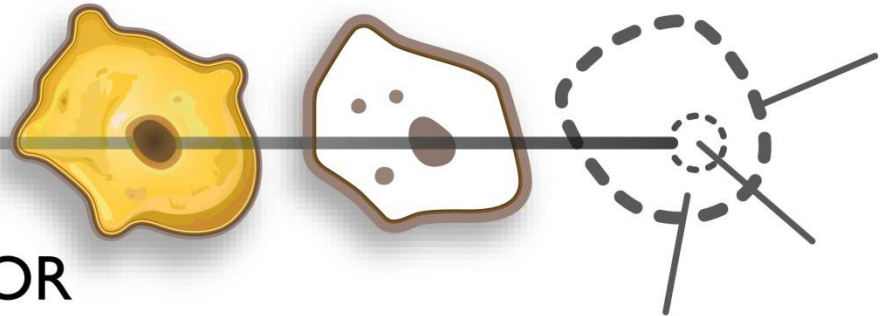


# NCBO BioPortal

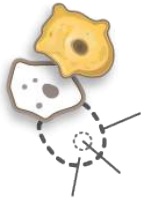
**Mark Musen, Benjamin Dai,  
and the BioPortal Team**

**February 26, 2008**



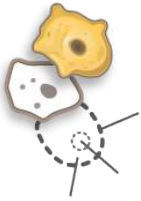
NATIONAL CENTER FOR

**BIOMEDICAL ONTOLOGY**

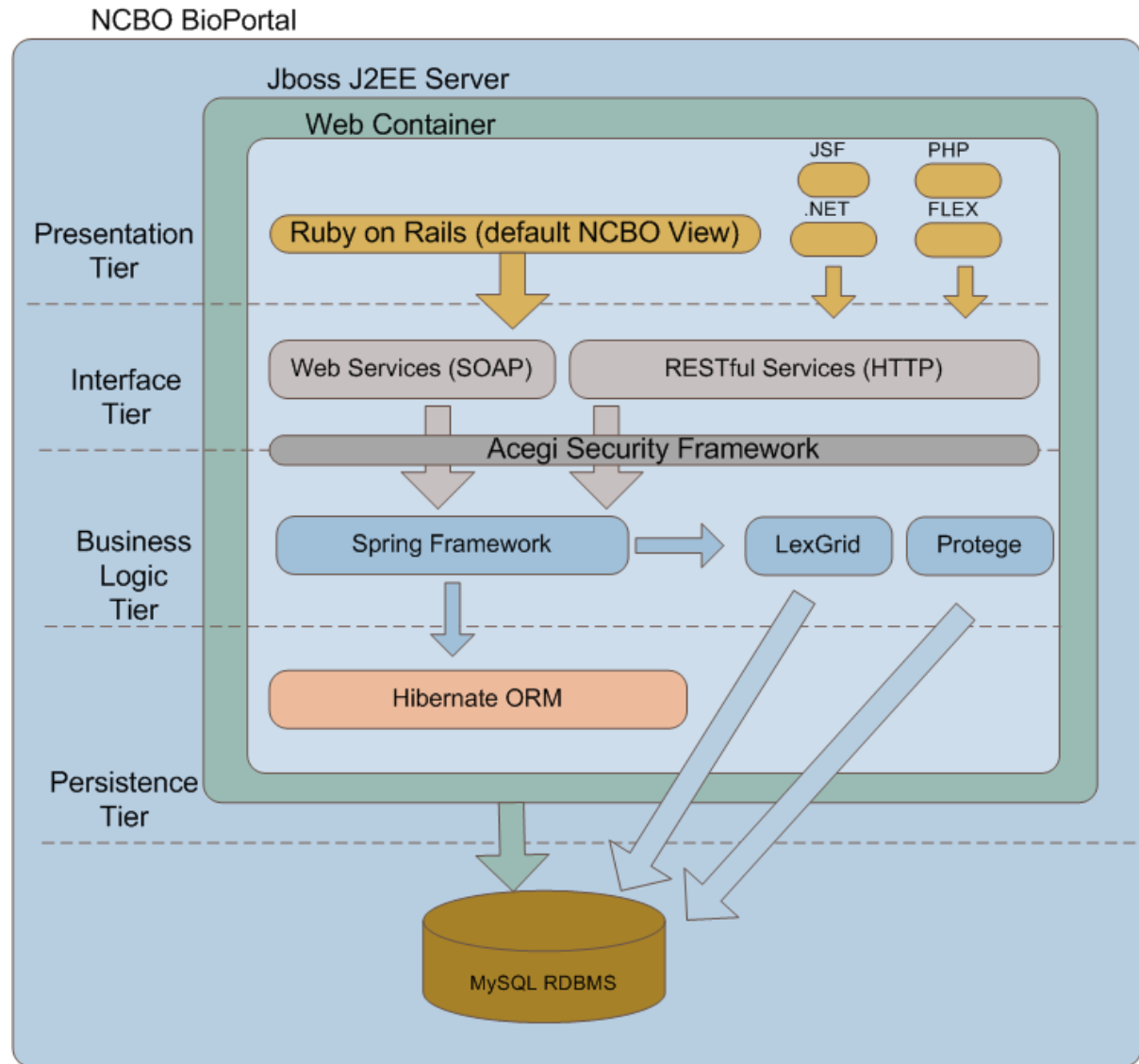


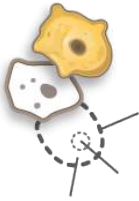
# NCBO BioPortal

- The National Center for Biomedical Ontology (<http://bioontology.org>) is developing **BioPortal**, an open-source repository of ontologies, terminologies, and thesauri of importance in biomedicine.
- An early version of BioPortal is accessible at <http://bioportal.bioontology.org>. Users can access the BioPortal content interactively via Web browsers or programmatically via Web services.

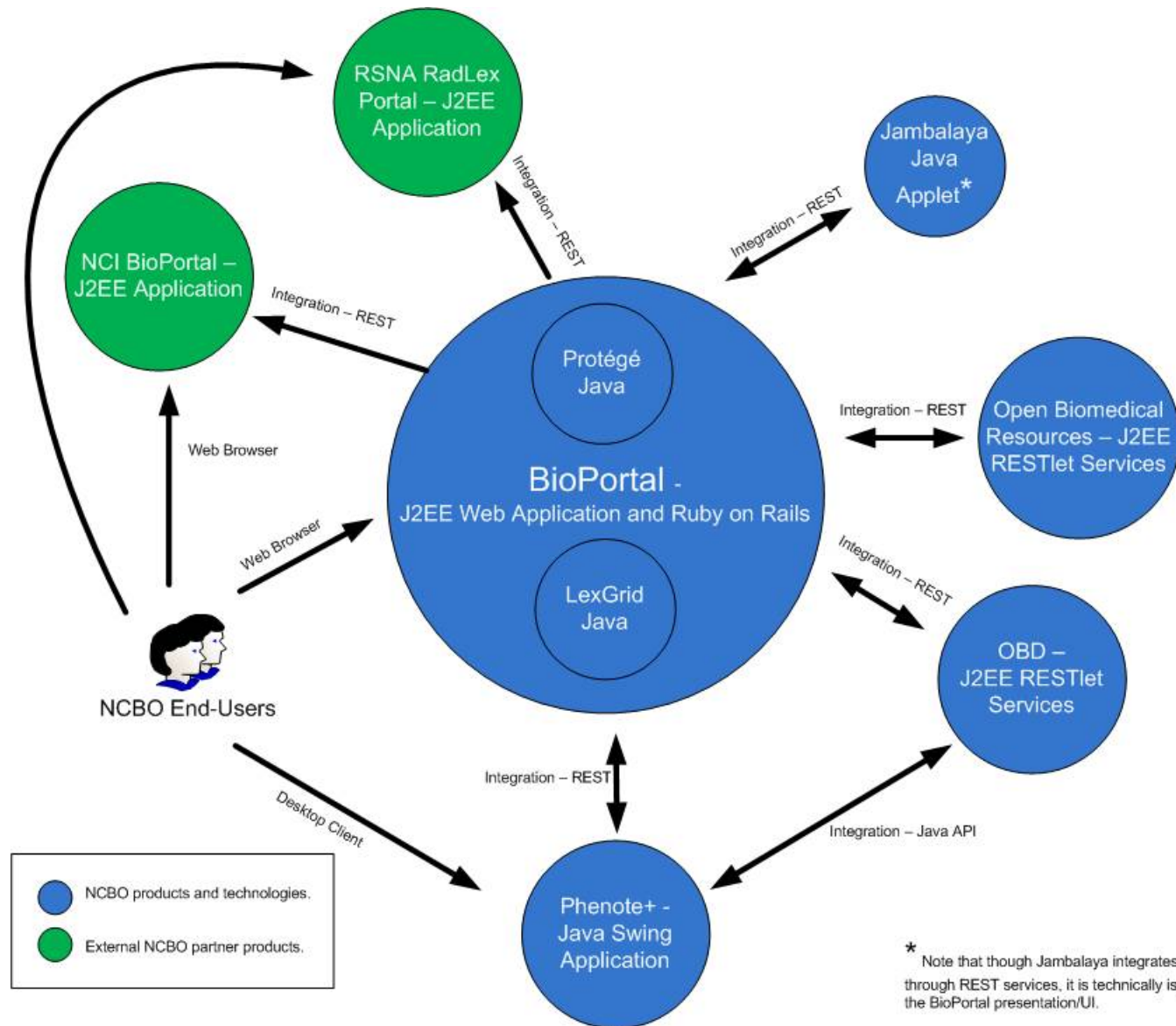


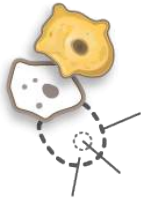
# BioPortal adopts a layered architecture





# NCBO Products and Technologies Landscape





# New BioPortal prototype

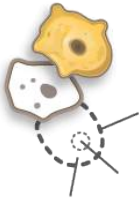
- New features include:
  - Visualization
  - Mappings between ontologies
  - “Marginal notes” to annotate ontologies
- To join the testing team, visit our Web site:
  - URL: <http://alpha.bioontology.org>
  - Email Feedback: [ngriff@stanford.edu](mailto:ngriff@stanford.edu)
- An active BioPortal user group is providing feedback on new features and guiding future development work

# Feature: Browse Ontologies

The screenshot displays the NCI Thesaurus web interface in a Mozilla Firefox browser window. The address bar shows the URL `http://alpha.bioontology.org/visualize/NCI_Thesaurus/C53529`. The page header includes the BioPortal logo and navigation tabs for Home, Browse, Search, and NCI Thesaurus. A sidebar on the left lists various ontology categories, with 'Non-Neoplastic Disorder' selected and highlighted. The main content area, titled 'Non-Neoplastic Disorder', features a 'Visualization' tab and a 'Show Network Neighborhood' dropdown menu. Below this, a hierarchical diagram illustrates the relationships between concepts:

- Disease or Disorder** (green oval) is the root concept.
- Non-Neoplastic Disorder** (yellow oval) is a subclass of 'Disease or Disorder', indicated by a 'hasSubclass' relationship.
- Non-Neoplastic Disorder by Site** (green oval) and **Non-Neoplastic Disorder by Special Category** (green oval) are both subclasses of 'Non-Neoplastic Disorder', indicated by 'hasSubclass' relationships.

The diagram uses ovals to represent concepts and arrows labeled 'hasSubclass' to show the hierarchical structure. The 'Non-Neoplastic Disorder' node is highlighted in yellow, while all other nodes are green.



# Feature: Multiple Ontology Navigation

NCI Thesaurus - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://alpha.bioontology.org/visualize/NCI\_Thesaurus

Google Search

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**BioPortal**

Home Browse Search Galen (x) FMA (x) NCI Thesaurus (x) [My Account](#) [Log Out](#)

Gastrointestinal Disorder

- Gastrointestinal System
- Anal Disorder
- Esophageal Disorder
- Gastrointestinal Neoplasm
  - Ampulla of Vater Neoplas
  - Anal Neoplasm
  - Appendix Neoplasm
  - Benign Gastrointestinal N
  - Esophageal Neoplasm
  - Gastric Neoplasm**
  - Gastrointestinal Intraepit
  - Gastrointestinal Neuroen
  - Gastrointestinal Stromal
  - Gastrointestinal Tract Ad
  - Hepato-Biliary Neoplasm
  - Intestinal Neoplasm
  - Malignant Gastrointest
  - Pancreatic Neoplasm
  - Gastrointestinal Polyp
  - Gastrointestinal Precancer

## Gastric Neoplasm

Visualization Details Marginal Notes Mappings Resources

Show Network Neighborhood

```
graph TD; GI[Gastric Neoplasm] -- hasSubclass --> BGN[Benign Gastric Neoplasm]; GI -- hasSubclass --> GA[Gastric Adenoma]; GI -- hasSubclass --> GCT[Gastric Germ Cell Tumor]; GI -- hasSubclass --> GGCT[Gastric Granular Cell Tumor]; GI -- hasSubclass --> GIN[Gastric Intraepithelial Neoplasia]; GI -- hasSubclass --> GNE[Gastric Neuroendocrine Neoplasm]; GI -- hasSubclass --> GSTN[Gastric Soft Tissue Neoplasm]; GI -- hasSubclass --> GI_N[Gastrointestinal Neoplasm]; GI -- hasSubclass --> SD[Stomach Disorder];
```

Done







# Feature: Create Mapping

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**BioPortal**

Home Browse Search

BIRNLex

Visualization Class/Type Details Marginal Notes Mappings Resources Subscribe

**New Mapping For Mutation Type**  
Mapping from Birnlex 368 to :

1 Ontology: Adult Mouse Anatomy  
Search: blood  
Search

2 Preview of blood, MA\_0000059


```
graph TD
    blood((blood)) -- UNDEFINED_part_of --> dietetic_system((dietic system))
    blood -- UNDEFINED_part_of --> cardiovascular_system((cardiovascular system))
    blood -- is_a --> body_fluid_sub((body fluid/sub))
```

Children:

3 Create Close

# Feature: Links to Online Data Repositories

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Home Browse Search

NCI Thesaurus

Visualization Class/Type Details Marginal Notes Mappings Resources **Subscribe**

- + Childhood Hepatic Neoplasms
  - ... Focal Nodular Hyperplasia
  - ... Hepatic Carcinoid Tumor
  - ... Hepatic Dysplastic Nodule
  - ... Hepatic Fibroma
  - ... Hepatic Hemangioma
  - ... Hepatic Inflammatory Myofibroblastic Tumor
  - ... Hepatic Leiomyoma
  - ... Hepatic Lipoma
  - + Hepatic Lymphoma
  - ... Hepatic Mesenchymal Hamartoma
  - + Hepatic Sarcoma
  - + Hepatic Vascular Disorder
    - ... Hepatocellular Adenoma
    - + Hepatocellular Carcinoma
    - ... Intrahepatic Bile Duct Adenoma
    - ... Intrahepatic Bile Duct Cystadenoma
    - ... Intrahepatic Bile Duct Papillary Cystadenoma
  - + Intrahepatic Cholangiocarcinoma
  - + Metastatic Malignant Neoplasm of Liver
  - + Non-Neoplastic Hepatic Disease

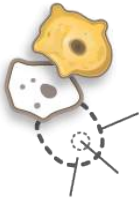
Element ID	Annotation Context	Element Link
E-GEOD-4731	description	<a href="#">View Element</a>
E-GEOD-5230	title	<a href="#">View Element</a>
E-GEOD-5230	description	<a href="#">View Element</a>
E-MEXP-199	title	<a href="#">View Element</a>
E-MEXP-199	description	<a href="#">View Element</a>
E-MEXP-84	description	<a href="#">View Element</a>
E-SMDB-2975	description	<a href="#">View Element</a>
E-TABM-36	description	<a href="#">View Element</a>

PubMed is a service of the U.S. National Library of Medicine that includes over 17 million citations from MEDLINE and other life science journals for biomedical articles back to the 1950s. PubMed includes links to full text articles and other related resources. Elements:29

ArrayExpress is a public repository for microarray data, which is aimed at storing MIAME-compliant data in accordance with MGED recommendations. The ArrayExpress Data Warehouse stores gene-indexed expression profiles from a curated subset of experiments in the repository. Elements:8

ClinicalTrials.gov provides regularly updated information about federally and privately supported clinical research in human volunteers. ClinicalTrials.gov gives you information about a trial's purpose, who may participate, locations, and phone numbers for more details. The information provided on ClinicalTrials.gov should be used in conjunction with advice from health care professionals. Before searching, you may want to learn more about clinical trials. Elements:206

Gene Expression Omnibus is a gene expression/molecular abundance repository supporting MIAME compliant data submissions, and a curated, online resource for gene expression data browsing, query and retrieval. Elements:7



# Feature: Marginal Notes

NCI Thesaurus

http://alpha.bioontology.org/visualize/NCI\_Thesaurus

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**BioPortal**

Home Browse Search **NCI Thesaurus (X)** [Sign In](#) [Register](#)

- + Abnormal\_Cell\_Kind
- + Activity\_Kind
- + Anatomy\_Kind
- + Biological\_Process\_Kind
- + Chemicals\_and\_Drugs\_Kind
- + Chemotherapy\_Regimen\_Kind
- + Diagnostic\_and\_Prognostic\_Factors\_Kind
- + EO\_Anatomy\_Kind
- + EO\_Findings\_and\_Disorders\_Kind
- + Equipment\_Kind
- **Findings\_and\_Disorders\_Kind**
  - + Disease, Disorder or Finding
- + Gene\_Kind
- + Gene\_Product\_Kind
- Kind
- + Molecular\_Abnormality\_Kind
- + NCI\_Thesaurus\_Kind
- + NCI\_Kind
- + Organism\_Kind
- + Pathway\_Kind
- + Properties\_or\_Attributes\_Kind
- + Retired\_Kind

## Findings\_and\_Disorders\_Kind

Visualization Details **Marginal Notes** Mappings Resources

**Advice: Class with just one subclass** nigam at 02/12/08 09:58

This class has only one subclass. What would be the differentiating characteristics of that subclass from its parent?

[Reply](#)

**Comment:** natasha at 02/13/08 10:26



# Feature: BioPortal Ontology Developer Home Page

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Home Browse Search

## 2 Subscribed Feeds

Comment: [Xenopus anatomy and development => Cell](#)  
*"I think the definition for this class would..."*

Change: [Pathway Ontology => Diabetes Pathway:Definition](#)  
*"A broad condition with various manifestations that is associated..."*

Proposal: [NCI Thesaurus => Cell:Definition](#)

Addition: [NCI Thesaurus => Blood](#)

## Statistics

Total Number of Ontologies 72

NCBO Library 59

Remote 13

Number of Classes/Types 300109\*

\*ontologies which have been parsed and indexed

## 1 My Ontologies

[Xenopus anatomy and development =>](#)

7 new comments added

3 proposals added

[Sequence types and features =>](#)

7 new comments added

3 proposals added

[Pathway ontology =>](#)

7 new comments added

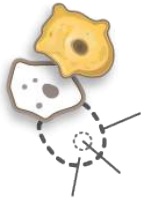
3 proposals added

## 3 Proposals

Your proposal for [Xenopus anatomy and development => adult](#) is still pending.

Your proposal for [Xenopus anatomy and development => embryo](#) has been approved.

A proposal has been created for [Sequence types and features => mutation](#).



# BioPortal will offer

- Ontology repository functionality
- Linkages among different ontologies
- Community-based peer review and ontology annotation
- Linkages between ontology content and related online data repositories
- Support for communities of ontology users and developers