

Biomedical Resource Ontology

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Biomedical Resource Ontology

- Provides semantics for Biositemaps
 - Resource type
 - An entity that provides access to material, intellectual, financial, technological, or electronic means of carrying out research and development, e.g. Core Facility, Algorithm
 - Activity
 - Activity of interest that may be related to a Resource, e.g. Biospecimen Management
 - Area of Research
 - Area of research that may be related to a Resource, e.g. Bioinformatics

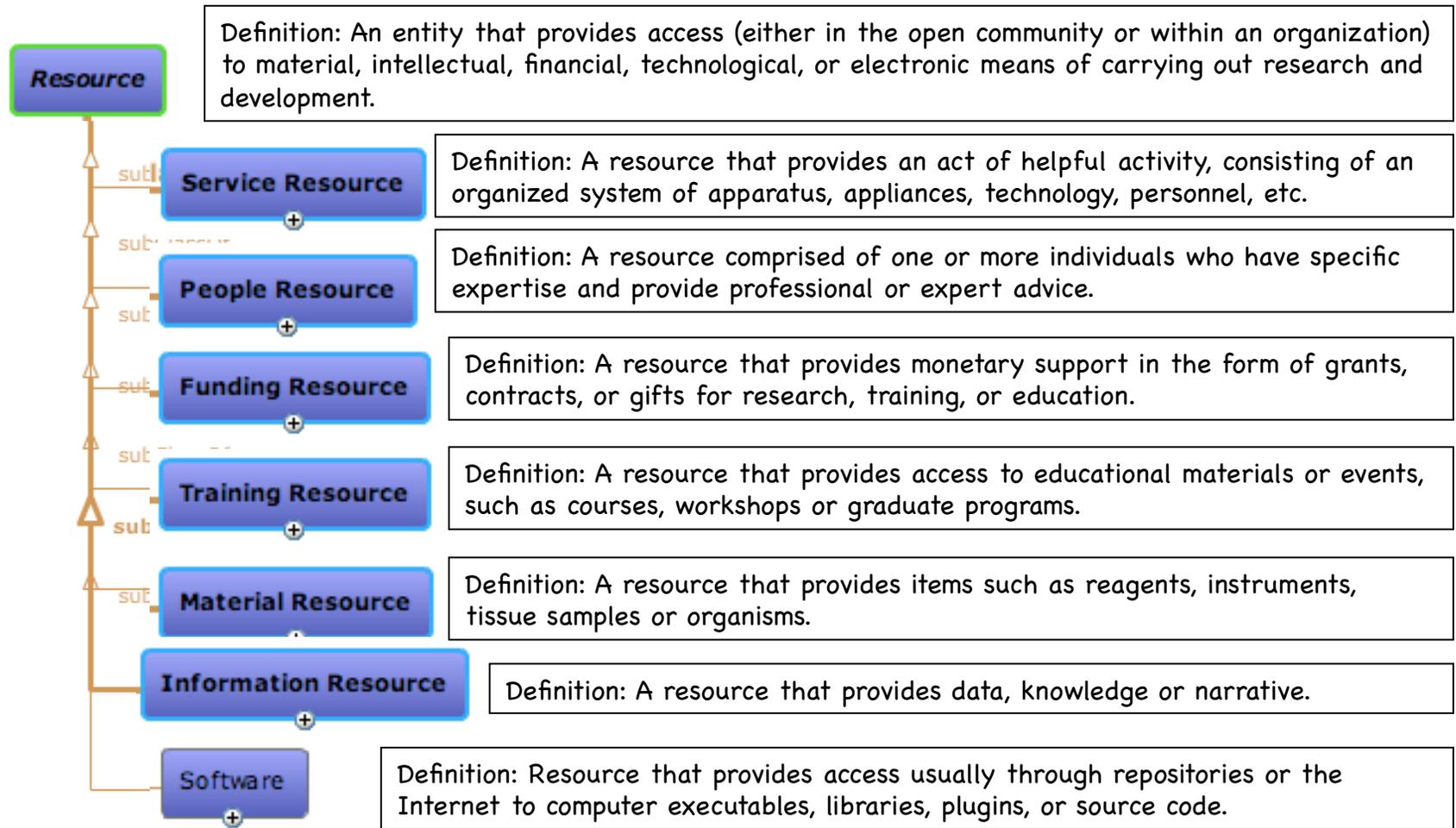
Use Cases

- A researcher wants to know where to send samples for full genome sequencing using a particular type of *next generation sequencer*
- A *genomics* core director wants to know what experiences others have had with two different *data storage system* vendors

Use Cases

- A researcher is studying *physiology* and *metabolism*. She already makes use of a *calorimeter* at her home institution, but is not aware of a double-labeled water technology to quantify oxidation, available at another institution – and useful for various applications within the study of metabolism and physiology.

Biomedical Resource Ontology



BRO Design Principles

- Utilitarian approach
 - Include what is needed
- Term definitions
 - Format “A resource that provides...”
- Simple structure
 - Yes, there is multiple inheritance
- Metadata
 - SKOS (W3C standard)

BRO Development Process

Community

BioPortal Notes

Developers

Web Protégé

Applications

- Biositemaps Editor and Search Tool
- iTools
- Resource Discovery System
- SimTK
- NCBO Resource Index
- ODiSSea Gadget

Resource Discovery System

Scientific explorer

Resource Discovery System

[Software](#)
[Material Resources](#)
[Funding Resources](#)
[Service Resources](#)
[Training Resources](#)
[People Resources](#)

Search Advanced Search | Map | FAQ | About

1,475 **Resources** found, displaying 1 to 25.

Name	Organization	Description	Links
1000 Functional Connectomes Project		ATTENTION The 1000 Functional Connectomes Project has a new home page at NITRC. Please visit us at http://con_1000.projects.nitrc.org or simply...	Home page Contact: Stan Colcombe
3D RNA Modeling & Simulation Workshop, UIC Chicago, March 2010	Stanford University	The structure and dynamics of molecules is central to understanding biological function, and yet most experimentalists find existing structural modeling...	Home page Contact: Blanca Pineda, Joy Ku
3D RNA Modeling and Simulation Workshop, June 19, 2009	Stanford University	The structure and dynamics of molecules is central to understanding biological function, and yet most experimentalists find existing structural modeling...	Home page Contact: Blanca Pineda, Joy Ku
3D Slicer		An extensible cross-platform totally open research platform for image computing.	Home page Contact: Dominik Meier
A Coarse-Grained Physical Model for RNA	University of Texas at A	This project aims to develop a coarse-grained	Home page Golubkov

<http://biositemaps.ncbcs.org/cirwp/index.html>

SimTK

simtk Home Search Simtk.org News Log In
About Simtk.org Go Create Project Register
How to Contribute Advanced Search

Search Results for: Search

No Keyword; Current Categories: Publicly Available Downloads;
Viewing 1 - 25 of 113 Projects (**refine search w. categories on left**)

Categories

You searched
No Keyword
[All Categories](#)
and Publicly Available Downloads

Refine Search:

Restrict by DBP

- [Cardiovascular Dynamics](#)
- [Myosin Dynamics](#)
- [Neuromuscular Biomechanics](#)
- [Protein Folding](#)
- [RNA Folding](#)

Restrict by Classification

Projects

OpenSim
 Provide easy-to-use, extensible software for modeling, simulating, controlling, and analyzing the neuromusculoskeletal system.
Ontology: Modeling_and_Simulation, Multibody_Dynamics
Keywords: muscle-driven simulation, musculoskeletal biomechanics, neuromuscular simulation

SimTK, the Simbios biosimulation Toolkit
 This project describes SimTK (the Simbios Biosimulation Toolkit) and includes links to all sub-projects that make up SimTK.
Ontology: Application_Programming_Interface, Contact_Modeling, Linear_Algebra_Tool, Mechanical_Simulation, Molecular_Dynamics, Molecular_Interaction, Molecular_Model, Multibody_Dynamics, Numerical_Integrator, Numerical_Method, Optimizer
Keywords: computational biomechanics, gpu acceleration, linear algebra, molecular dynamics, multibody dynamics, numerical integration, numerical methods, optimization, random numbers, root finding

OpenMM
 The functionality of OpenMM v... everything that one would ne... molecular simulation.
Ontology: Molecular_Dynamics, Molecular_Modeling, and Classification

People

(affiliated with projects from your search results)
Click on a person to see their profile and projects.

- [Ahmet Erdemir](#)
- [Ajay Seth](#)
- [Alain Laederach](#)
- [Alan Grossfield](#)
- [Alberto Figueroa](#)
- [Alex TenEyck](#)
- [Allison Arnold](#)
- [Andrea Menegolo](#)
- [Andres Kriete](#)
- [Anita Vasavada](#)
- [Ankur Dhanik](#)
- [Ayman Habib](#)

<https://simtk.org/xml/index.xml>

NCBO Resource Index

Genomics **(preferred name)** from: Biomedical Resource Ontology x

Database **(preferred name)** from: Biomedical Resource Ontology x

Search

Clear

Ontology filters | Terms restricted by 1 ontology

0	 ARRS GoldMiner	?	0	Adverse Event Reporting System Data
13	 ArrayExpress	?	6	 Biositemaps
8	 ClinicalTrials.gov	?	0	 Conserved Domain Database (CDD)
0	 Database of Genotypes and Phenotypes	?	0	DrugBank
13	 Gene Expression Omnibus DataSets	?	0	MICAD
0	 Online Mendelian Inheritance in Man	?	0	 Pathway Commons
0	 PharmGKB [Disease]	?	0	 PharmGKB [Drug]
0	 PharmGKB [Gene]	?	0	 PubChem
57	 PubMed	?	0	 Reactome
5	 ResearchCrossroads	?	137	 Stanford Microarray Database
0	 UniProt KB	?	0	 WikiPathways
0	 caNanoLab	?		

NCBO Resource Index

BioPortal Browse Search Projects Annotate All Mappings All Resources Alpha Sign In Register Help/About Send Fee

Biomedical Resource Ontology

Biomedical Resource Ontology Version 3.0 Algorithm | Link Here | Subscribe

View Ontology Summary Details Visualization Notes (0) Mappings (0) Resource Index

Jump To: Go

Legend

- Activity
- Area of Research
- Biositemaps Information Model
- Deprecated Area of Research
- Resource
 - Funding Resource
 - Information Resource
 - Material Resource
 - People Resource
 - Service Resource
 - Software
 - Algorithm
 - Data Acquisition Software
 - Data Analysis Software
 - Data Processing Software
 - Data Transfer and Communication
 - Database Software
 - Integration and Interoperability Tool
 - Interactive Tool
 - Knowledge Mining and Capturing
 - Modeling and Simulation
 - Training Resource
 - Deprecated Resource
 - Deprecated Activity

This tab shows records in public data sources that we have automatically annotated with the terms associated with the class Algorithm or its subclasses based on the textual descriptions of those records.

 Adverse Event Reporting System Data	Adverse Event Reporting System (AERS) Databases are validated and normalized to provide consistent results to our users that depend on data such as this for research into Adverse Events reported to the FDA by Consumers, Doctors and many other health care related professionals.	Annotations:0
 ArrayExpress	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.	Annotations:0
 ARRS GoldMiner	ARRS GoldMiner provides instant access to images published in selected peer-reviewed radiology journals. This new, web-based system allows viewers to search for images by findings, anatomy, imaging technique, and patient age and sex.	Annotations:0
 Biositemaps	Biositemaps represent a mechanism for computational biologists and bio-informaticians to openly broadcast and retrieve meta-data about biomedical data, tools and services (i.e., biomedical resources) over the Internet.	Annotations:25

NAME	ELEMENTID
Fable	http://www.med.upenn.edu/apps/my/itmat/ctsa/ctsa_biositemap-pennmed.rdf+Fable
CHOPPY	http://www.med.upenn.edu/apps/my/itmat/ctsa/ctsa_biositemap-pennmed.rdf+CHOPPY
LIMS	http://www.dbmi.pitt.edu/CTSA/Biositemap_C TSA_Yale_Univ.rdf+LIMS

<http://bioportal.bioontology.org/visualize/42483/BRO:Algorithm>

ODiSSea

The screenshot displays the ODiSSea web interface. On the left, there is a navigation sidebar with the SciVerse logo and links for 'Home' and 'My settings'. Below this is a search bar containing the term 'imaging'. A yellow banner indicates 'About 8899374 results. S'. Underneath, there are options to 'Search within results' and 'Refine Results' with 'Limit to' and 'Exclude' buttons. A 'Content Sources' section lists various databases with checkboxes, including Journal (133976), ScienceDirect (6), MEDLINE / Pub (489025), Pubmed Central, IOP Publishing (6), Scitation (25787), Nature Publishing (17281), BioMed Central (11843), American Physical Society (10905), SAGE Publications (5093), and Crystallography Journals Online (3596).

The main content area features a search bar with 'imaging technology', 'medical imaging', 'Imaging technique', and 'imaging domain' as suggestions. To the right, there are radio buttons for selecting an ontology: Gene Ontology, Human Disease Ontology, Mammalian Phenotype, Mouse Adult Gross Anatomy, NCI Thesaurus (selected), and SNOMED Clinical Terms. A 'Find Terms' button is located below these options. Further right, a list of public data resources is provided: ClinicalTrials.gov, DrugBank, Online Mendelian Inheritance in Man (OMIM), and Research Crossroads. A note instructs users to 'Select an Ontology and click "Find Terms" to see recognized terms for your query' and to 'Click on the tabs to see results from the four public data resources:'.

Below the ontology selection, there are tabs for 'Clinical Trials (13128)', 'Drugs (28)', 'Genes (28)', and 'Grants (23979)'. The 'Clinical Trials' tab is active, showing 'Results from ClinicalTrials.gov'. A list of six search results is displayed, each with a 'Search Hub' link:

- 1) Utility of FDG-PET Scan on the Selection of Patients for Resection of Hepatic Colorectal Metastases
- 2) Evaluation of Functional MRI and DTI (Imaging Techniques) in Children With Epilepsy and Focal Brain Lesions
- 3) 18F-Fluorodeoxyglucose (18F-FDG) Positron Emission Tomography in Oncology
- 4) VEGF Early Imaging for Breast Cancer
- 5) Whole-Body Magnetic Resonance Imaging/Positron Emission Tomography (MRI/PET) in the Staging of Non-Small-Cell Lung Cancer (NSCLC)
- 6) Fludeoxyglucose F 18 PET Scan, CT Scan, and Ferumoxtran-10 MRI Scan Before Chemotherapy and Radiation Therapy in

A link 'See all resources at NCBO' is provided below the list. At the bottom of the main content area, there is a section for 'Arch Facial Plast Surg -- Topic Collections : Radiologic Imaging' with a URL and a list of related articles. A 'See all terms & resources' button is located at the bottom right of the main content area.

Community Interactions

- NIF
 - Synchronize resource hierarchy
 - Harmonize term definitions
- eagle-i, NIF and OBI
 - Instrument term pilot project

Future Work

- Develop modules for submission of resource types
- Separate out the Biositemaps Information Model as a separate ontology
- Add alphanumeric identifiers for terms
- Import Instrument terms from OBI and adjust tools as necessary

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Inventory Resources

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<http://biositemaps.ncbcs.org>