

Mapping Repository in BioPortal

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BioPortal: A Community-Based Ontology Repository

The screenshot shows the BioPortal website interface. At the top, there is a navigation bar with tabs: BioPortal, Browse, Search, Projects, Annotate, All Mappings, All Resources Alpha, Sign In, Register, Help/About, and Send Feedback. Below the navigation bar, there is a breadcrumb trail: human phenotype ontology.

The main content area is divided into several sections:

- Search all ontologies:** A search box with a "Search" button and a link to "Advanced Search".
- Find an ontology:** A search box with an "Explore" button and a link to "Browse Ontologies >".
- Search resources:** A search box with a "Search" button and a link to "Advanced Resource Search".
- Most Active Ontologies:** A table listing the most active ontologies.
- Latest Notes:** A list of recent notes and updates.
- Latest Mappings:** A list of recent ontology mappings.
- Statistics:** A table showing overall statistics for the repository.

| Ontology | Version | Notes | Mappings |
|---|---------|-------|----------|
| Human disease | 1.36 | 0 | 17732 |
| Mouse adult gross anatomy | 1.194 | 0 | 3905 |
| NCI Thesaurus | 08.12d | 9 | 3798 |
| Foundational Model of Anatomy | 3.0 | 0 | 1997 |
| Zebrafish anatomy and development | 1.21 | 0 | 791 |

| Category | Count |
|-------------------|---------|
| Ontologies | 143 |
| Concepts | 723,806 |
| Resources Indexed | 11 |

<http://bioportal.bioontology.org>

BioPortal

- Web accessible repository of ontologies for the biomedical community:
 - <http://bioportal.bioontology.org>
- Online support for ontology
 - Peer review
 - Notes (comments and discussion)
 - Versioning
 - Mapping
 - Search
 - Resources

The BioPortal Technology

- BioPortal is a library of more than 300 biomedical ontologies
- All BioPortal data is accessible through **REST services**
 - BioPortal user interface accesses the repository through REST services as well
- The BioPortal technology is **domain-independent**
 - There are installations of BioPortal for libraries in other domains
 - BioPortal code is open-source

Why Would a Mapping Repository Help?

- Source of data for **automatic algorithms**
 - machine learning
 - algorithms that need a priori alignment
- Use for **annotating and browsing** resources through ontology elements
- Use for finding “**important**” ontologies:
 - If everyone maps to NCI Thesaurus, it must be important
- Accessible through **web services**
 - can be used in other applications

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
- ~2M mappings in BioPortal now

View Ontology Details

Jump To:

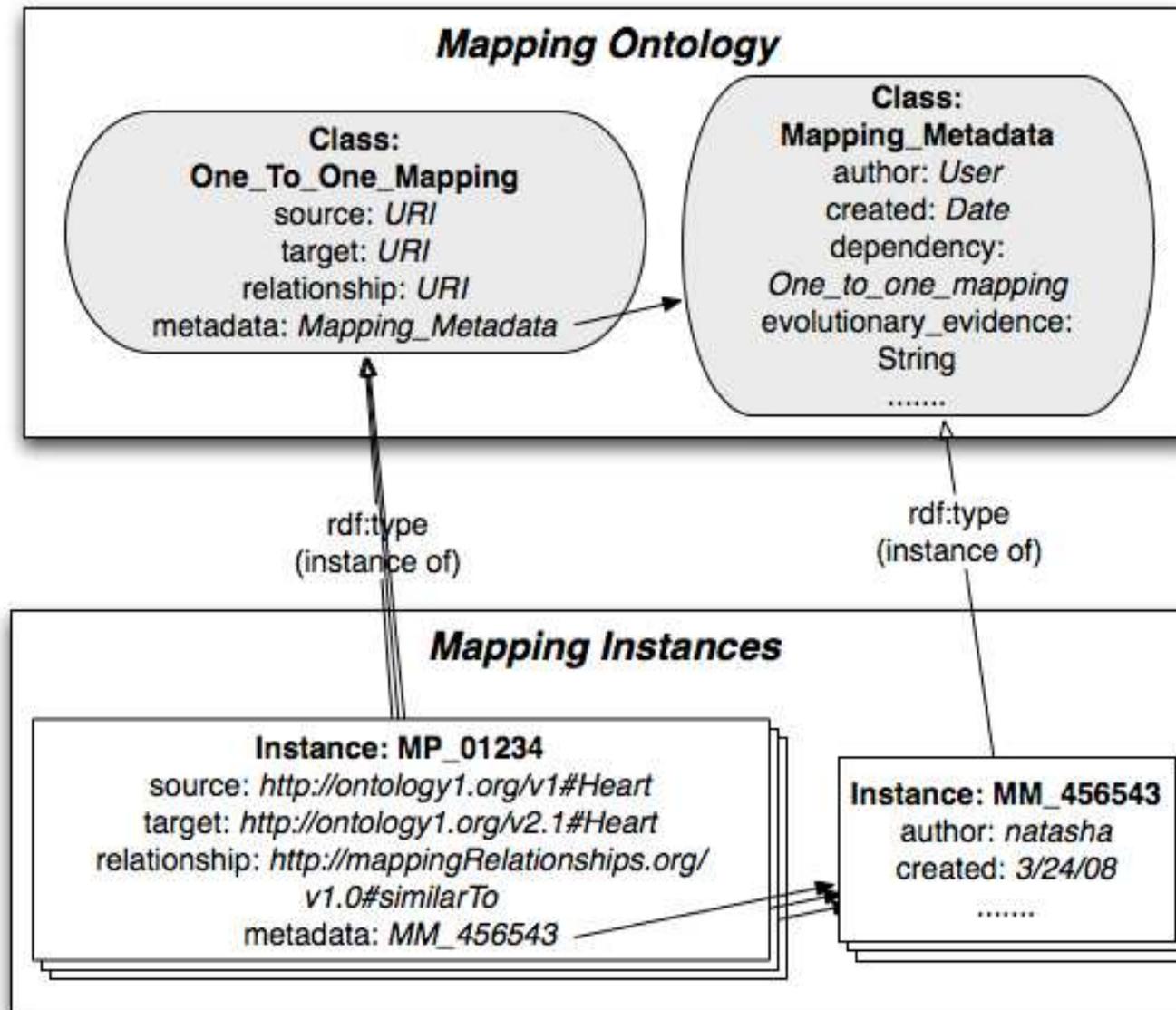
- ⊕ Nerve Tissue
- ⊕ Synovial Membrane
- ⊕ Muscle Tissue
 - ⊕ Smooth Muscle Tissue
 - ⊕ Muscle Layer
 - ⊕ Striated Muscle Tissue
 - ⊕ Skeletal Muscle Tissue
 - ⊕ Visceral Striated Muscle Tissue
 - ⊕ Myocardium
- ⊕ Adipose Tissue
- ⊕ Skin Tissue
- ⊕ Blood Vessel Tissue
- ⊕ Endothelium
- ⊕ Parathyroid Gland Tissue
- ⊕ Salivary Gland Tissue
- ⊕ Parenchyma
- ⊕ Epithelial Tissue
- ⊕ Embryonic Tissue
- ⊕ Splenic Tissue
- ⊕ Nerve Tissue, Neuroepithelial Tissue
- ⊕ Intestinal Wall Tissue
- ⊕ Endocrine Reproductive Tissue
- ⊕ Other Anatomic Concept
- ⊕ Body Part

Details Visualization Notes **Mappings** Resources [alpha](#)

["New Point-to-Point Mapping"](#)

| MAPPING TO | SOURCE | MAPPED BY | MAPPED ON | NOTES |
|---|------------------------|---------------|-----------|----------------------------|
| Myocardium (Galen) | Prompt | ngriff | 02/12/08 | View Notes |
| heart myocardium (Mouse adult gross anatomy) | NCICB | TerryHayamizu | 04/23/08 | View Notes |
| myocardium (Mouse adult gross anatomy) | NCICB | TerryHayamizu | 04/23/08 | View Notes |
| cardiac muscle tissue (Mouse adult gross anatomy) | NCICB | TerryHayamizu | 04/23/08 | View Notes |
| myocardium (Mouse adult gross anatomy) | NLM | SongmaoZhang | 04/23/08 | View Notes |

Representing mappings



Mapping Metadata

- mapping relationship
- provenance (who created the mapping and when)
- comments, which may include transformation scripts, etc.
- discussion and comments
- application context
- mapping dependency
- algorithm used to create the mapping (configuration, parameters, etc.)
- external references

Types of mappings in BioPortal

- Lexical match on preferred names or preferred names and synonyms (skos:closeMatch)
- For ontologies from UMLS, a CUI-based mapping
 - created if two terms have the same CUI
 - skos:closeMatch
- Terms in different ontologies with the same URI (skos:exactMatch)

Issues

- Mappings and ontology versions
 - Re-generate all automatically generated mappings as new versions become available
 - Delete mappings for previous versions, unless they have discussions associated with them
 - Make mappings accessible through all versions
- Scalability
 - Majority of mappings have the same provenance data
 - Reuse the object that represents the provenance metadata

Current work

- Re-generating all the mappings
- Adding mappings to the SPARQL endpoint