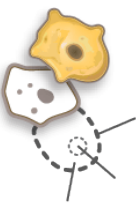




BioPortal Status and Plans

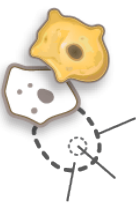
September 2011

Ray Fergerson
NCBO Project Director
Stanford University
ray.fergerson@stanford.edu



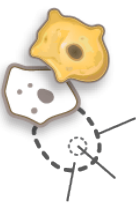
Outline

- What is the NCBO?
- What is BioPortal?
- What is new?
- What is coming?



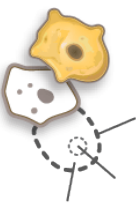
What is the NCBO?

- *A National Center for Biomedical Computing (NCBC)* created by the US National Institutes of Health and administered by NHGRI.
- Collaborating Sites
 - Stanford University (Mark Musen)
 - Mayo Clinic (Chris Chute)
 - University of Victoria (Peggy Storey)
 - University at Buffalo (Barry Smith)



NCBO Key Activities

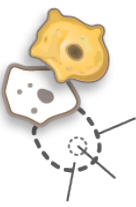
- We **create and maintain a library** of biomedical ontologies.
- We **build tools and Web services** to support the use of ontologies.
- We **collaborate with scientific communities** that develop and use ontologies.



What is BioPortal?

Library of 290+ biomedical ontologies

- Gene Ontology (GO) and Extended Gene Ontology
- Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT)
- International Classifications of Diseases (ICD)
- Medical Subject Headings (MeSH)
- Read Codes (CTV3)
- Biomedical Resource Ontology (BRO)
- NCBI organismal classification
- RadLex
- NCI Thesaurus
- RxNORM
- Foundational Model of Anatomy (FMA)



What is BioPortal?

- Work with ontologies themselves
 - Submit, update, and download an ontology
 - Browse and visualize an ontology
 - Comment on and suggest changes to an ontology (*Notes*)
 - Post a review of an ontology
 - Create a *view* of an ontology
 - Create *mappings* between ontology terms
- Demonstrate the use of ontologies
 - Text annotation with ontological terms (*Annotator*)
 - Resource search with ontological terms (*Resource Index*)



Ontology Browsing

Access all ontologies that are available in BioPortal: You can filter this list by category to display ontologies relevant for a certain domain (try selecting "Anatomy or Experimental Conditions" in the "Filter by category" menu below). You can also filter ontologies that belong to a certain group such as ontologies from the [OBO Foundry](#), or ontologies from the [Cancer Biomedical Informatics Grid \(caBIG\)](#). [Subscribe to the BioPortal RSS feed](#) to receive alerts for submissions of new ontologies, new versions of ontologies, new notes, and new projects. You can subscribe to feeds for a specific ontology at the individual ontology page. Add a new biomedical ontology to BioPortal using the [Submit New Ontology](#) link.

FILTER BY CATEGORY: All Categories

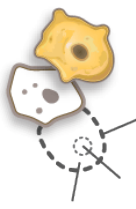
FILTER BY GROUP: All Groups

FILTER BY TEXT:

[Submit New Ontology](#)

[Subscribe to all updates](#)

ONTOLOGY NAME	▲ VISIBILITY	TERMS	NOTES	REVIEWS	PROJECTS	UPLOADED	AUTHOR
ABA Adult Mouse Brain (ABA)	Public	913	0	0	2	08/08/2009	Allen Institute for Brain Science
Adverse Event Ontology (AEO)	Public	431	0	0	0	04/13/2011	Yongqun "Oliver" He
Adverse Event Reporting ontology (AERO)	Public	240	0	0	1	04/09/2011	Melanie Courtot
African Traditional Medicine (ATMO)	Public	223	2	2	2	06/28/2009	Ghislain Atemezang
AI/RHEUM (AIR)	Public	681	0	0	0	02/05/2010	May Cheh
Amino Acid (amino-acid)	Public	46	5	0	3	07/02/2010	Nick Drummond, Georgina Moulton, Robert Stevens, Phil Lord
Amphibian gross anatomy (AAO)	Public	700	0	0	3	02/15/2011	David Blackburn
Amphibian taxonomy (ATO)	Public	6,135	0	0	1	11/02/2009	AmphiAnat list
Anatomical Entity Ontology (AEO)	Public	137	0	0	0	02/15/2011	EMAP Administrators
Animal natural history and life history (ADW)	Public	360	0	0	0	08/31/2010	Animal Diversity Web technical staff



Term Browsing

SNOMED Clinical Terms

Terms ▾

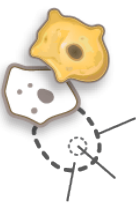


Jump To:

Details
Visualization
Notes (0)
Mappings (5)
Resource Index

- ⊕ Body structure
- ⊕ Clinical finding
- ⊕ Environment or geographical location
- ⊕ Event
- ⊕ Linkage concept
- ⊕ Observable entity
- ⊕ Organism
 - ⊕ Chromista
 - ⊕ Kingdom Animalia
 - ⊕ Kingdom Plantae
 - ⊕ Life-cycle form
 - ⊕ Microorganism
 - ⊕ Antimicrobial susceptible organism
 - ⊕ Eukaryota
 - ⊕ Fungus
 - Microbiologic agent
 - ⊕ Prion
 - ⊕ Prokaryote
 - ⊕ Resistant organism
 - ⊕ Virus
 - ⊕ Renotrophic organism
 - ⊕ Trophic life form
- ⊕ Pharmaceutical / biologic product
- ⊕ Physical force
- ⊕ Physical object
- ⊕ Procedure
- ⊕ Qualifier value
- ⊕ Record artifact
- ⊕ Situation with explicit context

Preferred Name	Fungus
Synonyms	Fungi Mycete Fungus (organism) Fungus, NOS
ID	23496000
Full Id	http://purl.bioontology.org/ontology/SNOMEDCT/23496000
Causative Agent Of	Allergic fungal sinusitis
Conceptstatus	0
Ctv3	X79pZ
Isa	Microorganism
Isprimitive	1
Semantic Type	Fungus
Snomedid	L-40000
Synonym Fn	Fungus (organism)
Synonym Is	Fungus, NOS
Synonym Sy	Fungi Mycete



Visualization

SNOMED Clinical Terms

Terms

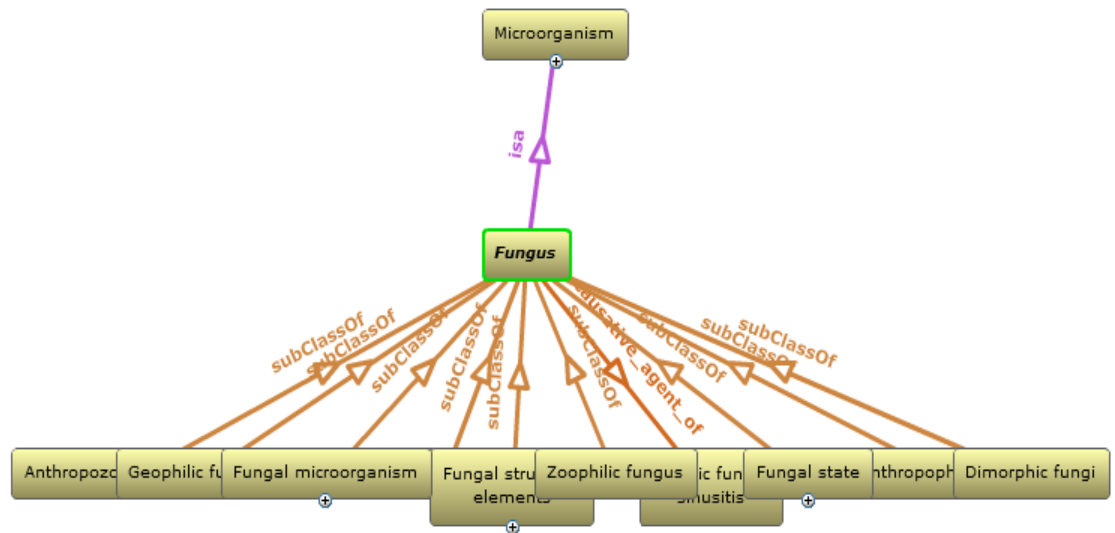
Jump To:

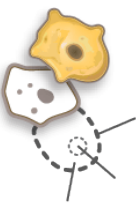
Details Visualization Notes (0) Mappings (5) Resource Index

Show Network Neighborhood

Full Version

- Body structure
 - Clinical finding
 - Environment or geographical location
 - Event
 - Linkage concept
 - Observable entity
 - Organism
 - Chromista
 - Kingdom Animalia
 - Kingdom Plantae
 - Life-cycle form
 - Microorganism
 - Antimicrobial susceptible organism
 - Eukaryota
 - Fungus
 - Microbiologic agent
 - Prion
 - Prokaryote
 - Resistant organism
 - Virus
 - Renotrophic organism
 - Trophic life form
- Pharmaceutical / biologic product
 - Physical force
 - Physical object
 - Procedure
 - Qualifier value
 - Record artifact
 - Situation with explicit context





Notes

Biomedical Resource Ontology

Terms ▾

Jump To:

Details Visualization **Notes (3)** Mappings (0) Resource Index

- ⊕ Activity
- ⊕ Area of Research
- ⊕ Biositemaps Information Model
- ⊕ core:Collection
- core:Concept
- core:ConceptScheme
- ⊕ Deprecated Activity
- Deprecated Area of Research
- ⊕ Deprecated Resource
- ⊖ Resource
 - ⊕ Funding Resource
 - ⊕ Information Resource
 - ⊖ Material Resource
 - Assessment Material Resource
 - Biomaterial Supply Resource
 - Biomedical Supply Resource
 - ⊖ Facility Core
 - Biosafety Level Facility
 - ⊕ Cell Biology Facility
 - Fabrication Facility
 - Imaging Facility
 - ⊕ Molecular Biology Facility
 - ⊕ Physiology Facility
 - ⊕ Research Animals Facility
 - ⊕ Tissue Organ Facility
 - ⊕ Instrument
 - Laboratory Supply Resource
 - ⊕ Medical Device
 - Reagent Resource
 - ⊕ People Resource
 - ⊕ Service Resource
 - ⊕ Software

Show 50 ▾ entries

[Filtering Options](#) »

Search:

SUBJECT	AUTHOR	TYPE	CREATED
Review definition	whetzel	Comment	03/14/2010
New Term Proposal: Sleep Study Facility archived	Mette	New Term Proposal	06/15/2010
New Term Proposal: Exercise Study Facility archived	Mette	New Term Proposal	06/15/2010

New Term Proposal: Exercise Study Facility archived

New Term Proposal submitted by Mette about 1 year ago on [Physiology Facility](#) in [Biomedical Resource Ontology](#)

PREFERRED NAME	Exercise Study Facility	PROVISIONAL ID	PARENT	http://bioontology.org/ontologies/BiomedicalResourceOntology.owl#Physiology_Facility
REASON FOR CHANGE	Physiology facility child	STATUS	CONTACT INFO	
SYNONYMS				
DEFINITION	A facility or core devoted to exercise studies			

Responses [hide all](#) | [show all](#)

RE: New Term Proposal: Exercise Study Facility by whetzel about 1 year ago



Reviews

SNOMED Clinical Terms

Summary ▾

Details

ONTOLOGY ID:	1353
BIOPORTAL PURL:	http://purl.bioontology.org/ontology/SNOMEDCT
STATUS:	
FORMAT:	UMLS
CATEGORIES:	Health
GROUPS:	Cancer Biomedical Informatics Grid Unified Medical Language System WHO Family of International Classifications
CONTACT:	Vivian A. Auld, auld@nlm.nih.gov
HOME PAGE:	http://ihtsdo.org
PUBLICATIONS PAGE:	http://ihtsdo.org
DOCUMENTATION PAGE:	http://ihtsdo.org
DESCRIPTION:	SNOMED Clinical Terms

Metrics ?

NUMBER OF CLASSES:	391173
NUMBER OF INDIVIDUALS:	0
NUMBER OF PROPERTIES:	42
MAXIMUM DEPTH:	32
MAXIMUM NUMBER OF SIBLINGS:	10010
AVERAGE NUMBER OF SIBLINGS:	1
CLASSES WITH A SINGLE SUBCLASS:	28514
CLASSES WITH MORE THAN 25 SUBCLASSES:	2031
CLASSES WITH NO AUTHOR:	0
CLASSES WITH NO DEFINITION:	0

Reviews

[Add your review](#)

REVIEW BY VCDE

No ratings submitted with this review

The review group found that SNOMED CT has fully, or in-part, satisfied all of the review criteria except one. The group recommended that SNOMED CT be "certified" as an NCI standard vocabulary. The group further recommended that usage and implementation be further defined formerly via a consensus approach to VCDE, and provide recommendations for further enhancing the vocabulary evaluation instrument, especially as a number of ontologies



Views

Views [Create new view](#)

[Expand All](#) | [Collapse All](#)

▼ CORE Subset of SNOMED CT

- Description: The CORE Problem List Subset of SNOMED CT
- Ontology ID: 2040
- Definition Language: Manual

VERSION	BASE VERSION	CREATED	CREATED BY	ONTOLOGY FILE	DIFF FILE	VISUALIZE
CORE_2009_01_31	2009_07_31	01/31/2009	Vivian A. Auld, auld@nlm.nih.gov	Download View		

▼ SNOMED Anatomy

- Description: The Anatomy class subtree in SNOMED-CT
- Ontology ID: 2020
- Definition Language: Manual

VERSION	BASE VERSION	CREATED	CREATED BY	ONTOLOGY FILE	DIFF FILE	VISUALIZE
1.2	2009_07_31	07/16/2010	Tania Tudorache, tudorache@stanford.edu	Download View		Explore
1.1	2009_07_31	03/23/2010	Tania Tudorache, tudorache@stanford.edu	Download View		Explore
1.0	2009_01_31	09/09/2009	Tania Tudorache, tudorache@stanford.edu	Download View		Explore

▶ SNOMED Clinical Findings

▼ SNOMED Ethnic Group

- Description: Ethnic Group From SNOMED CT
- Ontology ID: 2057
- Definition Language: Manual

VERSION	BASE VERSION	CREATED	CREATED BY	ONTOLOGY FILE	DIFF FILE	VISUALIZE
1.0	2010_01_31	09/21/2010	Aniket Bhandare, abhandare@path.wustl.edu	Download View		Explore

▼ SNOMED Morphologically Abnormal Structure

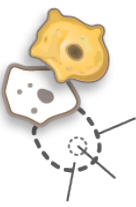


Mappings

Many ontologies in BioPortal have terms with similar meanings (e.g., there is a term for "Heart" in several ontologies). BioPortal users and NCBO researchers have contributed mappings between related terms from different ontologies. Use this page to explore mappings between ontologies that you are interested in. You will also see the mappings when you browse individual ontologies. The mappings can also be accessed from the [Mappings web service](#).

Display Mappings for **SNOMED Clinical Terms (1239844)** (Only Ontologies with Mappings are displayed)

ONTOLOGY	MAPPINGS TO	MAPPINGS FROM
AI/RHEUM	953	953
COSTART	9947	9947
Event (INOH pathway ontology)	2	2
ICD-10-PCS	93	93
ICPC-2 PLUS	18460	18460
International Classification of Primary Care	1664	1664
Logical Observation Identifier Names and Codes	20808	20808
Master Drug Data Base	8366	8366
MedDRA	106747	106747
Medical Subject Headings	45225	45225
MedlinePlus Health Topics	2739	2739
National Drug Data File	23954	23954
National Drug File	39974	39974



Web Page Widgets

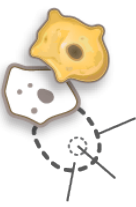
SNOMED Clinical Terms

Widgets ▾

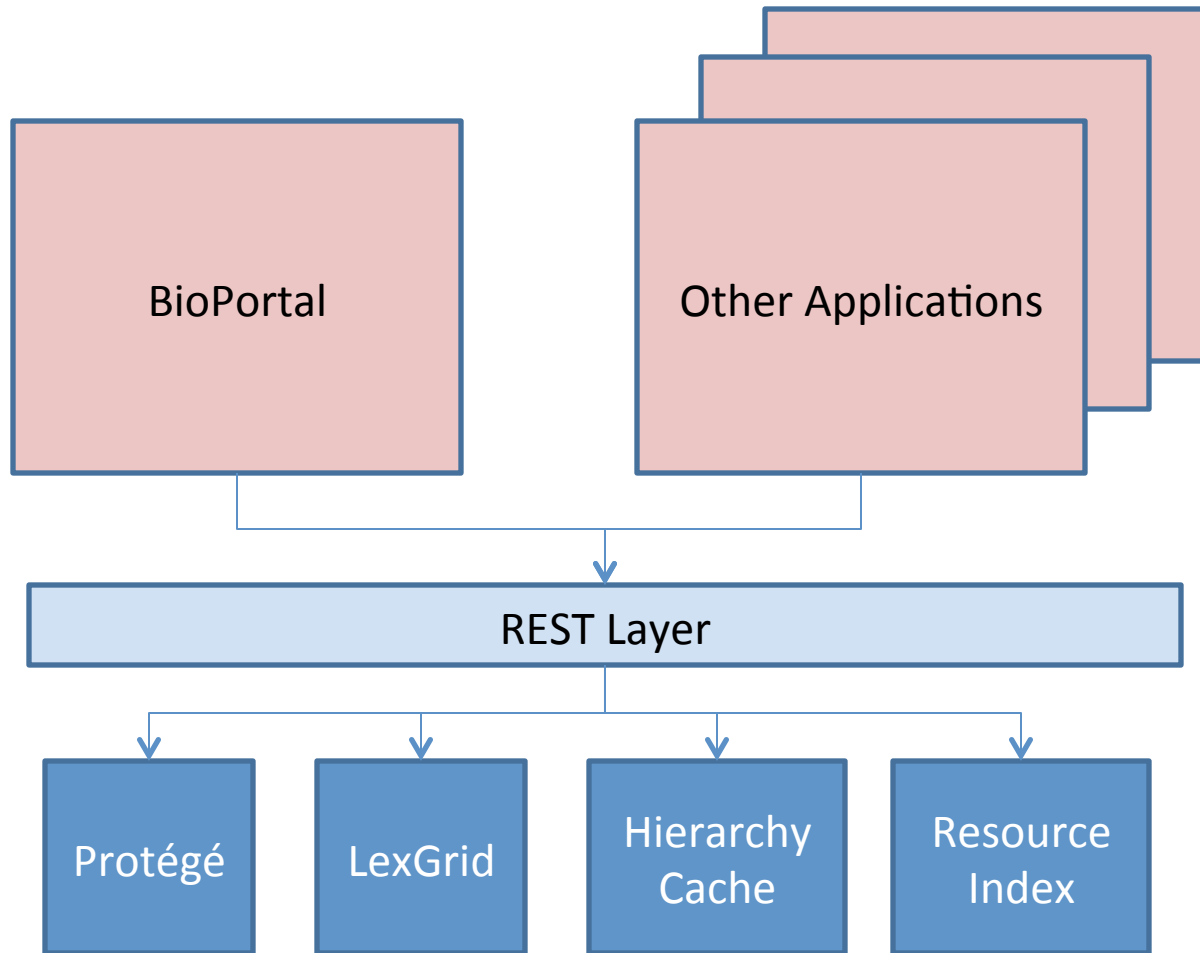
Adding NCBO Widgets for SNOMED Clinical Terms to Your Site

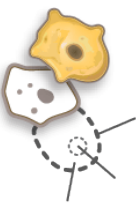
Step 1: Select a widget

Widget	Widget Demonstration
Jump To Type a term in SNOMED Clinical Terms and jump to it in BioPortal Get Code	Jump To: <input type="text"/> Go to BioPortal
Form Autocomplete Fill in a field in your form with a term from SNOMED Clinical Terms Get Code	Example 1 (start typing the term name to get its full URI) <input type="text"/> Example 2 (get the ID for a term) melanoma Example 3 (get the preferred name for a term) <input type="text"/>
RSS Feed Get RSS feed for changes in SNOMED Clinical Terms Get Code	No new changes to the ontology

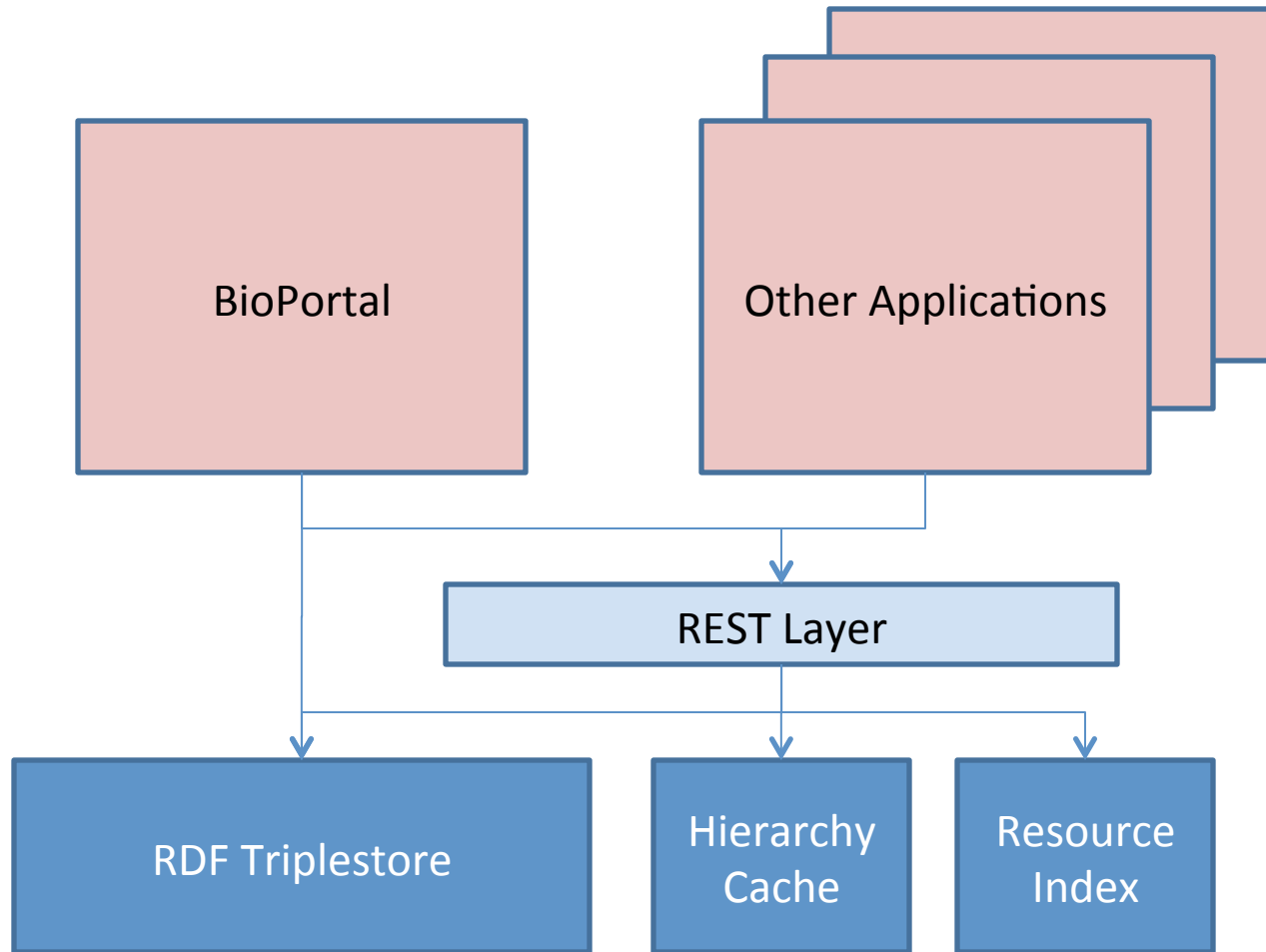


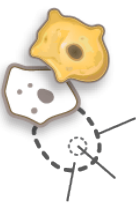
Current Architecture





Planned Architecture

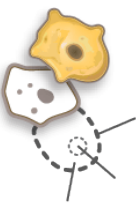




Applications Using Our Technology

35 applications use our infrastructure, including:

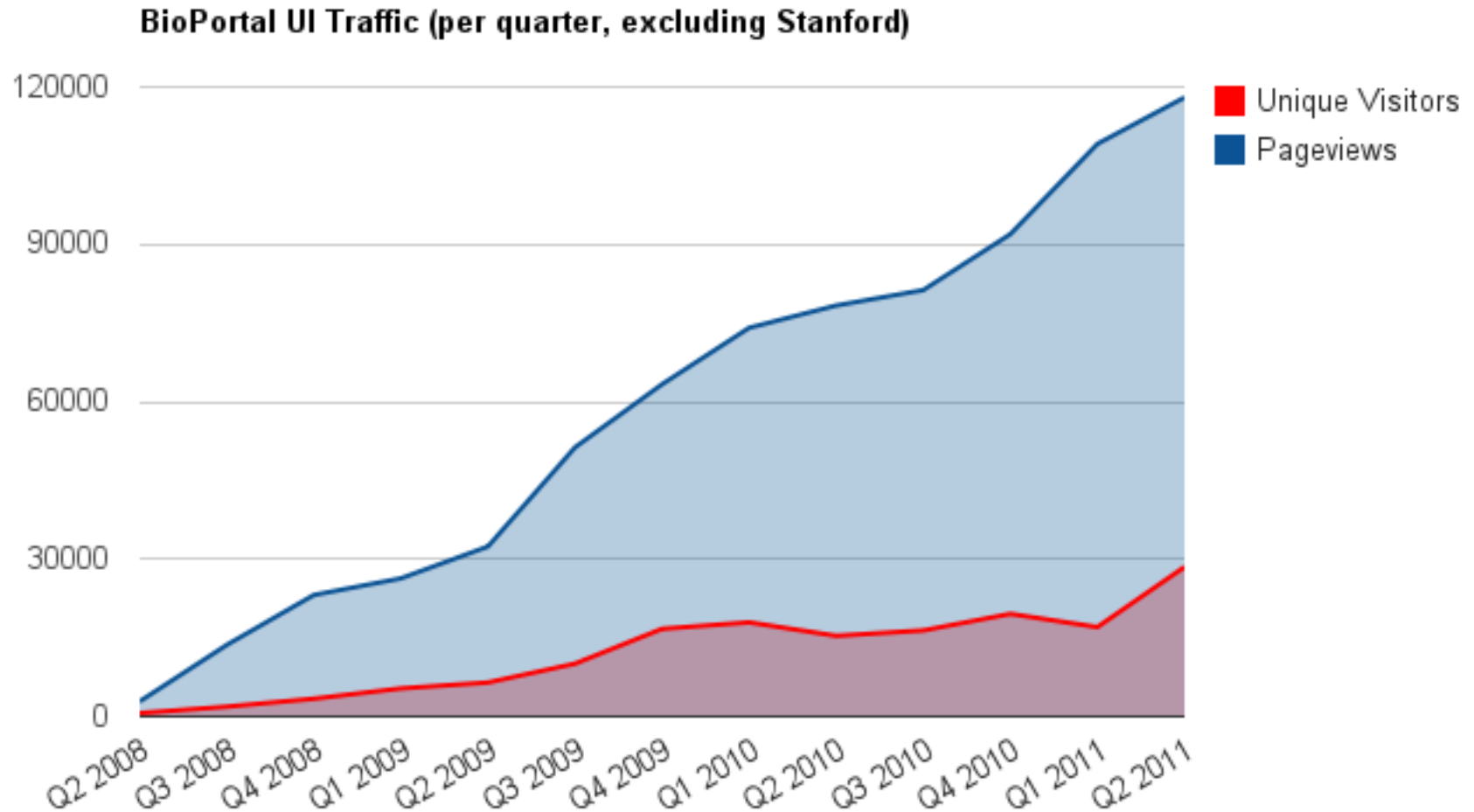
- eleMap data harmonization tool from the eMERGE network
- Gene Wiki for documenting all notable human genes
- ODiSSea biomedical resource explorer created by Elsevier



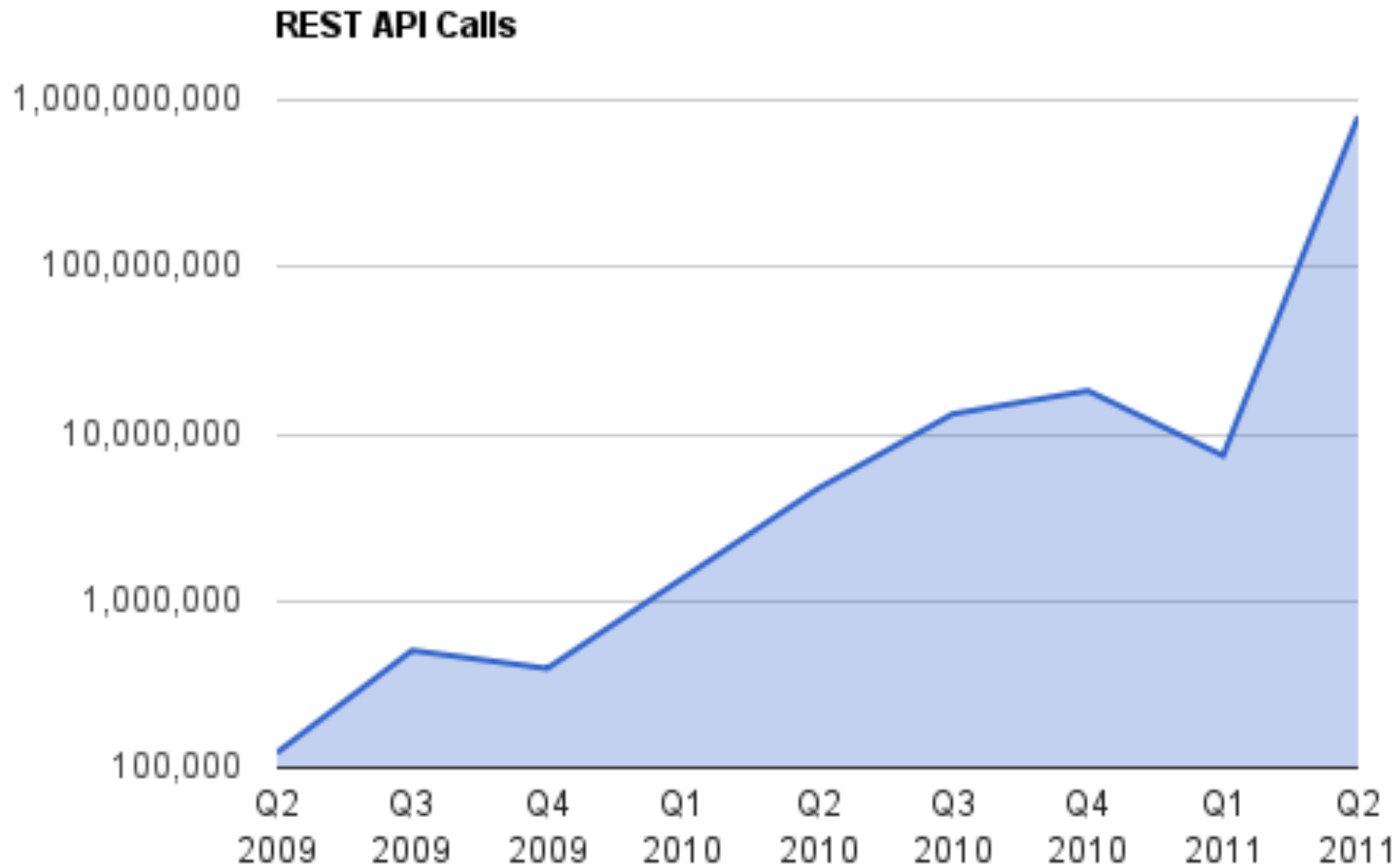
Local BioPortal Installations

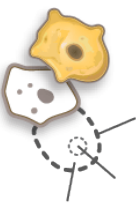


BioPortal UI Traffic



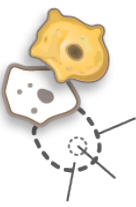
REST Traffic





What is new?

- Adoption of 2-clause BSD license
- Ontology Recommender
 1. Accept a paragraph or two of text
 2. Analyze its use of ontology terms
 3. Recommend closely matched ontologies
- Private ontologies
 - Submitter designates who can browse ontology
- Improved support for OWL 2



What is coming?

- Licensed Ontologies
- RDF triple-store supporting SPARQL queries
- *MyBioPortal* (limiting visible ontologies)
- Improved ontology visualization
- Removal of all usage of Flash technology
- Allow local installations to add/remove tabs

<http://palexander.posterous.com/extending-bioportals-rails-ui>