SchizConnect:
Large-Scale Schizophrenia Neuroimaging Data Integration and Sharing

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NIMH

Outline

I. Introduction

II. SchizConnect

III. Demonstration

IV. Next steps

I. Introduction

- Where is schizophrenia neuroimaging data?
- Data sharing challenges
- SchizConnect solution
- Datasets in SchizConnect
- Data compatibility

Where is schizophrenia neuroimaging data?

- Institutional databases:
  - COINS (MCIC, COBRE), XNAT Central (NUSDAST)
- Federated databases:
  - FBIRN
- Individual labs
  - ENGIMA Schizoprhenia Working Group
  - Numerous "unincorporated" others

ENGIMA Schizoprhenia Working Group

Sample	N (Total)	M/F (HC)	M/F (SZ)	Mean Age (HC)	Mean Age (SZ)	Mean Age of Onset	Mean DOI	PANSS Total	SANS Total	SAPS Total	mean CPZ
AMC*	376	114/56	180/26	23.3	22.1	20	2	69			276
CLiNG*	372	132/191	36/13	25.2	32.4	21	11	51			638
Dublin*	284	98/129	39/18	29.9	42.6	23	20				344
Edin-burgh	36	10/10	9/7	37.6	36.3	23	16	43			433
FBIRN**	365	127/51	141/46	37.5	38.9	22	17	69	22	16	510
Galway	154	46/28	56/24	34.2	33.3	24	10	36	15	8	704
HMS	101	21/34	32/14	39.6	28.4	28	0.8	90			313
HUBIN	200	73/31	70/26	41.6	42	25	17		32	14	
MCIC**	323	103/62	119/39	31.4	33.5	23	11		21	18	553
NU	201	52/41	74/34	32	34.2	21	13		33	23	
Olin*	888	259/300	184/145	37.9	37.4	25	13	66			
PAFIP	229	51/30	91/57	27.6	29.6	29	2		18	41	
TOP	524	160/145	130/89	35.4	32	26	7	62			449
UMCU	275	72/44	130/29	32.9	31	21	11	60			394
UPENN*	370	89/104	105/72	35.9	38.4	21	17		24	18	343
Total	4698	1407/1256	1401/634	31.1	33.8	23	11	64	23	21	436

van Erp, T.G.M., Hibar, D.P., Rasmussen, J., Andreassen, O.A., Haukvik, U.K., Agartz, I., Potkin, S.G., Hulshoff-Pol, H., Ophoff, R., Haren, N.E.M.v., Gruber, O., Krämer, B., Erhlich, S., Hass, J., Wang, L., Alpert, K., Pearlson, G.D., Glahn, D., Thompson, P.M., Turner, J.A., 2014. Subcortical and cortical variations in schizophrenia: the ENIGMA SZ Working Group. Human Brain Mapping, Hamburg, Germany.

Data sharing challenges

- User interacts directly with individual sites
- Different data use agreements
- Needs to understand and relate data organization, variables and values from all sites
- Data transfer
- Example: COINS + FBIRN + NU
  - Turner, J.A., et al, 2012. Heritability of multivariate gray matter measures in schizophrenia. Twin Res Hum Genet 15, 324-335.

SchizConnect solution

- User interacts with one portal

- Data modeling with common ontology

- Facilitate user authentication, compliance with data use agreements & data transfer

- Test bed of 3 data sources: MCIC/COBRE (COINS), FBIRN, NUSDAST (XNAT Central), expand to including others

Datasets

	NU	FBIRN	MRN
Database	XNAT	HID	COINS
# Subjects	**Currently available**		
	570 (451 with 1.5T)	237 (Phase II)	432 (213 MCIC 219 COBRE)
	To be released		
New subjects	130 (3T)	400 (Phase 3)	200 (R01)
Timeline	Y2	Y3	Y3-Y4

Data types: More complex than the number of individual subjects

	NU	FBIRN	MRN
Database	XNAT	HID	COINS
Additional types			
	-	Resting fMRI Task fMRI DTI	Resting fMRI Task fMRI DTI
To be released			
New subjects	Structural MRI Resting fMRI Task fMRI DTI	Structural MRI Resting fMRI Task fMRI DTI	Structural MRI Resting fMRI Task fMRI DTI
Timeline	Y2	Y3	Y3-Y4

Imaging Data Compatibility

- Compatible definitions at all 3 data sources
- SchizConnect Ontology
- Mapping to NeuroLEX, INCF standards
  - Facilitating common terms where possible across SchizConnect and other projects
  - Number of terms linked: 15 (out of 19 modeled)

| SchizConnect	INCF/NeuroLEX
Imaging_Protocol	Image
Structural	None
T1	T1-weighted 3D image
T2	T2-weighted 3D image
Difusion	Diffusion-weighted 3D image
Perfusion	Perfusion-weighted 3D image
Functional	None
Resting_State	TBD
Task_Paradigm	birnlex_2075/COGPO_0049
Auditory_Oddball	birnlex_2161
Breath_Hold	birnlex_2007
Mismatch_Negativity	birnlex_2181
Sternberg_Item_Reco	birnlex_2031
Finger_Tapping	nlx_145967/CAO_00745
Sensory_Motor	nlx_146049/CAO_00827
Go_NoGo	birnlex_2047 (finger tapping's defini
Working_Memory	TBD
Field_Mapping	TBD
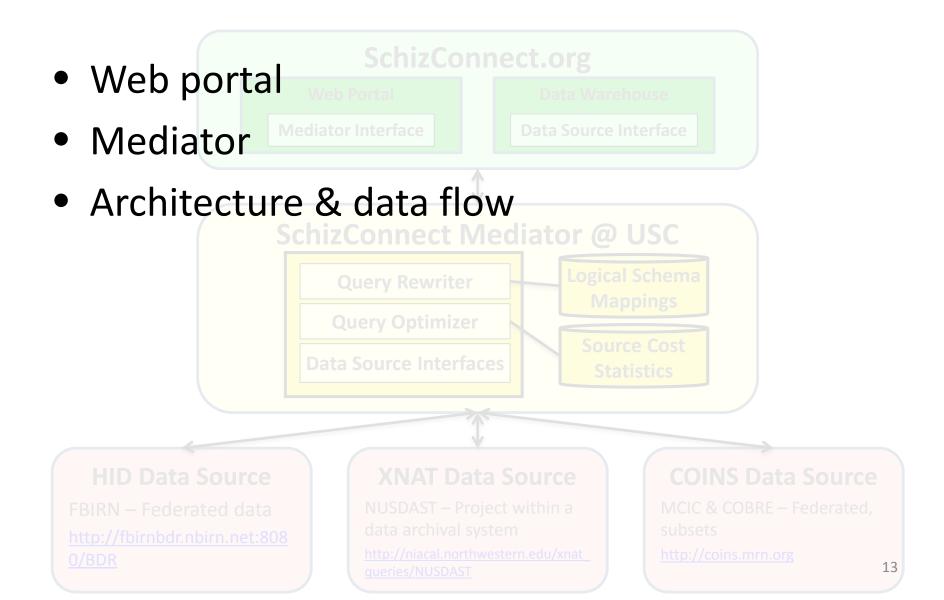
Meta Data Compatibility
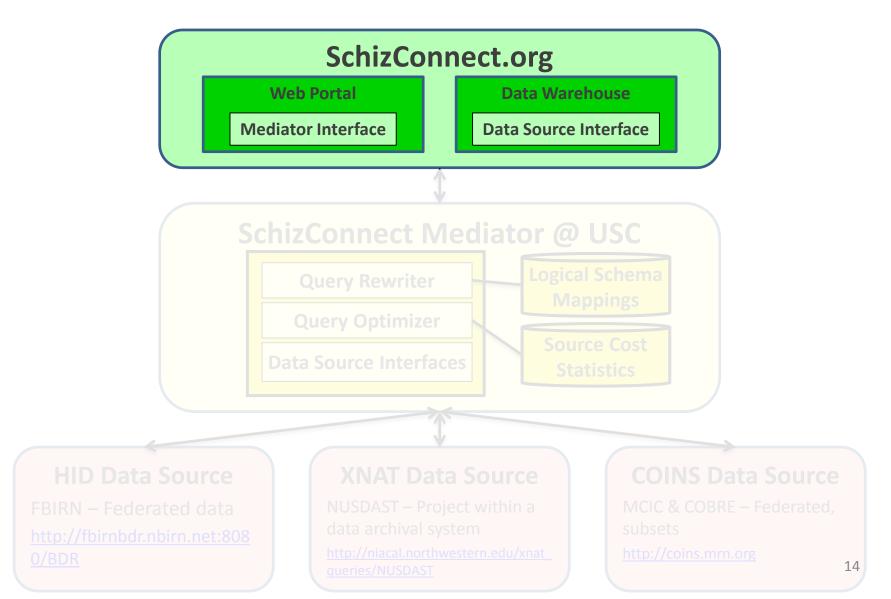
- Compatible definitions at all 3 data sources
- SchizConnect Ontology
- Mapping to NeuroLEX, INCF standards
  - Facilitating common terms where possible across SchizConnect and other projects
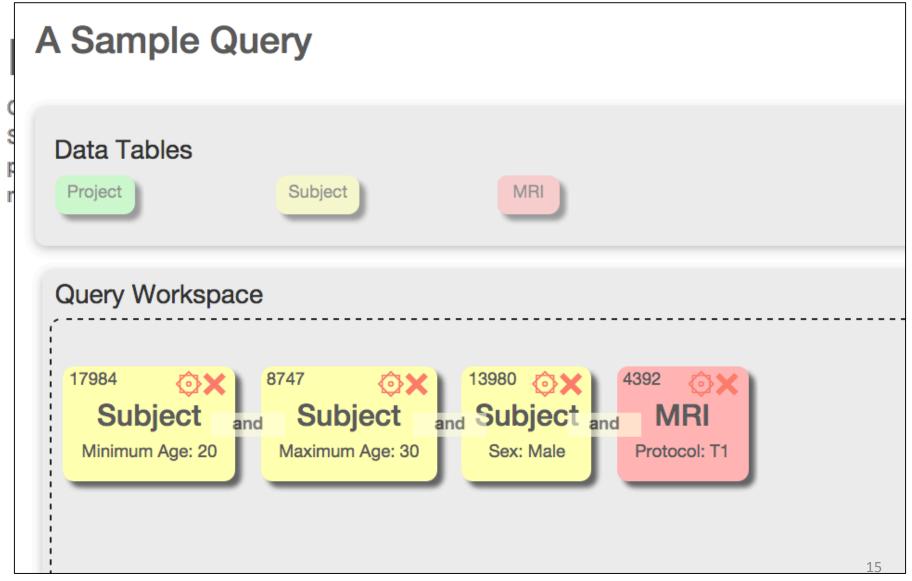 - Number of terms linked: TBD

SchizConnect Common Terms
Diagnosis
Mental_Disorder
Psychotic_Disorder
Schizophrenia_Broad
Schizophrenia_Strict
Schizoaffective
Bipolar_Disorder
Physical_Disorder
Neurological_Disorder
Possible_Disorder
Sibling_of_Schizophrenia_Strict
No_Known_Disorder
Sibling_of_No_Known_Disorder

II. SchizConnect

- Web portal
- Mediator
- Architecture & data flow

SchizConnect.org
- Web Portal
  - Mediator Interface
- Data Warehouse
  - Data Source Interface

SchizConnect Mediator @ USC
- Query Rewriter
- Query Optimizer
- Data Source Interfaces
- Logical Schema Mappings
- Source Cost Statistics

HID Data Source
FBIRN – Federated data
http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source
NUSDAST – Project within a data archival system
http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source
MCIC & COBRE – Federated, subsets
http://coins.mrn.org

SchizConnect.org Web Portal

SchizConnect.org Web Portal

SchizConnect.org Web Portal

A Sample Query Query Results

Your query returned 1,046 downloadable images from 250 subjects. View My Qu

- COBRE (COINS): 129 downloadable images from 47 distinct subjects
- MCICShare (COINS): 144 downloadable images from 54 distinct subjects
- fBIRNPhaseII__0010 (HID): 308 downloadable images from 60 distinct subjects
- NUDataSharing (NUSDAST): 465 downloadable images from 89 distinct subjects

Note that some subjects have longidinal data, some visits contain multiple imaging sequences, and some scans have multiple formats.

To review your query, please use the View My Query link (the back button will take you to a blank query creation page).

Click the "Proceed to Image Download" button below to sign Data Use Agreements and begin package creation. Your package will inc the table below.

Please note that you will need 7zip to extract the contents of the downloaded package.

Proceed to Image Download

[10 ‡] records per page

Provenance	Name	Subjectid	Age	Sex	Dx	Field_strength	Img_date	Datauri	Maker
COINS	COBRE	A00000838	29	male	Schizophrenia_Strict	3	2015-01-01 00:00:00.0	296398	Siemens
COINS	COBRE	A00000838	29	male	Schizophrenia_Strict	3	2015-01-01 00:00:00.0	296398	Siemens

SchizConnect.org Web Portal

- One-click Interface
- Without having to register, the user can obtain a total count on the number of available datasets
- SchizConnect will facilitate user registration and compliance with data use agreement with each site
- User can download specific datasets without having to go to each data site
- The user can download both queried data and un-queried data associated with subjects satisfying the query criteria

MCIC Data Usage Agreement

SchizConnect Mediator

- Mediator is developed and deployed at USC/ISI
- Defines a virtual common schema for all sources
- Maps between source schemas and common schema
- Accepts user/client SQL queries over common schema
- Translates user query from common schema to source schemas
- Queries each data source in parallel (currently 3)
  - HID@UCI, NUSDAST@XNATCentral, COINS@MRN
- Mediator accepts SQL queries from:
  - SchizConnect web portal
  - Application programs can send queries to Mediator (with credentials)

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SchizConnect Mediator
Source Schemas

HIDPSQLResource_nc_experiment(uniqueid:NUMBER:f, tableid:NUMBER:f, owner:NUMBER:f, modtime:DATE:f, moduser:NUMBER:f, name:STRING:f, description:STRING:f, contactperson:STRING:f, ….)

HIDPSQLResource_nc_subjexperiment(uniqueid:NUMBER:f, … subjectid:STRING:f, ….)

HIDPSQLResource_nc_expsegment(segmentid, componentid, …, subjectid, … time_stamp:DATE:f, description:STRING:f, protocolversion, protocolid:STRING:f, …)

HIDPSQLResource_nc_collectionequipment(uniqueid, tableid, owner, modtime:DATE:f, …, make, model)

…

XnatSubjectResource_xnat__subjectData(PROJECT, SUBJECT_ID)

XnatMRSessionResource_xnat__mrSessionData(PROJECT, SCANNER, MARKER)

 …

COINSMySQLResource_subjects_v(ANONYMIZATION_ID, GENDER, YOB, SUBJECT_TYPE, STUDY_ID, AGE)

COINSMySQLResource_series_v(SERIES_ID, ANONYMIZATION_ID, AGE_AT_SCAN, SCAN_DATE_YEAR, SCAN_DATE, COLLECTION_TECHNIQUE, DEFINITION, SCANNER_LABEL, SCANNER_MODEL, …)

…

MappingsMySQLResource_protocol_mappings(szc_protocol_hier, source, protocolid)

MappingsMySQLResource_scanner_mappings(maker, model, field_strength, source, source_make, source_model)
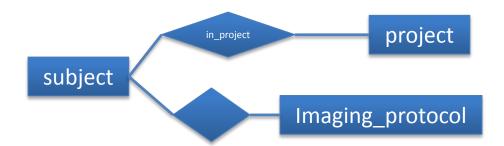
…

SchizConnect Mediator (Virtual) Common Schema

project(provenance:STRING, name:STRING, projectid:NUMBER, description:STRING)

subject(provenance, subjectid, age, sex, dx)

in_project(provenance, subjectid, projectid)

imaging_protocol(provenance, subjectid, szc_protocol_hier, img_date:DATE, notes, datauri, maker, model, field_strength)

SchizConnect Mediator Schema Mappings (1)

imaging_protocol("HID", SUBJECTID, SZC_PROTOCOL_HIER, DATE, NOTES, DATAURI,
MAKER, MODEL, FIELD_STRENGTH) **<-**

HIDPSQLResource_nc_scannersbyscan_mview(SUBJECTID, componentid, segmentid,
SOURCE_PROTOCOL, DATE, nc_colequipment_uniqueid, SOURCE_MAKE, SOURCE_MODEL,
DATAURI, NOTES) **^**

MappingsMySQLResource_protocol_mappings(SZC_PROTOCOL_HIER, "HID",
SOURCE_PROTOCOL, ID1) **^**

MappingsMySQLResource_scanner_mappings(MAKER, MODEL, FIELD_STRENGTH, "HID",
SOURCE_MAKE, SOURCE_MODEL, ID2)

imaging_protocol("NUSDAST", SUBJECTID, SZC_PROTOCOL_HIER, DATE, SCAN_ID, DATA_URI,
"SIEMENS", "VISION 1.5T", 1.5) **<-**

XnatMRSessionResource_xnat__mrSessionData(SUBJECTID, IMAGE_ID, SESSION_ID, DATE,
SCANNER, SCAN_ID, SCAN_TYPE, quarantine_status) **^**

MappingsMySQLResource_protocol_mappings(SZC_PROTOCOL_HIER, "NUSDAST", SCAN_TYPE, ID1) **^**

Concat(IMAGE_ID, "/scans/", SCAN_ID, DATA_URI)

...

SchizConnect Mediator Schema Mappings (2)

Algorithm for DX from HID assessment data:

subject_dx("HID",SUBJECTID, 'No_Known_Disorder') <-
HIDPSQLResource_nc_subjexperiment(uniqueid, tableid, owner, modtime, moduser, nc_exp_uniqueid, SUBJECTID, nc_researchgroup_uniqueid) ^
(nc_researchgroup_uniqueid IN [9612,4292]) ^ (nc_experiment_uniqueid = 9610)

subject_dx("HID",SUBJECTID, 'Mental_Disorder>Psychotic_Disorder>Schizophrenia_Broad>Schizophrenia_Strict') <-
HIDPSQLResource_nc_subjexperiment(uniqueid, tableid, owner, modtime, moduser, nc_exp_uniqueid, SUBJECTID, nc_researchgroup_uniqueid) ^
(nc_researchgroup_uniqueid = 9611) ^ (nc_experiment_uniqueid = 9610) ^
HIDPSQLResource_nc_assessmentinteger(tableid1, nc_assessmentdata_uniqueid1, scoreorder1, owner1, modtime1, moduser1, textvalue1, textnormvalue1, comments1, DATAVALUE1, datanormvalue1, storedassessmentid1, ASSESSMENTID1, SCORENAME1, scoretype1, ISVALIDATED1, isranked1, SUBJECTID, entryid1, keyerid1, raterid1, classification1, uniqueid1) ^
(ASSESSMENTID1 = 16415) ^ (SCORENAME1 = "SCID_P47") ^ (DATAVALUE1 = 3) ^ (ISVALIDATED1 = "TRUE") ^
HIDPSQLResource_nc_assessmentinteger(tableid2, nc_assessmentdata_uniqueid2, scoreorder2, owner2, modtime2, moduser2, textvalue2, textnormvalue2, comments2, DATAVALUE2, datanormvalue2, storedassessmentid2, ASSESSMENTID2, SCORENAME2, scoretype2, ISVALIDATED2, isranked2, SUBJECTID, entryid2, keyerid2, raterid2, classification2, uniqueid2) ^
(ASSESSMENTID2 = 16415) ^ (SCORENAME2 = "SCID_P53") ^ (DATAVALUE2 = 1) ^ (ISVALIDATED2 = "TRUE")

subject_dx("HID",SUBJECTID, 'Mental_Disorder>Psychotic_Disorder>Schizophrenia_Broad>Schizoaffective') <-
HIDPSQLResource_nc_subjexperiment(uniqueid, tableid, owner, modtime, moduser, nc_exp_uniqueid, SUBJECTID, nc_researchgroup_uniqueid) ^
(nc_researchgroup_uniqueid = 9611) ^ (nc_experiment_uniqueid = 9610) ^
HIDPSQLResource_nc_assessmentinteger(tableid1, nc_assessmentdata_uniqueid1, scoreorder1, owner1, modtime1, moduser1, textvalue1, textnormvalue1, comments1, DATAVALUE1, datanormvalue1, storedassessmentid1, ASSESSMENTID1, SCORENAME1, scoretype1, ISVALIDATED1, isranked1, SUBJECTID, entryid1, keyerid1, raterid1, classification1, uniqueid1) ^
(ASSESSMENTID1 = 16415) ^ (SCORENAME1 = "SCID_P53") ^ (DATAVALUE1 = 3) ^ (ISVALIDATED1 = "TRUE")

SchizConnect Mediator Query Rewriting

Using the schema mappings the SchizConnect mediator rewrites queries over the domain schema to queries over the source schemas

- Domain Query (over domain schema):
  SELECT * FROM imaging_protocol WHERE szc_protocol_hier like '%Auditory Oddball%'

- Rewritten Query (over source schemas):

(SELECT 'HID' as provenance, T6.subjectid as subjectid, T4.szc_protocol_hier as szc_protocol_hier, T6.date as img_date,
    T6.description as notes, T6.datauri as datauri, T2.maker as maker, T2.model as model, T2.field_strength as field_strength
 FROM MappingsMySQLResource_scanner_mappings T2, MappingsMySQLResource_protocol_mappings T4,
    HIDPSQLResource_nc_scannersbyscan_mview T6
 WHERE T2.source_make=T6.source_make and T2.source_model=T6.source_model and T2.source = 'HID' and
    T4.source_protocol=T6.source_protocol and T4.source = 'HID' and T4.szc_protocol_hier LIKE '%Auditory Oddball%')
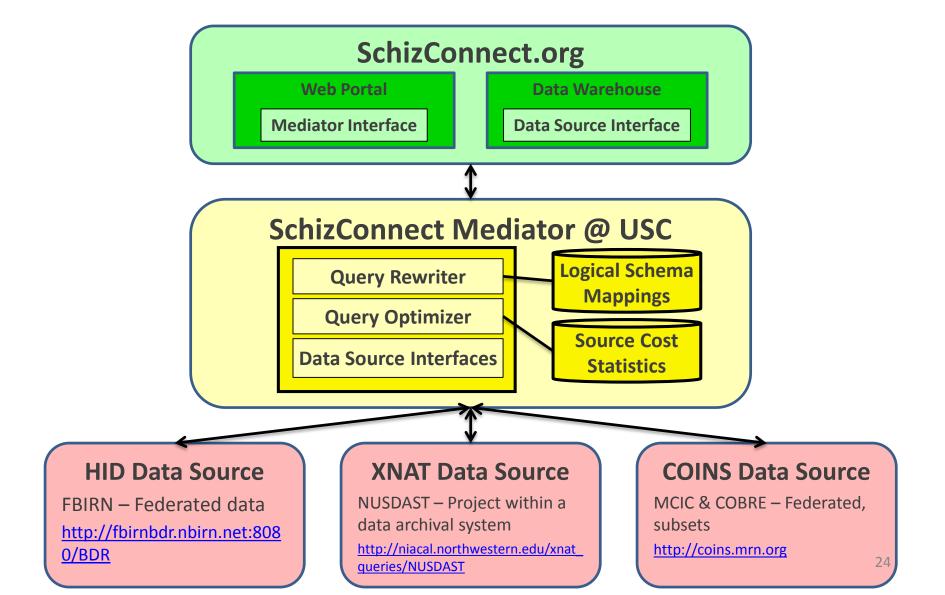UNION
(SELECT 'NUSDAST' as provenance, T10.SUBJECT_ID as subjectid, T8.szc_protocol_hier as szc_protocol_hier, T10.SCAN_DATE as img_date,
    T10.SCAN_ID as notes, Concat(T10.IMAGE_ID,'/scans/',T10.SCAN_ID) as datauri, 'SIEMENS' as maker, 'VISION 1.5T' as model,
    1.5 as field_strength
 FROM MappingsMySQLResource_protocol_mappings T8, XnatMRSessionResource_xnat__mrSessionData T10
 WHERE T8.source_protocol=T10.SCAN_TYPE and T8.source = 'NUSDAST' and T8.szc_protocol_hier LIKE '%Auditory Oddball%')
UNION
(SELECT 'COINS' as provenance, T12.ANONYMIZATION_ID as subjectid, T12.szc_protocol_hier as szc_protocol_hier,
    T12.SCAN_DATE as img_date, 'notes' as notes, T12.SERIES_ID as datauri, T12.SCANNER_MANUFACTURER as maker,
    T12.SCANNER_LABEL as model, T12.FIELD_STRENGTH as field_strength
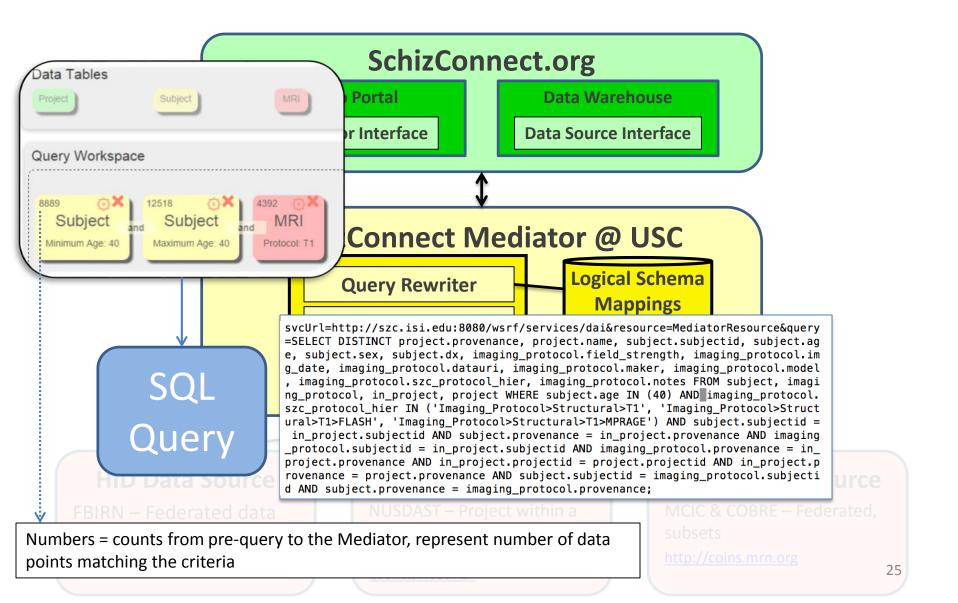 FROM COINSMySQLResource_series_v T12
 WHERE T12.szc_protocol_hier LIKE '%Auditory Oddball%')

SchizConnect Architecture & Data Flow

SchizConnect.org

Web Portal

Mediator Interface

Data Warehouse

Data Source Interface

SchizConnect Mediator @ USC

Query Rewriter

Query Optimizer

Data Source Interfaces

Logical Schema Mappings

Source Cost Statistics

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

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Query: Web Portal → Mediator

SchizConnect.org

Data Tables

| Project | Subject | MRI |

Query Workspace

| 8889 **Subject** Minimum Age: 40 | and | 12518 **Subject** Maximum Age: 40 | and | 4392 **MRI** Protocol: T1 |

Portal

Data Warehouse

or Interface

Data Source Interface

Connect Mediator @ USC

Query Rewriter

Logical Schema Mappings

SQL Query

```
svcUrl=http://szc.isi.edu:8080/wsrf/services/dai&resource=MediatorResource&query
=SELECT DISTINCT project.provenance, project.name, subject.subjectid, subject.ag
e, subject.sex, subject.dx, imaging_protocol.field_strength, imaging_protocol.im
g_date, imaging_protocol.datauri, imaging_protocol.maker, imaging_protocol.model
, imaging_protocol.szc_protocol_hier, imaging_protocol.notes FROM subject, imagi
ng_protocol, in_project, project WHERE subject.age IN (40) AND imaging_protocol.
szc_protocol_hier IN ('Imaging_Protocol>Structural>T1', 'Imaging_Protocol>Struct
ural>T1>FLASH', 'Imaging_Protocol>Structural>T1>MPRAGE') AND subject.subjectid =
 in_project.subjectid AND subject.provenance = in_project.provenance AND imaging
_protocol.subjectid = in_project.subjectid AND imaging_protocol.provenance = in_
project.provenance AND in_project.projectid = project.projectid AND in_project.p
rovenance = project.provenance AND subject.subjectid = imaging_protocol.subjecti
d AND subject.provenance = imaging_protocol.provenance;
```

HID Data Source

FBIRN – Federated data

NUSDAST – Project within a

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

Numbers = counts from pre-query to the Mediator, represent number of data points matching the criteria

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Query: Mediator →Data sources
In Parallel

SchizConnect.org
Web Portal
Mediator Interface
Data Warehouse
Data Source Interface

SchizConnect Mediator @ USC

Query Rewriter

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Data Source Interfaces

Logical Schema Mappings

Source Cost Statistics

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

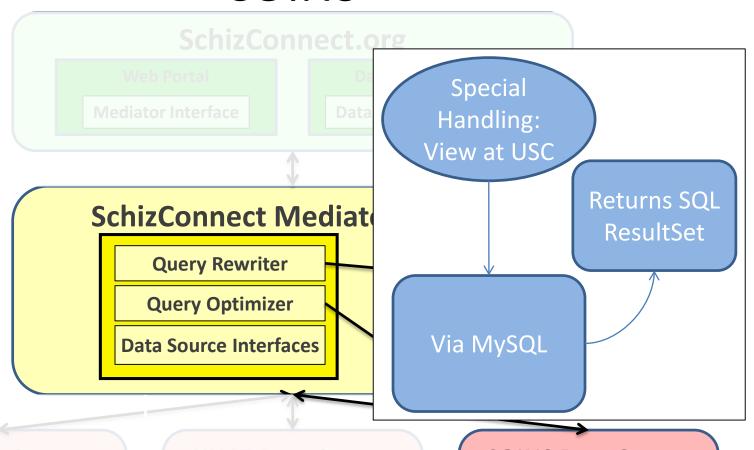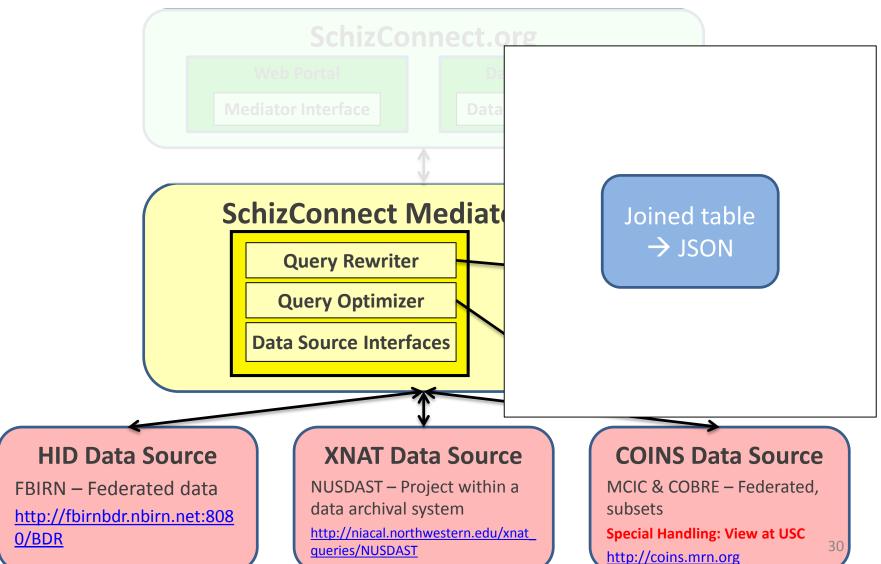NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

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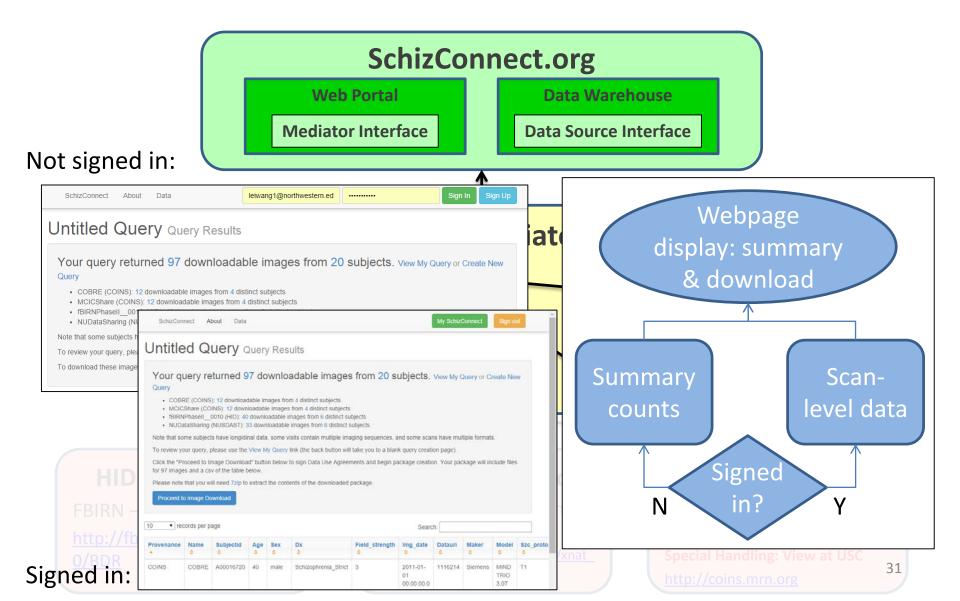# Query: Mediator → Data sources HID

Query: Mediator → Data sources XNAT

Query: Mediator →Data sources COINS

SchizConnect.org

Web Portal — Mediator Interface

SchizConnect Mediator
- Query Rewriter
- Query Optimizer
- Data Source Interfaces

Special Handling: View at USC

Returns SQL ResultSet

Via MySQL

HID Data Source
FBIRN – Federated data
http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source
NUSDAST – Project within a data archival system
http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source
MCIC & COBRE – Federated, subsets
Special Handling: View at USC
http://coins.mrn.org

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Query: Mediator →Data sources Join

SchizConnect.org

Web Portal

Mediator Interface

SchizConnect Mediator

Query Rewriter

Query Optimizer

Data Source Interfaces

Joined table → JSON

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

Special Handling: View at USC

http://coins.mrn.org
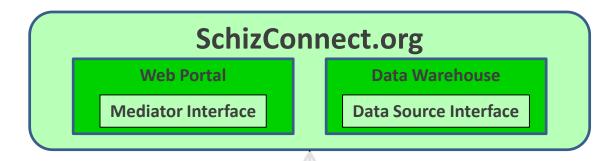
Query return: Mediator → Web Portal

Not signed in:

Signed in:
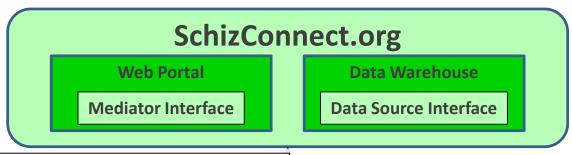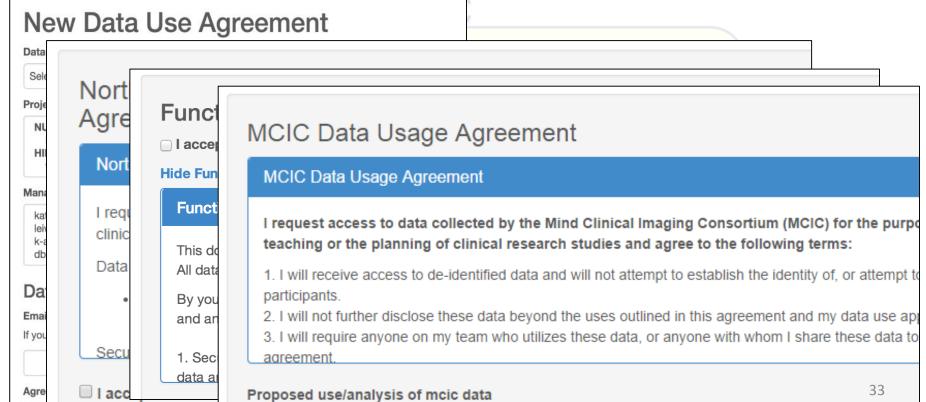
Data download: DUA

SchizConnect.org

Web Portal

Mediator Interface

Data Warehouse

Data Source Interface

- SchizConnect DUA is at the top of all DUAs – always mandatory
- Individual Data Source DUA – optional
  - One time for data source admin
  - Admin creates DUA form on SchizConnect – once only
  - DUA displayed on SchizConnect.org web portal
  - May need user-input info (such as institution, purpose etc)
- User to check boxes for agreeing – once only
- DUA pdf is viewable
- DUA pdf is emailed to user & data source admin
- Data download button activated

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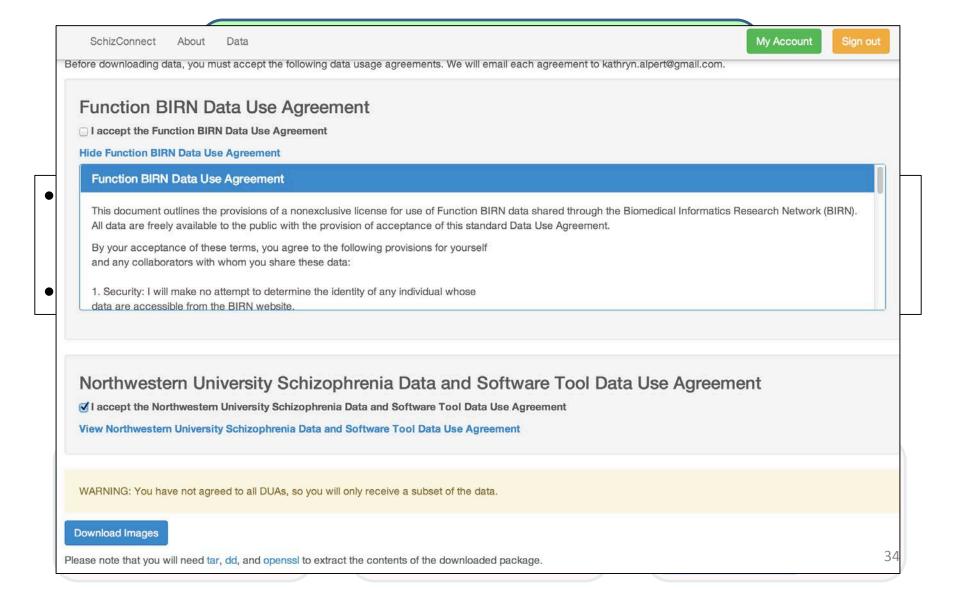
Data download: DUA

Data download: DUA

Data download: HID

SchizConnect.org

Web Portal

Mediator Interface

Data Warehouse

Data Source Interface

Data gridFTP

- SchizConnect.org interact with HID directly, without going through the Mediator
- Ensure that HID DUA is signed
- Download scans with HID gridFTP script (in background) on SchizConnect server
- Create a 7z archive of all HID scans (broken into 10GB "chunks" for quick download)

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

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Data download: XNAT

SchizConnect.org

Web Portal

Mediator Interface

Data Warehouse

Data Source Interface

Data API

- SchizConnect.org interact with XNAT directly, without going through the Mediator
- Ensure that XNAT DUA is signed
- Download scans with XNAT REST API (in background) on SchizConnect server
- Create a 7z archive of all XNAT scans (broken into 10GB "chunks" for quick download)

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

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Data download: COINS

SchizConnect.org

Web Portal

Mediator Interface

Data Warehouse

Data Source Interface

Data HTTP

- SchizConnect.org interact with COINS directly, without going through the Mediator
- Ensure that COINS DUA is signed
- Download scans with HTTP (in background) on SchizConnect server
- Create a 7z archive of all COINS scans (broken into 10GB "chunks" for quick download)

HID Data Source

FBIRN – Federated data

http://fbirnbdr.nbirn.net:8080/BDR

XNAT Data Source

NUSDAST – Project within a data archival system

http://niacal.northwestern.edu/xnat_queries/NUSDAST

COINS Data Source

MCIC & COBRE – Federated, subsets

http://coins.mrn.org

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Data download: Email

- Wait for all scans to finish downloading from all data sources (they may take

-

-

-

Dear Lei Wang,

The images you requested in query 40 + T1 are available for download on SchizConnect.

Please click each link below to download the data. These links will expire on September 29, 2014 at 10:22am Central Time.

- COINS Images (1 of 1): schizconnect_COINS_images_20140915094447_3.7z.001 (395 MB)
- HID Images (1 of 1): schizconnect_HID_images_20140915094447_3.7z.001 (158 MB)
- NUSDAST Images (1 of 1): schizconnect_NUSDAST_images_20140915094447_3.7z.001 (333 MB)
- Meta-Data: schizconnect_metaData_20140915094447_3.csv (17.4 KB)

Once you have downloaded *all* 7z files, you can extract the archives by running the commands below or with the 7zip GUI.

- 7z x schizconnect_COINS_images_20140915094447_3.7z.001
- 7z x schizconnect_HID_images_20140915094447_3.7z.001
- 7z x schizconnect_NUSDAST_images_20140915094447_3.7z.001

Please note: if you have multiple 7z files from a given data source (i.e., extensions like *7z.001, *7z.002, etc.), they are all part of a single archive. You only need to run the extraction on the *.7z.001 files to extract all the images in your package.

If you do not have the 7zip utility, you can download it from the 7zip website.
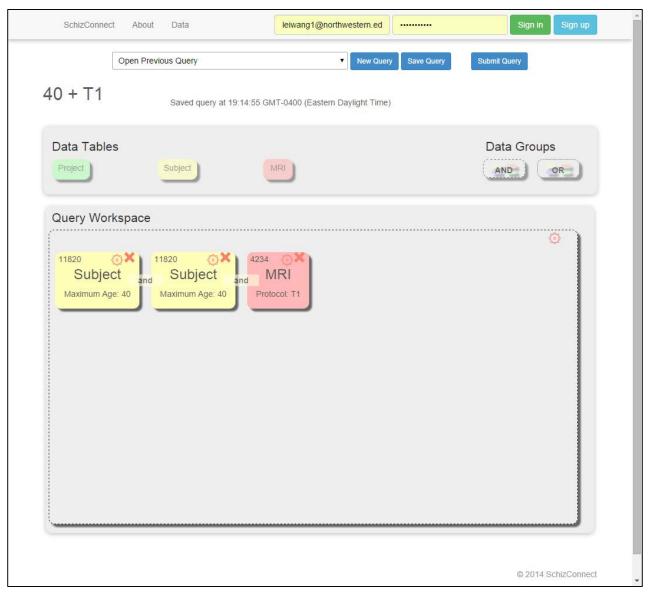
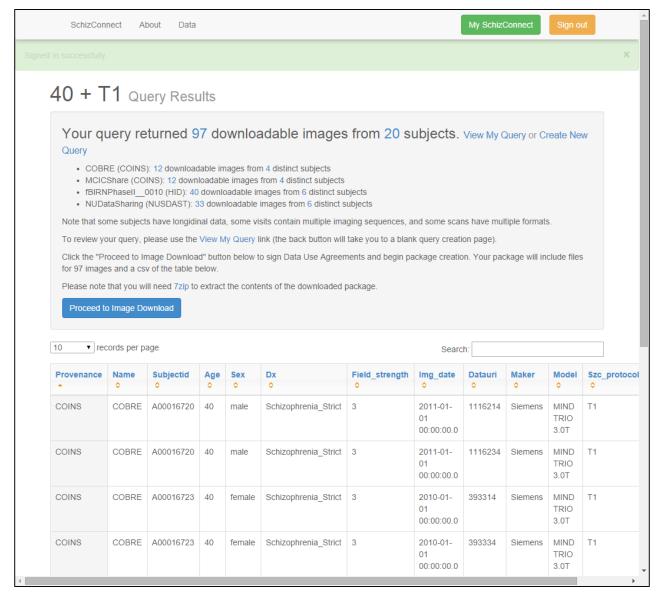Please reply to this email with any issues.

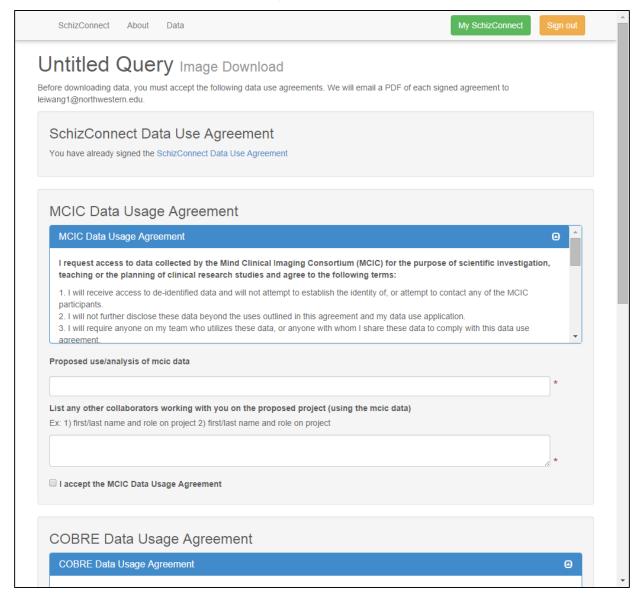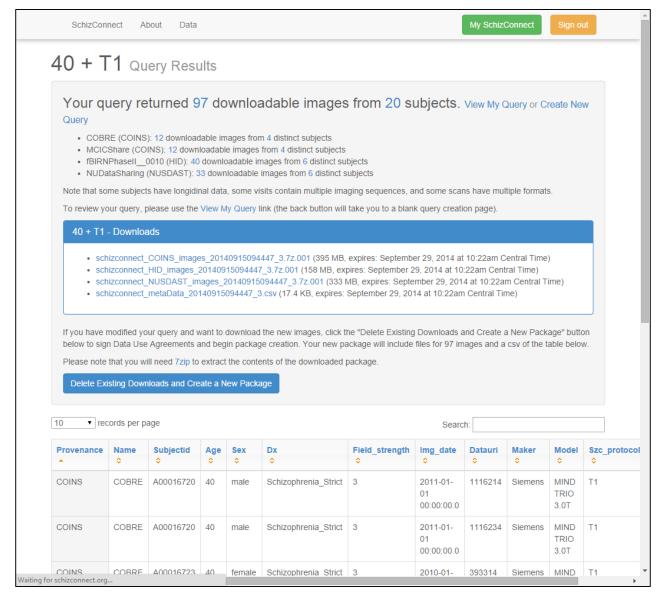Regards,

The SchizConnect Team

III. Demonstration

- Drag-n-drop query GUI
- Two-phase return
  - Summary counts without signing in
  - Subject-level data after signing in
- DUA
- Download
- Example queries for schizophrenia research

40 + T1

40 + T1

leiwang1@northwestern.ed   ••••••••••   Sign in   Sign up

40 + T1 Query Results

Your query returned 97 downloadable images from 20 subjects. View My Query or Create New Query

- COBRE (COINS): 12 downloadable images from 4 distinct subjects
- MCICShare (COINS): 12 downloadable images from 4 distinct subjects
- fBIRNPhaseII__0010 (HID): 40 downloadable images from 6 distinct subjects
- NUDataSharing (NUSDAST): 33 downloadable images from 6 distinct subjects

Note that some subjects have longidinal data, some visits contain multiple imaging sequences, and some scans have multiple formats.

To review your query, please use the View My Query link (the back button will take you to a blank query creation page).

To download these images and/or view summary data, please Sign In.

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40 + T1

40 + T1

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40 + T1

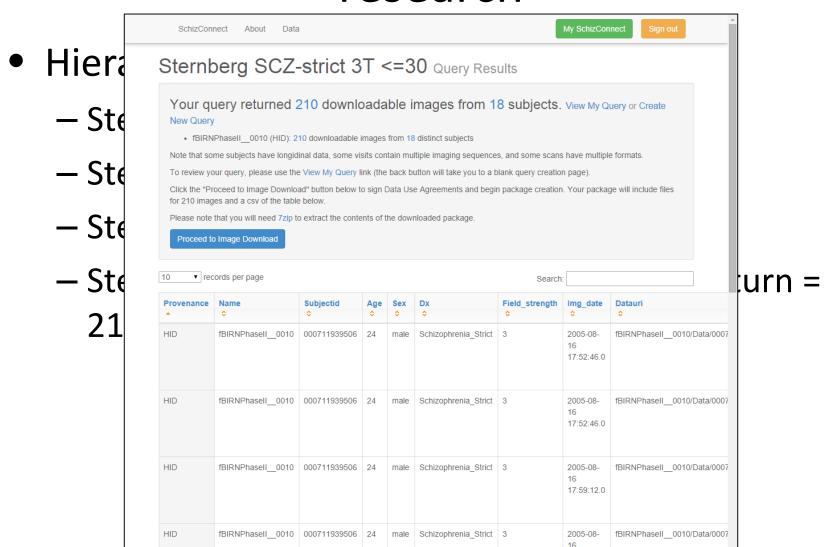# Example queries for schizophrenia research

- Hierarchical search
  - Sternberg & SCZ-broad: return = 1,462
  - Sternberg & SCZ-broad & 3T: return = 841
  - Sternberg & SCZ-strict & 3T: return = 489
  - Sternberg & SCZ-strict & 3T & age <=30: return = 210

Example queries for schizophrenia research

- Hiera
  - Ste
  - Ste
  - Ste
  - Ste   turn = 21

Example queries for schizophrenia research

- Hiera
  - Ste
  - Ste
  - Ste
  - Ste   turn = 21

Example queries for schizophrenia research

- 40 + T1
- Male <= 40 yr 1.5T T1
- Sternberg SCZ-strict 3T <=30
- RESTing BP+CON
- T1 (SCZ+CON) 20-50 3T
- SCZ+CON 1.5T T1
- ALL Images

IV. Next Steps

- Dissemination
- Enhanced interface for more complex queries
- Additional variables
- Additional data types
- Additional datasets/subjects
- Additional data sources

Dissemination

- Paper
- Presentations
  - OHBM 2013 ("Sources of actual imaging data for mega- or meta-analyses," J Turner)
  - ACNP 2014 (Submitted)
  - ICOSR 2015 (To be submitted)
- Big Data Tool R01
  - 1R01EB020062-01, Neurodegenerative and Neurodevelopmental Subcortical Shape Diffeomorphometry (Miller, M, PI)

Additional Variables

- Symptom domains
  - PANS
  - SAPS/SANS
- Neuropsychological domains
  - WM (Working Memory)
  - EM (Episodic Memory)
  - EF (Executive Function)

Additional Data Types

	NU	FBIRN	MRN
Database	XNAT	HID	COINS
Additional types			
	-	Resting fMRI Task fMRI DTI	Resting fMRI Task fMRI DTI
To be released			
New subjects	Structural MRI Resting fMRI Task fMRI DTI	Structural MRI Resting fMRI Task fMRI DTI	Structural MRI Resting fMRI Task fMRI DTI
Timeline	Y2	Y3	Y3-Y4

Additional Datasets

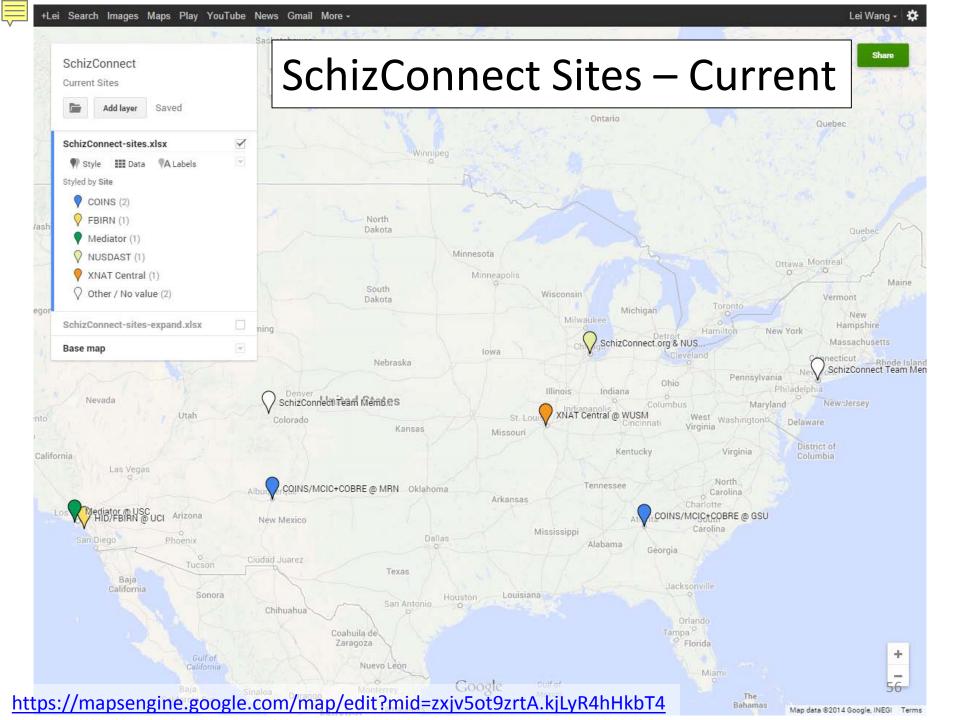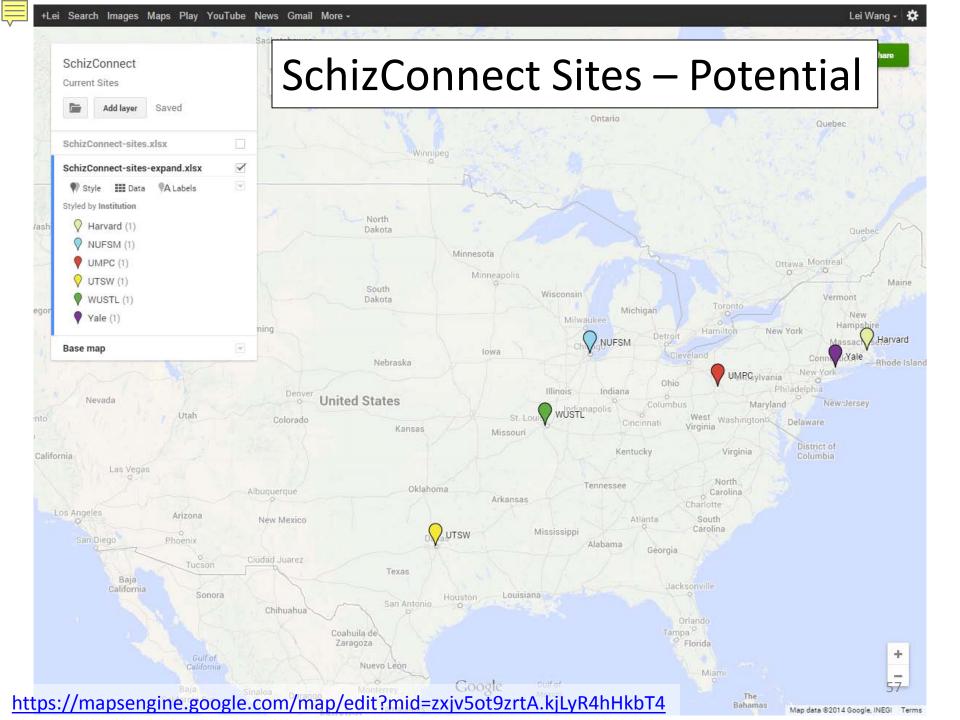|	NU	FBIRN	MRN
Database	XNAT	HID	COINS
# Subjects	**Currently available**		
	570 (451 with 1.5T)	237 (Phase II)	432 (213 MCIC 219 COBRE)
	To be released		
New subjects	130 (3T)	400 (Phase 3)	200 (R01)
Timeline	Y2	Y3	Y3-Y4

Additional Data Sources

- Up to 3 sites
- At least one site with a substantially different database architecture than XNAT, COINS, HID
- Willingness to participate
- Sample size
- Completeness and quality of data
- Commitment to keeping their database publicly available on an ongoing basis to the research community

Additional Data Sources

- 6 sites expressed interest:

1	Konasale Prasad at UMPC	prasadkm@upmc.edu
2	Carol Tamminga at UTSW	Carol.Tamminga@utsouthwestern.edu
3	Ty Cannon at UCLA, now Yale	cannon@psych.ucla.edu
4	Herb Meltzer at Vanderbilt, now NU	herbert.meltzer@Vanderbilt.Edu
5	Deanna Barch at WUSM	dbarch@artsci.wustl.edu
6	Lynn E. DeLisi at Harvard	DeLisi76@AOL.com

SchizConnect Sites – Current

https://mapsengine.google.com/map/edit?mid=zxjv5ot9zrtA.kjLyR4hHkbT4

SchizConnect Sites – Potential

https://mapsengine.google.com/map/edit?mid=zxjv5ot9zrtA.kjLyR4hHkbT4

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  - HID/FBIRN @ UCI: David Keator, Steven G. Potkin
  - COINS/MCIC+COBRE @ MRN: Vince Calhoun, Margaret King, Drew Landis, @ GSU: Jessica A. Turner
  - XNAT Central/NUSDAST @ NU: Kathryn I. Alpert, Alex Kogan