TAB-Nano](#) project site.