Current and Emerging NCBO Technologies

Advancing biology and medicine with tools and methodologies for the structured organization of knowledge.

Benjamin Dai
Chief Software Architect
September 10, 2008
NCBO Technologies

• **BioPortal 2.0**
  – *Browsing Biomedical Ontologies*

• **Open Biomedical Resources**
  – *Using Ontologies to Access Public Data*

• **Open Biomedical Annotator**
  – *Using Ontologies to Annotate Your Data*

• **NCBO Fabric and REST Services**
  – *Embedding Our Services in Your Tools*

• **Emerging User Interface Tools**
  – *Innovations in Visualization*

• **NCBO PURL Server**
  – *Providing URIs for Biomedical Concepts*
BioPortal 2.0 Demonstration

• Live Demo

• http://bioportal.bioontology.org
Open Biomedical Annoator (OBA)

Annotation Service
NCBO Fabric and REST Services

NCBO Fabric and REST Services diagram showing the integration of various components such as NCBO End-Users, RSNA RadLex Portal, NCI BioPortal, NCI BioPortal - J2EE Application, NCBO PURL Server, Other Partner Organizations, FlexViz Visualization, Protégé Java, LexGrid Java, Open Biomedical Resources (OBR) and Ontology-Based Services (OBS) - J2EE and REST, Biomedical Annotations Repository (BAR) - RDF Triple Store, and NCBO UMLS Service, Berkeley OBOtoOWL Service, and BioPortal FOAF RDF User Service.
NCBO Fabric and REST Services

• NCBO Fabric (NetKernel)
• UMLS Services (leverages URI Security Gating)
  – ./umls
  – ./umls/{SAB}
  – ./umls/{SAB}/{AUI or CUI}
  – ./umls/{SAB}/{AUI or CUI}/children
  – ./umls/{SAB}/{AUI or CUI}/parents
  – ./umls/{SAB}/{AUI or CUI}/path
  – ./umls/{SAB}/search/{keyword}
  – ./umls/{SAB}/search/{keyword}/{index}/{count}

• OBOtoOWL Converter Service – (leverages Throttling/Queuing)
• BioPortal FOAF RDF User Service
Emerging User Interface Tools

- Ongoing FlexViz Enhancements
- Diamond: a degree of interest/usage model for navigating ontologies
- CogZ: cognitive support for ontology mapping
- Apply Uvic’s portfolio of visualization components to delivery of a stand-alone OBR user-interface.
NCBO PURL Server

- PURL = Persistent URL
- Example
  - http://purl.org/obo/owl/MA#MA:0000072
  - http://berkeleybop.org/ontologies/owl/MA#MA:0000072

The identifiers above represent the same thing.
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Next-Steps

• Q&A

• Contact
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Appendix

• Additional Materials
BioPortal 2.0: Browse Ontologies
BioPortal 2.0: Multiple Ontology Navigation
BioPortal 2.0: Mappings between Ontologies

### Immune system (Link To Concept)

<table>
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<th>Source</th>
<th>Mapped By</th>
<th>Mapped On</th>
<th>Notes</th>
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<td>NCICB</td>
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</tr>
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**BioPortal 2.0**

The National Center for Biomedical Ontology

Home Browse Search All Mappings NCI Thesaurus Biomedical Resource Ontology Mouse adult gross anatomy

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**View Ontology Metadata**

- mouse anatomy
  - adult mouse
    - anatomic region
    - organ system
    - integumental system
    - hemolymphoid system
    - endocrine system
    - immune system
    - connective tissue
    - musculoskeletal system
    - cardiovascular system
    - sensory organ system
    - exocrine system
    - visceral organ system
    - nervous system
    - body fluid/substance

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**New Point-to-Point Mapping**
BioPortal 2.0: Creating a Mapping
BioPortal 2.0: Marginal Notes
BioPortal 2.0: Open Biomedical Resources
BioPortal 2.0: Open Biomedical Resources
BioPortal adopts a layered architecture
• Detailed view of BioPortal layered architecture.