

National Institutes of Health



The National Cancer Institute Nanotechnology Working Group (NCI Nano WG)

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NCI Center for Biomedical Informatics and Information Technology, CBIIT NanoInformatics Workshop

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The emphasis on data sharing at NIH









The Nano WG – Historical Perspective

- Initiated in 2008 as a working group of the caBIG program, with the objectives of:
 - Assessing and defining needs of the cancer nanotechnology research community
 - Defining standards for cancer nanotechnology research community in a variety of areas
 - Defining and prioritize informatics applications in nanotechnology that fulfill priority needs





Who are we?

- Government
 - National Institutes of Health
 - NCI, NHLBI, NIBIB, NIEHS
 - Center for Disease Control
 - Food and Drug Administration
 - Environmental Protection Agency
 - National Institutes of Standards and Technology
- Academia
 - Oregon State
 - UNC
 - Stanford
 - UCLA
 - Duke
 - Umass
 - Pacific Northwest National Lab

- Standards organizations
 - ASTM E56
 - ISO TC229
 - ISA Commons
- Alliances and organizations
 - NCI Alliance for Nanotechnology in Cancer
 - International Alliance for NanoEHS Harmonization
 - Oregon Nanoscience and Microtechnologies Institute
 - National Nanotechnology Initiative
 - National Nanomanufacturing Network
 - EU NanoSafety Cluster
- Industry
 - Pennsylvania NanoSystems
 - NanoSafe, Inc.





Nanomaterial Data Sharing Initiatives

NCI Nanotechnology MATERIALS **Working Group** PROJECT GoodNanoGuide NANDPARTICL INFORMATION caNanoLab LIBRARY InterNano

Resources for Nanomanufacturing



NANOMATERIALREGISTRY





Introducing the Leadership 2012-present

Stacey L. Harper – Oregon State University, Oregon Nanoscience and Microtechnologies Institute



- Assistant Professor in the Department of Environmental & Molecular Toxicology and the School of Chemical, Biological & Environmental Engineering at Oregon State University
- Research Focus: nanotoxicology, ecotoxicology, rapid assays, nanoinformatics
- Member of NanoWG since 2009, co-chair of ASTM International E56 Committee on Nanotechnologies, ISO/TC 229 (2007-2013)
- Christine Hendren Duke University, Center for the Environmental Implications of NanoTechnology (CEINT)



- Research Scientist and Executive Director of CEINT
- Research Focus: decision analysis for risk assessment, linking data to reduce uncertainty and inform decisions
- CEINT Data Management Team lead





NCI Nanotechnology Working Group

- Enable nanomedicine informatics applications...
 - Develop data exchange standards (ISA-TAB-Nano)
 - Develop ontologies (Nano Particle Ontology)
 - Build a community of interest (Nanomaterial Data Curation Initiative)
- ...to support ultimate goals of informatics in nanomedicine
 - Predictive models for nanomaterial activity
 - Rational design of nanomaterials

wiki.nci.nih.gov/display/ICR/Nanotechnology+Working+Group nciphub.org/groups/nanowg



National Cancer Informatics Program (NCIP) HUB https:// nciphub.org





NCIP Hub: collaborative platform for managing collaborations, sharing data, tools and standards

https://nciphub.org

NanoWG:

- Visible for all, currently hosts meeting calendar, presentations, contacts
- · Opportunities for future use: Discussion forum, links to external resources







NCIP Hub: Resources

	Nanotechnology Working Group	Nano WG) Resources	Start a cor	tribution
	Categories All Public Protected Private		↓ Rating ↓ Title	L Date
	Resources (12 results)			
Group Manager 👻	Some Thoughts on Reproducibility 05 Dec 2014 Presentations Contributor(s): J	uhn Rumble	ជាជាជាជា 0.0 out of 5 stars	3
Overview	Nano WG December 4, 2014			
L Members 36	https://nciphub.org/resources/788			
Wiki Resources 12	Data, Metadata and "Data Quality" for Databa	ees ederick C. Klaessig, Meni Heiskanen	វេជាជាជាជ ា 0.0 out of 5 stars	3
Server Forum	Nano WG December 4, 2014			
🗩 Blog	https://nciphub.org/resources/786	Some Thoughts on Reproducibility	/ Edit	Download (PPT)
Vish List	Data PaproducibilityNanotochnology Knowlog	By John Rumble		
III Usage	05 Dec 2014 Presentations Contributor(s): M			Some Rights Reserved
✓ Projects	Nano WG presentation on December 4, 2014			
🛱 Calendar 🛛 🔍 3	https://nciphub.org/resources/784	About Reviews Supporting Docs		
Announcements	Sustainable Data Curation and Dissemination	Category Publis	hed on	
Collections	17 Nov 2014 Presentations Contributor(\$): K	Presentations 05	Dec 2014	
John Rumble ("Some Though https://nciphuk	2014), its on Reproducibility," o.org/resources/788.	Abstract Nano WG December 4, 2014 Cite this work Researchers should cite this work as follows: John Rumble (2014), "Some Thoughts on Reproducib BibTex EndNote Submitter	lity," https://nciphub.org/resources/788.	



Develop exchange standards: ISA-TAB-Nano

- Open collaborative development effort
- Based on ISA-TAB community work
- Customized for nanotechnology characterization data
- ASTM standard
- Focused on data exchange, archiving



https://wiki.nci.nih.gov/display/ICR/ISA-TAB-Nano



Current users of ISA-TAB-Nano



caNanoLab Curation Team	 Data curated for the caNanoLab database is also made available as ISA-TAB-Nano files on the project wiki 	PSSay ISA-T
NBI Knowledge Base	 Data elements are mapped to ISA-TAB- Nano fields 	
EU Nano Safety Cluster	 eNanoMapper MODERN Consortium – validator available NANoREG 	
	BMC Biotechno	ology 20

BMC Biotechnology 2013, **13**:2 (2013) Nature Nanotechnology **8**, 73–74 (2013)



Develop Ontologies: Nanoparticle Ontology



www.nano-ontology.org



Build a community of interest: Nanomaterial Data Curation Initiative

Subtopic Area	Description	
Curation workflows	Capture the current processes in nanomaterial data curation (Christy Powers, EPA)	
Data completeness and quality	Addresses the level and quality of data need to meet scientific objectives. (Richard Marchese-Robinson, Liverpool John Moores University)	
Curation responsibilities	Established and developing roles in the curation process; challenges associated with quantity vs. quality of data entries	
Primary key definition	What is the "kernel" that makes an individual record unique?	
Integration	How do we define and operationalize integration between databases and datasets?	
Metadata	How an instance of characterization is represented to enable comparisons and reproducibility	
	nciphub.org/groups/nanotechnologydatacurationinteres	



Nanomaterial Data Curation Initiative

https://nciphub.org/groups/nanotechnologydatacurationinterestgroup/overview

Submit a request for membership approval

		Nanomaterial Data Curation Initiative > Overview
		ABOUT THE GROUP
Group Manager	•	<i>i</i> The National Cancer Informatics Program (NCIP) NanoWG has undertaken a project to develop a shared vision for curation of nanoscale material and system data (nano curation). A series of consensus papers on nano curation sub-topics of interest is being developed communally for publication via the NCIP NanoWG Hub, in order to:
		Capture a snapshot of current curation practices and concerns, and
🖶 Overview		Develop recommendations for moving the nanoinformatics community toward increasingly standardized curation practices.
Members	33	This page is the online hub for the Nanomaterial Data Curation Initiative; joining this group allows you to follow the initiative as a whole. You will need to create a NCIP Hub
📮 Wiki	2	account to request access to the Nanomaterial Data Curation Initiative Group. You can individually join each curation paper project that interests you by entering you name
Resources	1	folder.)
🙊 Forum	1	
Dlog		More information about this initiative and guidelines for writing papers are available in the wiki:
Wish List		Nano Curation Primer
III Usage		https://psiphub.org/groups/papateshpalagy/datasurationinterasteroup/wiki/MainPage
🛹 Projects	8	
🛱 Calendar		Guidelines for writing curation papers
Announcements		https://nciphub.org/groups/nanotechnologydatacurationinterestgroup/wiki/CurationPapers
Collections	1	Your contributions are very welcome!





Process and Author Guidelines

Group Manager Cutlin	ne and process for writing curation papers
Overview 1. Iden	ntify the lead author (role defined below).
▲ Members 33 2. Crea	ate an author group. The author group will be based on individuals who have expressed interest in the given nanocuration subtopic, ideally through posting relevant content to that
D Wiki 2 Projec	t area of the NCIP Hub.
Resources 3. App	propriate members of the Nano WG leadership meets and identifies the set of questions to ask the curation stakeholders (roles defined below).
Server 1 4. Rele	ease the questions to the stakeholder group, provide a timeline for responses (e.g., 2-3 weeks).
Deg 5. Lea	d author creates the first draft of the paper, based on the standard outline.
😨 Wish List 🔹 W	/hy the nano curation sub-topic is important and relevant
• He	ow does the driving purpose of the resource or goals of the curation effort impact the design and challenges involved with this specific aspect of curation?
🐗 Projects 🛛 8 🔹 • W	/hat are established handling methods for this sub-topic in mature fields (e.g. biocuration)?
😇 Calendar 🔹 W	/hat are the key challenges for emerging materials / nanomaterials with regard to this sub-topic?
Announcements • An	re there any specific use cases to illustrate these issues and make them tangible?
Collections	ecommendations: Are there opportunities to leverage existing nanoinformatics resources (e.g. ISA-TAB Nano) in addressing integration for this sub-topics, or reasons not to do so?
• W	/hat are some practical next steps for individual stakeholders or the community as a whole?
Discoverability: 6. Con	tributing authors provide content, edits.
7. Itera	ate
Restricted	ar Dales and Cuidelines
Created:	
https://nciphub.org/groups/nanotechnologydatacura	tioninterestgroup/wishlist DICS

How can you get involved? Request access to

https://nciphub.org/groups/nanotechnologydatacurationinterestgroup

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Papers/**Projects**

		Nano		
		R	Projec	
	Group Manager	•	5	
==	Overview			
2	Members	33	4	
φ	Wiki	2		
	Resources	1	5	
	Forum	1	1	
•	Blog		T	
8	Wish List		2	
di	Usage			
4	Projects	8		
27	Calendar		1	
s	Announcements		14	

	.ist (8)	Updates Feed 😖			Create a Projec
Project	ts owr	ed by this group (8)			Have a new project?
_		Title	Status	My Role	a dedicated space fo
	A	Curation Framing Paper	» active	manager	collaboration? Create today!
10	6	Liaison Profile	» active	manager	Add Project
T	A	Nanocuration Sub-Topic 1: Curation Workflows	» active	manager	
T	A	Nanocuration Sub-Topic 2: Data Completeness and Quality	» active	manager	Your Projects
	A	Nanocuration Sub-Topic 3: Curation Responsibilities	» active	manager	View a list of all the p
	A	Nanocuration Sub-Topic 4: Primary key	» active	manager	Go to your projects
	•	Nanacuration Sub Table 5: Integration between Databases and Datasets	» active	manager	

lave a new project? Want to create dedicated space for project ollaboration? Create a project odav! Add Project

Your Projects

/iew a list of all the projects you ollaborate on.

Current status:

- Framing paper (primary key): complete (Christine Hendren, Stacey Harper) 1.
- 2. Curation Workflow: final revisions (Christy Powers)
- Data Completeness and Quality: in progress (Richard Marchese-Robinson) 3. We are looking for lead authors for the remaining papers: curator responsibilities, data integration and metadata.



How does Nano WG promote data sharing and collaboration?

- Nano WG mission is to develop resources to support useful data sharing:
 - ISA-TAB-Nano,
 - Nano Particle Ontology (NPO)
 - Data Curation Initiative
- NCIP Hub supports collaboration and data sharing. Future linkage with external resources e.g. NanoHub to increase community participation and promote use of data standards.





Join the NCI Nano WG!

- To meet likeminded researchers interested in promoting data sharing in nanotechnology .
- Learn about complimentary projects and establish new collaborations.
- Participate in the development of data standards and guidelines.

How to join the NCI Nano WG?

- Participate in Nano WG weekly virtual meetings, see calendar at https://nciphub.org/groups/nanowg
- Join the mailing list <u>NANO-STANDARDS-L@LIST.NIH.GOV</u> at <u>https://list.nih.gov/</u>
- E-mail <u>Mervi.Heiskanen@nih.gov</u>



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NCI Nanotechnology WG Leads

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