

Functional Genomics Ontology FuGO and Metabolomics Society Ontology group

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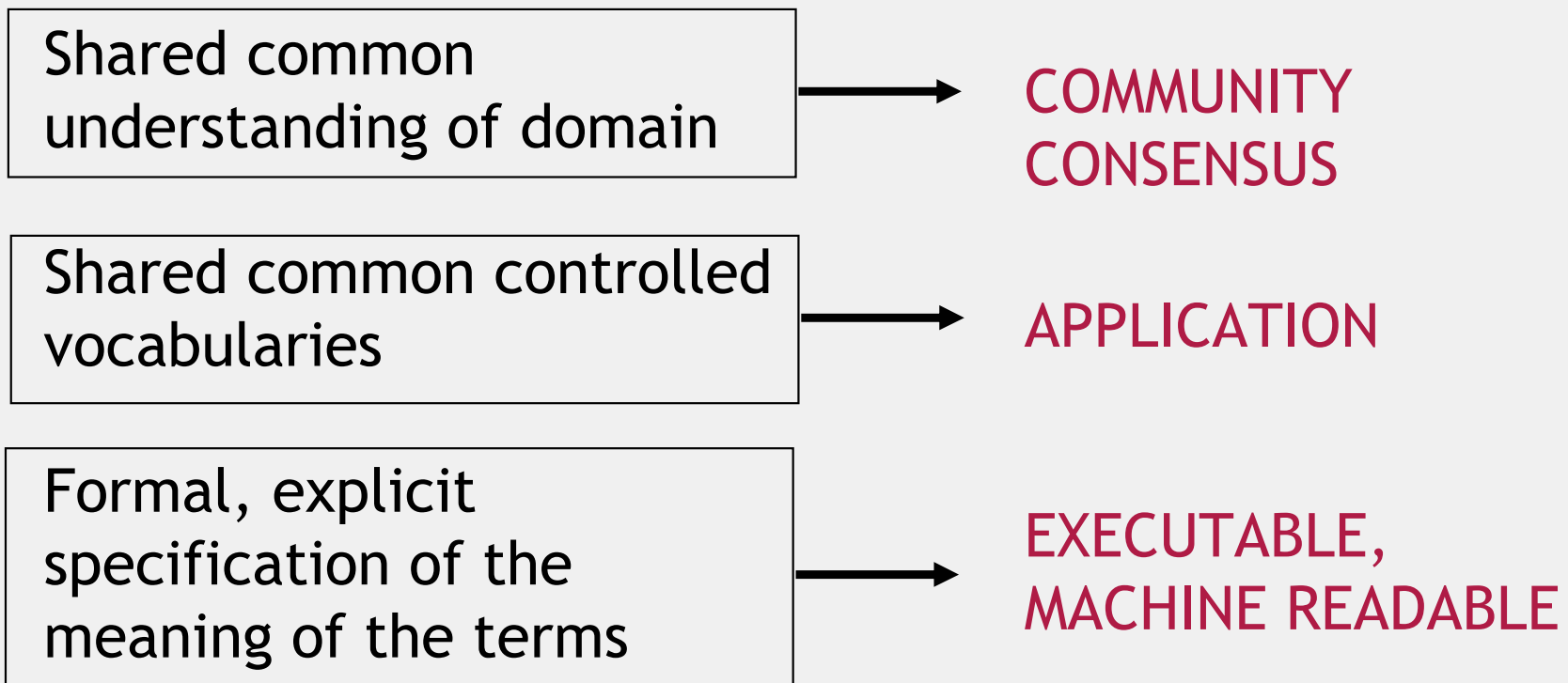
Metabolomics Society and MGED Society

Functional Genomics Context

- Standardization activities in (single) omics domains
 - Reporting structures, object models and CVs/ontology
- Pieces of the functional genomics puzzle
 - Standards should stand alone BUT also function together
 - Build it in a modular way
 - Maximize interactions
- Benefits
 - Optimize development of tools (time and costs)
 - Manufactures and vendors covering in multiple technologies
 - Facilitate integration of omics data
 - Experimentalists, developers, data miners, reviewers
- Extensive liaisons between communities and culture change !
 - Individual projects vs international-open collaborative efforts

Ontology - Goals

- From **Carole Goble:**” The Capulets and Montagues - A plague on both your houses?” presentation, SOFG meeting, 2004
 - *“Interoperating resources, intelligent mining and sharing of knowledge, be it by people or computer systems, requires a consistent shared understanding of what the information contained means”*



Functional Genomics Ontology - FuGO

■ Goals

- Unambiguous description of how the investigation was performed
- Consistent annotation, powerful queries and data integration

■ Coordinated activity since 2004

- Several groups representing **technological** and **biological** domains
 - HUPO-PSI, MGED and Metabolomics Society Ontology working groups
 - RSBI working groups
 - > Toxicogenomics (Industry, governmental bodies, incl NIEHS, NCI, FDA)
 - > Nutrigenomics (European organization NuGO)
 - > Environmental genomics (NERC Bioinformatics Center)

■ Open source approach

- Protégé tool and OWL format

■ No dependency on any Object Model

- Can be mapped to any object model, e.g. FuGE OM

Functional Genomics Ontology - FuGO

▪ Purpose

- NOT model biology, NOR the experimental workflow
- BUT provide **descriptors** for experiment components
 - Investigation (organization, intent, design etc)
 - Material (biological and chemical, manipulation and transformation)
 - Protocols and instrumentation
 - Data generated and types of analysis performed on it
- Core of ‘universal’ descriptors
 - Regardless of specific biological/technological domain described
- Biological and technological domain-specific terms
 - To meet the annotation requirements of any given domain

▪ Interoperability with existing bio-ontology

- Mechanisms to refer to those and avoid overlapping

FuGO - Advisory Board (FAB)


Current members


- Barry Smith, Buffalo
- Frank Hartel, NIH
- Mark Musen, Stanford
- Robert Stevens, MIT
- Steve Oliver, Marquette
- Suzie Lewis, Berkeley

Role

- Advising on high level issues
 - Unified vs multiple
- Linking to other I

The Ontogenesis Network

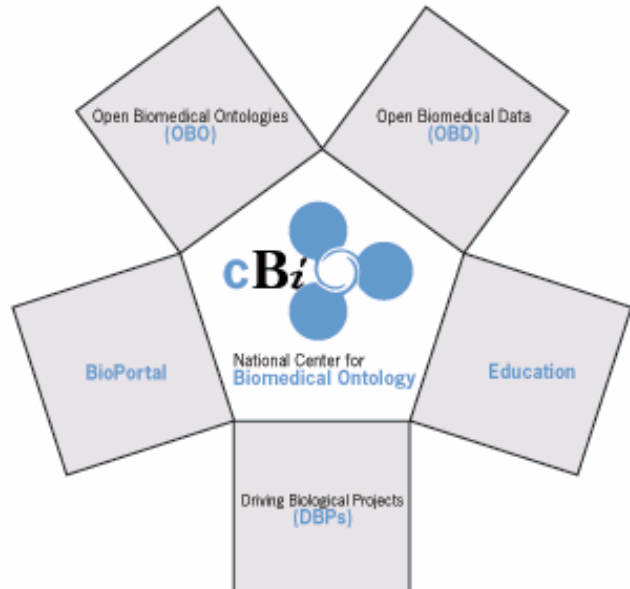




The National Center for Biomedical Ontology

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Advancing biomedicine with tools and methodologies for the structured organization of knowledge. ([more](#))



Interest Group

Un of Oxford

Current News

Meet [our team](#)

Workshop on Bio-Ontologies, University at Buffalo, October 28, 2005: Co-sponsored by the National Center for Biomedical Ontology

Invited panel on ontologies in biomedicine at AMIA 2005 Drs. Mark Musen, Barry Smith, Chris Chute, and Suzanna Lewis will present an invited panel on Wednesday, Oct 26 at 8 AM entitled: "Ontologies in Biomedicine: What is the 'Right' Amount of Semantics?" in which the mission and goals of the Center will be addressed.

[Tutorial on Ontologies](#)

FuGO - Preliminary Independent Works

- **MGED Ontology working group**
 - Review and refactor MGED Ontology
 - Separating general concepts from microarray specific one

- **HUPO-PSI Ontology working group**
 - Compile controlled vocabularies (CVs) lists
 - Molecular interaction
 - Mass Spectrometry
 - General Proteomics

- **RSBI Toxicology- Nutri- and Environmental Genomics groups**
 - Agree on a ‘core set of common terms’
 - Describe investigations employing multiple functional genomic and conventional technologies

- **All groups**
 - Gathering real use cases of functional genomics investigations

Metabolomics Society Ontology WG

■ Current members

- Oliver Fiehn (Un of California Davis, US)
- Helen Jenkins (University of Wales, Aberystwyth)
- Matej Oresic (VTT Technical Research Centre of Finland)
- Philippe Rocca-Serra (EBI, Nutrigenomics/Toxicogenomics MGED)
- Susanna-Assunta Sansone (EBI, MGED)
- Daniel Schober (EBI) -> BBSRC eScience funds for FuGO-Metabolomics
- Irena Spasic (Un of Manchester)
- Larissa Soldatova (University of Wales, Aberystwyth)
- Chris Taylor (EBI, HUPO-PSI)

■ Teleconferences and minutes of discussions

- First on December 16th 2005, next Jan 12th 2006 then every 2 weeks
- Ontology WG page on the Metabolomics Society website (soon)

Metabolomics Society Ontology WG

■ Current activities

- Introductions and survey
 - Identify other key members
 - Compile a list of existing, individual relevant efforts
 - > ArMet CVs, NMR draft ontology, PSI MS list of terms, etc..
- Roadmap
 - Compile a list of agreed controlled vocabularies (CVs)
 - > Draft ready for review by June 06 (Metab Society meeting)
 - Identify a mechanism to build an ontology
 - > Engage with FuGO
- Awareness
 - Participate to relevant meetings and advertise our activities

Acknowledgements and Resources

- **Metabolomics Society Ontology WG**
 - www.metabolomicssociety.org/mstandards.html
- **FuGO Working Group**
 - <http://fugo.sourceforge.net>
- **Funds**
 - NIH-NHGRI funds (Towards FuGO workshops)
 - BBSRC e-Science Development Fund (Towards a dedicated FuGO postdoc)
 - NERC, NuGO and funds to individuals
- **References for standardization initiatives**
 - OMICS journal, special free, on-line issue in Mar/Apr
 - Metabolomics Standard initiative , MGED, PSI, FuGE, FuGO papers and many others

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