Towards a Structural Framework for Managing, Integrating and Visualizing Biomedical Information:

Current Research in the UW Structural Informatics Group

November 2009

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Shared Vision

- Worldwide network of integrated data and knowledge
- Brings relevant information to point of need
- Fosters translation

Long-term Goals

- Contribute to shared vision
- A structural information framework for biomedicine
- Use as a basis for organizing biomedical information

Rationale

- Structure of the body is the most useful means for organizing biomedical information
- Most manifestations of health and disease are properties of anatomical entities

Primary Informatics Research Questions

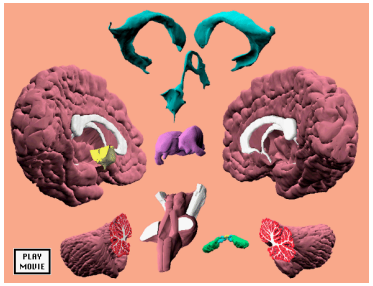
- How to create a structural information framework
- How to use this framework as a basis for organizing information

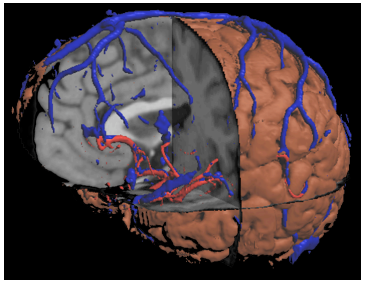
Approach

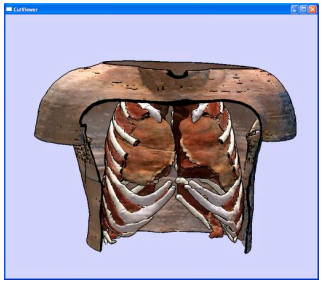
- Classify types of information
- Represent and implement as different modules
- Integrate within a distributed framework
- Develop applications opportunistically
- Applications drive methods

Classification of structural information

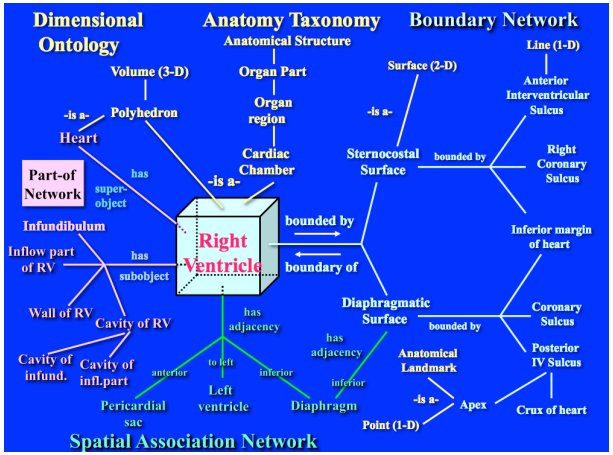
- Spatial (graphical)



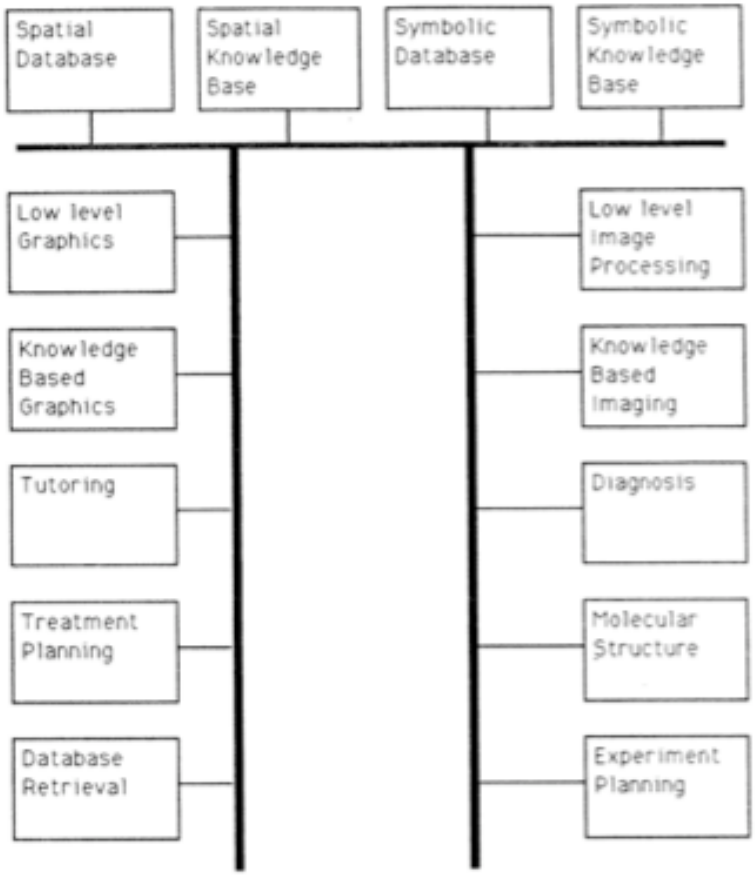




- Symbolic



Implement within a distributed system



Brinkley, James F and Prothero, J. S. and Prothero, John W and Rosse, Cornelius (1989) A Framework for the Design of Knowledge-Based Systems in Structural Biology. In *Proceedings, 15th Annual Symposium on Computer Applications in Medical Care*, pages pp. 61-65.

Driving Biological Applications

- Anatomy Education
- Radiation treatment planning
- Image management and retrieval
- Brain mapping
- Proteomics
- Clinical trials
- Integration of biosimulation models

Driving Biological Applications

- Anatomy Education
- Translational medicine
  - Radiation treatment planning
  - Image management and retrieval
  - Brain mapping
  - Proteomics
  - Clinical trials
  - Integration of biosimulation models

Research Themes

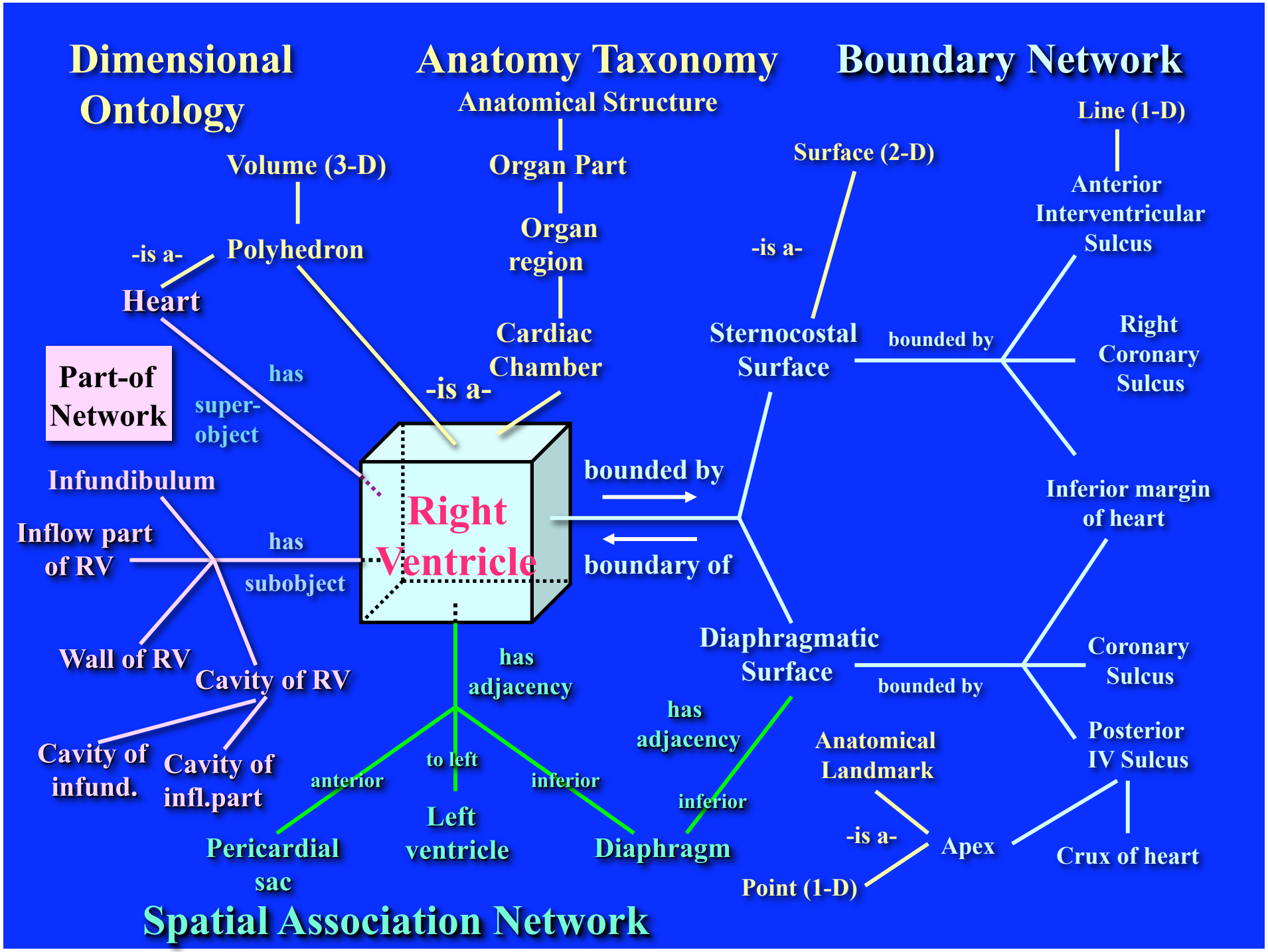
- Structural framework
- Data management
- Data visualization
- Data integration

Projects

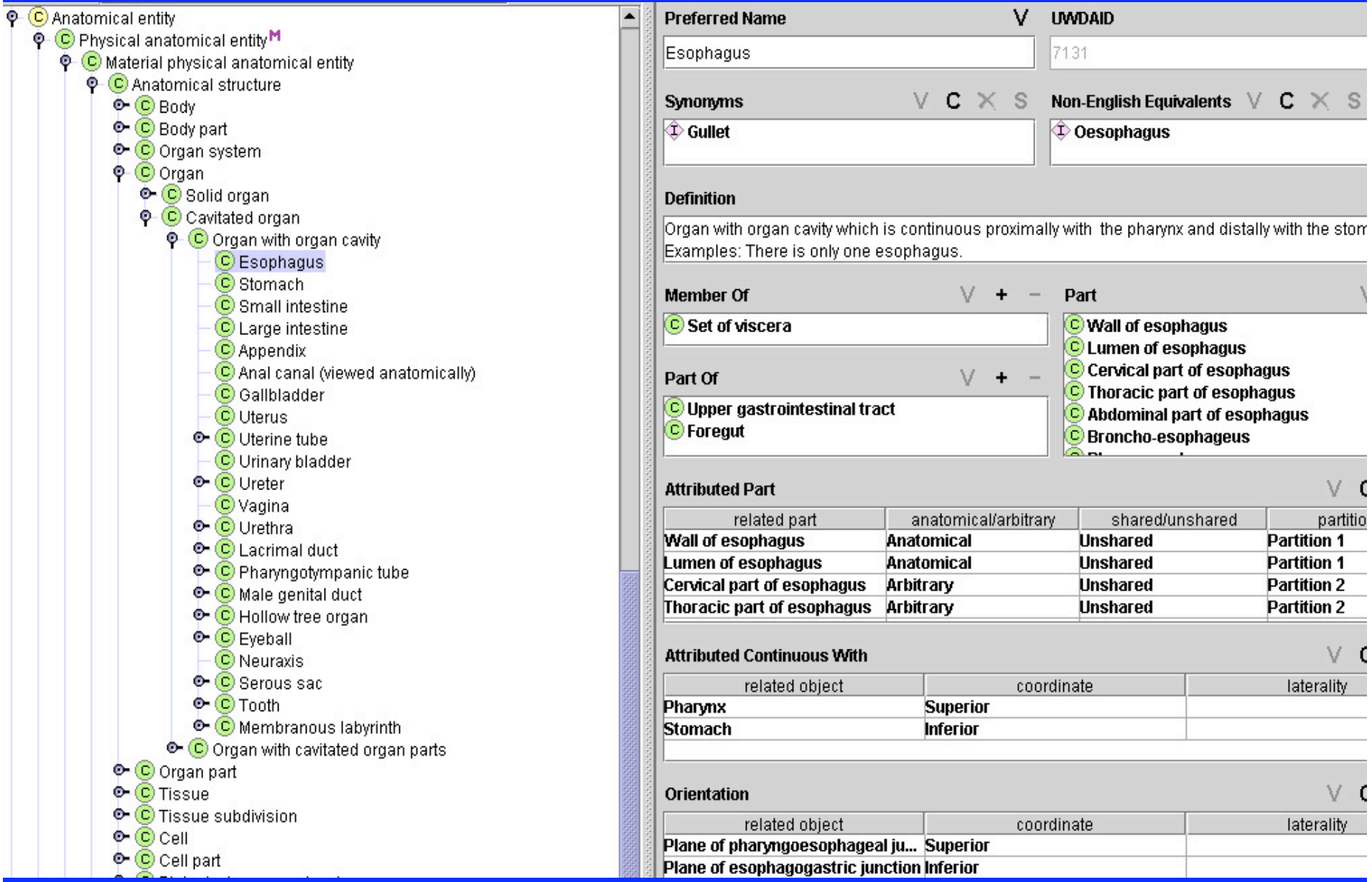
- Foundational Model of Anatomy
- Ontology Views
- Data management
- Data integration

Foundational Model of Anatomy

Cornelius Rosse and Onard Mejino


Dimensional Ontology
Anatomy Taxonomy
Boundary Network
Anatomical Structure
Volume (3-D)
Organ Part
Surface (2-D)
Line (1-D)
Polyhedron
Organ region
Anterior Interventricular Sulcus
-is a-
-is a-
Heart
Cardiac Chamber
Sternocostal Surface
bounded by
Right Coronary Sulcus
Part-of Network
has super-object
-is a-
Infundibulum
bounded by
Inferior margin of heart
Inflow part of RV
has subobject
Right Ventricle
boundary of
Diaphragmatic Surface
Coronary Sulcus
Wall of RV
Cavity of RV
has adjacency
bounded by
has adjacency
Posterior IV Sulcus
Anatomical Landmark
Cavity of infund.
Cavity of infl.part
anterior
to left
inferior
inferior
-is a-
Apex
Crux of heart
Pericardial sac
Left ventricle
Diaphragm
Point (1-D)
Spatial Association Network

Protege

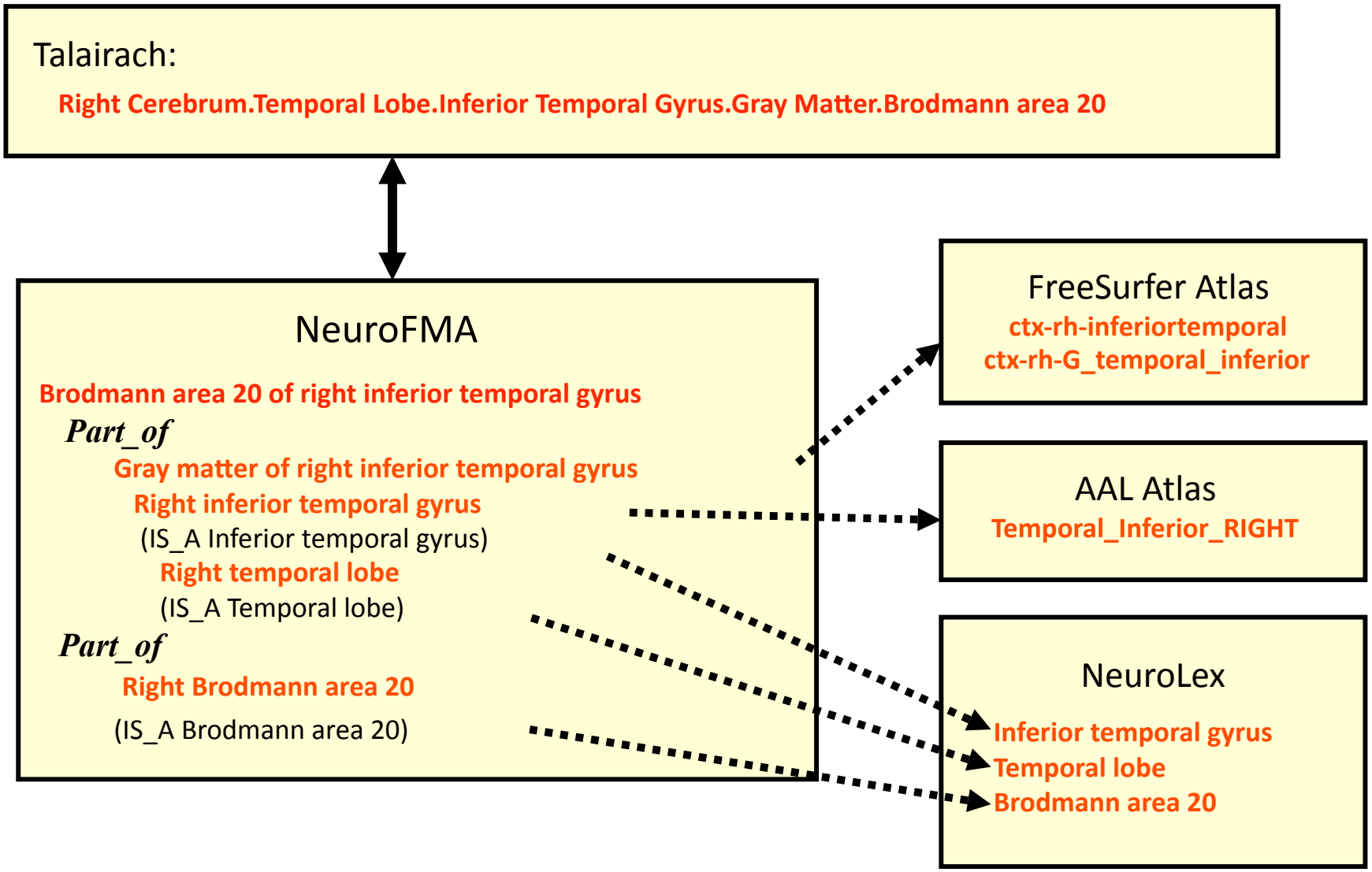

Anatomical entity
Physical anatomical entity
Material physical anatomical entity
Anatomical structure
Body
Body part
Organ system
Organ
Solid organ
Cavitated organ
Organ with organ cavity
Esophagus
Stomach
Small intestine
Large intestine
Appendix
Anal canal (viewed anatomically)
Gallbladder
Uterus
Uterine tube
Urinary bladder
Ureter
Vagina
Urethra
Lacrimal duct
Pharyngotympanic tube
Male genital duct
Hollow tree organ
Eyeball
Neuraxis
Serous sac
Tooth
Membranous labyrinth
Organ with cavitated organ parts
Organ part
Tissue
Tissue subdivision
Cell
Cell part
Preferred Name
Esophagus
UWDAID
7131
Synonyms
Gullet
Non-English Equivalents
Oesophagus
Definition
Organ with organ cavity which is continuous proximally with the pharynx and distally with the stom
Examples: There is only one esophagus.
Member Of
Set of viscera
Part
Wall of esophagus
Lumen of esophagus
Cervical part of esophagus
Thoracic part of esophagus
Abdominal part of esophagus
Broncho-esophageus
Part Of
Upper gastrointestinal tract
Foregut
Attributed Part
related part | anatomical/arbitrary | shared/unshared | partitio
Wall of esophagus | Anatomical | Unshared | Partition 1
Lumen of esophagus | Anatomical | Unshared | Partition 1
Cervical part of esophagus | Arbitrary | Unshared | Partition 2
Thoracic part of esophagus | Arbitrary | Unshared | Partition 2
Attributed Continuous With
related object | coordinate | laterality
Pharynx | Superior
Stomach | Inferior
Orientation
related object | coordinate | laterality
Plane of pharyngoesophageal ju... | Superior
Plane of esophagogastric junction | Inferior

Influence of the FMA

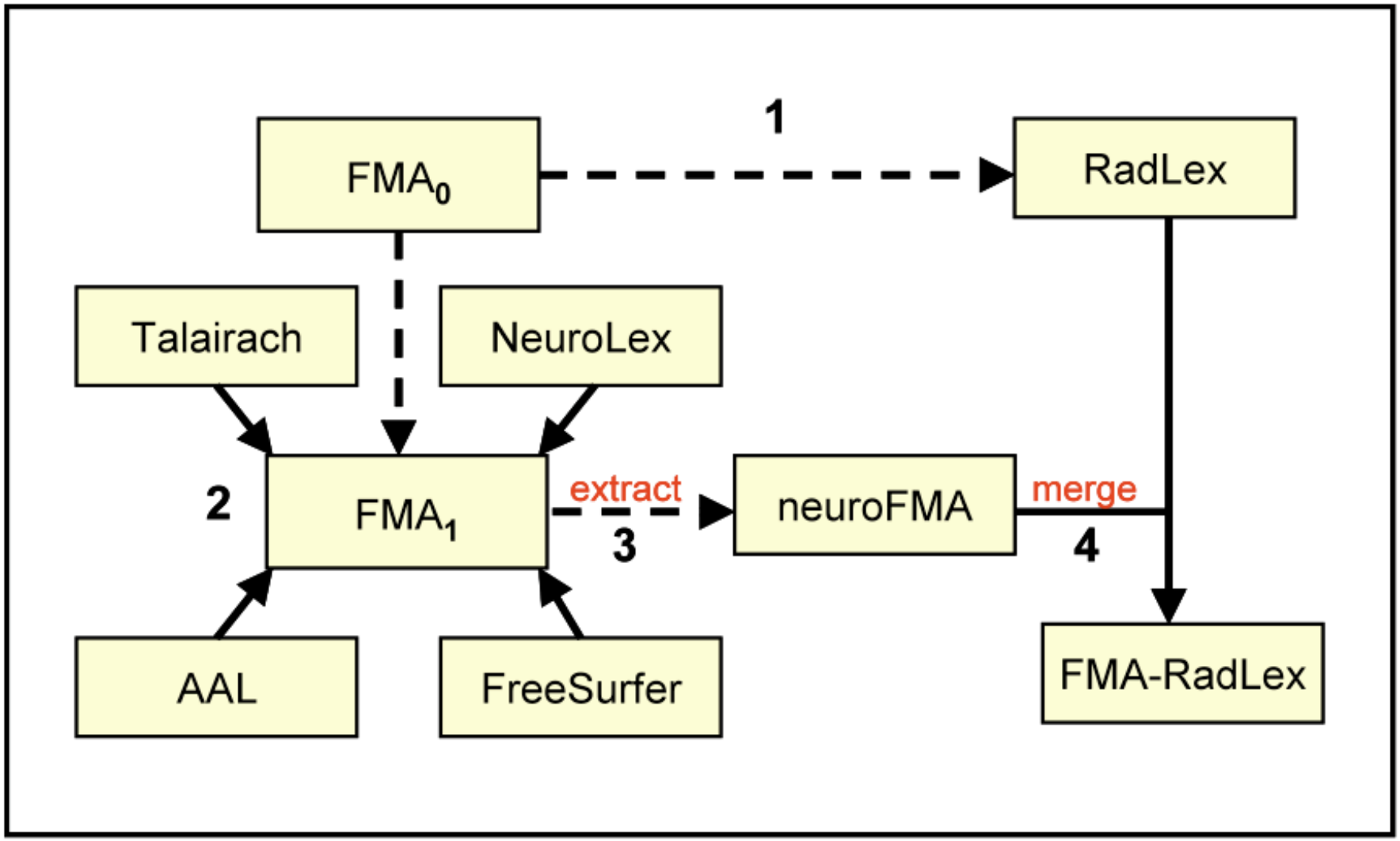
- > 2000 registered downloads
- Use by industry, institutions
- Framework for several large projects
- Template for other ontologies
- Existing terminologies aligning to FMA
- Testbed for ontology tool development
- Becoming the standard for anatomy ontologies

NeuroFMA

- Use the FMA to reconcile different neuroanatomy terminologies
- Challenge
  - They are not all semantically comparable
- Approach:
  - Extend FMA to highest level of granularity in all terminologies
  - Map other terms to less granular levels


Talairach:
Right Cerebrum.Temporal Lobe.Inferior Temporal Gyrus.Gray Matter.Brodmann area 20
NeuroFMA
Brodmann area 20 of right inferior temporal gyrus
Part_of
Gray matter of right inferior temporal gyrus
Right inferior temporal gyrus
(IS_A Inferior temporal gyrus)
Right temporal lobe
(IS_A Temporal lobe)
Part_of
Right Brodmann area 20
(IS_A Brodmann area 20)
FreeSurfer Atlas
ctx-rh-inferiortemporal
ctx-rh-G_temporal_inferior
AAL Atlas
Temporal_Inferior_RIGHT
NeuroLex
Inferior temporal gyrus
Temporal lobe
Brodmann area 20

Reorganizing RadLex



FMA Challenges

- How to expand when only one person is entering knowledge
- How to coordinate with others who want to add knowledge
- How to make useful in applications
- How to integrate into the semantic web

Projects

- Foundational Model of Anatomy
- Ontology Views
- Data management
- Data integration

Ontology Views in the Semantic Web

A BISTI Collaborative RO1 with the National Center for Biomedical Ontology

Motivation

- Large number of application ontologies
- Need to link them together into the semantic web
- Reference ontologies as one way to do this
- But reference ontologies are (or will be) too large for practical use
- How can reference ontologies be made practical for applications, yet retain potential to link application ontologies?

Approach

- Application ontologies as views over one or more reference ontologies
- A view is a query that defines a formal transformation from one or more source ontologies to a target application ontology

SparQL Extensions: vSparQL

Marianne Shaw, Todd Detwiler and Dan Suciu

- Gleen Regular path library
- Subqueries
- Recursive Queries
- Skolem functions

Shaw M, Detwiler LT, Brinkley JF, Suciu D. Generating application ontologies from reference ontologies. AMIA 2008.

vSparQL Subquery

```
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl:<http://www.w3.org/2002/07/owl#>
PREFIX gleen:<java:edu.washington.sig.gleen.>
PREFIX fma:<http://sig.biostr.washington.edu/fma3.0#>

SELECT ?subj ?prop ?obj
FROM NAMED <liver> [
        CONSTRUCT {fma:Liver fma:regional_part ?z}
        FROM <http://sig.biostr.washington.edu/fma3.0>
        WHERE {fma:Liver fma:regional_part ?z .}
]
WHERE { GRAPH <liver> {?subj ?prop ?obj .} }
```

Subquery

subj	prop	obj
fma:Liver	fma:regional_part	fma:Right_lobe_of_liver
fma:Liver	fma:regional_part	fma:Left_lobe_of_liver

vSparQL Recursive Query

Base case

Recursive step

```
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl:<http://www.w3.org/2002/07/owl#>
PREFIX gleen:<java:edu.washington.sig.gleen.>
PREFIX fma:<http://sig.biostr.washington.edu/fma3.0#>

SELECT ?subj ?prop ?obj
FROM NAMED <liver> [
        CONSTRUCT {fma:Liver fma:regional_part ?z}
        FROM <http://sig.biostr.washington.edu/fma3.0>
        WHERE {fma:Liver fma:regional_part ?z .}

        UNION
        # Get all of the regional_parts of the liver recursively
        CONSTRUCT {?c fma:regional_part ?d}
        FROM NAMED <liver>
        FROM NAMED <http://sig.biostr.washington.edu/fma3.0>
        WHERE {
            GRAPH <liver>
                  { ?a ?b ?c . } .
            GRAPH <http://sig.biostr.washington.edu/fma3.0>
                  { ?c fma:regional_part ?d . } .
        }
]
WHERE { GRAPH <liver> {?subj ?prop ?obj .} }
```

Enter SparQL Query:

```
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl:<http://www.w3.org/2002/07/owl#>
PREFIX gleen:<java:edu.washington.sig.gleen.>
PREFIX fma:<http://sig.biostr.washington.edu/fma3.0#>

SELECT ?subj ?prop ?obj
FROM NAMED <liver> [
        CONSTRUCT {fma:Liver fma:regional_part ?z}
        FROM <http://sig.biostr.washington.edu/fma3.0>
        WHERE {fma:Liver fma:regional_part ?z .}

        UNION
        # Get all of the regional_parts of the liver recursively
        CONSTRUCT {?c fma:regional_part ?d}
        FROM NAMED <liver>
        FROM NAMED <http://sig.biostr.washington.edu/fma3.0>
```

Submit Query

Results

subj	prop	obj
fma:Left_lobe_proper_of_liver	fma:regional_part	fma:Medial_segment_of_left_lobe_of_liver
fma:Left_lobe_proper_of_liver	fma:regional_part	fma:Lateral_segment_of_left_lobe_of_liver
fma:Lateral_segment_of_left_lobe_of_liver	fma:regional_part	fma:Lateral_superior_area_of_lateral_segment_of_left_lobe_of_liver
fma:Lateral_segment_of_left_lobe_of_liver	fma:regional_part	fma:Lateral_inferior_area_of_lateral_segment_of_left_lobe_of_liver
fma:Left_lobe_of_liver	fma:regional_part	fma:Left_lobe_proper_of_liver
fma:Left_lobe_of_liver	fma:regional_part	fma:Caudate_lobe_of_liver
fma:Left_lobe_of_liver	fma:regional_part	fma:Quadrate_lobe_of_liver
fma:Right_lobe_of_liver	fma:regional_part	fma:Anterior_segment_of_right_lobe_of_liver
fma:Right_lobe_of_liver	fma:regional_part	fma:Posterior_segment_of_right_lobe_of_liver
fma:Anterior_segment_of_right_lobe_of_liver	fma:regional_part	fma:Anterior_inferior_area_of_anterior_segment_of_right_lobe_of_liver
fma:Anterior_segment_of_right_lobe_of_liver	fma:regional_part	fma:Anterior_superior_area_of_anterior_segment_of_right_lobe_of_liver
fma:Liver	fma:regional_part	fma:Left_lobe_of_liver
fma:Liver	fma:regional_part	fma:Right_lobe_of_liver
fma:Caudate_lobe_of_liver	fma:regional_part	fma:Right_segment_of_caudate_lobe_of_liver
fma:Caudate_lobe_of_liver	fma:regional_part	fma:Papillary_process_of_caudate_lobe_of_liver
fma:Caudate_lobe_of_liver	fma:regional_part	fma:Left_segment_of_caudate_lobe_of_liver
fma:Caudate_lobe_of_liver	fma:regional_part	fma:Caudate_process_of_caudate_lobe_of_liver
fma:Medial_segment_of_left_lobe_of_liver	fma:regional_part	fma:Medial_inferior_area_of_medial_segment_of_left_lobe_of_liver
fma:Medial_segment_of_left_lobe_of_liver	fma:regional_part	fma:Medial_superior_area_of_medial_segment_of_left_lobe_of_liver
fma:Posterior_segment_of_right_lobe_of_liver	fma:regional_part	fma:Posterior_superior_area_of_posterior_segment_of_right_lobe_of_liver
fma:Posterior_segment_of_right_lobe_of_liver	fma:regional_part	fma:Posterior_inferior_area_of_posterior_segment_of_right_lobe_of_liver

Evaluation of Expressivity

- Define a set of use cases
- Create and execute vSparQL queries for use cases
- Examine query results for correctness
  - Expert
  - Comparison with manually derived view
- Other measures
  - Length of query
  - Response time
- Comparison with other methods

Use Cases

- NCI Thesaurus simplification (NCIt)
- Components of mitotic cell cycle (Reactome)
- Organ spatial location (FMA)
- Biosimulation annotation editor (FMA)
- Blood in the heart (FMA)
- Radiologist liver ontology (FMA)
- Blood fluid properties (FMA, OPB)
- NeuroFMA (FMA)

NeuroFMA

```
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl:<http://www.w3.org/2002/07/owl#>
PREFIX gleen:<java:edu.washington.sig.gleen.>
PREFIX temp:<http://sig.biostr.washington.edu/temp#>
PREFIX fma:<http://sig.biostr.washington.edu/fma3.0#>

###############################################################################
# Generate the NeuroFMA
###############################################################################
CONSTRUCT
{
        ?x ?y ?z
}
FROM <http://sig.biostr.washington.edu/fma3.0>

# all parts recursively of neuraxis
FROM NAMED <top_pre_neuraxis_parts> [
        CONSTRUCT {temp:set temp:member ?part}
    FROM <http://sig.biostr.washington.edu/fma3.0>
    WHERE {fma:Neuraxis gleen:OnPath ("([fma:regional_part]|[fma:constitutional_part])*" ?part)}
]
```

298 lines ….

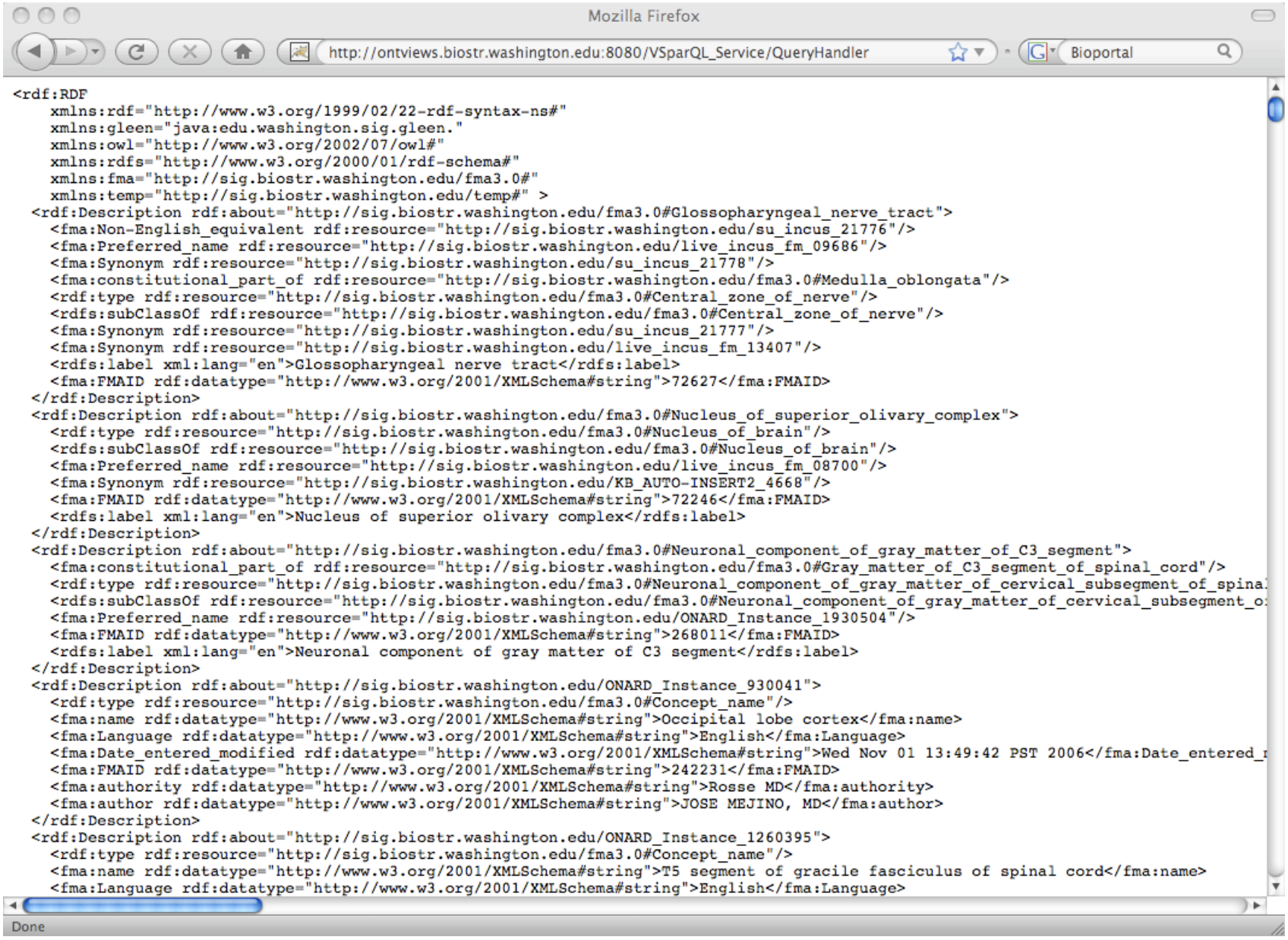
VSparQL Demo

Enter SparQL Query:

```
PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl:<http://www.w3.org/2002/07/owl#>
PREFIX gleen:<java:edu.washington.sig.gleen.>
PREFIX temp:<http://sig.biostr.washington.edu/temp#>
PREFIX fma:<http://sig.biostr.washington.edu/fma3.0#>

###############################################################################
# Generate the NeuroFMA
###############################################################################
CONSTRUCT
{
        ?x ?y ?z
}
FROM <http://sig.biostr.washington.edu/fma3.0>
```

Submit Query


Mozilla Firefox
http://ontviews.biostr.washington.edu:8080/VSparQL_Service/QueryHandler
Bioportal
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:gleen="java:edu.washington.sig.gleen."
xmlns:owl="http://www.w3.org/2002/07/owl#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:fma="http://sig.biostr.washington.edu/fma3.0#"
xmlns:temp="http://sig.biostr.washington.edu/temp#" >
<rdf:Description rdf:about="http://sig.biostr.washington.edu/fma3.0#Glossopharyngeal_nerve_tract">
<fma:Non-English_equivalent rdf:resource="http://sig.biostr.washington.edu/su_incus_21776"/>
<fma:Preferred_name rdf:resource="http://sig.biostr.washington.edu/live_incus_fm_09686"/>
<fma:Synonym rdf:resource="http://sig.biostr.washington.edu/su_incus_21778"/>
<fma:constitutional_part_of rdf:resource="http://sig.biostr.washington.edu/fma3.0#Medulla_oblongata"/>
<rdf:type rdf:resource="http://sig.biostr.washington.edu/fma3.0#Central_zone_of_nerve"/>
<rdfs:subClassOf rdf:resource="http://sig.biostr.washington.edu/fma3.0#Central_zone_of_nerve"/>
<fma:Synonym rdf:resource="http://sig.biostr.washington.edu/su_incus_21777"/>
<fma:Synonym rdf:resource="http://sig.biostr.washington.edu/live_incus_fm_13407"/>
<rdfs:label xml:lang="en">Glossopharyngeal nerve tract</rdfs:label>
<fma:FMAID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">72627</fma:FMAID>
</rdf:Description>
<rdf:Description rdf:about="http://sig.biostr.washington.edu/fma3.0#Nucleus_of_superior_olivary_complex">
<rdf:type rdf:resource="http://sig.biostr.washington.edu/fma3.0#Nucleus_of_brain"/>
<rdfs:subClassOf rdf:resource="http://sig.biostr.washington.edu/fma3.0#Nucleus_of_brain"/>
<fma:Preferred_name rdf:resource="http://sig.biostr.washington.edu/live_incus_fm_08700"/>
<fma:Synonym rdf:resource="http://sig.biostr.washington.edu/KB_AUTO-INSERT2_4668"/>
<fma:FMAID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">72246</fma:FMAID>
<rdfs:label xml:lang="en">Nucleus of superior olivary complex</rdfs:label>
</rdf:Description>
<rdf:Description rdf:about="http://sig.biostr.washington.edu/fma3.0#Neuronal_component_of_gray_matter_of_C3_segment">
<fma:constitutional_part_of rdf:resource="http://sig.biostr.washington.edu/fma3.0#Gray_matter_of_C3_segment_of_spinal_cord"/>
<rdf:type rdf:resource="http://sig.biostr.washington.edu/fma3.0#Neuronal_component_of_gray_matter_of_cervical_subsegment_of_spina
<rdfs:subClassOf rdf:resource="http://sig.biostr.washington.edu/fma3.0#Neuronal_component_of_gray_matter_of_cervical_subsegment_o
<fma:Preferred_name rdf:resource="http://sig.biostr.washington.edu/ONARD_Instance_1930504"/>
<fma:FMAID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">268011</fma:FMAID>
<rdfs:label xml:lang="en">Neuronal component of gray matter of C3 segment</rdfs:label>
</rdf:Description>
<rdf:Description rdf:about="http://sig.biostr.washington.edu/ONARD_Instance_930041">
<rdf:type rdf:resource="http://sig.biostr.washington.edu/fma3.0#Concept_name"/>
<fma:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Occipital lobe cortex</fma:name>
<fma:Language rdf:datatype="http://www.w3.org/2001/XMLSchema#string">English</fma:Language>
<fma:Date_entered_modified rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Wed Nov 01 13:49:42 PST 2006</fma:Date_entered_
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<fma:authority rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Rosse MD</fma:authority>
<fma:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">JOSE MEJINO, MD</fma:author>
</rdf:Description>
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<rdf:type rdf:resource="http://sig.biostr.washington.edu/fma3.0#Concept_name"/>
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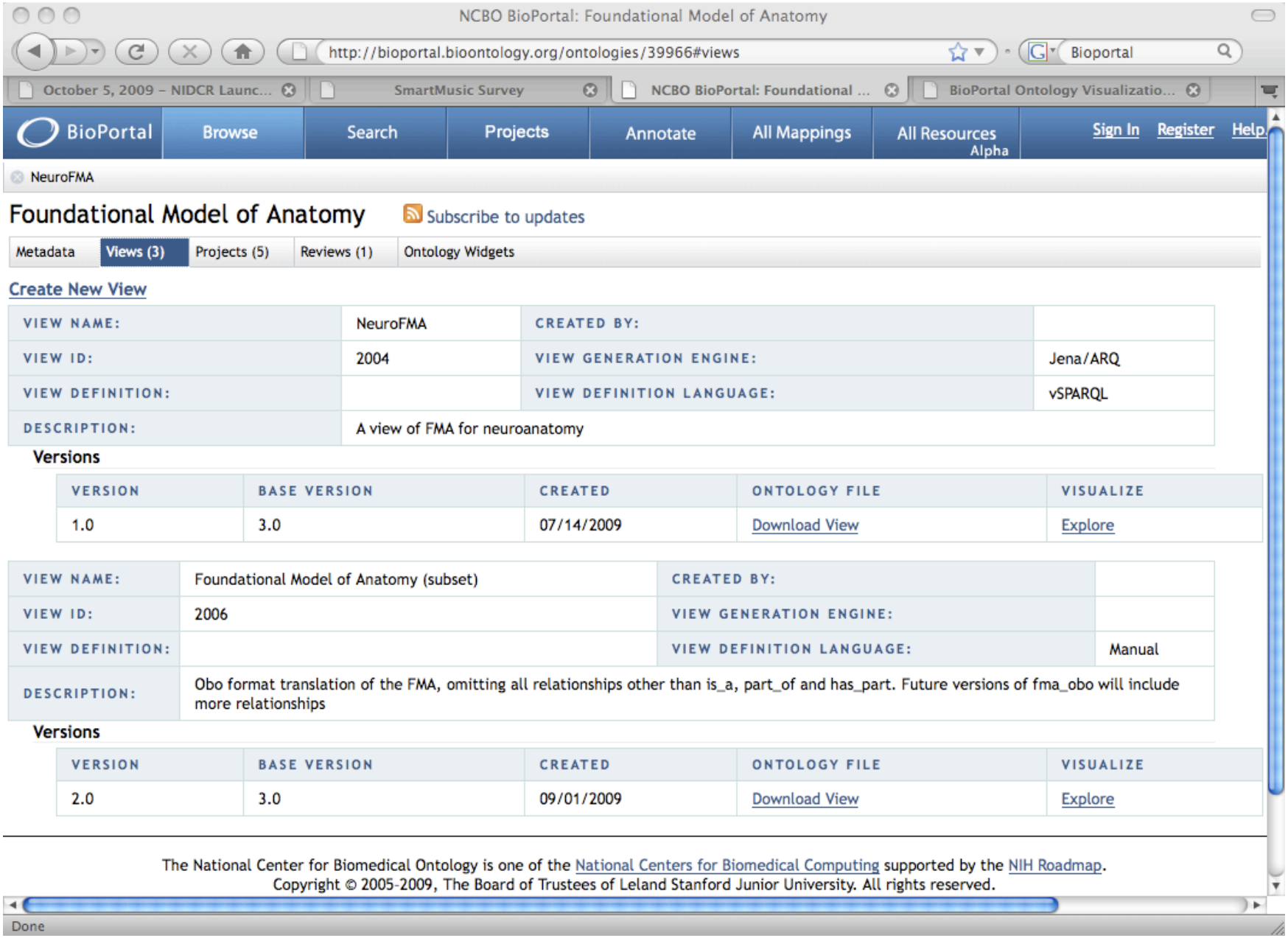
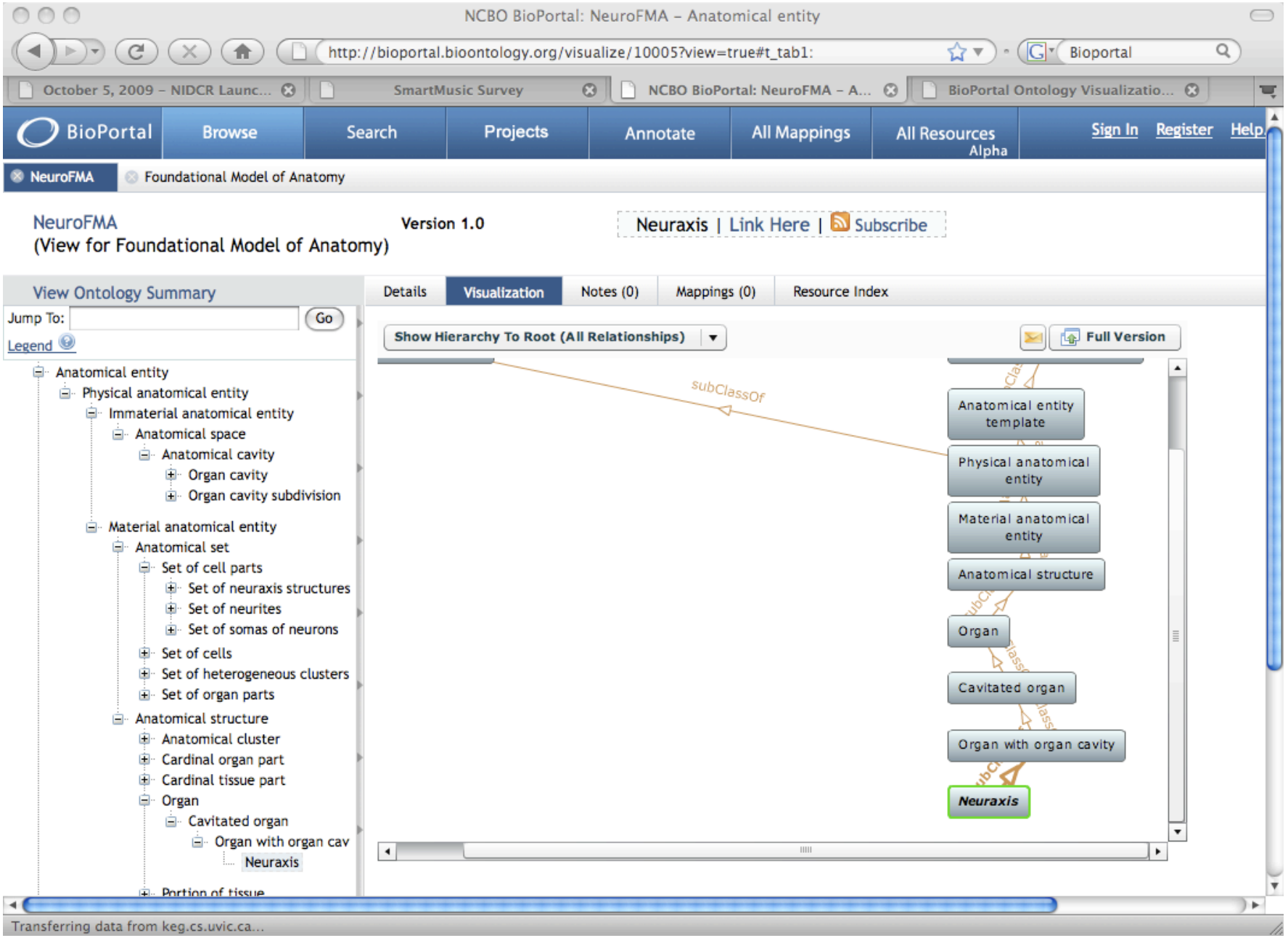
<fma:Language rdf:datatype="http://www.w3.org/2001/XMLSchema#string">English</fma:Language>
Done


NCBO BioPortal: Foundational Model of Anatomy
http://bioportal.bioontology.org/ontologies/39966#views
Bioportal
October 5, 2009 – NIDCR Launc...
SmartMusic Survey
NCBO BioPortal: Foundational ...
BioPortal Ontology Visualizatio...
BioPortal
Browse
Search
Projects
Annotate
All Mappings
All Resources
Alpha
Sign In
Register
Help
NeuroFMA
Foundational Model of Anatomy
Subscribe to updates
Metadata
Views (3)
Projects (5)
Reviews (1)
Ontology Widgets
Create New View
VIEW NAME: NeuroFMA
CREATED BY:
VIEW ID: 2004
VIEW GENERATION ENGINE: Jena/ARQ
VIEW DEFINITION:
VIEW DEFINITION LANGUAGE: vSPARQL
DESCRIPTION: A view of FMA for neuroanatomy
Versions
VERSION | BASE VERSION | CREATED | ONTOLOGY FILE | VISUALIZE
1.0 | 3.0 | 07/14/2009 | Download View | Explore
VIEW NAME: Foundational Model of Anatomy (subset)
CREATED BY:
VIEW ID: 2006
VIEW GENERATION ENGINE:
VIEW DEFINITION:
VIEW DEFINITION LANGUAGE: Manual
DESCRIPTION: Obo format translation of the FMA, omitting all relationships other than is_a, part_of and has_part. Future versions of fma_obo will include more relationships
Versions
VERSION | BASE VERSION | CREATED | ONTOLOGY FILE | VISUALIZE
2.0 | 3.0 | 09/01/2009 | Download View | Explore
The National Center for Biomedical Ontology is one of the National Centers for Biomedical Computing supported by the NIH Roadmap.
Copyright © 2005-2009, The Board of Trustees of Leland Stanford Junior University. All rights reserved.
Done


NCBO BioPortal: NeuroFMA – Anatomical entity
http://bioportal.bioontology.org/visualize/10005?view=true#t_tab1:
Bioportal
October 5, 2009 – NIDCR Launc...
SmartMusic Survey
NCBO BioPortal: NeuroFMA – A...
BioPortal Ontology Visualizatio...
BioPortal
Browse
Search
Projects
Annotate
All Mappings
All Resources
Alpha
Sign In
Register
Help
NeuroFMA
Foundational Model of Anatomy
NeuroFMA
(View for Foundational Model of Anatomy)
Version 1.0
Neuraxis | Link Here | Subscribe
View Ontology Summary
Jump To:
Go
Legend
Anatomical entity
Physical anatomical entity
Immaterial anatomical entity
Anatomical space
Anatomical cavity
Organ cavity
Organ cavity subdivision
Material anatomical entity
Anatomical set
Set of cell parts
Set of neuraxis structures
Set of neurites
Set of somas of neurons
Set of cells
Set of heterogeneous clusters
Set of organ parts
Anatomical structure
Anatomical cluster
Cardinal organ part
Cardinal tissue part
Organ
Cavitated organ
Organ with organ cav
Neuraxis
Portion of tissue
Details
Visualization
Notes (0)
Mappings (0)
Resource Index
Show Hierarchy To Root (All Relationships)
Full Version
subClassOf
Anatomical entity template
Physical anatomical entity
Material anatomical entity
Anatomical structure
Organ
Cavitated organ
Organ with organ cavity
Neuraxis
Transferring data from keg.cs.uvic.ca...

Use Case	NCI Thesaurus simplification	Mitotic cell cycle	Organ spatial location	Biosimulation annotation editor	Blood fluid properties	Blood in the heart	Radiologist liver ontology	NeuroFMA
View Length (#LOC)	13	33	39	82	20	44	92	298
# RDF triples	44	36	131	38	1023	58	421	72,090
Processing time (secs)	9	2	11	4	4	20	30	220

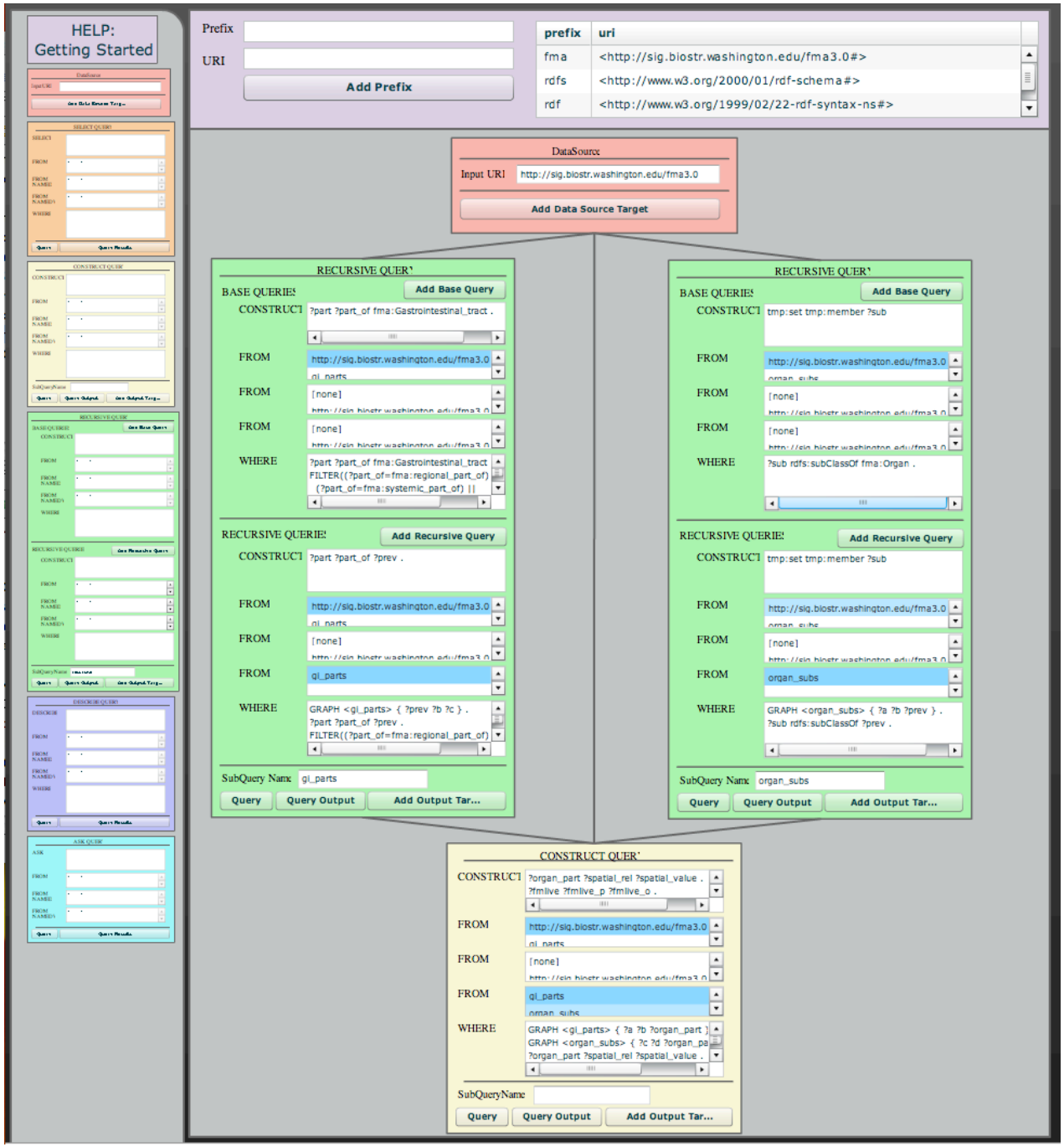
	RQL+RVL	SPARQL	ARQ	SPARQLer	CPSPARQL	nSPARQL	SPARQL++	vSPARQL
Closure	Y	Y	Y	Y	Y	Y	Y	Y
Multiple sources		Y	Y	Y	Y	Y	Y	Y
Edge selection	Y	Y	Y	Y	Y	Y	Y	Y
Static edge creation	Y	Y	Y	Y	Y	Y	Y	Y
Dynamic edge creation	Y	Y	Y	Y	Y	Y	Y	Y
Anonymous node creation	Y	Y	Y	Y	Y	Y	Y	Y
Nameable node/edge creation							*	Y
Paths of arbitrary length	*		*	*	Y	Y		Y
Subgraph extraction	*			*	Y			Y
Iterate over paths of arbitrary length								Y
Intermediate results	Y		*				*	Y
Intermedate results with Blank Nodes								Y

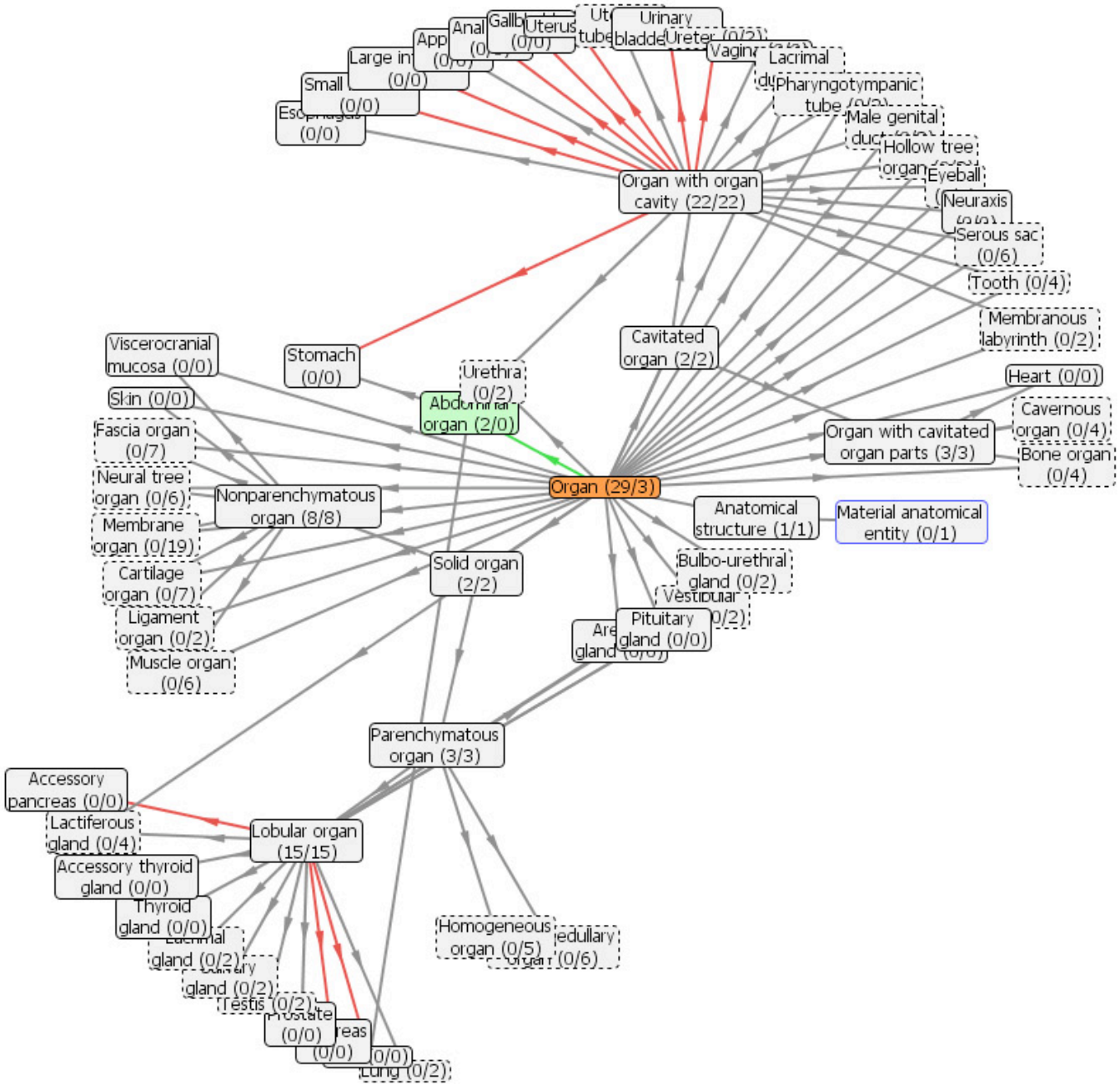
Conclusions from evaluation of expressivity

- vSparQL can express all the use cases we have come across
- Other methods may be easier to use for some cases
- Language is difficult for humans to express
- Needs to be optimized

Views current work

- Intermediate language
  - Easier construction from a graphical user interface
  - Easier optimization
- Graphical user interface


HELP:
Getting Started
Prefix
URI
Add Prefix
prefix
uri
fma
<http://sig.biostr.washington.edu/fma3.0#>
rdfs
<http://www.w3.org/2000/01/rdf-schema#>
rdf
<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
DataSource
Input URI
http://sig.biostr.washington.edu/fma3.0
Add Data Source Target
RECURSIVE QUERY
BASE QUERIES
Add Base Query
CONSTRUCT
?part ?part_of fma:Gastrointestinal_tract .
FROM
http://sig.biostr.washington.edu/fma3.0
gl_parts
FROM
[none]
FROM
[none]
WHERE
?part ?part_of fma:Gastrointestinal_tract
FILTER((?part_of=fma:regional_part_of)
(?part_of=fma:systemic_part_of) ||
RECURSIVE QUERIES
Add Recursive Query
CONSTRUCT
?part ?part_of ?prev .
FROM
http://sig.biostr.washington.edu/fma3.0
gl_parts
FROM
[none]
FROM
gl_parts
WHERE
GRAPH <gl_parts> { ?prev ?b ?c } .
?part ?part_of ?prev .
FILTER((?part_of=fma:regional_part_of)
SubQuery Name
gl_parts
Query
Query Output
Add Output Tar...
RECURSIVE QUERY
BASE QUERIES
Add Base Query
CONSTRUCT
tmp:set tmp:member ?sub
FROM
http://sig.biostr.washington.edu/fma3.0
organ_subs
FROM
[none]
FROM
[none]
WHERE
?sub rdfs:subClassOf fma:Organ .
RECURSIVE QUERIES
Add Recursive Query
CONSTRUCT
tmp:set tmp:member ?sub
FROM
http://sig.biostr.washington.edu/fma3.0
organ_subs
FROM
[none]
FROM
organ_subs
WHERE
GRAPH <organ_subs> { ?a ?b ?prev } .
?sub rdfs:subClassOf ?prev .
SubQuery Name
organ_subs
Query
Query Output
Add Output Tar...
CONSTRUCT QUERY
CONSTRUCT
?organ_part ?spatial_rel ?spatial_value .
?fmlive ?fmlive_p ?fmlive_o .
FROM
http://sig.biostr.washington.edu/fma3.0
gl_parts
FROM
[none]
FROM
gl_parts
organ_subs
WHERE
GRAPH <gl_parts> { ?a ?b ?organ_part }
GRAPH <organ_subs> { ?c ?d ?organ_pa
?organ_part ?spatial_rel ?spatial_value .
SubQueryName
Query
Query Output
Add Output Tar...


Urinary bladder
Uterus (0/0)
Lacrimal
Pharyngotympanic tube
Male genital
Hollow tree
Eyeball
Neuraxis
Serous sac (0/6)
Tooth (0/4)
Membranous labyrinth (0/2)
Heart (0/0)
Cavernous organ (0/4)
Bone organ (0/4)
Organ with organ cavity (22/22)
Cavitated organ (2/2)
Organ with cavitated organ parts (3/3)
Stomach (0/0)
Urethra (0/2)
Viscerocranial mucosa (0/0)
Skin (0/0)
Fascia organ (0/7)
Neural tree organ (0/6)
Membrane organ (0/19)
Cartilage organ (0/7)
Ligament organ (0/2)
Muscle organ (0/6)
Nonparenchymatous organ (8/8)
Organ (29/3)
Anatomical structure (1/1)
Material anatomical entity (0/1)
Solid organ (2/2)
Bulbo-urethral gland (0/2)
Pituitary gland (0/0)
Parenchymatous organ (3/3)
Accessory pancreas (0/0)
Lactiferous gland (0/4)
Lobular organ (15/15)
Accessory thyroid gland (0/0)
Thyroid gland (0/0)
Homogeneous organ (0/5)
Lung (0/2)

Projects

- Foundational Model of Anatomy
- Ontology Views
- Data management
- Data integration

Data Management

- Ron Shaker
- Xenia Hertzenberg
- Joshua Franklin

History

UW Integrated Brain Project
Language Map Experiment Management System

[Repository: *bmap_repo*] [User: *brinkley*] [Group: ADMINISTRATOR]

[Main Menu] [Patient List Status] [Help] [WIRM Console]

Patient Browser

New patient

Set Sort Order | Pnum | Type | GAO# | E#

There are 110 patients in the database:

Patient	Type	GAO#	E#	Side	Grid	Age	Sex	VIQ	MRI	Models	Codes	Photos	Maps
P1	Standard	9628	E5988	?	?	25	M	77	N	3/3	0/0/1	1	6
P2	Standard	9538	E4445	?	?	44	M	105	N	3/3	0/0/1	1	6
P3	Standard	9627	E5919	?	?	41	F	101	N	3/3	0/0/1	1	6
P4	Standard	9411	E2740	?	?	32	M	92	N	2/2	0/0/1	2	6
P5	Standard	9415	E2831	?	?	31	F	94	N	2/2	0/0/1	1	6
P6	Standard	9602	E4995	?	?	18	F	80	N	3/3	0/0/1	1	6
P7	Standard	9617	E5653	?	?	15	M	71	N	2/2	0/0/1	1	6
P8	Standard	9612	E5426	?	?	26	M	94	N	2/2	0/0/1	1	6
P9	Standard	9451	E3583	?	?	37	F	100	N	3/3	0/0/1	1	5
P10	Standard	9410	E2726	?	?	32	M	94	N	2/2	0/0/1	1	6
P11	Standard	9535	E4379	?	?	36	M	119	N	3/3	0/0/1	1	6
P12	Standard	9618	E5678	?	?	17	F	77	N	3/3	0/0/1	1	6

Digital Anatomist
Image Collection Manager

Home - My Images - Other Images - Options - Help - Log Out

My Collections

Create new collection

BRAIN IMAGES | BRAIN02 | COMMISSURE | DA071805 | DIGITAL ANATOMIST ATLASES | ILLUSTRATIONS

IMAGE TYPES | MEBI534 | MEDED 534 | MEDVIZ | OVERVIEW | RGR

SCIENCE IN MEDICINE 2003 | SIG SNAPSHOTS | STRUCTURAL BRAIN IMAGING | TEST

Questions to: brinkley@u.washington.edu
Copyright © 2001-2005 University of Washington

Lab Home | Logout | Data Store Home | Help

Family Study

Find ALIQUOT Results

10 Items Found

AliquotID	sample	aliquot_type	aliquot_label	box	row	col	state	aliquot_usedby	aliquot_useddate	aliquot_usedfor	comments	Item ID	Actions
													Re-Sort
6353	PLE 020A.422.12/31/2002	WB	1	33	B	9	ALL_USED				sample used prior to CHRMC move	129539	
6354	PLE 020A.422.12/31/2002	WB	2	02	A	09	NOT_USED					129540	
6358	PLE 020A.422.12/31/2002	PLASMA	1	05	A	08	NOT_USED					129541	
6359	PLE 020A.422.12/31/2002	PLASMA	2	41	E	2	NOT_USED	awiede			220uL removed and sent to Veronika Spies	129542	
6368	PLE 020A.422.12/31/2002	DRY_PELLET	DRY_PELLET4				NOT_USED				LOCATION?	129543	
6373	PLE 020A.422.12/31/2002	PBMC	4	17H	E	03	NOT_USED				sample stored at -80 for prolonged time (integrity?)	129544	
6374	PLE 020A.422.12/31/2002	PBMC	5	17H	E	04	NOT_USED				sample stored at -80 for prolonged time (integrity?)	129545	
6375	PLE 020A.422.12/31/2002	PBMC	6	17H	E	05	ALL_USED		10/20/2005	To FHCRC 10/20/05		129546	
6376	PLE 020A.422.12/31/2002	PBMC	7	BOX1	H	4	ALL_USED				sample used prior to CHRMC move	129547	
6377	PLE 020A.422.12/31/2002	PBMC	8	NUNC			ALL_USED				sample used prior to CHRMC move NUNC	129548	

THE EYE LAB | Image Database

Home | Lab Main Menu | Experiment Main Menu | Log Out

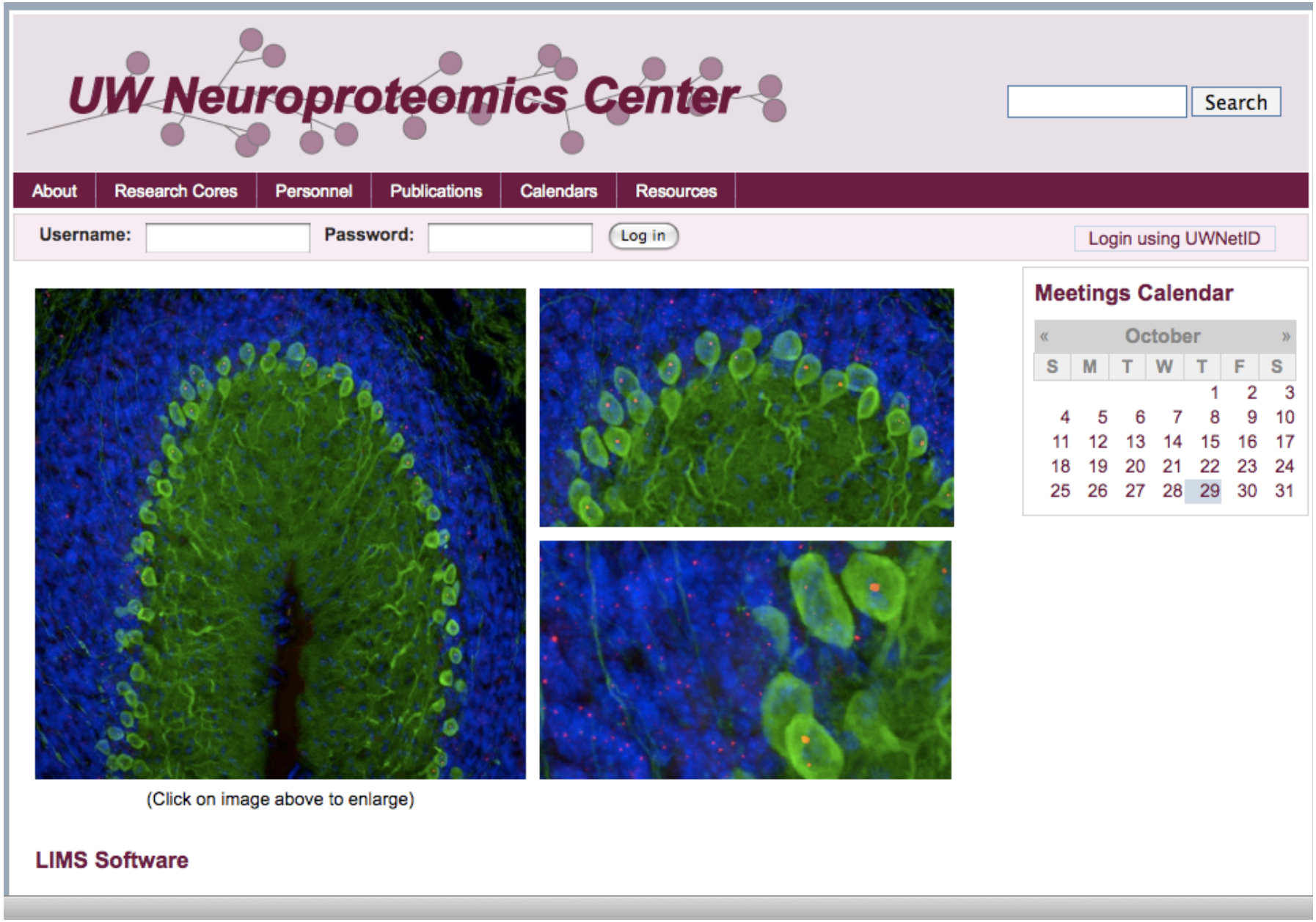
Irradiated CP49 KO and wildtype

All Images

4 Items found in Repository:

ID #	File Image	Image type	Image filter	Strain Strain ID	Age (months)	Eye	Date taken	Notes	User Login name	Actions
9		Slit Lamp	Excitation Filter	CP49 knockout	16.235	left	05-15-2003	Test image	cfong	[View Profile] [Edit][Delete] [Copy]
3885		Slit Lamp	Excitation Filter	CP49 knockout	12	left	03-15-2005	This is a test image	cfong	[View Profile] [Edit][Delete] [Copy]
3890		Slit Lamp	Excitation and Emmition Filter	CP49 knockout	25.21	right	03-25-2005	Another test	cfong	[View Profile] [Edit][Delete] [Copy]
4007		Anterior	White Light	2157	12	left	11-17-2004	test	cfong	[View Profile] [Edit][Delete] [Copy]

Ron Shaker


UW Neuroproteomics Center
Search
About
Research Cores
Personnel
Publications
Calendars
Resources
Username:
Password:
Log in
Login using UWNetID
Meetings Calendar
« October »
S M T W T F S
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
(Click on image above to enlarge)
LIMS Software

Account

My Account
Logout

Navigation

NPC web site

All labs
All spreadsheets
All samples
All proteins
All peptides

Actions

New protein

Relations

Parent sample

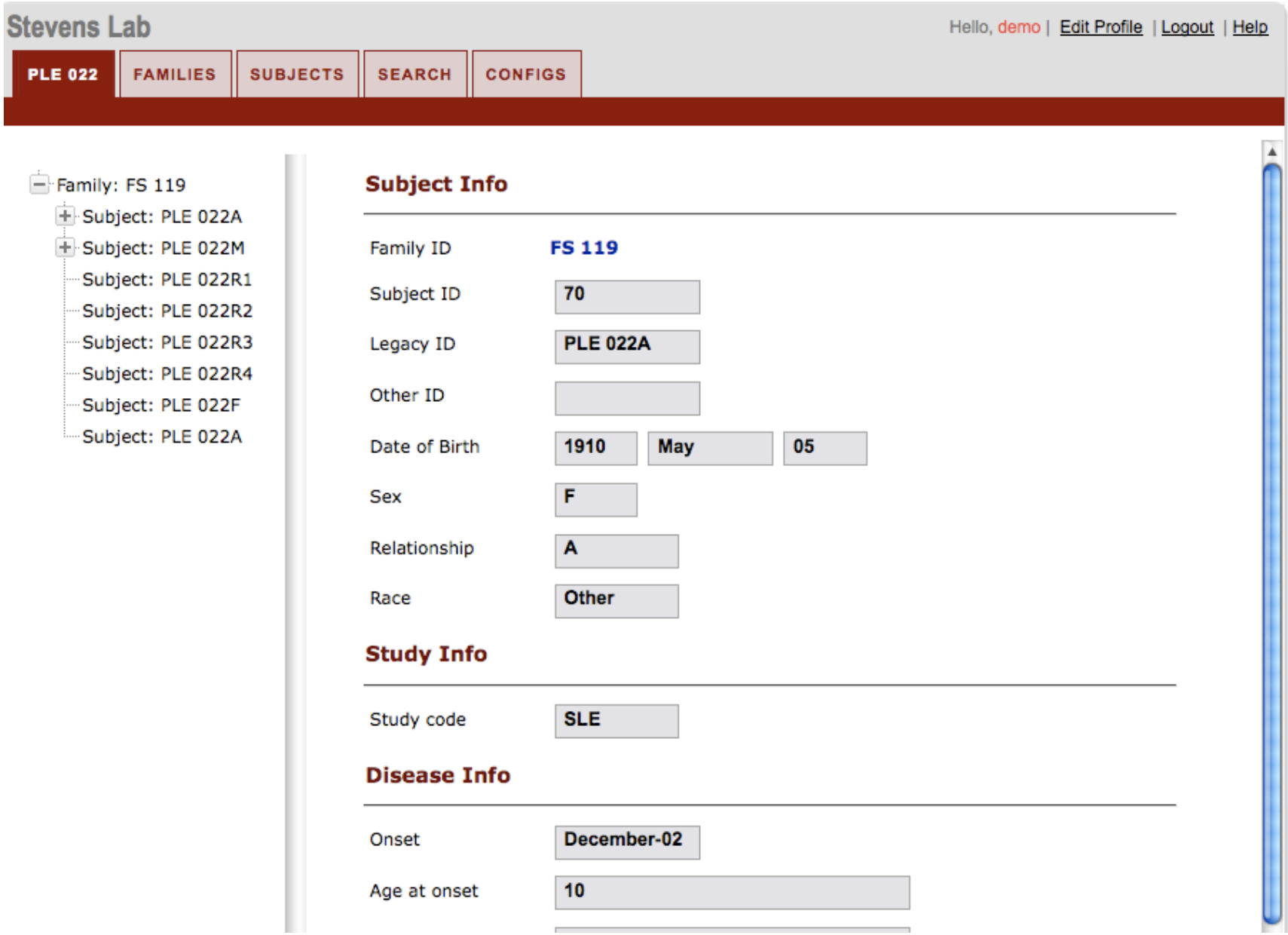
Listing proteins in spreadsheet #1

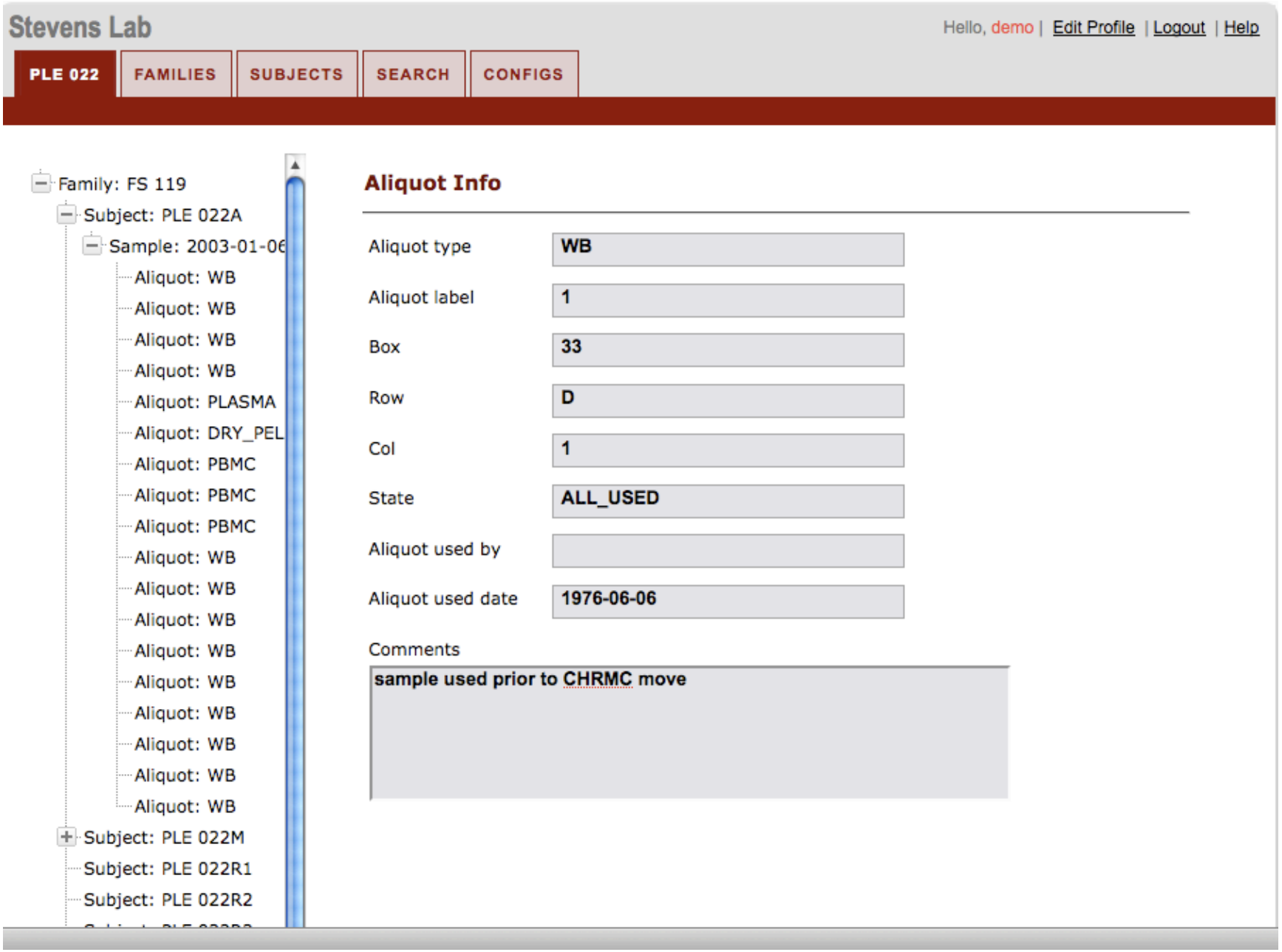
« Previous 1 2 3 Next »

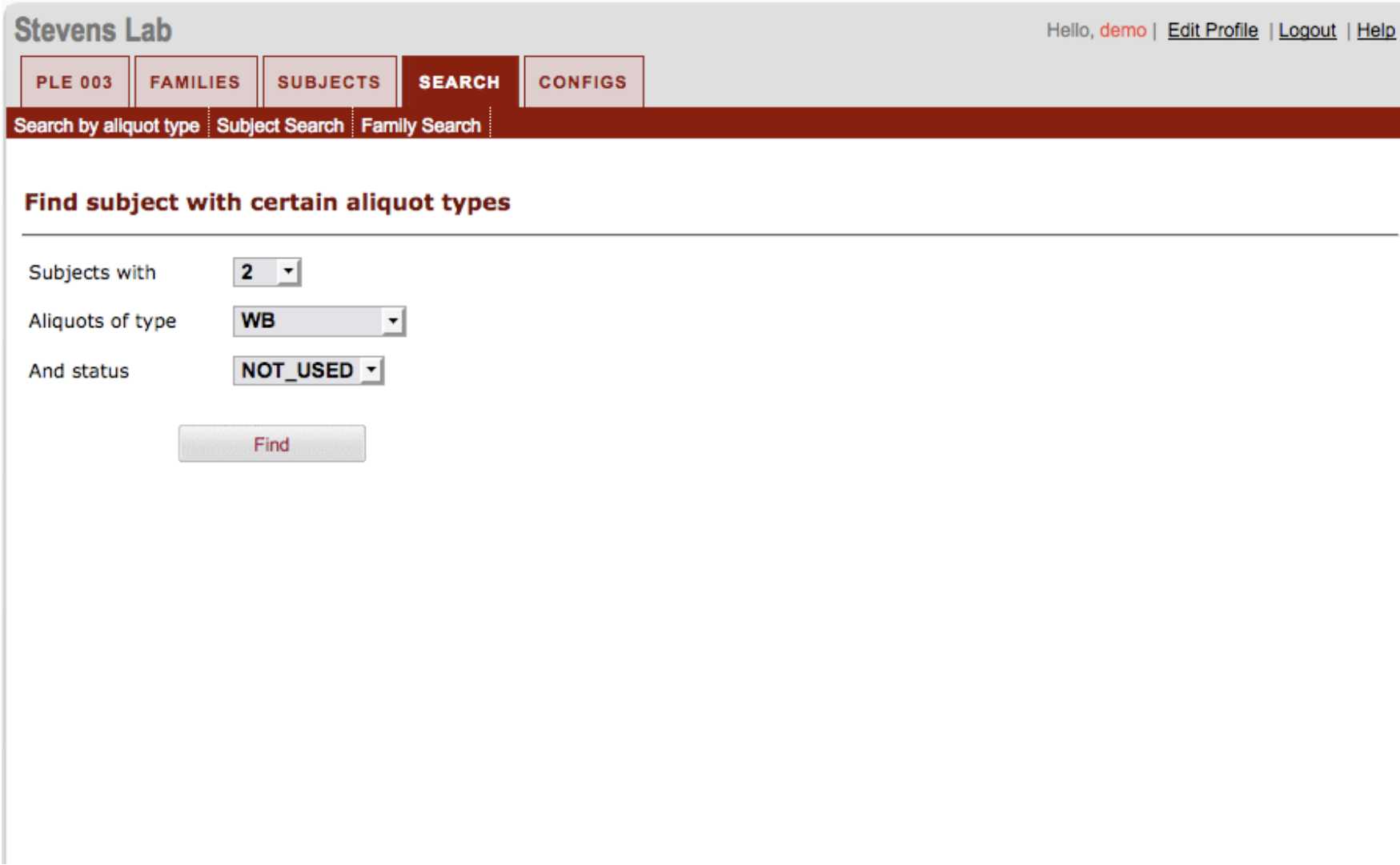
			Id	Parent id	Protein name
Show	Edit	Delete	1	1	Pescadillo homolog 1...
Show	Edit	Delete	2	1	Ribosome biogenesis protein BOP1 (Block ...
Show	Edit	Delete	3	1	Nucleophosmin (NPM) (Nucleolar phosphopr...
Show	Edit	Delete	4	1	40S ribosomal protein S15 (RIG protein)...
Show	Edit	Delete	5	1	Tubulin alpha-1 chain (Alpha-tubulin 1) ...
Show	Edit	Delete	6	1	Calmodulin (CaM)...
Show	Edit	Delete	7	1	MGC34732 protein...
Show	Edit	Delete	8	1	Tubulin alpha-3 chain (Alpha-tubulin 3) ...
Show	Edit	Delete	9	1	Calpain small subunit 1 (CSS1) (Calcium-...
Show	Edit	Delete	10	1	Elongation factor 1-alpha 1 (EF-1-alpha-...

« Previous 1 2 3 Next »

Xenia Hertzenberg




Stevens Lab
Hello, demo | Edit Profile | Logout | Help
PLE 022
FAMILIES
SUBJECTS
SEARCH
CONFIGS
Family: FS 119
Subject: PLE 022A
Sample: 2003-01-06
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: PLASMA
Aliquot: DRY_PEL
Aliquot: PBMC
Aliquot: PBMC
Aliquot: PBMC
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Aliquot: WB
Subject: PLE 022M
Subject: PLE 022R1
Subject: PLE 022R2
Aliquot Info
Aliquot type
WB
Aliquot label
1
Box
33
Row
D
Col
1
State
ALL_USED
Aliquot used by
Aliquot used date
1976-06-06
Comments
sample used prior to CHRMC move


Stevens Lab
Hello, demo | Edit Profile | Logout | Help
PLE 003
FAMILIES
SUBJECTS
SEARCH
CONFIGS
Search by aliquot type
Subject Search
Family Search
Find subject with certain aliquot types
Subjects with
2
Aliquots of type
WB
And status
NOT_USED
Find

Stevens Lab

Hello, demo | Edit Profile | Logout | Help

PLE 003 | FAMILIES | SUBJECTS | SEARCH | CONFIGS

Export results to spreadsheet

<< first < prev 1 2 3 4 5 6 7 8 9 next > last >>

Family ID	Legacy ID	Date Of Birth	Sex	R	Race	Onset	Age	Dx	Dx Date	Comments
FS 018	PLE 024A	1989-12-31	F	A	MIXE	January-02	12		2002-02-25	in remission, strong FHx SLE
FS 018	PLE 024M	1961-05-16	F	M	C				1976-06-06	Mom says she gave blood and MW. Dan Bin will call Dad for detailed family hx.
FS 018	PLE 024F	1962-01-26	M	F	H				1976-06-06	
FS 005	PLE 028A	1998-01-05	F	A	A	August-03	5		1976-06-06	Filipino
FS 032	PLE 032A	1990-04-23	F	A	C	June-03	13	Lupus	1976-06-06	
FS 040	PLE 034A	1988-09-30	F	A	C	August-03	14		1976-06-06	
FS 017	PLE 043A	1990-05-03	F	A		April-05	15		2005-04-28	
FS 017	PLE 043M	1976-06-06		M					1976-06-06	
FS 020	PLE 044R1	1992-06-26	M	R1					1976-06-06	younger; MW given to kate 12/16/05
FS 021	PLE 045A	1992-07-02	F	A	A	July-05	13	SLE	2005-08-12	
FS 021	PLE 045M	1976-06-06	F	M					1976-06-06	
FS 022	NOP 223A	1967-12-22	F	A	C				1976-06-06	4 draws (dont know all dates)

ITHS
Institute of Translational Health Sciences

UW Seattle
Institute of Translational Health Science (ITHS)

Wennberg R21: Risk factors for encephalopathy in newborns with severe hyperbilirubinemia

This application was designed to collect and report data for a specific research project. Please cite Institute of Translational Health Science (ITHS) grant support **(UL1 RR025014 from NCRR/NIH)** in publications relating to this project. Please also cite the REDCap project when publishing manuscripts (citation information and template methods language are available here). Contact Joshua Franklin for additional details or help with this application.

Current Users	
User	**Expires**
aleksand (aleksandr yakovlevitch aravkin)	10/01/2010
amiraelshenawy (AMIRA SHENNAWY)	10/01/2010
bhutani (Vinod Bhutani)	10/01/2010
brinkley (Jim Brinkley)	never
dstevenson (David Stevenson)	10/01/2010
imanisk (Iman Iskander)	10/01/2010
imanseoud (Iman Seoud)	10/01/2010
jdftest (jdf test)	10/01/2010

Database Statistics	
Records in database	0
Data exports	1
Logged events	20
Most recent activity	10/20/2009 10:23
Database status	**In Production**

Video Tutorials

- General Overview of Database Creation (5 min)
- The Data Dictionary (12 min)
- The Database "Applications" Menu (11 min)

General Information

Data Entry

- Demorgraphic And Family History
- Birth History
- Infant History
- Admission Assessment
- Bind 1
- Bind 2
- Bind 3
- Bind 4
- Bind 5
- Bind 6
- Automated Autditory Brainstem Response 1
- Automated Autditory Brainstem Response 2
- Automated Autditory Brainstem Response 3
- Discharge Hearing
- Lab
- Bilirubin
- Hospital Course And Outcome Of Clinical Care

Title: PedsQL Patient(Child) Multidimensional Fatigue Scale -- General, Sleep-Rest, Cognitive

Instructions: Below is a list of things that might be a problem for you. Please tell up how much of a problem each one has been for you during the past ONE month. There are no right or wrong answers. If you do not understand a question, please ask for help.

Page: 1

Visit Date *

○ Form Not Completed ○ Form Not Applicable ◉ Form Applicable - Reset Other Selections *

Select PedsQL Child Fatigue form type ○ Toddler-Ages 2-4 ○ Young Child-Ages 5-7 ◉ Child-Ages 8-12 ○ Teen-Ages 13-18 ○ Adult-Ages 18-25

In the past ONE month, how much of a problem has this been for you ...
0 - Never _____ 1 - Almost Never _____ 2 - Sometimes _____ 3 - Often _____ 4 - Almost Always

General Fatigue (problems with...)

1. I feel tired.

:-) ○ 0 ○ 1 ○ 2 ◉ 3 ○ 4 :-(..... ○ Not Answered

2. I feel Physically weak (not strong)

:-) ○ 0 ○ 1 ◉ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

3. I feel too tired to do things that I like to do.

:-) ○ 0 ◉ 1 ○ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

4. I feel too tired to spend time with my friends

:-) ◉ 0 ○ 1 ○ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

5. I have trouble finishing things.

:-) ◉ 0 ○ 1 ○ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

6. I have trouble starting things.

:-) ◉ 0 ○ 1 ○ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

Sleep/Rest Fatigue (problems with...)

1. I sleep a lot.

:-) ○ 0 ○ 1 ○ 2 ◉ 3 ○ 4 :-(..... ○ Not Answered

2. It is hard for me to sleep through the night.

:-) ○ 0 ○ 1 ◉ 2 ○ 3 ○ 4 :-(..... ○ Not Answered

3. I feel tired when I wake up in the morning.

:-) ○ 0 ○ 1 ○ 2 ◉ 3 ○ 4 :-(..... ○ Not Answered

Data Entry - Pediatric Autoimmunity Study Questionnaire		
#	**Data Point**	**Value**
1	Raynaud's Phenomenon	(•) 1 - Yes
		( ) 0 - No
1	Skin tightening	(•) 1 - Yes
		( ) 0 - No
1	Rashes	(•) 1 - Yes
		( ) 0 - No
1	Mouth sores	(•) 1 - Yes
		( ) 0 - No
1	Difficulty swallowing	( ) 1 - Yes
		(•) 0 - No
1	Skin sensitive to the sun	( ) 1 - Yes
		(•) 0 - No
1	Kidney problems	( ) 1 - Yes
		(•) 0 - No
1	Calcium deposits	(•) 1 - Yes
		( ) 0 - No
1	Lung or breathing problems	( ) 1 - Yes
		(•) 0 - No
1	Arthritis	( ) 1 - Yes
		(•) 0 - No
1	Heart trouble	( ) 1 - Yes
		(•) 0 - No
1	Dry eyes or dry mouth	(•) 1 - Yes
		( ) 0 - No

Data management current work

- Paul Fearn
  - Author of Caisis
  - caTissue for sample management
  - Tracking sample provenance

Data management challenges

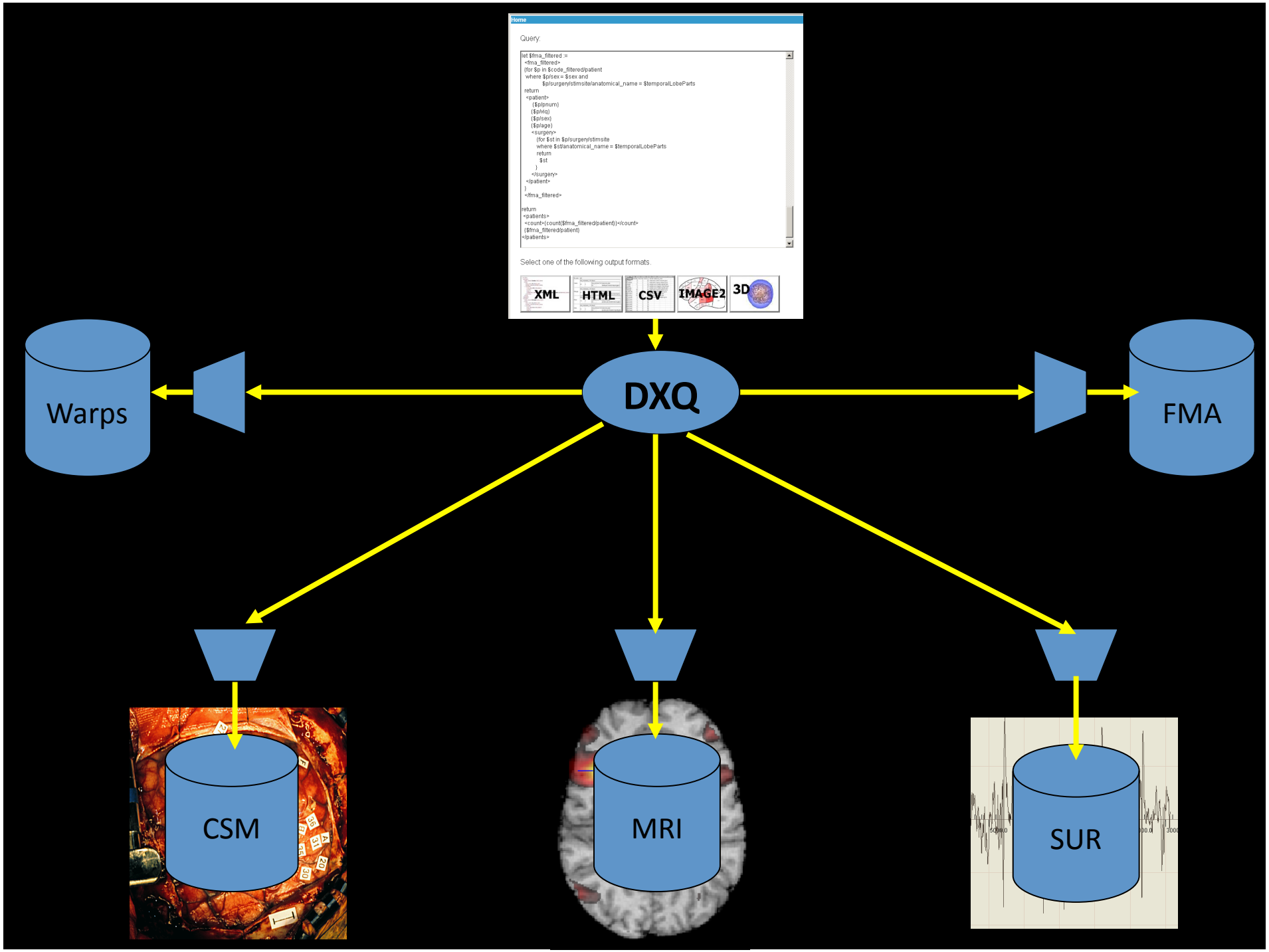
- Build versus buy
- Incorporating common terminology for later data integration
- Reducing the time to develop custom applications

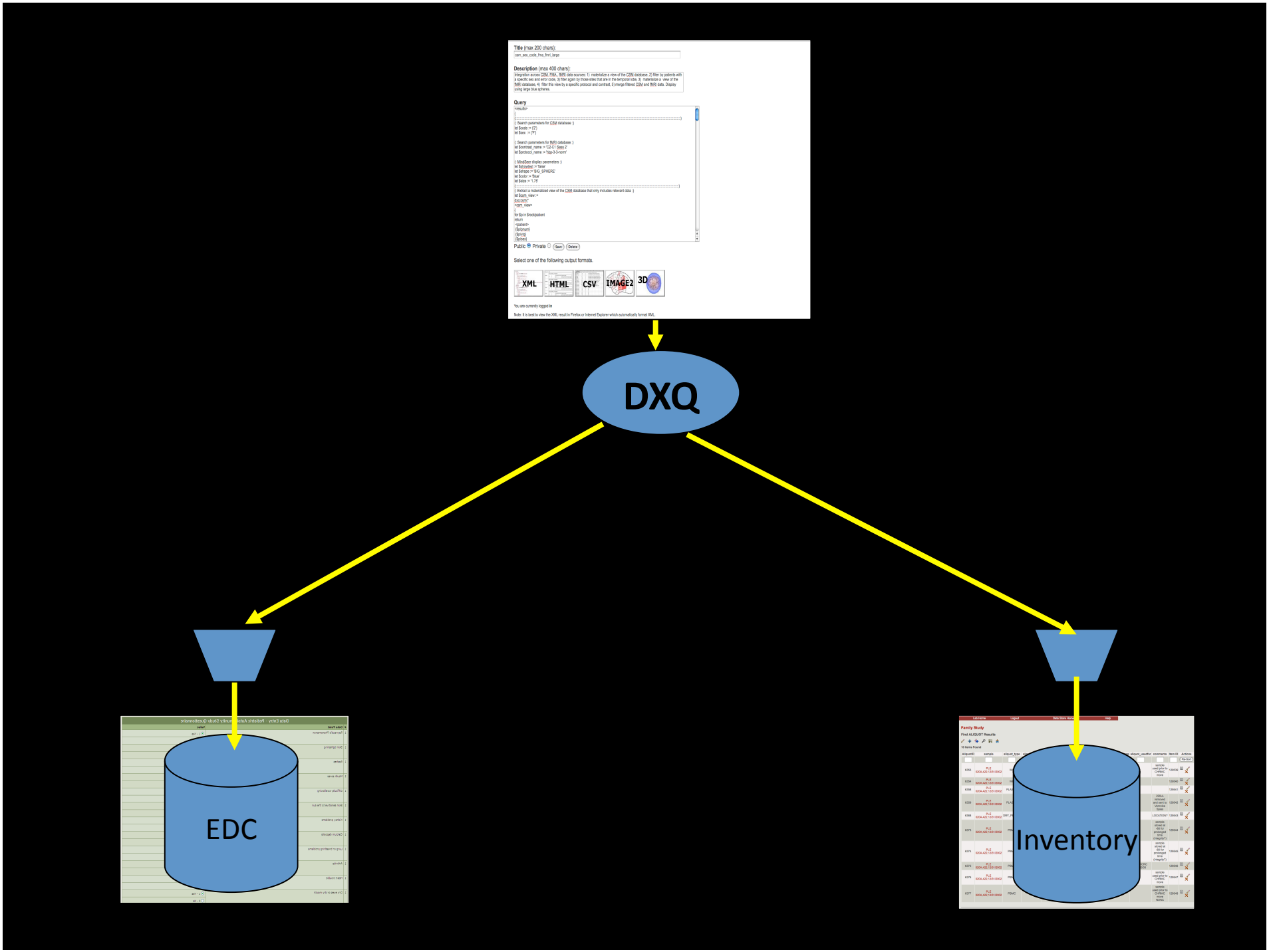
Projects

- Foundational Model of Anatomy
- Ontology Views
- Data management
- Data integration systems

Data Integration Systems

- Todd Detwiler
- Joshua Franklin
- Wayne Warren


Home
Query:
let $fma_filtered :=
<fma_filtered>
{for $p in $code_filtered/patient
where $p/sex = $sex and
$p/surgery/stimsite/anatomical_name = $temporalLobeParts
return
<patient>
{$p/pnum}
{$p/viq}
{$p/sex}
{$p/age}
<surgery>
{for $st in $p/surgery/stimsite
where $st/anatomical_name = $temporalLobeParts
return
$st
}
</surgery>
</patient>
}
</fma_filtered>
return
<patients>
<count>{count($fma_filtered/patient)}</count>
{$fma_filtered/patient}
</patients>
Select one of the following output formats.
XML
HTML
CSV
IMAGE2
3D
Warps
DXQ
FMA
CSM
MRI
SUR


Title (max 200 chars):
Description (max 400 chars):
Query
Public
Private
Save
Delete
Select one of the following output formats.
XML
HTML
CSV
IMAGE2
3D
DXQ
EDC
Inventory

Data Entry - Pediatric Autoimmunity Study Questionnaire		
#	**Data Point**	**Value**
1	Raynaud's Phenomenon	(•) 1 - Yes
		( ) 0 - No
1	Skin tightening	(•) 1 - Yes
		( ) 0 - No
1	Rashes	(•) 1 - Yes
		( ) 0 - No
1	Mouth sores	(•) 1 - Yes
		( ) 0 - No
1	Difficulty swallowing	( ) 1 - Yes
		(•) 0 - No
1	Skin sensitive to the sun	( ) 1 - Yes
		(•) 0 - No
1	Kidney problems	( ) 1 - Yes
		(•) 0 - No
1	Calcium deposits	(•) 1 - Yes
		( ) 0 - No
1	Lung or breathing problems	( ) 1 - Yes
		(•) 0 - No
1	Arthritis	( ) 1 - Yes
		(•) 0 - No
1	Heart trouble	( ) 1 - Yes
		(•) 0 - No
1	Dry eyes or dry mouth	(•) 1 - Yes
		( ) 0 - No

```
<?xml version="1.0" encoding="utf-8" ?>
- <ODM xmlns:ds="http://www.w3.org/2000/09/xmldsig#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.cdisc.org/ns/odm/v1.3 ODM1-3-0.xsd" ODMVersion="1.3" FileOID="research.crc.washington.edu/2212
  FileType="Snapshot" Granularity="AllClinicalData" Description="" AsOfDateTime="2007-11-05T13:40:48.1858678-08:00" CreationDateTime="2
  05T13:40:48.1858678-08:00" Originator="The University of Washington, General Clinical Research Center" SourceSystem="The University
  Management System" SourceSystemVersion="1.0.0" xmlns="http://www.cdisc.org/ns/odm/v1.3">
  - <Study OID="6817">
    - <GlobalVariables>
        <StudyName>Family Study of Pediatric Autoimmunity</StudyName>
      + <StudyDescription>
        <ProtocolName>2212</ProtocolName>
      </GlobalVariables>
      <BasicDefinitions />
    + <MetaDataVersion OID="2212" Name="Data Items and Item Groups for Protocol #2212">
    - <MetaDataVersion OID="2212.24" Name="Less Than 1 Month">
        <Include StudyOID="6817" MetaDataVersionOID="2212" />
      - <Protocol>
          <StudyEventRef StudyEventOID="24.105" Mandatory="No" />
          <StudyEventRef StudyEventOID="24.106" Mandatory="No" />
          <StudyEventRef StudyEventOID="24.107" Mandatory="No" />
          <StudyEventRef StudyEventOID="24.108" Mandatory="No" />
          <StudyEventRef StudyEventOID="24.109" Mandatory="No" />
        </Protocol>
      + <StudyEventDef OID="24.105" Name="Initial Visit - Month 00" Repeating="No" Type="Scheduled" Category="Outpatient Visit">
      + <StudyEventDef OID="24.106" Name="Surgery" Repeating="No" Type="Scheduled" Category="Inpatient Visit">
      - <StudyEventDef OID="24.107" Name="Visit - Month 03" Repeating="No" Type="Scheduled" Category="Outpatient Visit">
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          <FormRef FormOID="184" Mandatory="No" />
          <FormRef FormOID="187" Mandatory="No" />
          <FormRef FormOID="177" Mandatory="No" />
        </StudyEventDef>
      + <StudyEventDef OID="24.108" Name="Visit - Month 12" Repeating="No" Type="Scheduled" Category="Outpatient Visit">
      + <StudyEventDef OID="24.109" Name="Visit - Month 24" Repeating="No" Type="Scheduled" Category="Outpatient Visit">
      </MetaDataVersion>
    + <MetaDataVersion OID="2212.25" Name="Greater Than 1 Month">
    </Study>
  - <ClinicalData StudyOID="6817" MetaDataVersionOID="24">
    - <SubjectData SubjectKey="078">
      - <StudyEventData StudyEventOID="25.106" StudyEventRepeatKey="1710">
        - <FormData FormOID="175" FormRepeatKey="5866">
          - <ItemGroupData ItemGroupOID="175" ItemGroupRepeatKey="5866">
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              <ItemData ItemOID="8672" Value="" IsNull="Yes" />
              <ItemData ItemOID="8496" Value="" IsNull="Yes" />
              <ItemData ItemOID="8497" Value="" IsNull="Yes" />
              <ItemData ItemOID="8498" Value="" IsNull="Yes" />
            </ItemGroupData>
```

Lab Home | Logout | Data Store Home | Help

Family Study

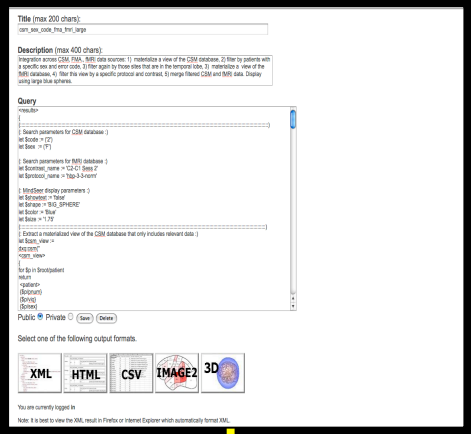
Find ALIQUOT Results

10 Items Found

AliquotID	sample	aliquot_type	aliquot_label	box	row	col	state	aliquot_usedby	aliquot_useddate	aliquot_usedfor	comments	Item ID	Actions
													Re-Sort
6353	PLE 020A,422,12/31/2002	WB	1	33	B	9	ALL_USED				sample used prior to CHRMC move	129539	
6354	PLE 020A,422,12/31/2002	WB	2	02	A	09	NOT_USED					129540	
6358	PLE 020A,422,12/31/2002	PLASMA	1	05	A	08	NOT_USED					129541	
6359	PLE 020A,422,12/31/2002	PLASMA	2	41	E	2	NOT_USED	awiede			220uL removed and sent to Veronika Spies	129542	
6368	PLE 020A,422,12/31/2002	DRY_PELLET	DRY_PELLET4				NOT_USED				LOCATION?	129543	
6373	PLE 020A,422,12/31/2002	PBMC	4	17H	E	03	NOT_USED				sample stored at -80 for prolonged time (integrity?)	129544	
6374	PLE 020A,422,12/31/2002	PBMC	5	17H	E	04	NOT_USED				sample stored at -80 for prolonged time (integrity?)	129545	
6375	PLE 020A,422,12/31/2002	PBMC	6	17H	E	05	ALL_USED		10/20/2005	To FHCRC 10/20/05		129546	
6376	PLE 020A,422,12/31/2002	PBMC	7	BOX1	H	4	ALL_USED				sample used prior to CHRMC move	129547	
6377	PLE 020A,422,12/31/2002	PBMC	8	NUNC			ALL_USED				sample used prior to CHRMC move NUNC	129548	

```
<SubjectID>62</SubjectID>
<SampleID>422</SampleID>
<Sample_Date>12/31/2002</Sample_Date>
<Sample_Type>BLOOD</Sample_Type>
<Disease_State>Unknown</Disease_State>
<Dz_Duration/>
<Age_at_Draw/>
<MLR_Samples/>
<SLEDAI_Score/>
- <Comments>
    Sample not in Tracking; Created From CHRMC INVENTORY
  </Comments>
  <Item_ID>129538</Item_ID>
- <Aliquot>
    <AliquotID>6353</AliquotID>
    <aliquot_type>WB</aliquot_type>
    <box>33</box>
    <row>B</row>
    <col>9</col>
    <state>ALL_USED</state>
  </Aliquot>
- <Aliquot>
    <AliquotID>6354</AliquotID>
    <aliquot_type>WB</aliquot_type>
    <box>02</box>
    <row>A</row>
    <col>09</col>
    <state>NOT_USED</state>
  </Aliquot>
- <Aliquot>
    <AliquotID>6358</AliquotID>
    <aliquot_type>PLASMA</aliquot_type>
    <box>05</box>
    <row>A</row>
    <col>08</col>
    <state>NOT_USED</state>
  </Aliquot>
- <Aliquot>
    <AliquotID>6359</AliquotID>
    <aliquot_type>PLASMA</aliquot_type>
    <box>41</box>
    <row>E</row>
    <col>2</col>
```

Find the freezer locations of unused aliquots for patients who have experienced Raynaud's phenomenon.



DXQ

EDC

Inventory

Title (max 200 chars):

Unused aliquots for Raynaud's subjects in study 2107

Description (max 400 chars):

Find all patients in WebTrial study 2107 who had Raynaud's phenomenon on a baseline visit (as checked in the pediatric autoimmunity questionnaure). For each of these look in the CELO database and retrieve unused aliquots, together with their row and column location in the freezer.

Query

```
(:
== local:ray-subjects ====================================
go through all subjects and return SubjectKey if they answered "yes" to Raynaud CRF item
:)
declare function  local:ray-subjects($subjects as node()*, $ray_oid as xs:string)  as node()*
{
   for $s in $subjects
   let $subjectkey := $s/@SubjectKey
   return
<notused>
{
   for $i in $s/StudyEventData/FormData/ItemGroupData/ItemData
   where
      $i/@ItemOID = $ray_oid and
      $i/@Value = "1"
   return
<subject>{$subjectkey }</subject>

}
</notused>} ;



(:
== local:matched-samples ====================================
given a list of subjects with IDS, find available inventory SampleIDs
:)
declare function  local:matched-samples($subjects as node()*)  as node()*
```

```
- <results>
  - <subjects>
    - <sample subject_id="PLE 20" sample_id="422">
      - <Aliquot>
          <AliquotID>6354</AliquotID>
          <aliquot_type>WB</aliquot_type>
          <box>02</box>
          <row>A</row>
          <col>09</col>
          <state>NOT_USED</state>
        </Aliquot>
      - <Aliquot>
          <AliquotID>6358</AliquotID>
          <aliquot_type>PLASMA</aliquot_type>
          <box>05</box>
          <row>A</row>
          <col>08</col>
          <state>NOT_USED</state>
        </Aliquot>
      - <Aliquot>
          <AliquotID>6359</AliquotID>
          <aliquot_type>PLASMA</aliquot_type>
          <box>41</box>
          <row>E</row>
          <col>2</col>
          <state>NOT_USED</state>
        </Aliquot>
      - <Aliquot>
          <AliquotID>6373</AliquotID>
          <aliquot_type>PBMC</aliquot_type>
          <box>17H</box>
          <row>E</row>
          <col>03</col>
          <state>NOT_USED</state>
        </Aliquot>
```

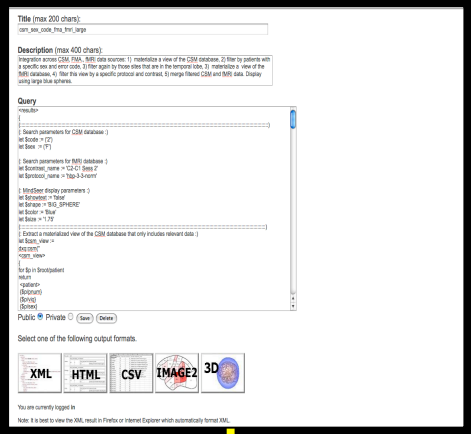
results

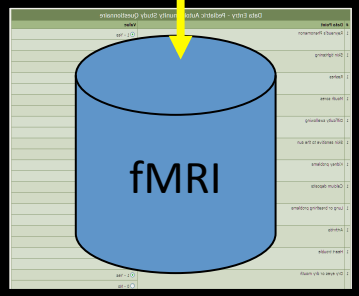
subjects

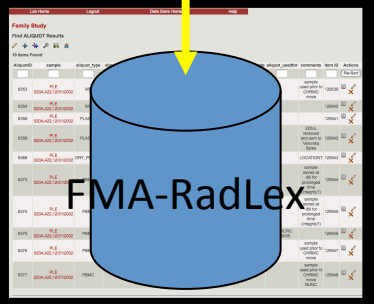
sample

@subject_id	@sample_id	Aliquot
PLE 20	422	AliquotID: 6354, aliquot_type: WB, box: 02, row: A, col: 09, state: NOT_USED
		AliquotID: 6358, aliquot_type: PLASMA, box: 05, row: A, col: 08, state: NOT_USED
		AliquotID: 6359, aliquot_type: PLASMA, box: 41, row: E, col: 2, state: NOT_USED
		AliquotID: 6373, aliquot_type: PBMC, box: 17H, row: E, col: 03, state: NOT_USED

Determine if there are any differences in the distribution of fMRI activations in schizophrenics vs normal controls in Brodman's area







<>	A	B	C	F	L	M	N	O	P	Q	R	S
1	BIRN_ID	Dx	Voxels	Max Z	X coor	Y coor	Z coor	hemisphere	lobe	gyrus	matter	BA
2	301882920	h	475	11.4	51	-43	2	Right Cerebrum	Temporal Lobe	Middle Temporal Gyrus	Gray Matter	Brodmann area 22
3	301882920	h	7287	11.3	44	1	24	Right Cerebrum	Frontal Lobe	Precentral Gyrus	Gray Matter	Brodmann area 6
4	301882920	h	232	10.1	-48	-50	1	Left Cerebrum	Temporal Lobe	Inferior Temporal Gyrus	Gray Matter	Brodmann area 37
5	301882920	h	210	9.55	-49	-44	21	Left Cerebrum	Temporal Lobe	Superior Temporal Gyrus	Gray Matter	Brodmann area 13
6	301882920	h	774	8.43	32	-60	51	Right Cerebrum	Parietal Lobe	Superior Parietal Lobule	Gray Matter	Brodmann area 7
7	301882920	h	416	7.54	-44	-11	52	Left Cerebrum	Frontal Lobe	Precentral Gyrus	Gray Matter	Brodmann area 4
8	301882920	h	500	7.17	50	-72	-5	Right Cerebrum	Occipital Lobe	Middle Occipital Gyrus	Gray Matter	Brodmann area 19
9	301882920	h	173	6.2	6	65	19	Right Cerebrum	Frontal Lobe	Superior Frontal Gyrus	Gray Matter	Brodmann area 10
10	301882920	h	317	5.82	46	18	-38	Right Cerebrum	Temporal Lobe	Superior Temporal Gyrus	Gray Matter	Brodmann area 38
11	301882920	h	102	5.57	42	-35	35	Right Cerebrum	Parietal Lobe	Inferior Parietal Lobule	Gray Matter	Brodmann area 40
12	301882920	h	244	5.45	32	49	16	Right Cerebrum	Frontal Lobe	Middle Frontal Gyrus	Gray Matter	Brodmann area 10
13	301882920	h	139	5.08	-24	21	-4	Left Cerebrum	Sub-lobar	Claustrum	Gray Matter	*
14	303269784	s	51936	17.2	0	-87	15	Left Cerebrum	Occipital Lobe	Cuneus	Gray Matter	Brodmann area 18
15	303269784	s	713	10.1	18	33	-32	Right Cerebrum	Frontal Lobe	Orbital Gyrus	Gray Matter	Brodmann area 11
16	303269784	s	148	6.64	-28	-66	-39	Left Cerebellum	Posterior Lobe	Inferior Semi-Lunar Lobule	Gray Matter	*
17	303269784	s	375	6.44	-48	51	10	Left Cerebrum	Frontal Lobe	Middle Frontal Gyrus	Gray Matter	Brodmann area 46
18	303269784	s	378	4.51	-65	-17	-23	Left Cerebrum	Temporal Lobe	Inferior Temporal Gyrus	Gray Matter	Brodmann area 20
19	303851049	h	12946	16.2	12	-93	3	Right Cerebrum	Occipital Lobe	Cuneus	Gray Matter	Brodmann area 17
20	303851049	h	9961	10.7	6	-9	61	Right Cerebrum	Frontal Lobe	Medial Frontal Gyrus	Gray Matter	Brodmann area 6
21	303851049	h	168	7.25	-30	49	18	Left Cerebrum	Frontal Lobe	Middle Frontal Gyrus	Gray Matter	Brodmann area 10

Title (max 200 chars):

Do SZ show the same distribution of activation as controls, over subdivisions of left Brodmann area 6? (spatial)

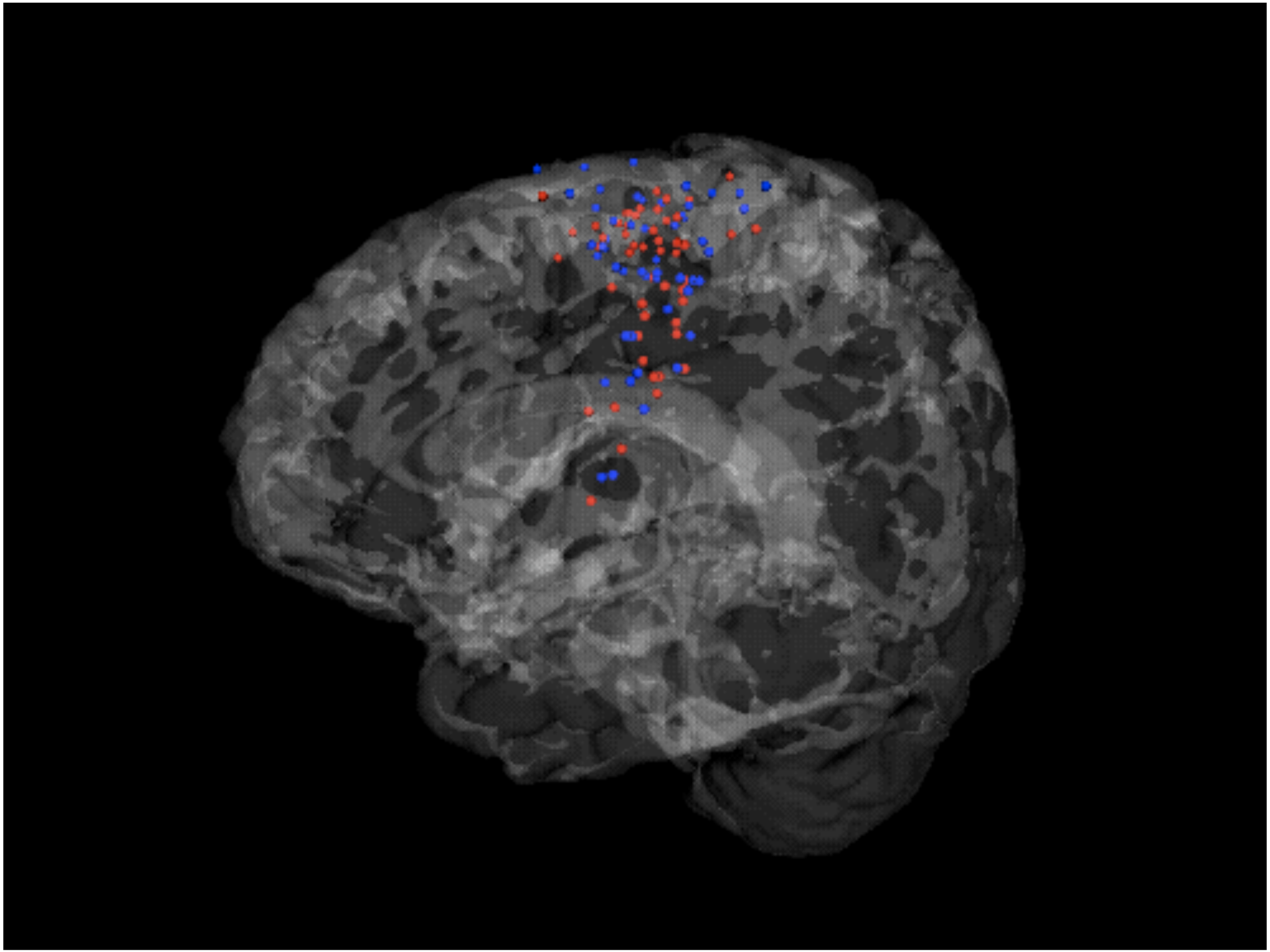
Description (max 400 chars):

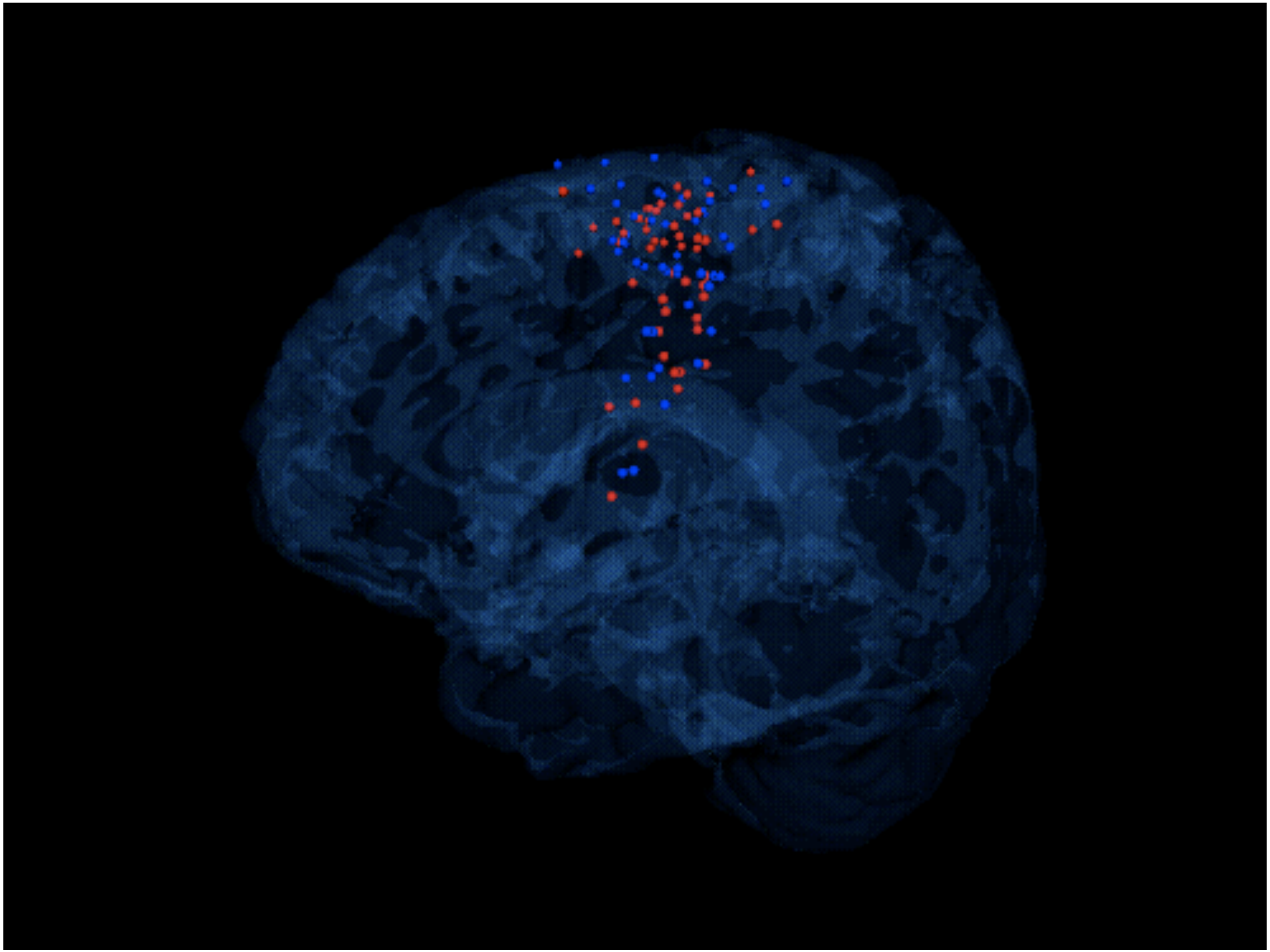
Do SZ show the same distribution of activation as controls, over subdivisions of left Brodmann area 6? For each BA6 subdivision with activation, show percentage of BA6 activations in that subdivision (for healthy and for schizophrenic).

Query

```
declare namespace radlex = "http://protege.stanford.edu/xml";

(: recursive function for following part relationships :)
declare function local:allParts($c as element(), $doc as document-node())
  as element()* {
    let $direct := local:directParts($c, $doc)
    return $direct | $direct/local:allParts(., $doc)
};

(: base function gets direct parts :)
declare function local:directParts($c as element(), $doc as document-node())
  as element()* {
    let $names := $c/radlex:own_slot_value[radlex:slot_reference/text()='Has_Part']/radlex:value
    let $direct := $doc//radlex:class[radlex:name=$names]
    return $direct
};

(: gather FMA info :)
let $radlex_doc := doc("http://sig.biostr.washington.edu/~detwiler/OntViews/RadLex/radlex3.0.xml")
let $anatomical_region_name := "left Brodmann area 6"
let $term_inst := $radlex_doc/radlex:knowledge_base/radlex:simple_instance
   [radlex:own_slot_value[radlex:slot_reference/text()='name']
   [radlex:value/text()=$anatomical_region_name]]
let $anatomical_region_cls := $radlex_doc/radlex:knowledge_base/radlex:class
   [radlex:own_slot_value[radlex:slot_reference/text()='Preferred_name' or radlex:slot_reference/text()='Synonym']
   [radlex:value/text()=$term_inst/radlex:name/text()]]
let $region_sub_names := local:allParts($anatomical_region_cls, $radlex_doc)/radlex:name/text()
let $region_sub_clses := $radlex_doc/radlex:knowledge_base/radlex:class[radlex:name=$region_sub_names]
```

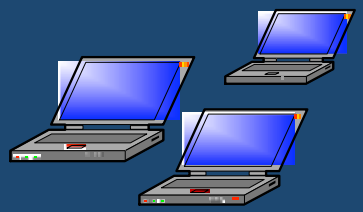
```
<results>
 <stats>
  <sub_region>
   <name>brodmann area 6 of left precentral gyrus</name>
   <h_count>22</h_count>
   <s_count>21</s_count>
   <h_percentage>40</h_percentage>
   <s_percentage>38.8888888888888889</s_percentage>
  </sub_region>
  <sub_region>
   <name>brodmann area 6 of left middle frontal gyrus</name>
   <h_count>7</h_count>
   <s_count>4</s_count>
   <h_percentage>12.7272727272727273</h_percentage>
   <s_percentage>7.4074074074074074</s_percentage>
  </sub_region>
  <sub_region>
   <name>brodmann area 6 of left superior frontal gyrus</name>
   <h_count>4</h_count>
   <s_count>8</s_count>
   <h_percentage>7.2727272727272727</h_percentage>
   <s_percentage>14.8148148148148148</s_percentage>
  </sub_region>
  <sub_region>
   <name>brodmann area 6 of left medial frontal gyrus</name>
   <h_count>22</h_count>
   <s_count>21</s_count>
   <h_percentage>40</h_percentage>
   <s_percentage>38.8888888888888889</s_percentage>
  </sub_region>
```





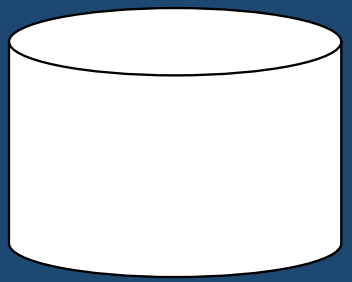
Biolucida
Wayne Warren

Client

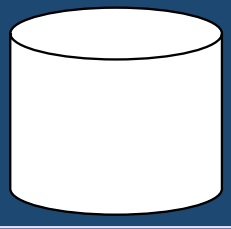


Brodel Server

FMA



Model Database

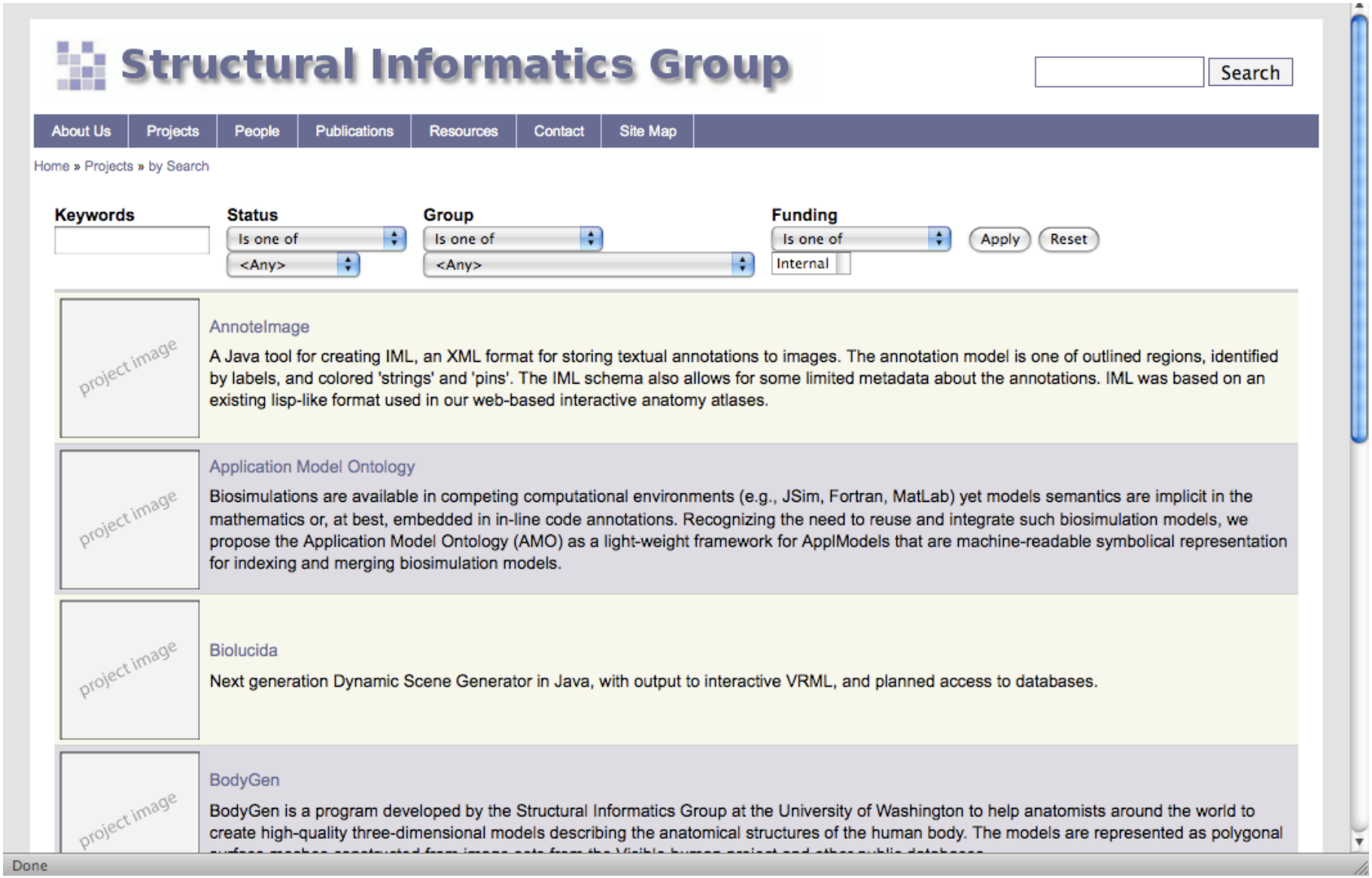


Data integration systems current work

- Biolucida
- DXBrain
  - Graphical interface to BIRN data: Nolan Nichols
  - Integration with views
  - Clinical trials
  - Integrate with larger-scale systems

Projects

- Foundational Model of Anatomy
- Ontology Views
- Data management
- Data integration


Structural Informatics Group
Search
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People
Publications
Resources
Contact
Site Map
Home » Projects » by Search
Keywords
Status
Is one of
<Any>
Group
Is one of
<Any>
Funding
Is one of
Internal
Apply
Reset
project image
AnnoteImage
A Java tool for creating IML, an XML format for storing textual annotations to images. The annotation model is one of outlined regions, identified by labels, and colored 'strings' and 'pins'. The IML schema also allows for some limited metadata about the annotations. IML was based on an existing lisp-like format used in our web-based interactive anatomy atlases.
project image
Application Model Ontology
Biosimulations are available in competing computational environments (e.g., JSim, Fortran, MatLab) yet models semantics are implicit in the mathematics or, at best, embedded in in-line code annotations. Recognizing the need to reuse and integrate such biosimulation models, we propose the Application Model Ontology (AMO) as a light-weight framework for ApplModels that are machine-readable symbolical representation for indexing and merging biosimulation models.
project image
Biolucida
Next generation Dynamic Scene Generator in Java, with output to interactive VRML, and planned access to databases.
project image
BodyGen
BodyGen is a program developed by the Structural Informatics Group at the University of Washington to help anatomists around the world to create high-quality three-dimensional models describing the anatomical structures of the human body. The models are represented as polygonal
Done

Funding

- Ontology views
- RadLex
- OcRE
- UW Neuroproteomics Center
- Children's
- ITHS
- Facebase
- ISIS
- caBIG
- NLM fellowships

Credits

- Cornelius Rosse
- Onard Mejino
- Todd Detwiler
- Joshua Franklin
- Ron Shaker
- Xenia Hertzenberg
- Paul Fearn
- Nikki Dell
- Nolan Nicols

Marianne Shaw

Dan Suciu

Linda Shapiro

- Dan Cook
- John Gennari
- Mark Musen
- Daniel Rubin
- Natasha Noy
- Jessica Turner
- Max Neal
- Melissa Clarkson
- Peter Tarczy-Hornoch

Towards a Structural Information Framework