W3C Work on Semantic Web in Health Care and Life Sciences

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Sanitation Engineer

Overview

- Integrating electronic patient records.

- Data integration challenges.

- Successes in biological data modeling.

- Group details.

Current HCLS Activity

- BioRDF — model and query biological processes

- COI (Clinical Observations Interoperability) — use cases for common clinical data model

Electronic Patient Records Integration.

Requires shared terms:

- Alice measures Blood Pressure (   ).

```
test1 systolicBP "120"^^:mmHg .
```

- Bob measures supine (   ) BP.

```
test7 systolicBP "118"^^:mmHg ;
      bodyPos    supine .
```

- Eve measures left arm BP with a cuff.

```
test3 systolicBP "121"^^:mmHg ;
      location   leftArm ;
      device     BPcuff .
```

Study Data Tabulation Model (STDM)

What is a Blood Pressure?

- systolic, diastolic

- units (mm of Hg, bar, ...)

- extensible context (measurement location, patient position, activity, ...)

Reuse Issues

- These BPs are not exactly the same

- These BPs are close enough for many purposes

  - *patient history in emergency room.*

  - ```
    SELECT ?bp
    WHERE { ?test systolicBP ?bp }
    ```

- They can be distinguished when necesary.

  - *drug response statistics*

  - ```
    SELECT ?bp
    WHERE { ?test systolicBP ?bp ;
            location    leftArm ;
            device      BPcuff }
    ```

Challenges

- Social

  - *patient privacy*

  - *health care proviser collaboration*

- Technical

  - *data unification*

  - *modelling*

Integrating large, independent databases:

- Historically difficult

- Easier with Semantic Web

- Proven on bilogical data in the Banff Demo results

"find me genes involved in signal transduction that are related to pyramidal neurons"

Web   Books   Results **1 - 10** of about **223,000** for **pyramidal neurons signal transducti**

Book results for pyramidal neurons signal transduction

Cerebral **Signal Transduction** - by Maarten Eduard Anton Reith - 440 pages
Neuroprotective **Signal Transduction** - by Mark Paul. Mattson - 347 pages
Toxins And **Signal Transduction** - by Yehuda Gutman, Philip Lazarovici - 520 pages

Neurotrophin-3 and brain-derived neurotrophic factor activate ...

... and brain-derived neurotrophic factor activate multiple **signal transduction** events but are
not survival factors for hippocampal **pyramidal neurons**. ...
www.ihop-net.org/UniPub/iHOP/pm/646092.html?pmid=8752100 - 12k -
Cached - Similar pages - Note this

K+ channel regulation of signal propagation in dendrites of ...

Pyramidal neurons receive tens of thousands of synaptic inputs on their dendrites. ...
Signal Transduction* Substances Potassium Channel Blockers ...
www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&
db=PubMed&list_uids=9202119&dopt=Abstract - Similar pages - Note this

Dopamine modulates inwardly rectifying potassium currents in ...

Using outside-out patches of mPFC **pyramidal neurons**, which preclude involvement of ...
Signal Transduction/drug effects **Signal Transduction**/physiology ...
www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&
db=PubMed&list_uids=15044547&dopt=Abstract - Similar pages - Note this
[More results from www.ncbi.nlm.nih.gov]

Loss of Hippocampal CA3 Pyramidal Neurons in Mice Lacking STAM1 ...

Loss of Hippocampal CA3 **Pyramidal Neurons** in Mice Lacking STAM1 ... and to be involved
in the regulation of intracellular **signal transduction** mediated by ...
mcb.asm.org/cgi/content/abstract/21/11/3807 - Similar pages - Note this

A Service of the National Library of Medicine
and the National Institutes of Health

| PubMed | Nucleotide | Protein | Genome | Structure | OMIM | PMC | Journals | Books |

▼ for `signal transduction pyramidal neurons` | Go | Clear | Save Search

Limits | Preview/Index | History | Clipboard | Details

Display Summary ▼ Show 20 ▼ Sort By ▼ Send to ▼

All: 2580 | Review: 160 ✕

Items 1 - 20 of 2580   Page | 1 | of 129 Next

☐ **1:** Naimark A, Barkai E, Matar MA, Kaplan Z, Kozlovsky N, Cohen H.   Related Articles, Links

Upregulation of neurotrophic factors selectively in frontal cortex in response to olfactory discrimination learning.
Neural Plast. 2007;:13427.
PMID: 17710248 [PubMed - in process]

☐ **2:** Nistico R, Piccirilli S, Sebastianelli L, Nistico G, Bernardi G, Mercuri NB.   Related Articles, Links

The blockade of K(+)-ATP channels has neuroprotective effects in an in vitro model of brain ischemia.
Int Rev Neurobiol. 2007;82:383-95.
PMID: 17678973 [PubMed - indexed for MEDLINE]

☐ **3:** Schmidt-Hieber C, Jonas P, Bischofberger J.   Related Articles, Links

Subthreshold dendritic signal processing and coincidence detection in dentate gyrus granule cells.
J Neurosci. 2007 Aug 1;27(31):8430-41.
PMID: 17670990 [PubMed - indexed for MEDLINE]

☐ **4:** Alvarez VA, Ridenour DA, Sabatini BL.   Related Articles, Links

Distinct structural and ionotropic roles of NMDA receptors in controlling spine and synapse stability.
J Neurosci. 2007 Jul 11;27(28):7365-76.
PMID: 17626197 [PubMed - indexed for MEDLINE]

☐ **5:** Smith SS, Gong QH.   Related Articles, Links

2580	**PubMed:** biomedical literature citations and abstracts	2	**Books:** online books
959	**PubMed Central:** free, full text journal articles	4	**OMIM:** online Mendelian Inheritance in Man
none	**Site Search:** NCBI web and FTP sites	none	**OMIA:** online Mendelian Inheritance in Animals

10 — **CoreNucleotide:** Core subset of nucleotide sequence records	2 — **dbGaP:** genotype and phenotype
none — **EST:** Expressed Sequence Tag records	none — **UniGene:** gene-oriented clusters of transcript sequences
34 — **GSS:** Genome Survey Sequence records	none — **CDD:** conserved protein domain database
16 — **Protein:** sequence database	none — **3D Domains:** domains from Entrez Structure
5 — **Genome:** whole genome sequences	none — **UniSTS:** markers and mapping data
none — **Structure:** three-dimensional macromolecular structures	none — **PopSet:** population study data sets
none — **Taxonomy:** organisms in GenBank	none — **GEO Profiles:** expression and molecular abundance profiles
none — **SNP:** single nucleotide polymorphism	none — **GEO DataSets:** experimental sets of GEO data
35 — **Gene:** gene-centered information	none — **Cancer Chromosomes:** cytogenetic databases
10 — **HomoloGene:** eukaryotic homology groups	none — **PubChem BioAssay:** bioactivity screens of chemical substances
none — **PubChem Compound:** unique small molecule chemical structures	none — **GENSAT:** gene expression atlas of mouse central nervous system
none — **PubChem Substance:** deposited chemical substance records	none — **Probe:** sequence-specific reagents
none — **Genome Project:** genome project information	1394 — **Protein Clusters:** a collection of related protein sequences

the Neurocommons:
semantic web proof of concept

getting precise answers to complex biological
questions

in conjunction with SW HCLS:
- produces standards requirements and
evidence
- early access to technical authority in semweb
and life sciences

"find me genes involved in signal transduction that are related to pyramidal neurons"

slide courtesy of kei chung, yale

Pathological Change — involves → Neuronal Property

Pathological Change — involves → Pathological Agent

Neuron — has → Compartment

Receptor — is_located_in → Compartment

Channel — is_located_in → Compartment

Pathological Agent — inhibits

Drug — inhibits → Agent
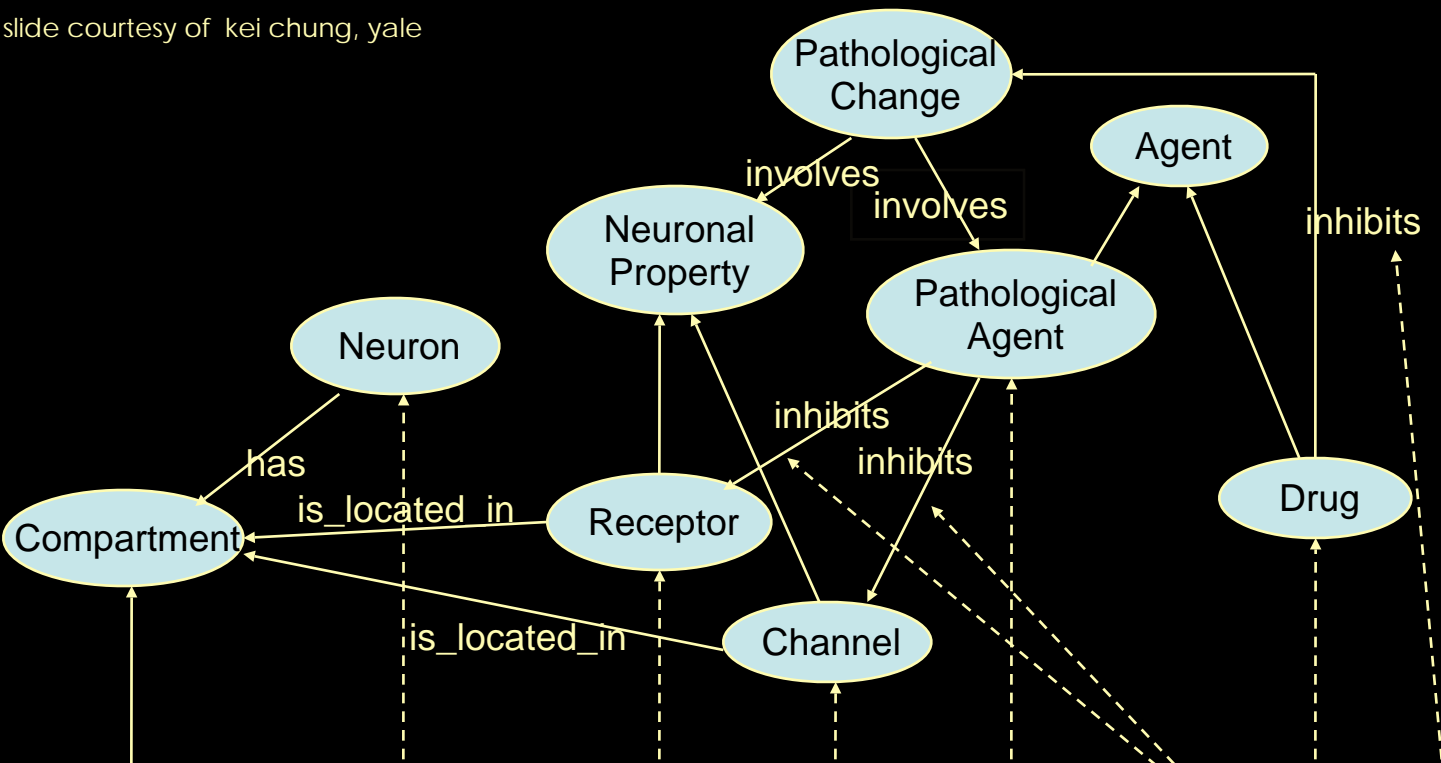
Compartment	Cell: NeuronDB	Receptor	Channel	Pathological Agent (PA)	PA Action	Drug	Drug Action	Stage	Note	Detail
Soma	CA1 pyramidal neuron		I A	beta Amyloid	Inhibits			Early	View	66240
	Olfactory bulb mitral cell	GabaA						Early	View	66750
Dendrite	CA1 pyramidal neuron		I A	beta Amyloid	Inhibits			Early	View	66240
	Olfactory bulb mitral cell	GabaA						Early	View	66750
Unspecified	Oocyte		I L high threshold	beta Amyloid	Inhibits			Early	View	66252
								Early	View	66753
	CA1 pyramidal neuron			beta Amyloid	Inhibits			Early	View	66758
	CA1 pyramidal neuron	NMDA	I Calcium	beta Amyloid	Inhibits		Inhibits		View	66250
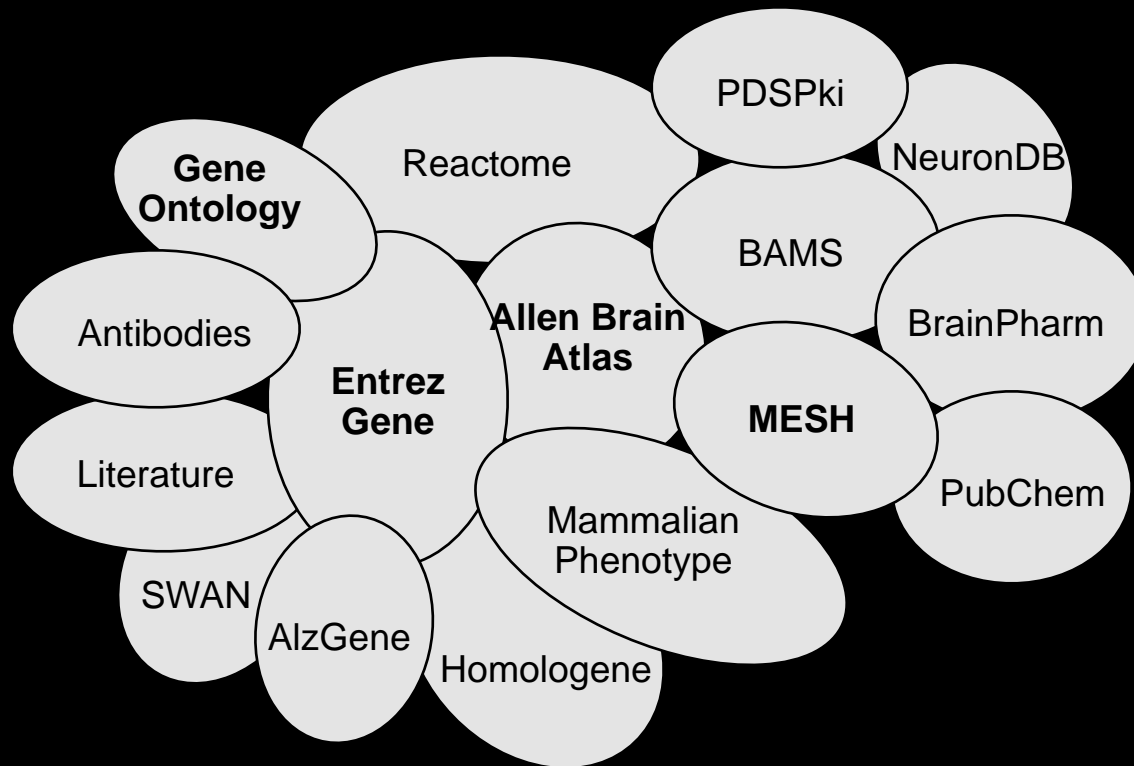
running code: semantic web query
/ four open government data sources

```
prefix go: <http://purl.org/obo/owl/GO#>
prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>
prefix owl: <http://www.w3.org/2002/07/owl#>
prefix mesh: <http://purl.org/commons/record/mesh/>
prefix sc: <http://purl.org/science/owl/sciencecommons/>
prefix ro: <http://www.obofoundry.org/ro/ro.owl#>

select ?genename ?processname
where
{  graph <http://purl.org/commons/hcls/pubmesh>
     { ?paper ?p mesh:D017966 .
       ?article sc:identified_by_pmid ?paper.
       ?gene sc:describes_gene_or_gene_product_mentioned_by ?article.
     }
   graph <http://purl.org/commons/hcls/goa>
     { ?protein rdfs:subClassOf ?res.
       ?res owl:onProperty ro:has_function.
       ?res owl:someValuesFrom ?res2.
       ?res2 owl:onProperty ro:realized_as.
       ?res2 owl:someValuesFrom ?process.
   graph <http://purl.org/commons/hcls/20070416/classrelations>
     {{?process <http://purl.org/obo/owl/obo#part_of> go:GO_0007166}
       union
       {?process rdfs:subClassOf go:GO_0007166 }}
       ?protein rdfs:subClassOf ?parent.
       ?parent owl:equivalentClass ?res3.
       ?res3 owl:hasValue ?gene.
     }
   graph <http://purl.org/commons/hcls/gene>
     { ?gene rdfs:label ?genename }
   graph <http://purl.org/commons/hcls/20070416>
     { ?process rdfs:label ?processname}
}
```

Mesh: Pyramidal Neurons

Pubmed: Journal Articles

Entrez Gene: Genes

GO: Signal Transduction

DRD1, 1812	adenylate cyclase activation
ADRB2, 154	adenylate cyclase activation
ADRB2, 154	arrestin mediated desensitization of G-protein coupled receptor protein signaling pathway
DRD1IP, 50632	dopamine receptor signaling pathway
DRD1, 1812	dopamine receptor, adenylate cyclase activating pathway
DRD2, 1813	dopamine receptor, adenylate cyclase inhibiting pathway
GRM7, 2917	G-protein coupled receptor protein signaling pathway
GNG3, 2785	G-protein coupled receptor protein signaling pathway
GNG12, 55970	G-protein coupled receptor protein signaling pathway
DRD2, 1813	G-protein coupled receptor protein signaling pathway
ADRB2, 154	G-protein coupled receptor protein signaling pathway
CALM3, 808	G-protein coupled receptor protein signaling pathway
HTR2A, 3356	G-protein coupled receptor protein signaling pathway
DRD1, 1812	G-protein signaling, coupled to cyclic nucleotide second messenger
SSTR5, 6755	G-protein signaling, coupled to cyclic nucleotide second messenger
MTNR1A, 4543	G-protein signaling, coupled to cyclic nucleotide second messenger
CNR2, 1269	G-protein signaling, coupled to cyclic nucleotide second messenger
HTR6, 3362	G-protein signaling, coupled to cyclic nucleotide second messenger
GRIK2, 2898	glutamate signaling pathway
GRIN1, 2902	glutamate signaling pathway
GRIN2A, 2903	glutamate signaling pathway
GRIN2B, 2904	glutamate signaling pathway
ADAM10, 102	integrin-mediated signaling pathway
GRM7, 2917	negative regulation of adenylate cyclase activity
LRP1, 4035	negative regulation of Wnt receptor signaling pathway
ADAM10, 102	Notch receptor processing
ASCL1, 429	Notch signaling pathway
HTR2A, 3356	serotonin receptor signaling pathway
ADRB2, 154	transmembrane receptor protein tyrosine kinase activation (dimerization)
PTPRG, 5793	transmembrane receptor protein tyrosine kinase signaling pathway
EPHA4, 2043	transmembrane receptor protein tyrosine kinase signaling pathway
NRTN, 4902	transmembrane receptor protein tyrosine kinase signaling pathway
`CTNND1, 1500	Wnt receptor signaling pathway

Many of the genes are indeed related to Alzheimer's Disease through gamma secretase (presenilin) activity

Default Graph: None ▼

SPARQL Query   Insert prefix ▼   Insert query ▼   Tools & Sn

```
        ?res2 owl:someValuesFrom ?process.
    graph <http://purl.org/commons/hcls/20070416/classrelations>
      {{?process <http://purl.org/obo/owl/obo#part_of> go:GO_0007166}
        union
      {?process rdfs:subClassOf go:GO_0007166 }}
        ?protein rdfs:subClassOf ?parent.
        ?parent owl:equivalentClass ?res3.
        ?res3 owl:hasValue ?gene.
      }
    graph <http://purl.org/commons/hcls/gene>
      { ?gene rdfs:label ?genename }
    graph <http://purl.org/commons/hcls/20070416>
      { ?process rdfs:label ?processname}
}
```

Output format: Table ▼   Max Rows 50 ▼

[Run Query] [Reset] [Clear]   ☐ Retrieve remote RDF data for all missing source graphs

result | request | response

```
POST /sparql/? HTTP 1.1
Host: ashby.csail.mit.edu:8890
Accept: text/html
Content-Type: application/x-www-form-urlencoded
Content-Length: 2074

query=prefix%20go%3A%20%3Chttp%3A%2F%2Fpurl.org%2Fobo%2Fowl%2FGO%23%3E%0Aprefix%20rdfs%3A%20%3Chttp%3A%2F%2Fww
```

http://hcls1.csail.mit.edu:8890/sparql/?query=prefix%20go%3A%20%3Chttp%3A%2F%2Fpurl.org%2Fobo%2Fowl%2FGO%23%3E%
0Aprefix%20rdfs%3A%20%3Chttp%3A%2F%2Fwww.w3.org%2F2000%2F01%2Frdf-schema%23%3E%0Aprefix%20owl%3A%20%
3Chttp%3A%2F%2Fwww.w3.org%2F2002%2F07%2Fowl%23%3E%0Aprefix%20mesh%3A%20%3Chttp%3A%2F%2Fpurl.org%
2Fcommons%2Frecord%2Fmesh%2F%3E%0Aprefix%20sc%3A%20%3Chttp%3A%2F%2Fpurl.org%2Fscience%2Fowl%
2Fsciencecommons%2F%3E%0Aprefix%20ro%3A%20%3Chttp%3A%2F%2Fwww.obofoundry.org%2Fro%2Fro.owl%23%3E%0A%
0Aselect%20%3Fgenename%20%3Fprocessname%0Awhere%0A%7B%20%20graph%20%3Chttp%3A%2F%2Fpurl.org%
2Fcommons%2Fhcls%2Fpubmesh%3E%0A%20%20%20%20%20%7B%20%3Fpaper%20%3Fp%20mesh%3AD017966%20.%0A%
20%20%20%20%20%20%20%3Farticle%20sc%3Aidentified_by_pmid%20%3Fpaper.%0A%20%20%20%20%20%20%20%3Fgene%
20sc%3Adescribes_gene_or_gene_product_mentioned_by%20%3Farticle.%0A%20%20%20%20%20%7D%0A%20%20%20graph%
20%3Chttp%3A%2F%2Fpurl.org%2Fcommons%2Fhcls%2Fgoa%3E%0A%20%20%20%20%20%7B%20%3Fprotein%20rdfs%
3AsubClassOf%20%3Fres.%0A%20%20%20%20%20%20%20%3Fres%20owl%3AonProperty%20ro%3Ahas_function.%0A%20%
20%20%20%20%20%20%3Fres%20owl%3AsomeValuesFrom%20%3Fres2.%0A%20%20%20%20%20%20%20%3Fres2%20owl%
3AonProperty%20ro%3Arealized_as.%0A%20%20%20%20%20%20%20%3Fres2%20owl%3AsomeValuesFrom%20%3Fprocess.%
0A%20%20%20graph%20%3Chttp%3A%2F%2Fpurl.org%2Fcommons%2Fhcls%2F20070416%2Fclassrelations%3E%0A%20%20%
20%20%20%7B%7B%3Fprocess%20%3Chttp%3A%2F%2Fpurl.org%2Fobo%2Fowl%2Fobo%23part_of%3E%20go%
3AGO_0007166%7D%0A%20%20%20%20%20%20%20union%0A%20%20%20%20%20%20%7B%3Fprocess%20rdfs%
3AsubClassOf%20go%3AGO_0007166%20%7D%7D%0A%20%20%20%20%20%20%20%3Fprotein%20rdfs%3AsubClassOf%20%
3Fparent.%0A%20%20%20%20%20%20%20%3Fparent%20owl%3AequivalentClass%20%3Fres3.%0A%20%20%20%20%20%20%
20%3Fres3%20owl%3AhasValue%20%3Fgene.%0A%20%20%20%20%20%20%7D%0A%20%20%20graph%20%3Chttp%3A%2F%
2Fpurl.org%2Fcommons%2Fhcls%2Fgene%3E%0A%20%20%20%20%20%7B%20%3Fgene%20rdfs%3Alabel%20%3Fgenename%
20%7D%0A%20%20%20graph%20%3Chttp%3A%2F%2Fpurl.org%2Fcommons%2Fhcls%2F20070416%3E%0A%20%20%20%20%
20%7B%20%3Fprocess%20rdfs%3Alabel%20%3Fprocessname%7D%0A%7D&format=&maxrows=50

Saved Queries: Neurocommons

Show me all signal transduction genes on the cell surface in pyramidal neurons

Search: ribosomal protein

Search GO term names/synonyms ▼

Search all ontologies ▼ | Search GO

...rotein, 5 go term(s) in total were found: [process (1) function (4) component (0)]

Name	GO ID
ribosomal protein import into nucleus	GO:0006610
ribosomal protein S6 kinase activity	GO:0004711
structural constituent of ribosome	GO:0003735
ribosomal-protein-alanine N-acetyltransferase activity	GO:0008999
unfolded protein binding	GO:0051082

GO term, or to display multiple terms in context select checkboxes and press a view button below.

...ntext | View selected terms in context | View unselected terms in context

National Library of Medicine - Medical Subject Headings

2007 MeSH

MeSH Descriptor Data

Standard View. Go to Concept View; Go to Expanded Concept View

MeSH Heading	Neoplasms
Tree Number	C04
Annotation	avoid: too general; prefer specifics; policy: Manual section 24; / chem ind permitted but consider also CARCINOG / class: consider also NEOPLASM STAGING (see note there) but "grading" = / pathol; / etiol: consider also ONCOGENIC VIRUSES; / vet: Manual 24.6+ or TN 136; TN 135: MeSH terms for neoplasms classed by tissue drug ther: consider also ANTINEOPLASTIC AGENTS & its specifics; / genet: consider also GENES, TUMOR SUPPRESSOR / immunol: consider also TUMOR ESCAPE; consider also ANTIGENS, NEOPLASM & ANTIBODIES, NEOPLASM; / microbiol: consider also ONCOGENIC VIRUSES; / nurs = the patient, ONCOLOGIC NURSING = the oncologic specialty; / prev: consider also ANTICARCINOGENIC AGENTS; / radiother = the patient, RADIATION ONCOLOGY = the specialty; consider also BRACHYTHERAPY; / secon NEOPLASM METASTASIS but do not confuse with NEOPLASMS, SECOND PRIMARY; familial: consider NEOPLASTIC SYNDROMES, HEREDITARY; metastatic cancer of unknown origin: index under NEOPLAS METASTASIS; Tumor Key: TN Suppl
Scope Note	New abnormal growth of tissue. Malignant neoplasms show a greater degree of anaplasia and have the properties invasion and metastasis, compared to benign neoplasms.
Entry Term	Benign Neoplasms
Entry Term	Cancer
Entry Term	Neoplasms, Benign
Entry Term	Tumors
See Also	Antibodies, Neoplasm
See Also	Anticarcinogenic Agents

the "view source" effect

```
prefix go: <http://purl.org/obo/owl/GO#>
prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>
prefix owl: <http://www.w3.org/2002/07/owl#>
prefix mesh: <http://purl.org/commons/record/mesh/>
prefix sc: <http://purl.org/science/owl/sciencecommons/>
prefix ro: <http://www.obofoundry.org/ro/ro.owl#>
```

Mesh: Cancer

```
select ?genename ?processname
where
{  graph <http://purl.org/commons/hcls/pubmesh>

   { ?paper ?p mesh:D009369 .
     ?article sc:identified_by_pmid ?paper.
     ?gene sc:describes_gene_or_gene_product_mentioned_by ?article.
   }
  graph <http://purl.org/commons/hcls/goa>
   { ?protein rdfs:subClassOf ?res.
     ?res owl:onProperty ro:has_function.
     ?res owl:someValuesFrom ?res2.
     ?res2 owl:onProperty ro:realized_as.
     ?res2 owl:someValuesFrom ?process.
  graph <http://purl.org/commons/hcls/20070416/classrelations>

   {{?process <http://purl.org/obo/owl/obo#part_of> go:GO_0006610}
     union

   {?process rdfs:subClassOf go:GO_0006610 }}
     ?protein rdfs:subClassOf ?parent.
     ?parent owl:equivalentClass ?res3.
     ?res3 owl:hasValue ?gene.
   }
  graph <http://purl.org/commons/hcls/gene>
   { ?gene rdfs:label ?genename }
  graph <http://purl.org/commons/hcls/20070416>
   { ?process rdfs:label ?processname}
}
```

GO: Ribosomal Protein

Getting Started   Latest Headlines   Scientific American ...   MagLev   HCLS Pubmed Results   AD and PD Therapeu...   HCLS Gene–Brain Im...

Allen Brain Atlas Gene Expression Results

3 entrez-gene-record   filtered from 26 originally (reset)

Copy All

hasName   3 ✓

derective
1b
homolog
(C.
elegans)

1 ✓ apoptotic
peptidase
activating
factor 1

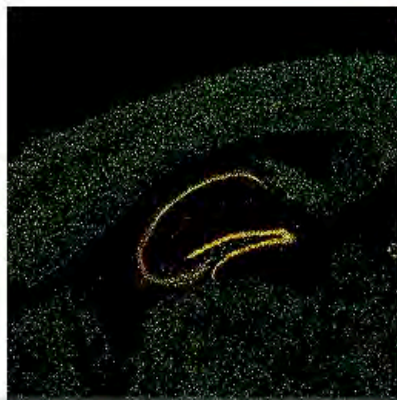sorted by: hasName; then by... • ☑ grouped as sorted • ○ show duplicates

1.
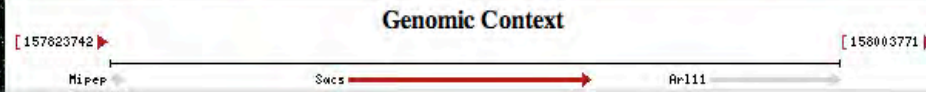## 56298
Entrez-Gene 56298
ADP-ribosylation factor-like 6 interacting protein 2

Transcript Region
NC_000083.4

◄ 79764456]
5'
3'
◄ 79756718]

NM_178050+2
NM_019717+1

NP_835151+1 isoform 2
NP_062691+2 isoform 1

■ – coding region   ■ – untranslated region

Genomic Context

[79615279 ▶
[79970531 ▶

Mipep
Tnfrsf19
Sacs ◄
Sgcg
Arl11
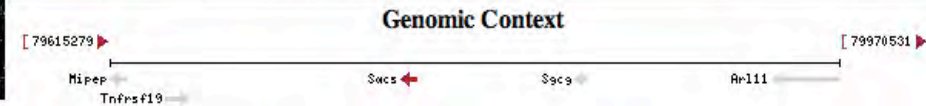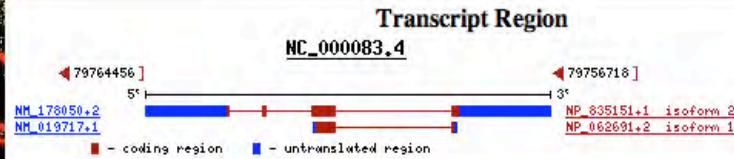
2.
433667
Entrez-Gene 433667
ankyrin repeat domain 13c

Transcript Region
NC_000069.4

[157882759 ▶
[157942130 ▶
5'
3'

NM_001013806+1
NP_001013828+1 CCDS17933+1

■ – coding region   ■ – untranslated region

Genomic Context

[157823742 ▶
[158003771 ▶

Mipep
Sacs ▶
Arl11

http://hcls1.csail.mit.edu/map/#Kcnip3@2850,Kcnd1@2800
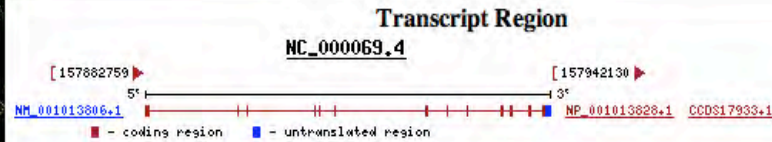
Javascript

Allen Brain Institute Servers

SPARQL
AJAX

Query

URL
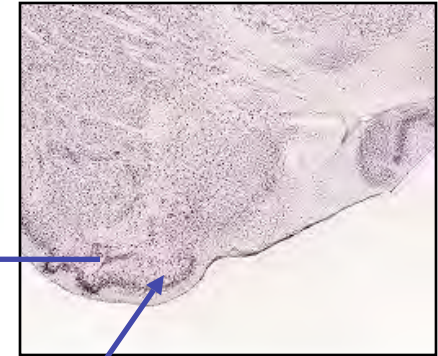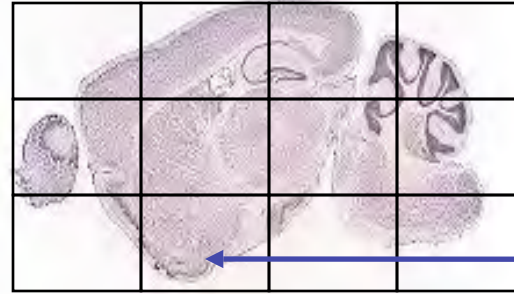
http://www.brainmap.org://....0205032816_B.aff/TileGroup3/1-0-1.jpg

Neurocommons Servers

Google
Maps
API

300,000,000+ RDF "triples"
pre-formatted queries
analytic software under BSD
$3,000 of off-the-shelf hardware
open source triple store

available for download and mirroring

Semantic Web HCLS

"The Semantic Web Health Care and Life Sciences Interest Group is designed to improve collaboration, research and development, and innovation adoption in the health care and life science industries. Aiding decision-making in clinical research, Semantic Web technologies will bridge many forms of biological and medical information across institutions."

Principal activities have centered around

- Building the community

- Exploring and documenting use cases

- Converting resources to RDF

- Learning to work with semantic web query/inference technology such as SPARQL, OWL, and rule engines.

Organization

- Chairs: Eric Neumann, Tonya Hongsermeier

- Group divided in to task forces (coordinator)

    BioRDF. Established initially to convert biomedical data to RDF (Susie Stephens) home page

    BIONT. Established initially to be resource for ontology needs for other groups (Vipul Kashyap) home page

    DSE (Drug Safety and Efficacy). Established initially to work on SW technology to support monitoring drug safety, pharmacovigilance (Eric Neumann) home page

    ACPP (Adaptable Clinical Protocols and Pathways) Established initially to work on method of representing and computing applicability of protocols to dynamically changing patient status (Helen Chen) home page

    Clinical Observations Interoperability. Established recently with two goals 1) Establish new collaboration with health care industry players 2) Work on issues at the intersection of electronic medical records and health care organization needs. (Vipul Kashyap) home page

Membership

- 64 participants from 38 organizations
- 3 Invited Experts:

    Kei Cheung, Yale University

    Michel Dumontier, Carleton University/Canada

    Matthias Samwald, Medical University of Vienna/Austria

- Many more non-member participants
- Breakdown at

http://www.w3.org/2007/09/19-HCLS-participants

Meetings

- Formal F2F, January 2006, Cambridge
- Formal F2F, October 2006, Amsterdam
- Workshop, ISWC November 2006, Banff
- Informal F2F (Demo) 3 x March/April, 2007, Cambridge
- Workshop, WWW 2007, May 2007, Banff
- Informal F2F (URI), July 2007, Cambridge
- Formal F2F, November 2007, Cambridge

Publications

- **In Print**

  ### Advancing translational research with the Semantic Web
  Alan Ruttenberg, Tim Clark, William Bug, Matthias Samwald, Olivier Bodenreider, Helen Chen,
  Donald Doherty, Kerstin Forsberg, Yong Gao, Vipul Kashyap, June Kinoshita, Joanne Luciano,
  M Scott Marshall, Chimezie Ogbuji, Jonathan Rees, Susie Stephens, Gwendolyn T Wong, Elizabeth Wu, Davide
  Zaccagnini, Tonya Hongsermeier, Eric Neumann, Ivan Herman and Kei-Hoi Cheung,
  BMC Bioinformatics 2007, 8(Suppl 3):S2

  ### An Ontology-based approach for Data Integration - An Application in Biomedical Research
  Vipul Kashyap, Kei-Hoi Cheung, Don Doherty, Matthias Samwald,   M. Scott Marshall, Joanne Luciano, Susie Stephens,
  Ivan Hermanand Ray Hookway, Book Chapter in Cardoso, J., Hepp, M.,Lytras, M. (Eds.) "Real-world Applications of
  Semantic Web Technology and Ontologies", Springer 2007.

- **Notes in progress**

  ### HCLS Community URI Recommendations
  ### Senselab RDF Conversion

Presentations

- WWW2007 Demo

- ISMB 2007 Demo

- ISMB BioOntology SIG Poster 2007

- Society for Neuroscience Poster Nov 2007

- Selection of presentation venues of members showing HCLS work

  Bridging Pharma and IT
  Drug Discovery Technology of Innovative Therapeutics
  1st European Semantic Web Conference
  Bio-IT World
  Norwegian Semantic Web Day
  InfoTech Pharma
  Modern Drug Discovery and Development Summit
  Massachusetts Biotechnology Panel
  eScience Institute; RDF, Ontologies and Meta-Data Workshop
  Virginia Biotechnology Summit
  Systems Biology
  Semantic Web Gathering
  Allen Institute for Brain Sciences
  Informatics and Interactomes in Huntington's Disease
  Ontology for Biomedical Informatics Workshop
  Clinical Trial Ontology Workshop
  Jackson Laboratories
  Pubmed Plus
  NIH Blueprint NIF Workshop

thank you

http://w3.org

http://sw.neurocommons.org/

http://esw.w3.org/topic/HCLS/Banff2007Demo

http://hcls1.csail.mit.edu:8890/nsparql/

http://hcls1.csail.mit.edu:8890/map/#Kcnip3@2850,Kcnd1@2800

http://sciencecommons.org