Harnessing the Power of the Community in a Library of Biomedical Ontologies

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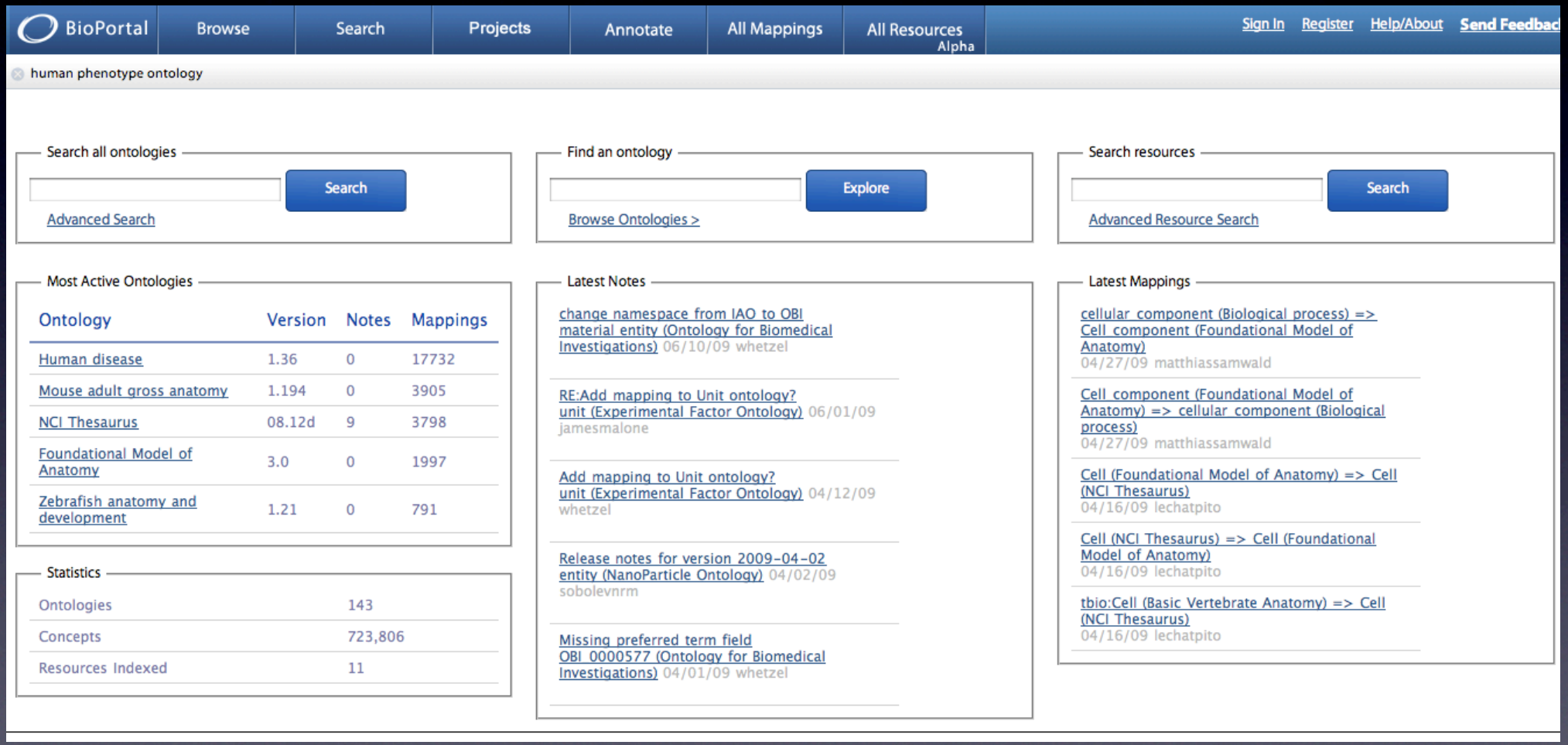
THE NATIONAL CENTER FOR
BIOMEDICAL ONTOLOGY

What are we trying to do

- You've built an ontology, how do you let the world know?
- You need an ontology, where do you go to get it?
- How do you know whether an ontology is any good?
- How do you find resources that are relevant to the domain of the ontology (or to specific terms)?

BioPortal: A Community-Based Ontology Repository



http://bioportal.bioontology.org

BioPortal Today

- ~170 ontologies and terminologies in OWL, RDFS, OBO format, RRF
- Well over 1,000,000 concepts
- ~1,000,000 mappings

Community Features in BioPortal

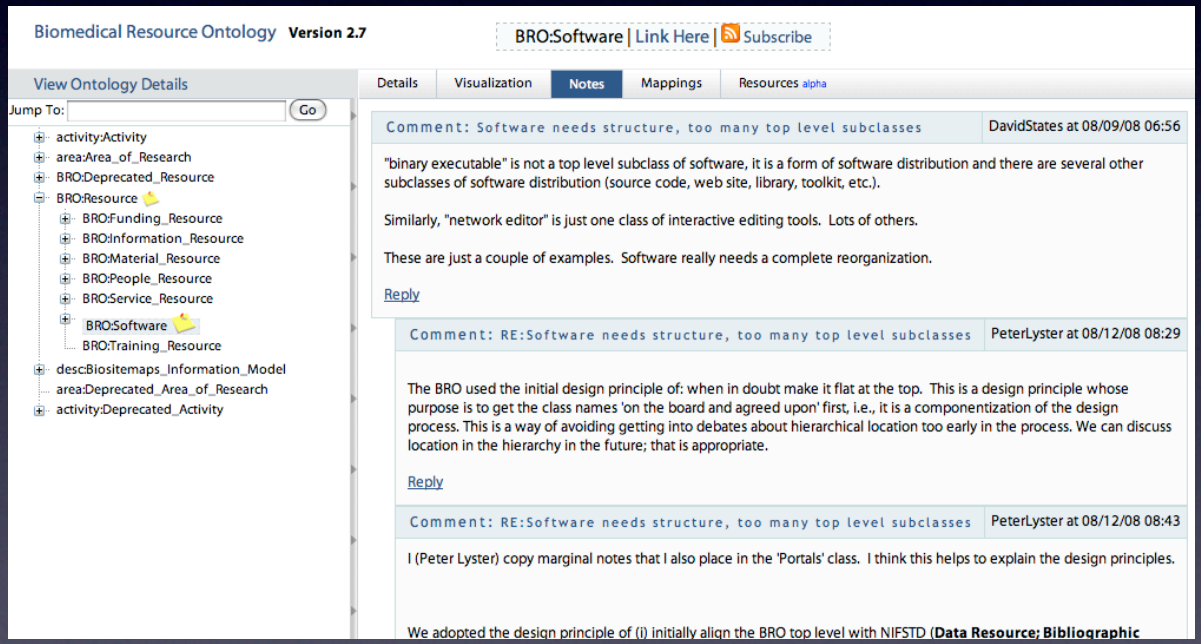
- Publication of ontologies
- Notes and discussions
- Ontology evaluation
- Mappings between concepts
- Ontology views

Publishing Ontologies

- Any ontology in biomedical domain can be published in BioPortal.
- When publishing the ontology, the authors provide the metadata describing salient features of their ontology.
- With publication, ontology authors get:
  - on-line browsing and search for their ontology
  - REST service access
  - version maintenance
  - RSS feeds for new comments, mappings, new versions

Notes and Discussion

- Users create notes to
  - discuss class definitions
  - suggest changes and corrections
  - request new items
  - provide additional information about a class (e.g., references, images, supporting documentation



Community-Based Evaluation

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- Our solution: Allow users to provide ratings for ontologies

Reviewers Provide

- General review and rating
- Usage information
  - Which applications have successfully used the ontology?
  - What problems were encountered?
- Coverage
  - Does it cover the domain properly?
  - Are there major gaps?
  - Are some parts developed better than others?

Projects in BioPortal

- Users can describe their ontology-based projects in BioPortal
- Projects are linked to ontologies they are using
- Ontology reviews can be done in the context of projects

Ontology Mappings

- BioPortal ontologies overlap in content
  - The same is true for almost any ontology library
- A mapping between two terms in different ontologies indicates a relationship between them
  - Usually a similarity relationship
  - For example, *nostril* in NCI Thesaurus is similar to *naris* in Mouse Anatomy Ontology

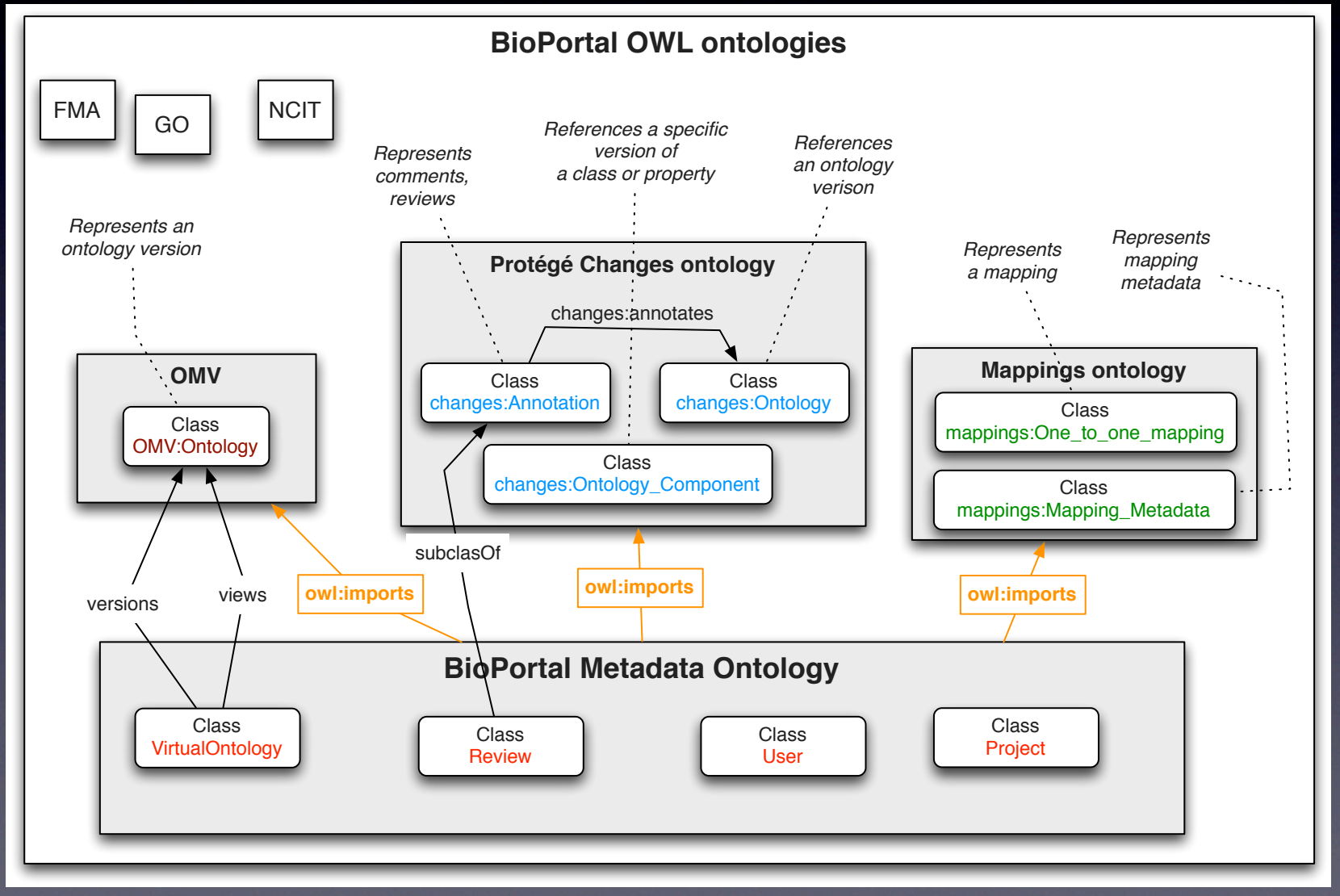
Mappings in BioPortal

- Mappings in BioPortal are concept-to-concept mappings
- Mappings are created by users or uploaded in bulk
- Bulk uploads are usually the results of automatic or semi-automatic mapping
- There is detailed metadata for provenance of mappings
- Users can comment on and discuss the mappings
- ~1,000,000 mappings in BioPortal now

Views, Subsets, and Value Sets

- Users can contribute their derivatives of BioPortal ontologies
  - which become first-class objects in BioPortal and can be used as all other ontologies are.
- A view can be
  - A manually extracted module
  - A module generated by a query
  - A translation of an ontology into another language (e.g., Amino-acid ontology in Chinese)
  - A transformation of an ontology into another ontology language (e.g., SKOS version of an OBO ontology

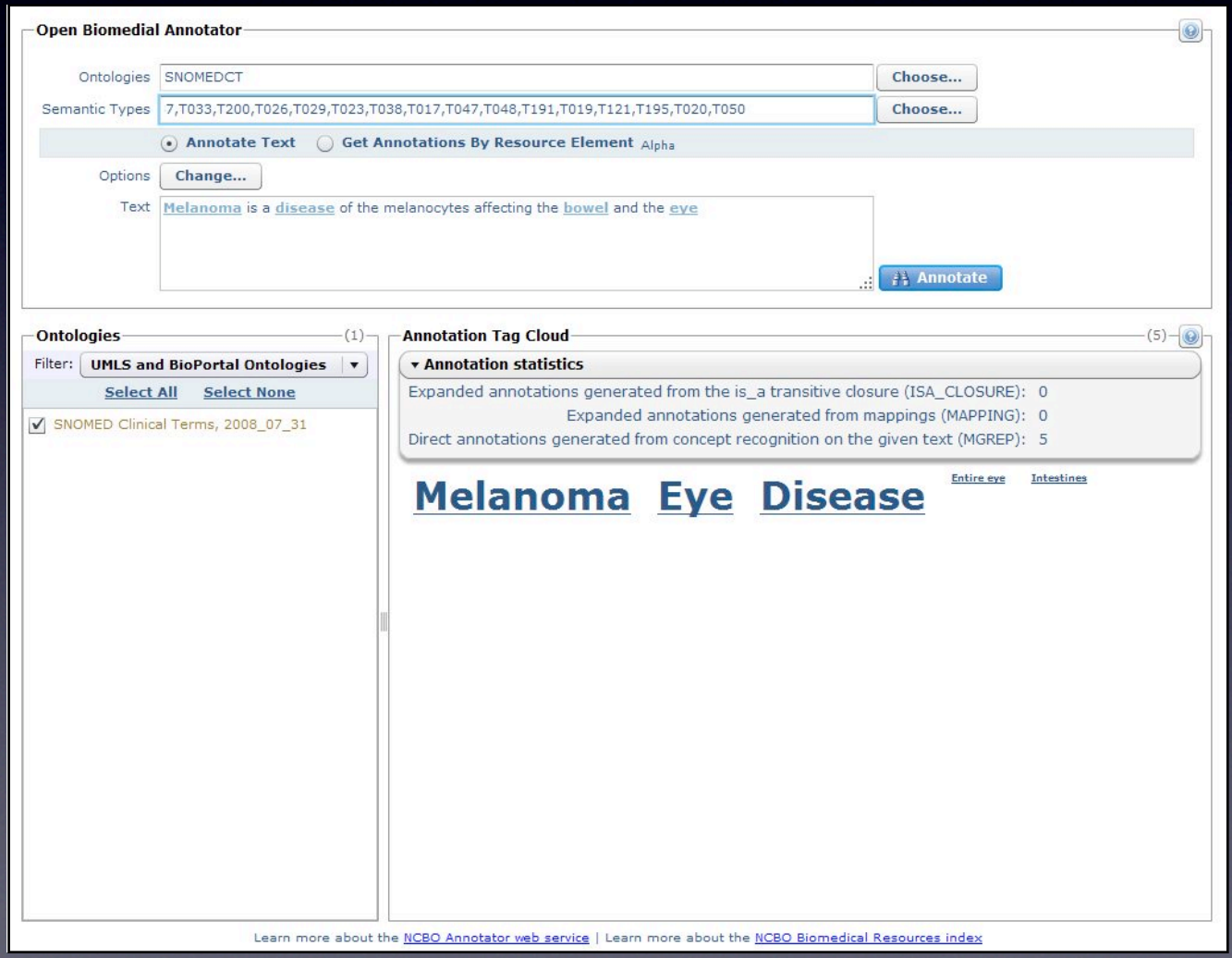
Implementation: BioPortal Metadata Ontology



Annotator

Use ontologies to annotate *your* data

- Give your text as input
- Select your parameters
- Get your results…
  - in text, XML or OWL



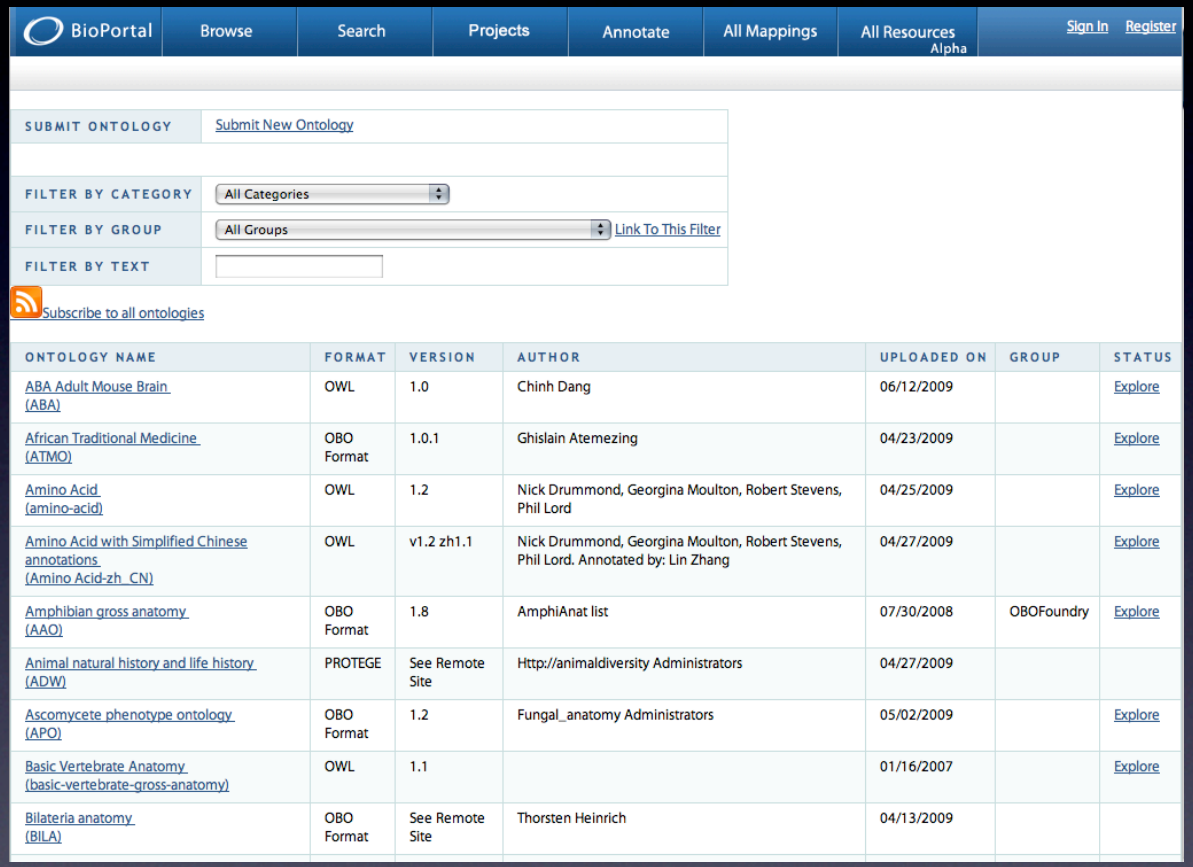
Discussion and Challenges

- "If we build it, will they come"?
- We must maintain community contributions as ontologies evolve
  - When is the contribution no longer relevant?
  - Who can delete notes, mappings, etc.
  - How do we prevent abuse?
- If we are successful, trust will become a major issue
  - Web of Trust
  - Privacy

Discussion and Challenges (cont'd)

- Too much of a good thing?
  - Users want their "private areas" of BioPortal where they can discuss evolving projects
  - Users want their own installation of BioPortal to keep sensitive data "in-house"
- How do we evaluate and measure the success of our work?

Try it out and contribute!



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