CCNA LORIS - Data Dissemination

Oct. 21st Workshop

Zia Mohades (CCNA LORIS Data Manager)

Jessica Callegaro (CCNA LORIS Developer)

CCNA
Canadian Consortium
on Neurodegeneration
in Aging

CCNV
Consortium canadien en
neurodégénérescence
associée au vieillissement

LORIS

INTRO – LORIS Overview

frontiers in Neuroinformatics

TECHNOLOGY REPORT
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National Neuroinformatics Framework for Canadian Consortium on Neurodegeneration in Aging (CCNA)

Zia Mohaddes[1,2†], Samir Das[1,2†], Rida Abou-Haidar[1,2], Mouna Safi-Harab[1,2], David Blader[1,2], Jessica Callegaro[1,2], Charlie Henri-Bellemare[1,2], Jingla-Fri Tunteng[1,2], Leigh Evans[1,2], Tara Campbell[1,2], Derek Lo[1,2], Pierre-Emmanuel Morin[3], Victor Whitehead[4], Howard Chertkow[4,5] and Alan C. Evans[1,2]*

[1] McGill Centre for Integrative Neuroscience, Montreal, QC, Canada, [2] Montreal Neurological Institute, Montreal, QC, Canada, [3] Centre de recherche de l'Institut Universitaire de Gériatrie de Montréal, Montreal, QC, Canada, [4] Lady Davis Institute, Montreal, QC, Canada, [5] Department of Neurology and Neurosurgery, McGill University, Montreal, QC, Canada

Goal:

- strengthen research groups to better manage the causes,detection, and treatment of AD.
- Help Advance findings and understanding of AD

Longitudinal

Online

Research &

Imaging

System

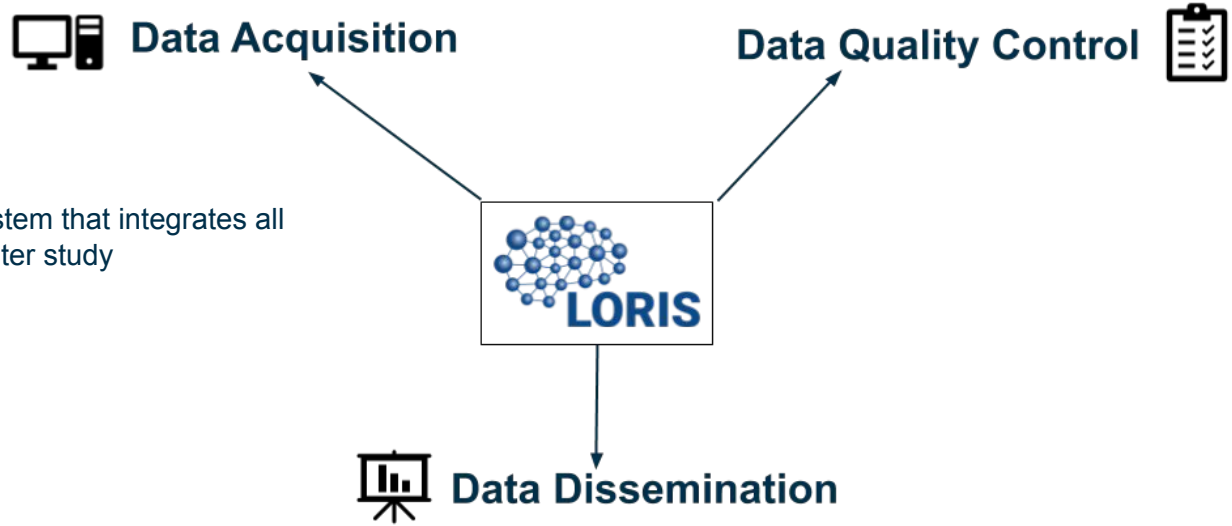
"...is a **modular** and **extensible web-based** data management system that integrates all aspects of a multi-center study:

From **heterogeneous** data acquisition (imaging, clinical, behavior, genetics) to storage, processing and ultimately dissemination."

LORIS

INTRO – LORIS Overview

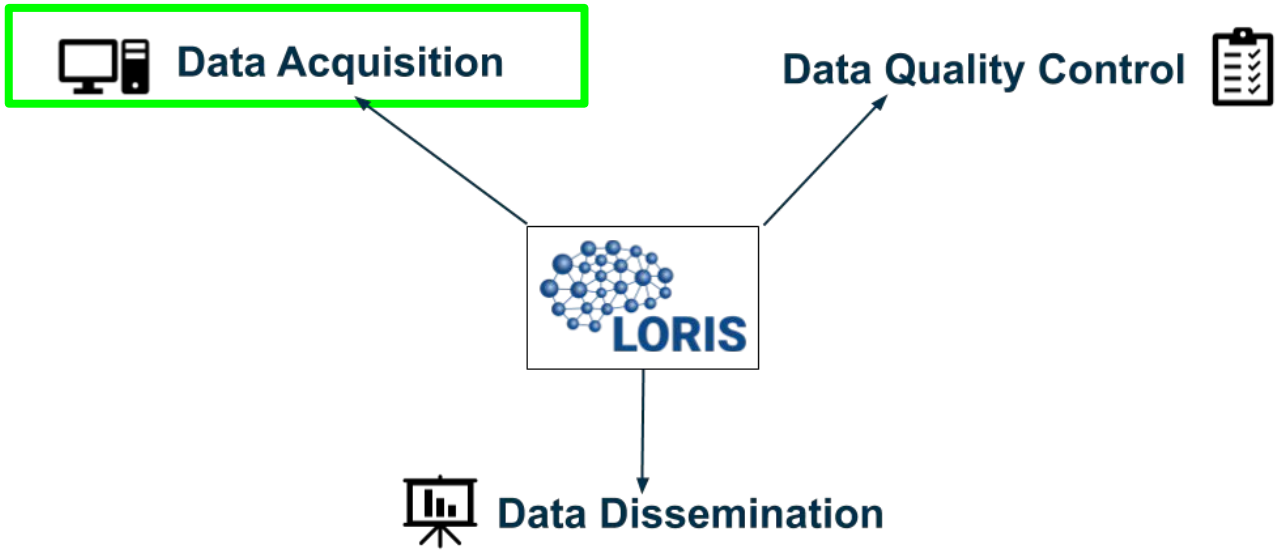
LORIS: **Heterogeneous Data Management**



data management system that integrates all aspects of a multi-center study

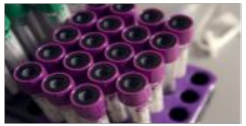
INTRO – Data Acquisition

LORIS: **Heterogeneous Data Management**



INTRO – Data Acquisition

Biosample



Behavioural/Neuropsych

Patient Profile:	Percentile Range		
	Standard Score Range		
Domain Scores	Subject Score	Standard Score	Percentile
Neurocognition Index (NCI)	NA	85	16
Composite Memory	102	103	58
Verbal Memory	51	93	32
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Processing Speed	48	79	8
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Psychomotor Speed	174	93	32

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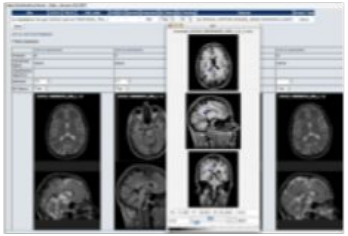
Imaging



Genetics

Uploading/collecting heterogeneous data-sets
(imaging, clinical, behavior, genetics)

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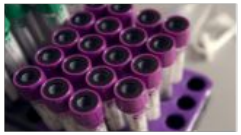
INTRO – Data Acquisition – BVL

Biosample



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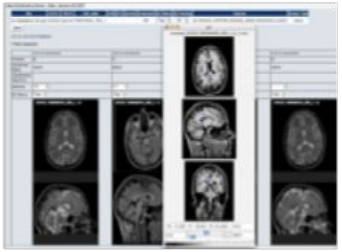
Imaging



Genetics

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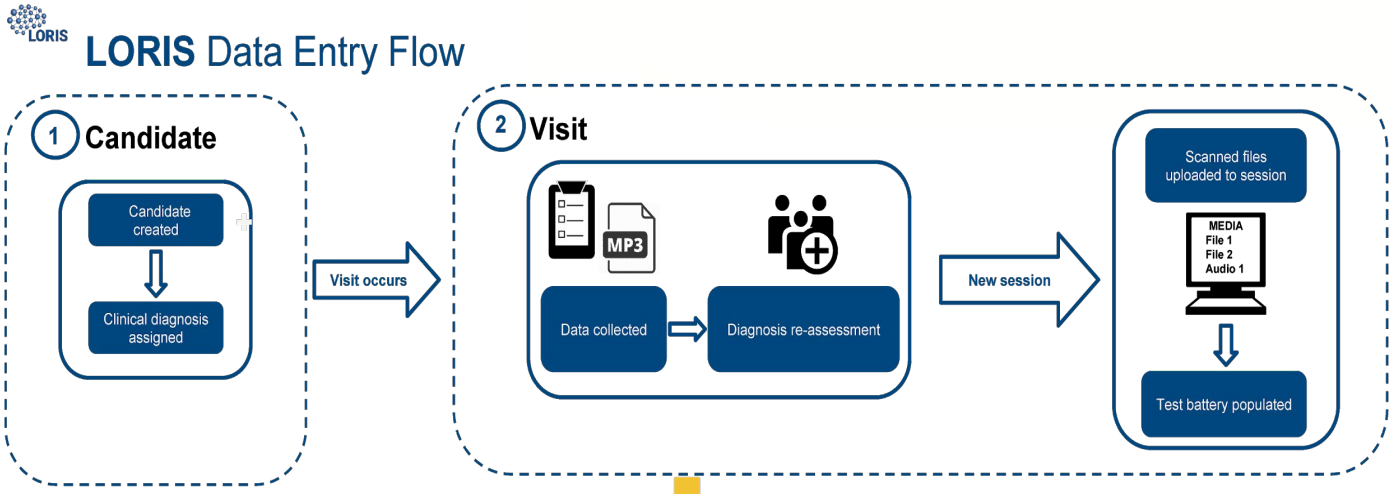
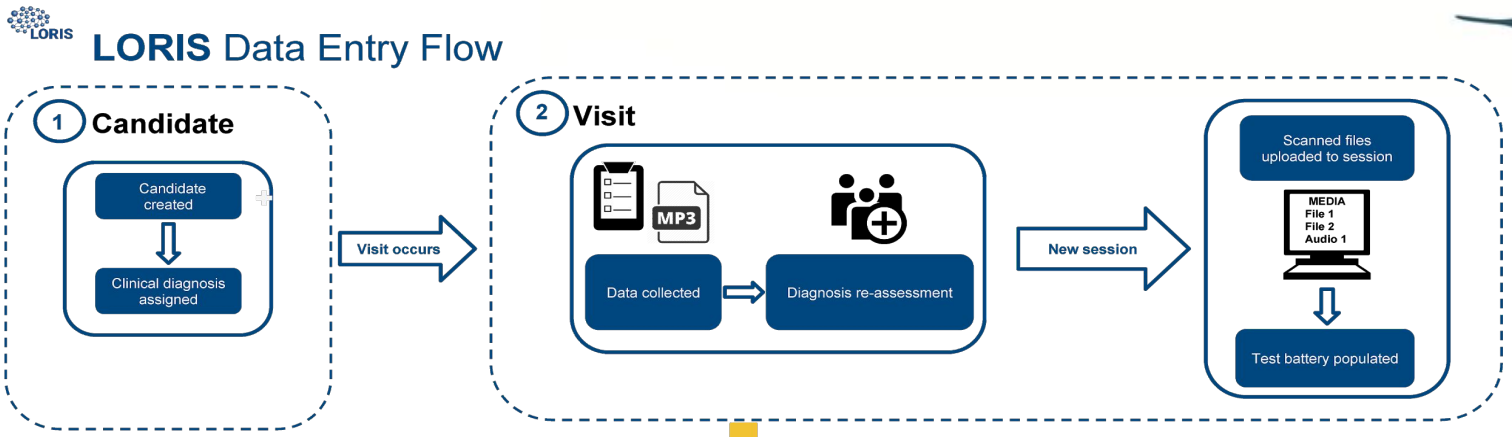
INTRO – Data Acquisition – BVL



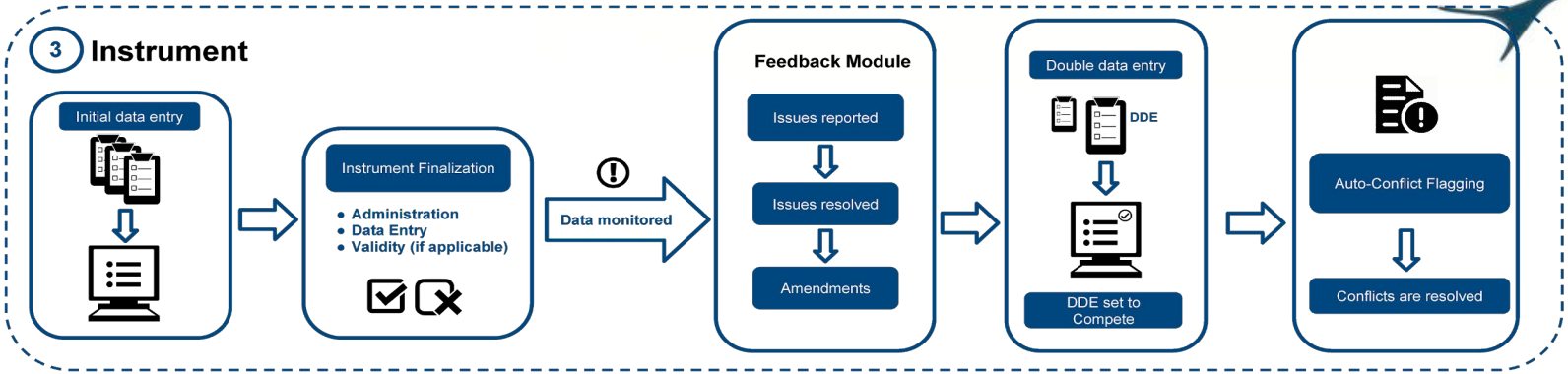
- Registration of a candidate
- Creation of a visit
- Uploading the Scanned copy of the assessment/Instrument

INTRO – Data Acquisition – Stats



Candidates (total)	Candidates (CND only)	Sites	Configured Timepoints	Cohorts (and sub-studies)
1423	**1115**	**61 (22 of which are imaging sites)**	**39**	**22**

INTRO – Data Acquisition – BVL



- Repeated for all the instruments at the given visit
- Requirement for setting the entire visit to approval and uploading to DQT

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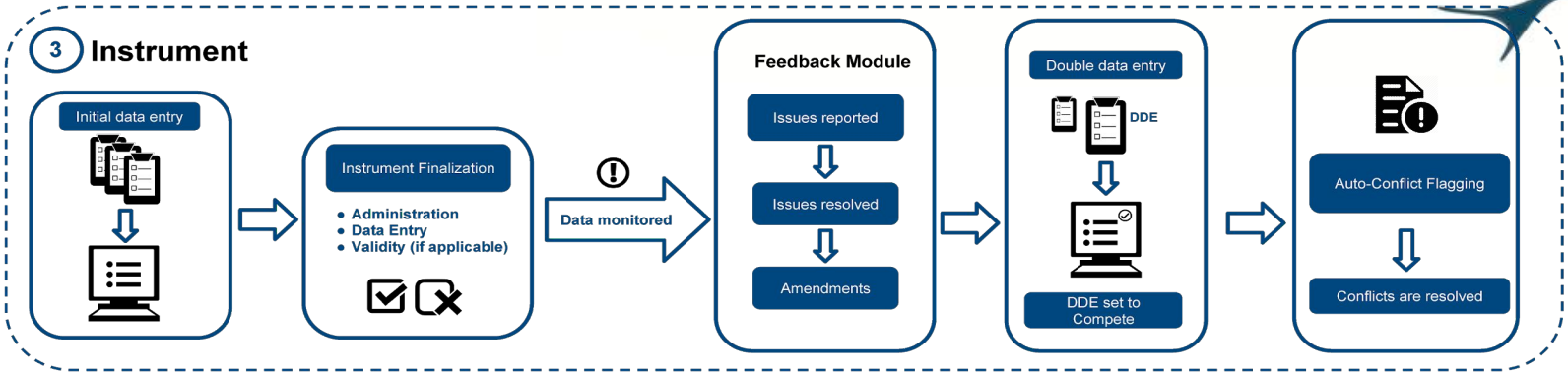
INTRO – Data Acquisition – Stats



Instruments /Forms Coded	Fields	Candidates with Baseline Visits Started	Candidates with Baseline Visit Completed	Candidates with Follow Up Visit Started	Candidates with Follow Up Visit Completed
247 (165 translated)	**12 506**	**1339 (out of 1423)**	**413(out of 1423)**	**865**	**382**

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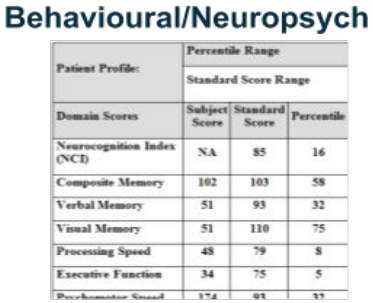
INTRO – Data Acquisition – Biosample



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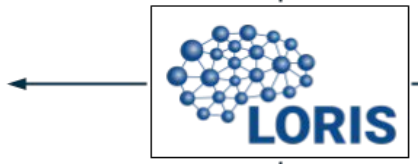

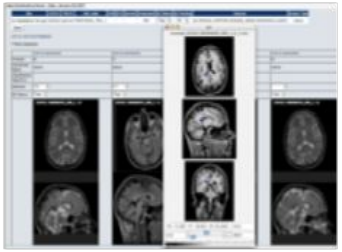

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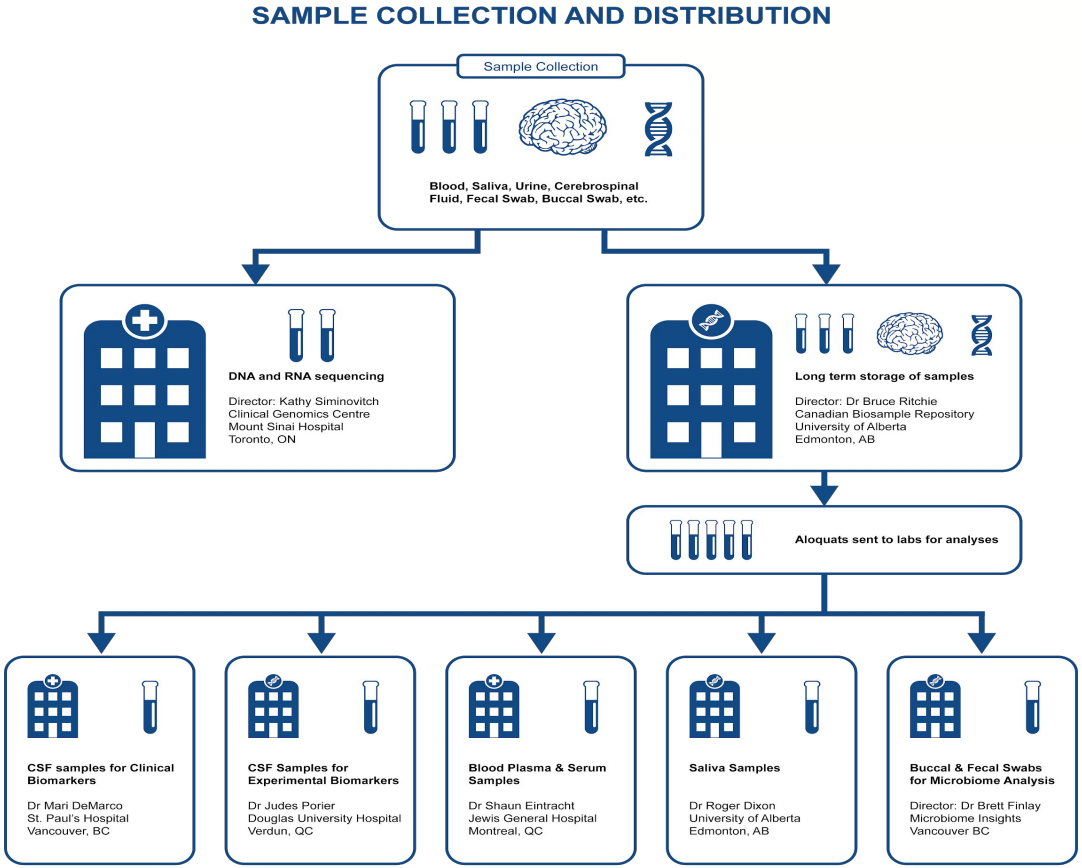

LORIS

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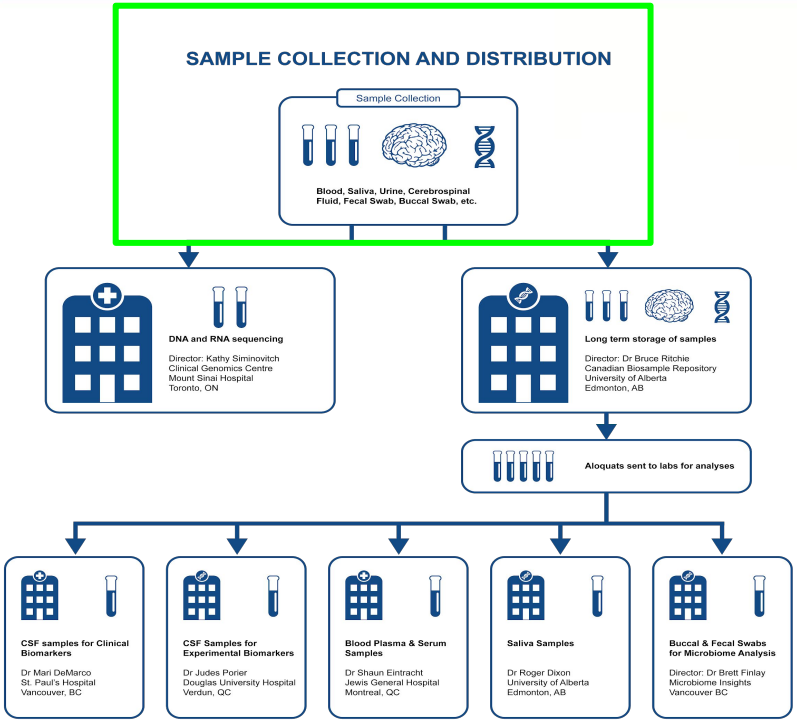

- Biobanking tool/module to import and track the collection process
- Tracking tool to streamline interaction with Canadian Biosample Repository (CBSR) Database
- Allow import of analyzed and processed data

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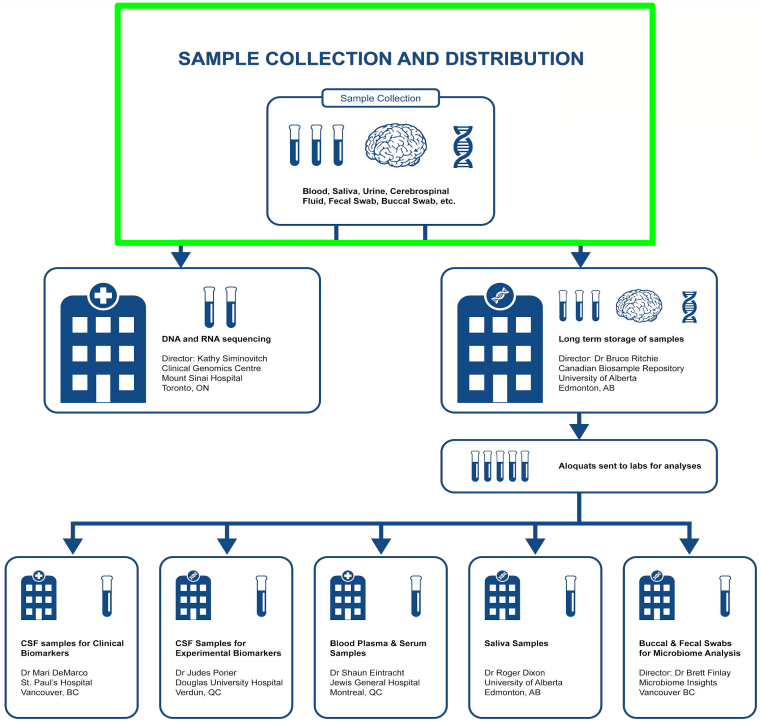
INTRO – Data Acquisition – Biosample



	Blood	CSF	Saliva	Buccal	Urine	Fecal
Raw	**1014**	**125**	**1072**	**767**	**1037**	**633**

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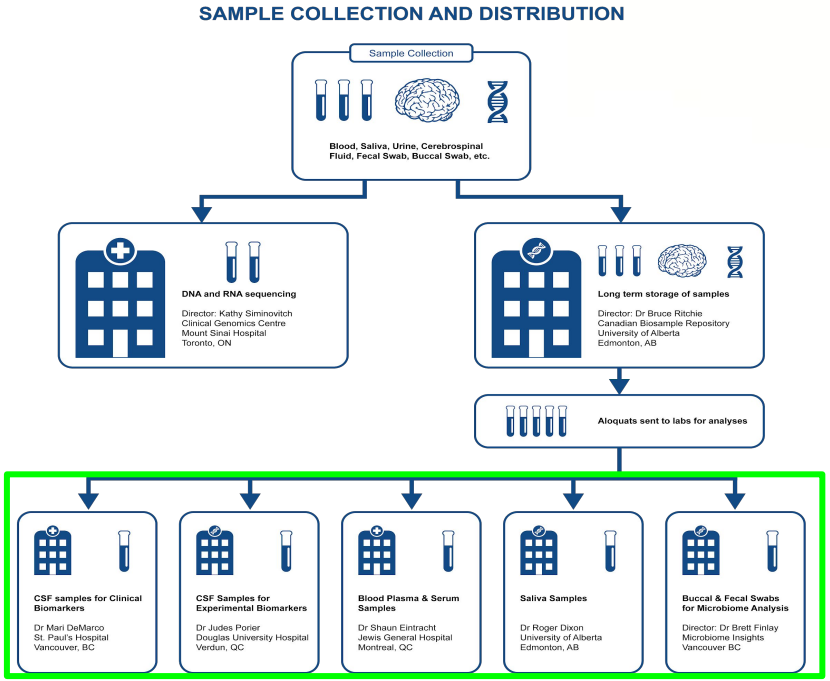
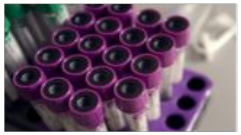


	Blood	CSF	Saliva	Buccal	Urine	Fecal
Raw	**1014**	**125**	**1072**	**767**	**1037**	**633**
Analysis	**313**	**72**	**-**	**-**	**-**	**-**

INTRO – Data Acquisition – Imaging

Biosample



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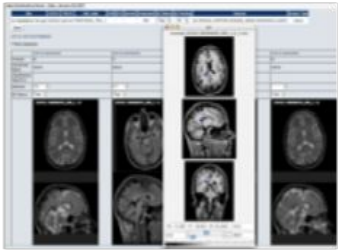

Genetics

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INTRO – Data Acquisition – Imaging

1 hour acquisition to acquire scans for different modalities

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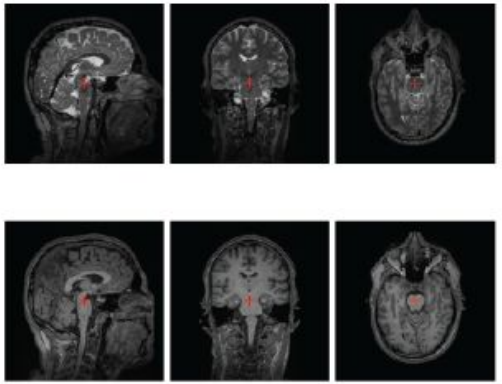
INTRO – Data Acquisition – Imaging

Scout	3D T1 Sagittal	PD/T2 Axial	FLAIR Axial	T2* Axial	DTI 30 dirs	BOLD Resting
	7 mins	5 mins	7 mins	5 mins	6 mins	11 mins

aces / DICOM_anonymizer

MRI scans are anonymized using the DICOM Anonymizer tool

Anonymized scans are uploaded to LORIS using the MRI Upload tool



Scans are viewable online through Brainbrowser

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INTRO – Data Acquisition – Imaging

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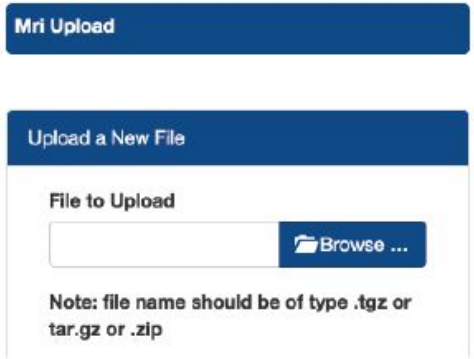

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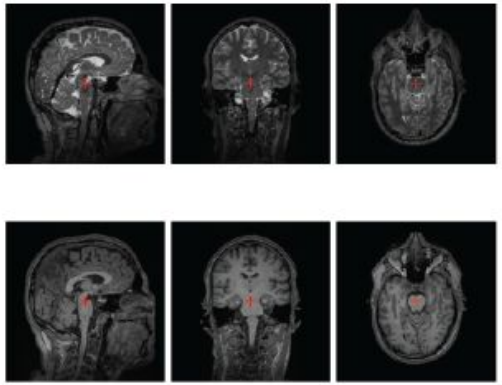

Scans are viewable online through Brainbrowser

Subject Scans Uploaded	Phantom Scans Uploaded	Modalities	Scans Undergone QC (phantoms + subjects)	Scans Passed QC (phantoms + subjects)
1103	228	11	1140	1053

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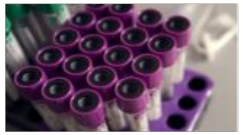
INTRO – Data Acquisition – Genetics

Biosample



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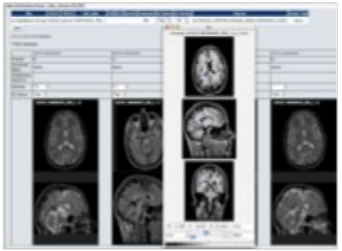

Genetics

Work in Progress

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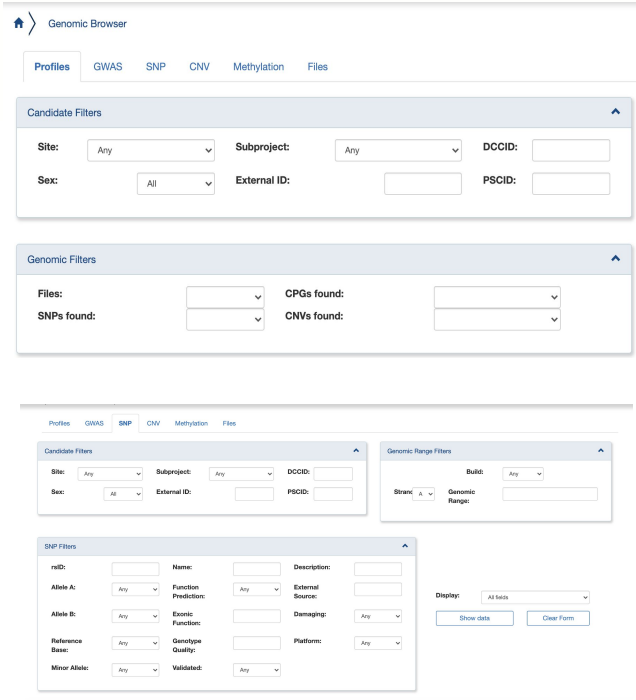
INTRO – Data Acquisition – Genetics

- Samples Genotyped at the University of Toronto
- Sequencing on an IlluminaMiSeq platform with a NeuroX or Affymetrix UK Biobank chip
- Aligned, annotated and variant calls at the analysis site

LORIS

INTRO – Data Acquisition – Genetics

- Genotyped at the University of Toronto
- Sequencing on an IlluminaMiSeq platform with a NeuroX or Affymetrix UK Biobank chip
- Aligned, annotated and variant calls at the analysis site
- **Storage of raw and processed files/genetic data in LORIS**



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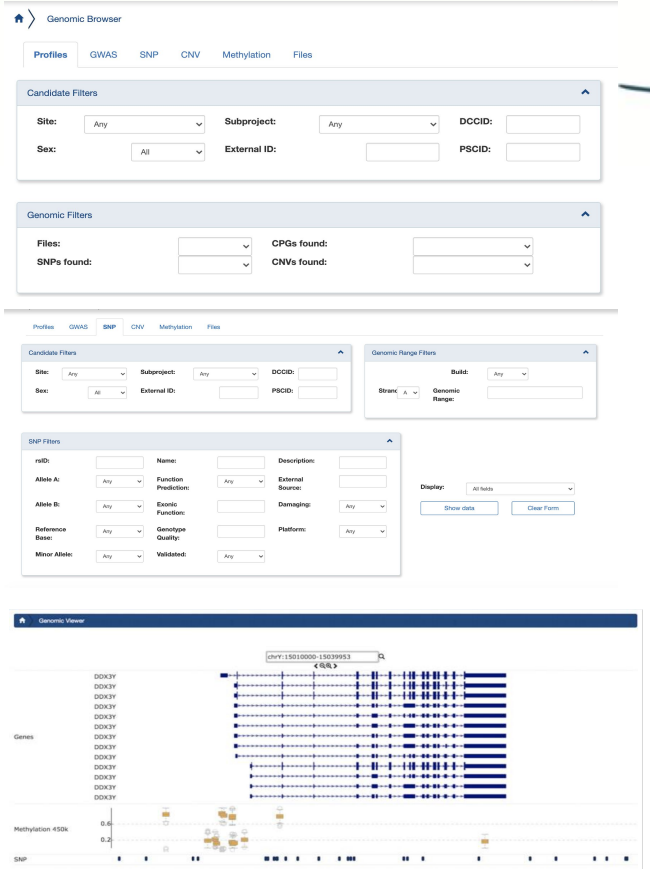
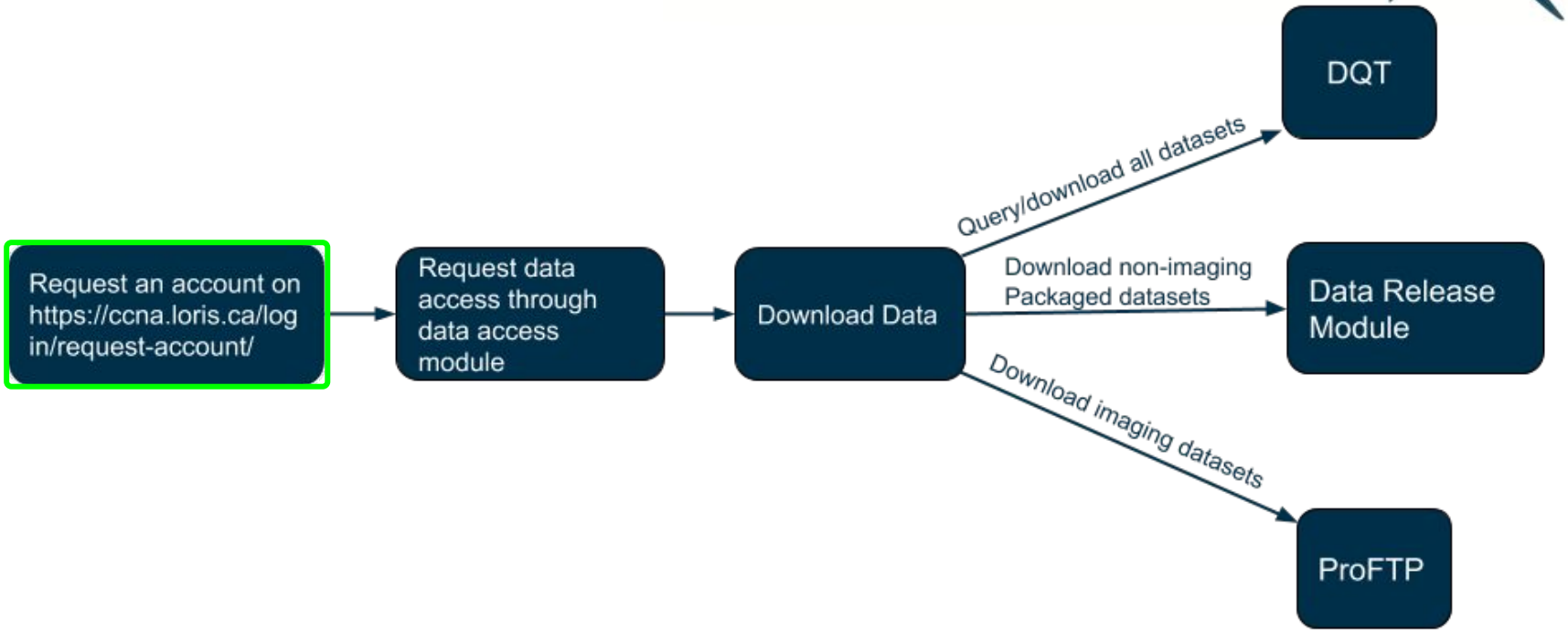
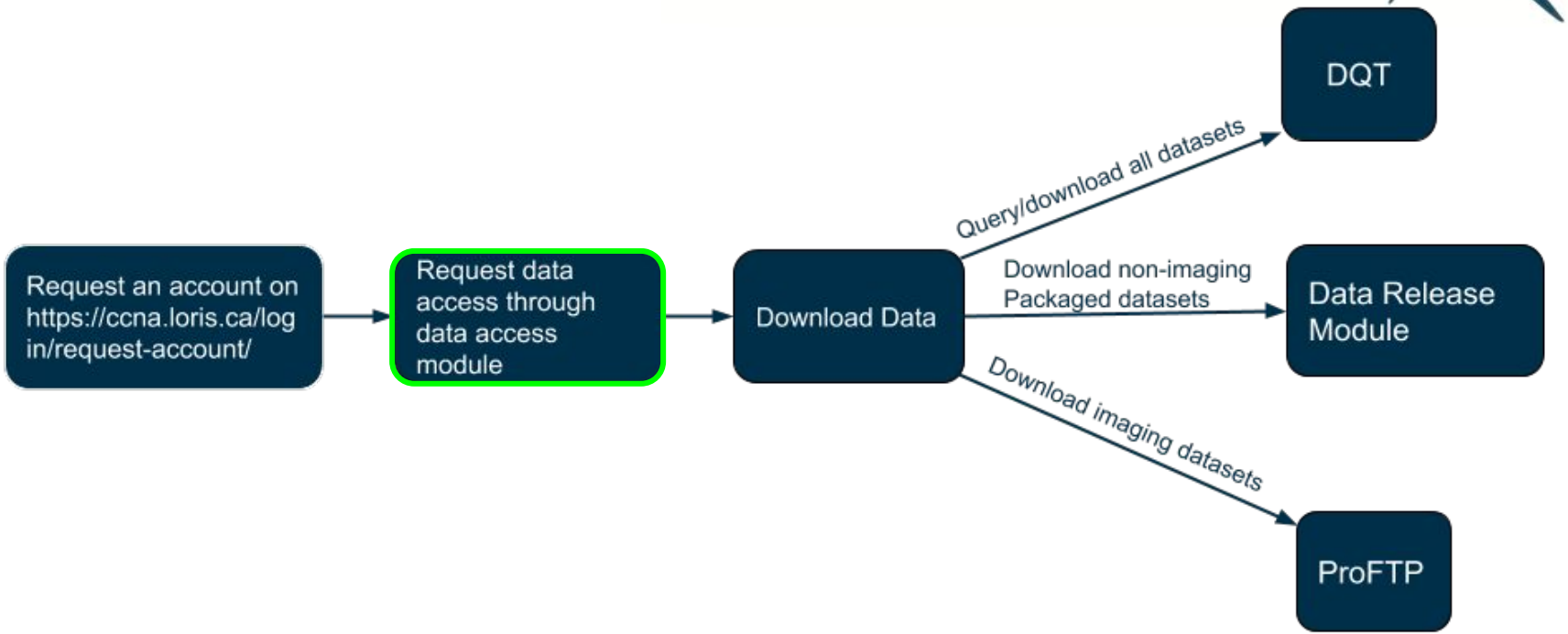
- Genotyped at the University of Toronto
- Sequencing on an IlluminaMiSeq platform with a NeuroX or Affymetrix UK Biobank chip
- Aligned, annotated and variant calls at the analysis site
- Storage of raw and processed files in LORIS
- **To view/QC through Genomic and SNP browser**



Request An Account



Request Data Access



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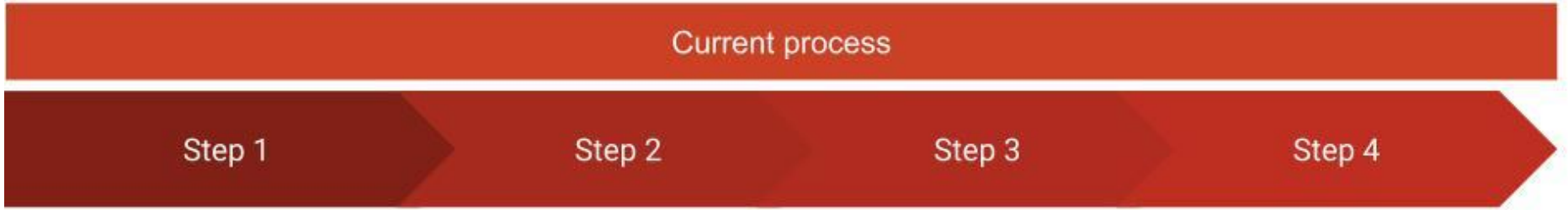

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Request Data Access Module

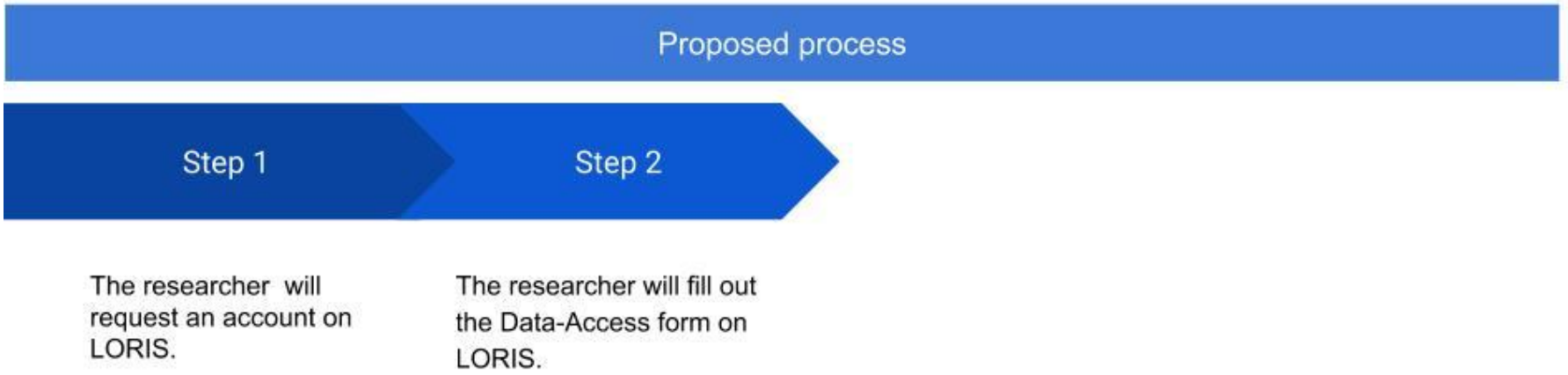
Data Access module was designed to facilitate the process of both requesting and granting access to data

Proposed process

Step 1

The researcher will request an account on LORIS.

Request Data Access Module



Request Data Access Module

Administrative information

Name*

Affiliation:*

Your status:

Address:

Street:

City:

Province:

Postal Code:

Email:*

Phone number:

Type of data requested

- [ ] Screening/Clinical/Behavioural

  Individual test/elements (optional):

- [ ] Neuropsychological

  Individual test/elements (optional):

- [ ] MRI

  Individual test/elements (optional):

- [ ] Biomarker results

  Individual test/elements (optional):

Submit Reset

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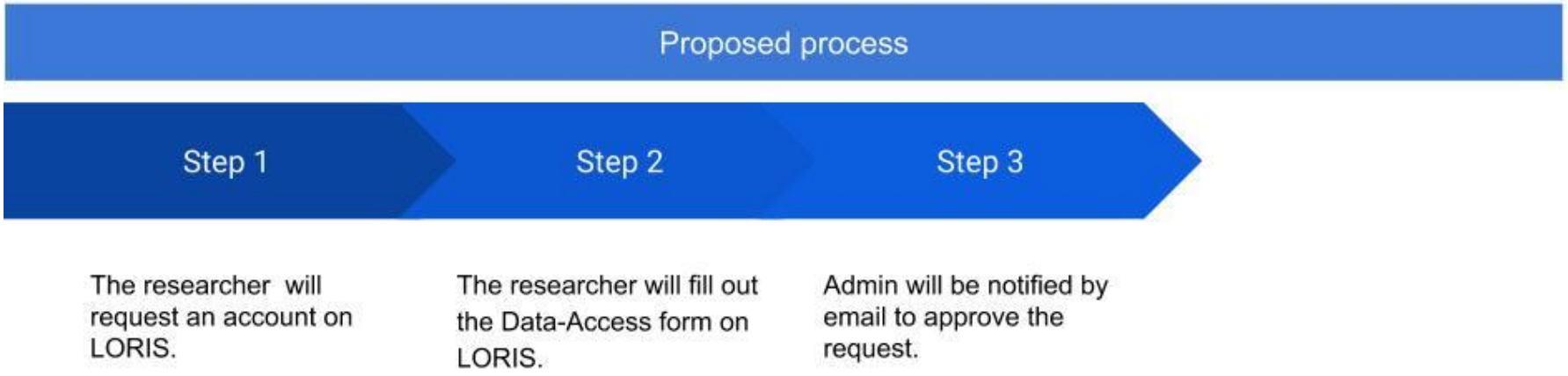
Request Data Access Module



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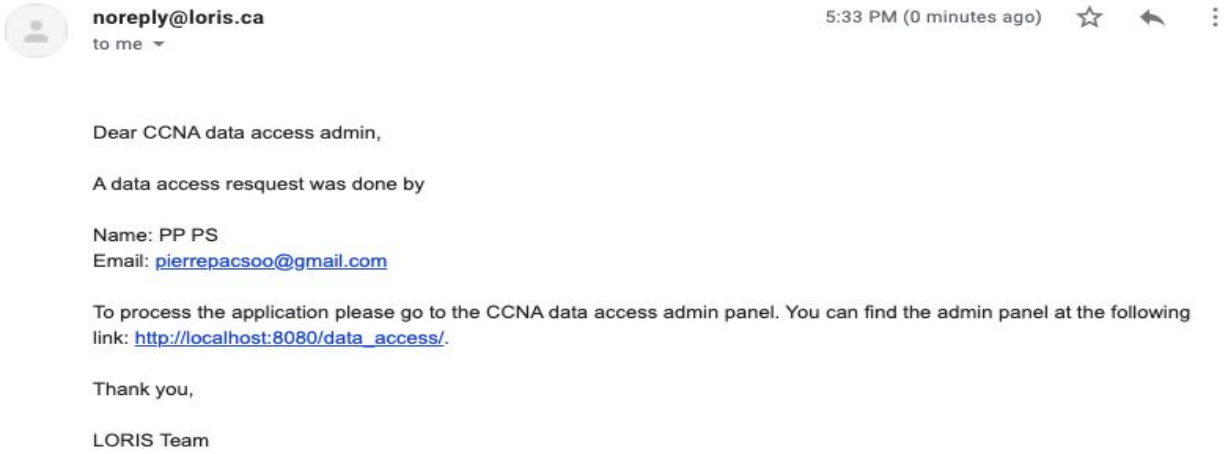

noreply@loris.ca
to me

5:33 PM (0 minutes ago)

Dear CCNA data access admin,

A data access resquest was done by

Name: PP PS
Email: pierrepacsoo@gmail.com

To process the application please go to the CCNA data access admin panel. You can find the admin panel at the following link: http://localhost:8080/data_access/.

Thank you,

LORIS Team

Request Data Access Module

Selection Filter

Researcher | Affiliation | Category (visit): Biomarker results, MRI, Neuropsychological, Screening/Clinical

Date | Status | Clear Filters

2 rows displayed of 2. (Maximum rows per page: 20)

Download Table as CSV

No.	Researcher	Affiliation	Category (visit)	Date	Application form	Status (select to change)
1	researcher 1	affiliation 1	Screening/Clinical, MRI	2020-10-19	View Form	in-progress
2	researcher 2	affiliation 2	MRI, Biomarker results	2020-10-19	View Form	requested

2 rows displayed of 2. (Maximum rows per page: 20)

approved
in-progress
rejected
requested

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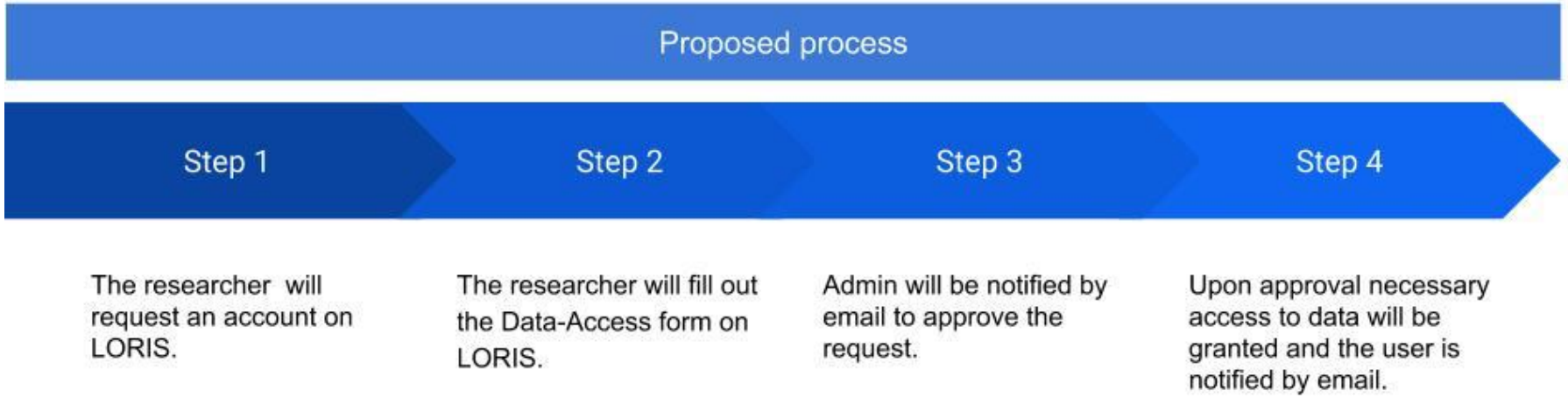
Request Data Access Module



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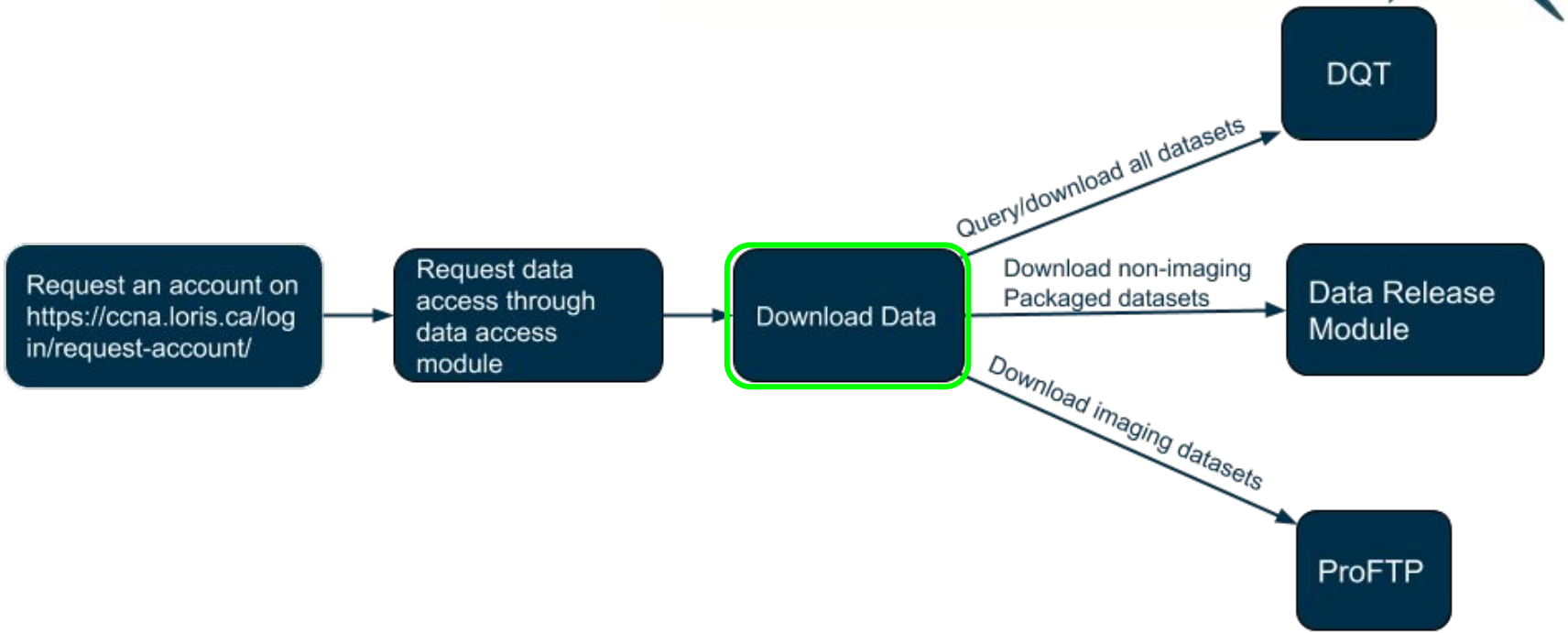
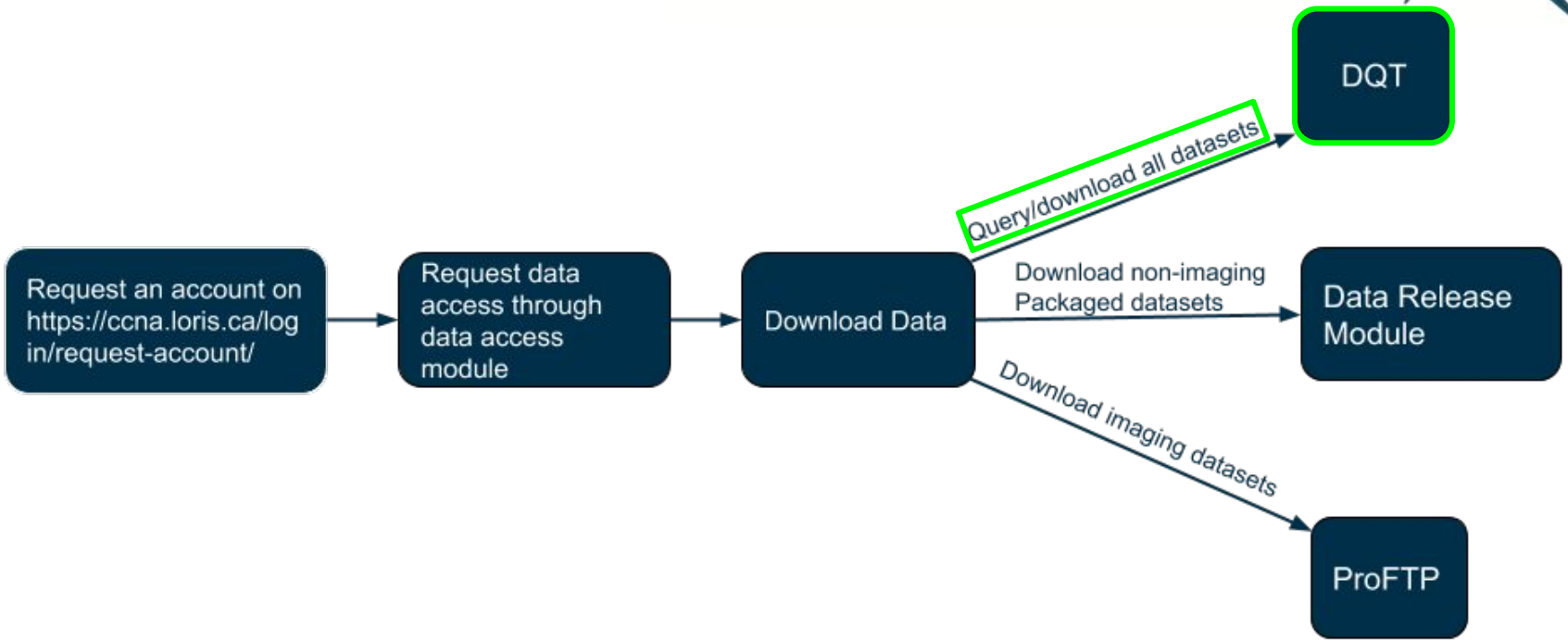
INTRO-How to access the data



Data Query Tool (DQT)



Data Query Tool (DQT) – What is it?

- **Query and retrieve data without technical expertise (or a programmer)**

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- **Design, execute, and save queries in a simple and intuitive manner**

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- Query and retrieve data without Technical expertise

- Design, execute, and save queries in a simple and intuitive manner

- **Selection of variables, and quick download in most commonly used formats**

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Data Query Tool (DQT) – What is it?

- Query and retrieve data without Technical expertise
- Design, execute, and save queries in a simple and intuitive manner
- Selection of variables, and quick download in most commonly used formats
- **Save and reload any query**

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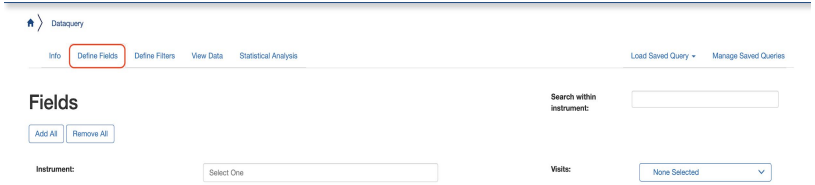
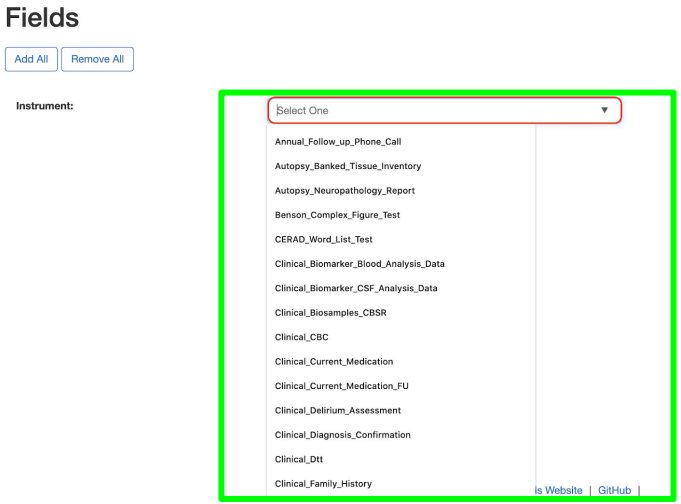
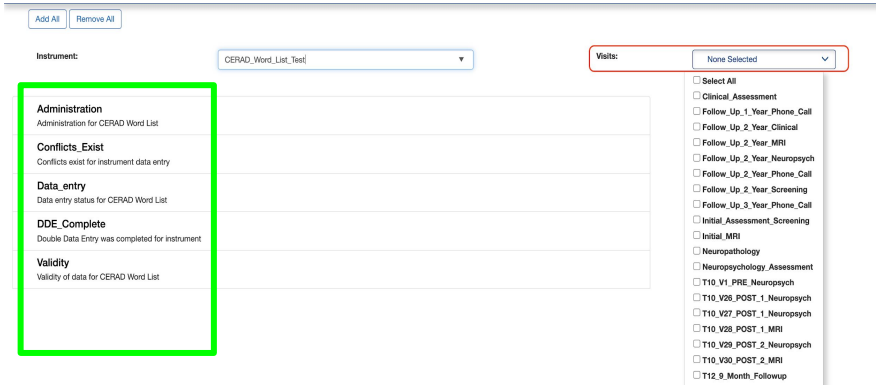
Data Query Tool (DQT) - Define Fields







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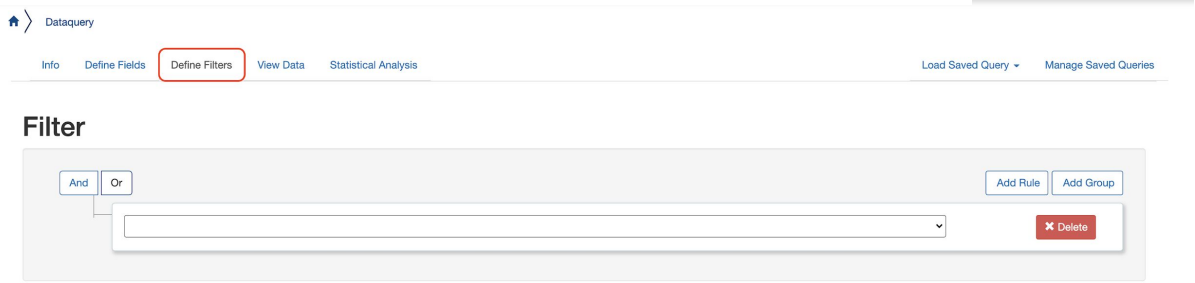
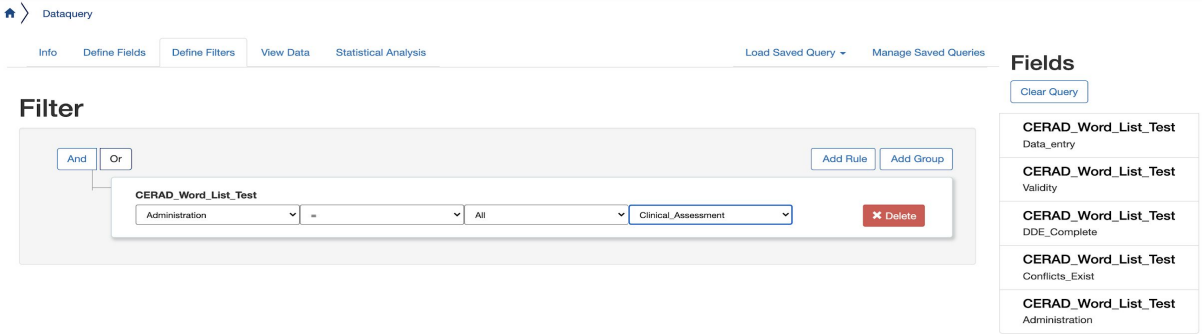
Data Query Tool (DQT) – Define Filters





Detailed examples
During the Live Demo!

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Data Query Tool (DQT) – View Data

LORIS Candidate Clinical Imaging Reports Tools Admin Members Portal ? Site Affiliations: 54 Admin account

Dataquery

Info | Define Fields | Define Filters | View Data | Statistical Analysis | Load Saved Query | Manage Saved Queries

Query Criteria

Run Query | Download Data as ZIP

Data: Cross-sectional

20 rows displayed of 413. (Maximum rows per page: 20)

1 2 3 4 5 6 7 »

Identifiers	Clinical_Medical_History,000_Administration	Clinical_Medical_History,000_Date_taken	Clinical_Medical_History,000_Validity	Clinical_Medi
BCT3499,Clinical_Assessment	All	2018-11-02		739
BCT3664,Clinical_Assessment	All	2018-08-31		729
BCT7918,Clinical_Assessment	All	2018-12-04		776.1
BCT9597,Clinical_Assessment	All	2018-09-21		923.7
BCT9713,Clinical_Assessment	All	2018-10-19		768.6
BCT9968,Clinical_Assessment	All	2018-09-07		1009.2
BRI1080,Clinical_Assessment	All	2018-01-30		857
BRI2365,Clinical_Assessment	All	2017-10-11		960.3

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Data Query Tool (DQT) - Download Data

Dataquery

Info | Define Fields | Define Filters | View Data | Statistical Analysis | Load Saved Query | Manage Saved Queries

Query Criteria

Run Query | Download Data as ZIP

Data: Cross-sectional

0 rows displayed of . (Maximum rows per page: 20)

Identifiers

0 rows displayed of . (Maximum rows per page: 20)

Download Table as CSV

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Data Query Tool (DQT) - Demo

Live Demo by Jessica Callegaro

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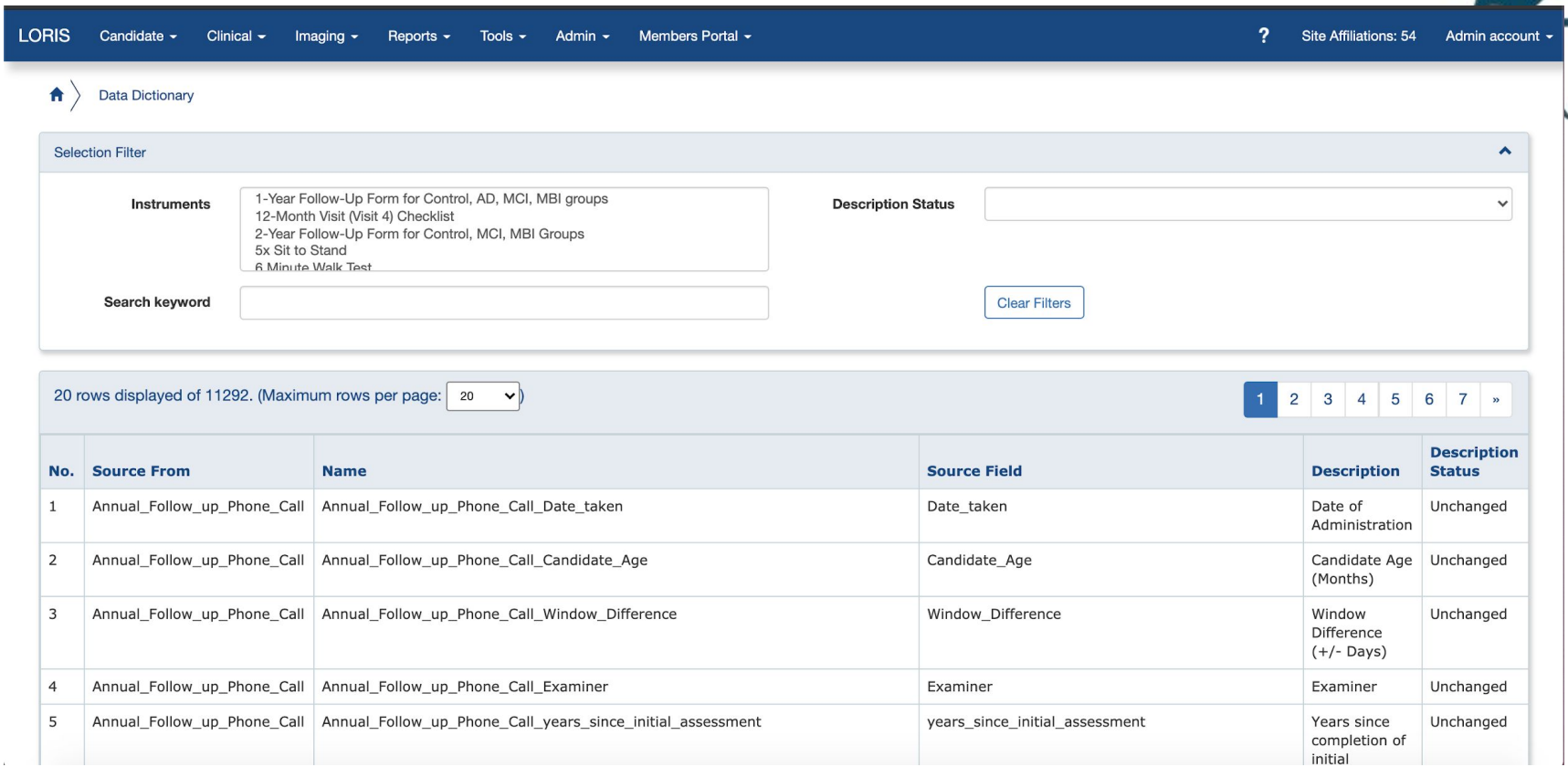
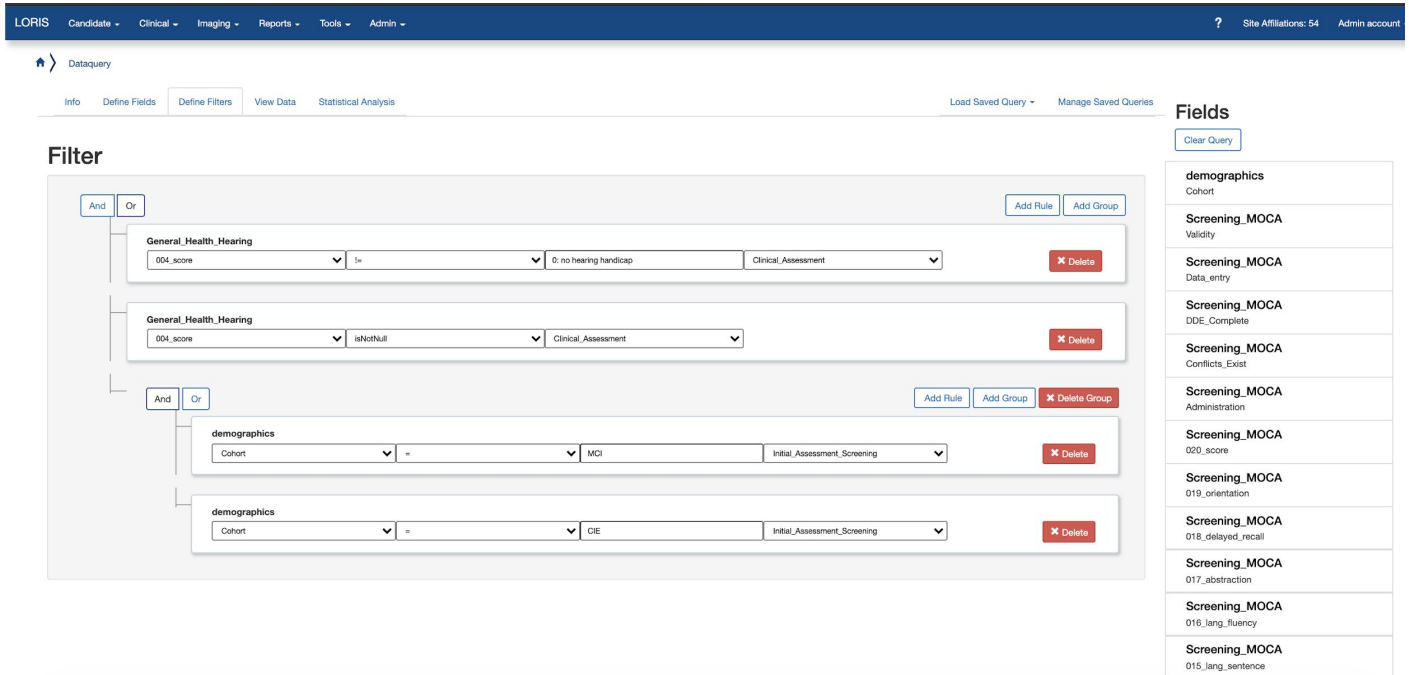
Data-Dictionary for DQT



No.	Source From	Name	Source Field	Description	Description Status
1	Annual_Follow_up_Phone_Call	Annual_Follow_up_Phone_Call_Date_taken	Date_taken	Date of Administration	Unchanged
2	Annual_Follow_up_Phone_Call	Annual_Follow_up_Phone_Call_Candidate_Age	Candidate_Age	Candidate Age (Months)	Unchanged
3	Annual_Follow_up_Phone_Call	Annual_Follow_up_Phone_Call_Window_Difference	Window_Difference	Window Difference (+/- Days)	Unchanged
4	Annual_Follow_up_Phone_Call	Annual_Follow_up_Phone_Call_Examiner	Examiner	Examiner	Unchanged
5	Annual_Follow_up_Phone_Call	Annual_Follow_up_Phone_Call_years_since_initial_assessment	years_since_initial_assessment	Years since completion of initial	Unchanged

DQT – Demo Test Case 1

Compare MOCA assessments for hearing-impaired MCI vs hearing-impaired Controls.



Tip:
make sure to select
'Longitudinal' view
when viewing data!

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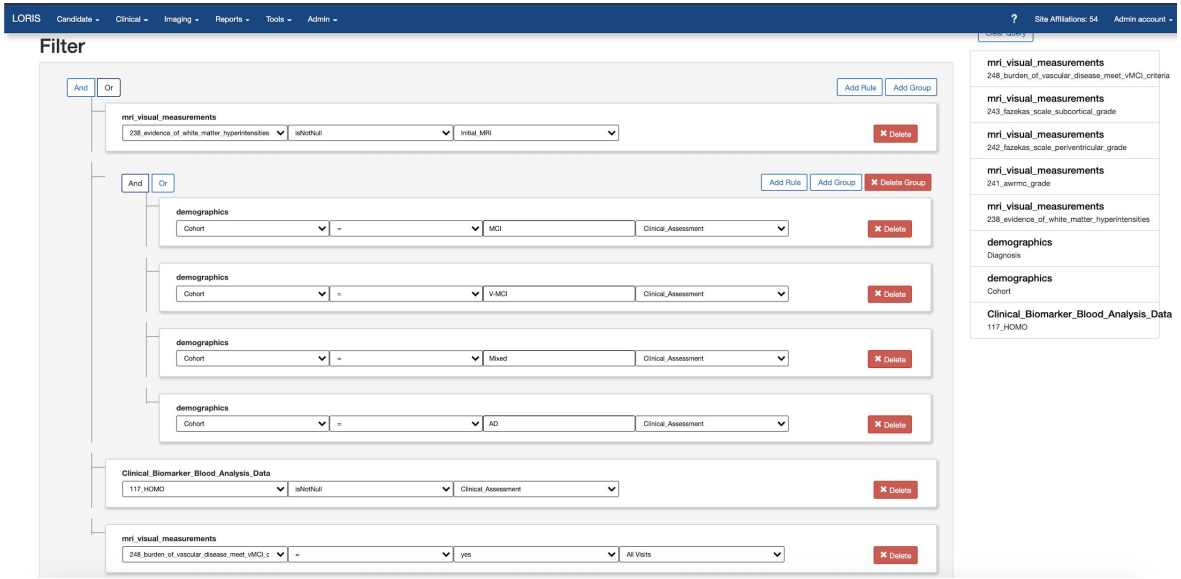
DQT – Demo Test Case 2

Investigate the link between homocysteine levels and WMH burden in different cohorts (AD, Mixed, MCI, V-MCI).

a) Using blood analysis data and MRI visual measurements related to WMH.

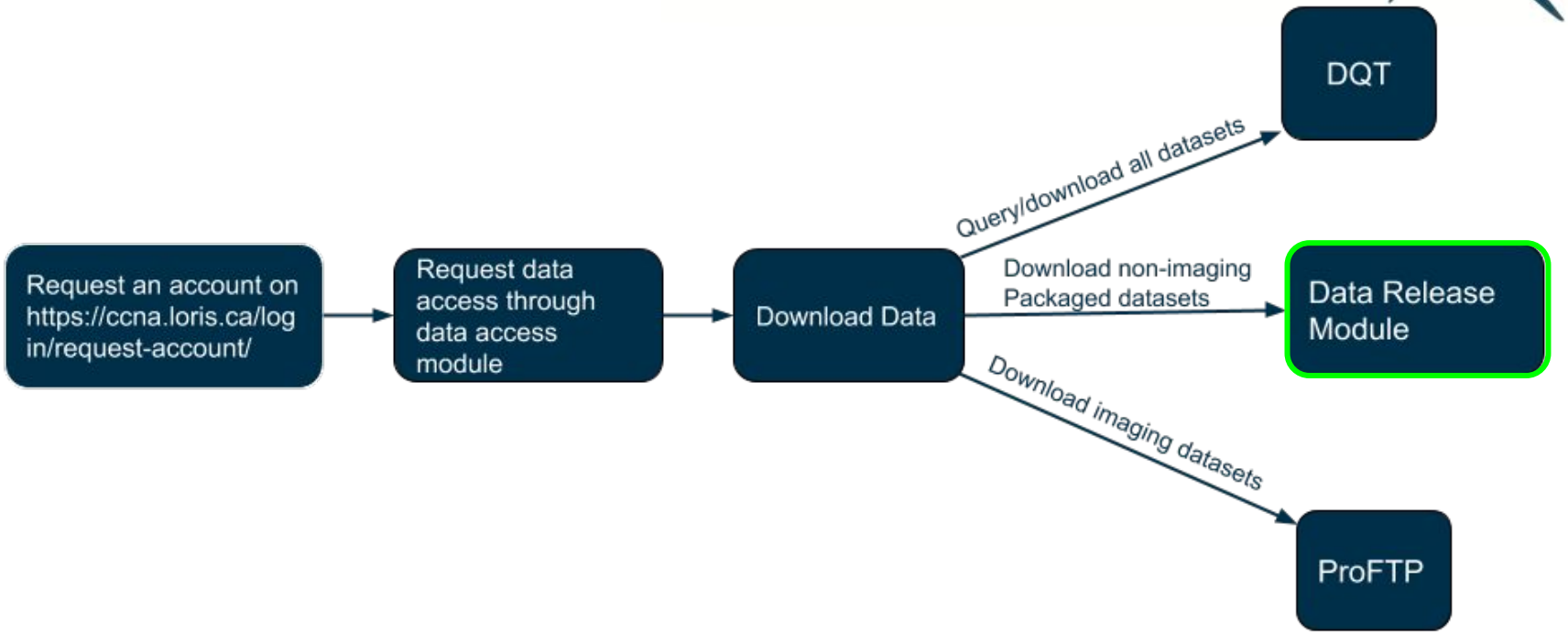
b) Checking specifically for px that meet the vascular dementia / cognitive impairment criteria (ARWMC >= 2)



Tip:
You can save your queries to retrieve and edit later!

DQT – Stats

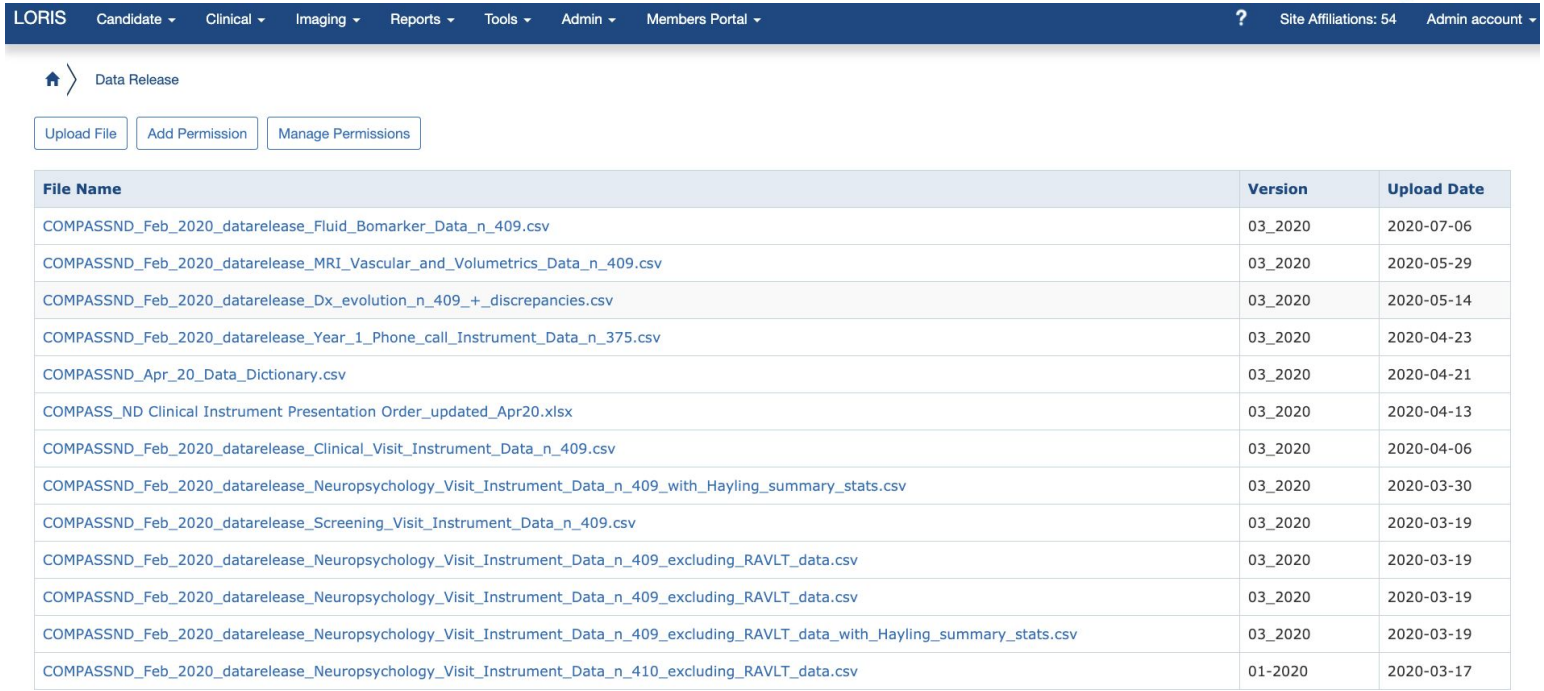
Data Release



Data Release

- The Data Release Module can be used to easily distribute packaged data releases of your study
- Users can download customized subsets of data from this module
- Scaling and transferring solutions were implemented for researchers downloading large datasets

Data Release



File Name	Version	Upload Date
COMPASSND_Feb_2020_datarelease_Fluid_Bomarker_Data_n_409.csv	03_2020	2020-07-06
COMPASSND_Feb_2020_datarelease_MRI_Vascular_and_Volumetrics_Data_n_409.csv	03_2020	2020-05-29
COMPASSND_Feb_2020_datarelease_Dx_evolution_n_409_+_discrepancies.csv	03_2020	2020-05-14
COMPASSND_Feb_2020_datarelease_Year_1_Phone_call_Instrument_Data_n_375.csv	03_2020	2020-04-23
COMPASSND_Apr_20_Data_Dictionary.csv	03_2020	2020-04-21
COMPASS_ND Clinical Instrument Presentation Order_updated_Apr20.xlsx	03_2020	2020-04-13
COMPASSND_Feb_2020_datarelease_Clinical_Visit_Instrument_Data_n_409.csv	03_2020	2020-04-06
COMPASSND_Feb_2020_datarelease_Neuropsychology_Visit_Instrument_Data_n_409_with_Hayling_summary_stats.csv	03_2020	2020-03-30
COMPASSND_Feb_2020_datarelease_Screening_Visit_Instrument_Data_n_409.csv	03_2020	2020-03-19
COMPASSND_Feb_2020_datarelease_Neuropsychology_Visit_Instrument_Data_n_409_excluding_RAVLT_data.csv	03_2020	2020-03-19
COMPASSND_Feb_2020_datarelease_Neuropsychology_Visit_Instrument_Data_n_409_excluding_RAVLT_data.csv	03_2020	2020-03-19
COMPASSND_Feb_2020_datarelease_Neuropsychology_Visit_Instrument_Data_n_409_excluding_RAVLT_data_with_Hayling_summary_stats.csv	03_2020	2020-03-19
COMPASSND_Feb_2020_datarelease_Neuropsychology_Visit_Instrument_Data_n_410_excluding_RAVLT_data.csv	01-2020	2020-03-17

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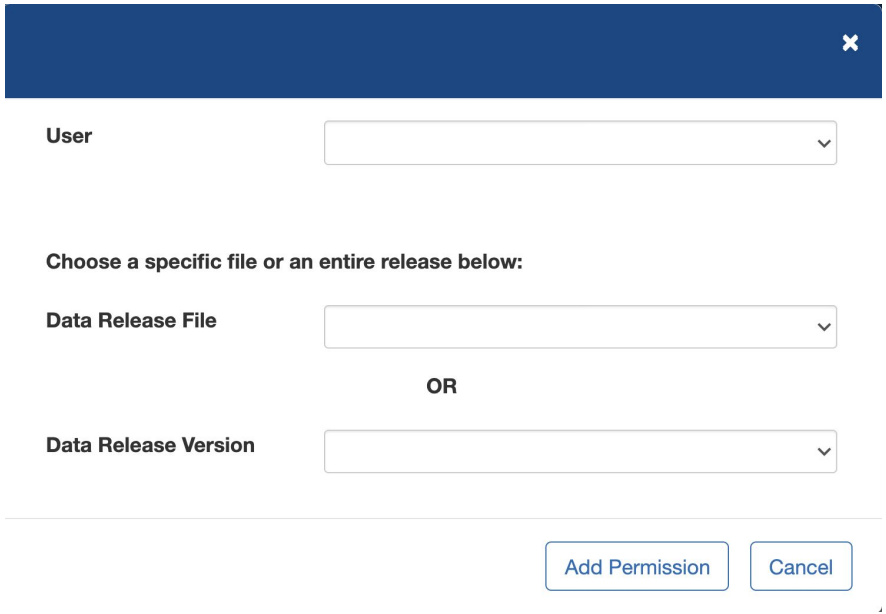
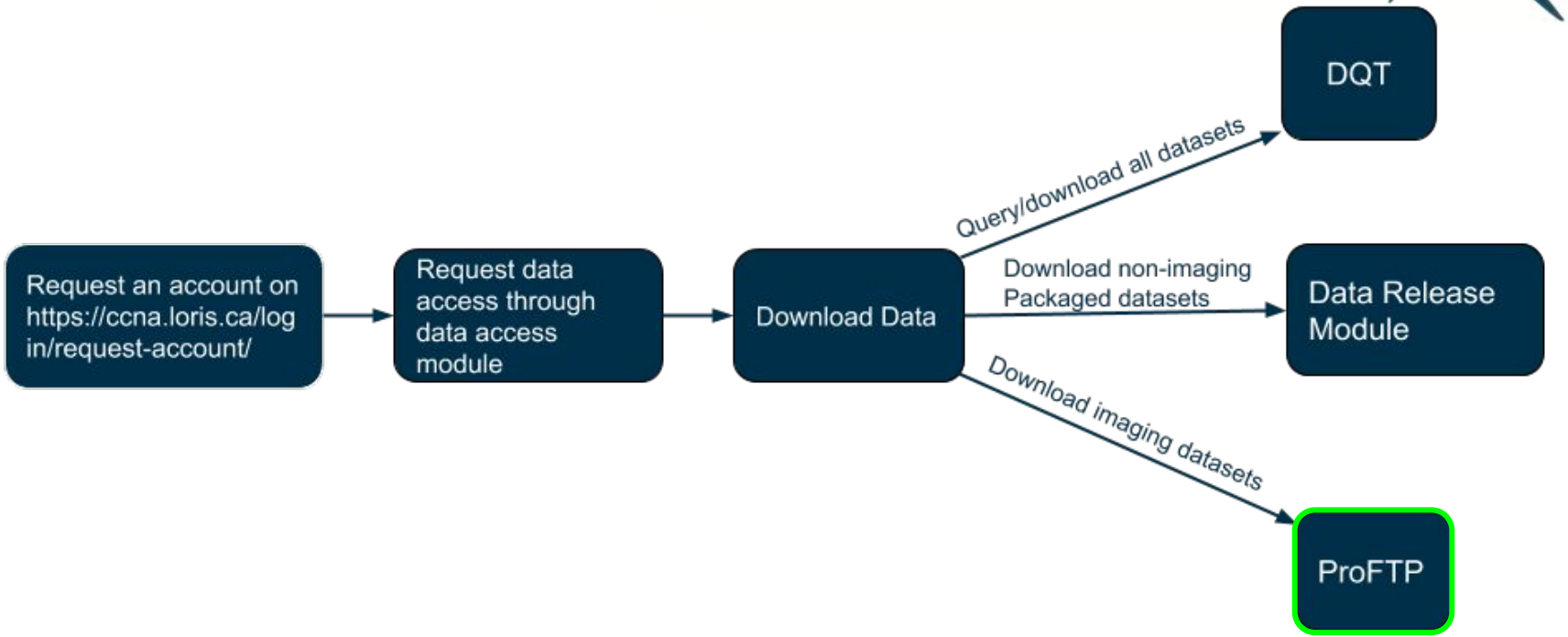
Data Release

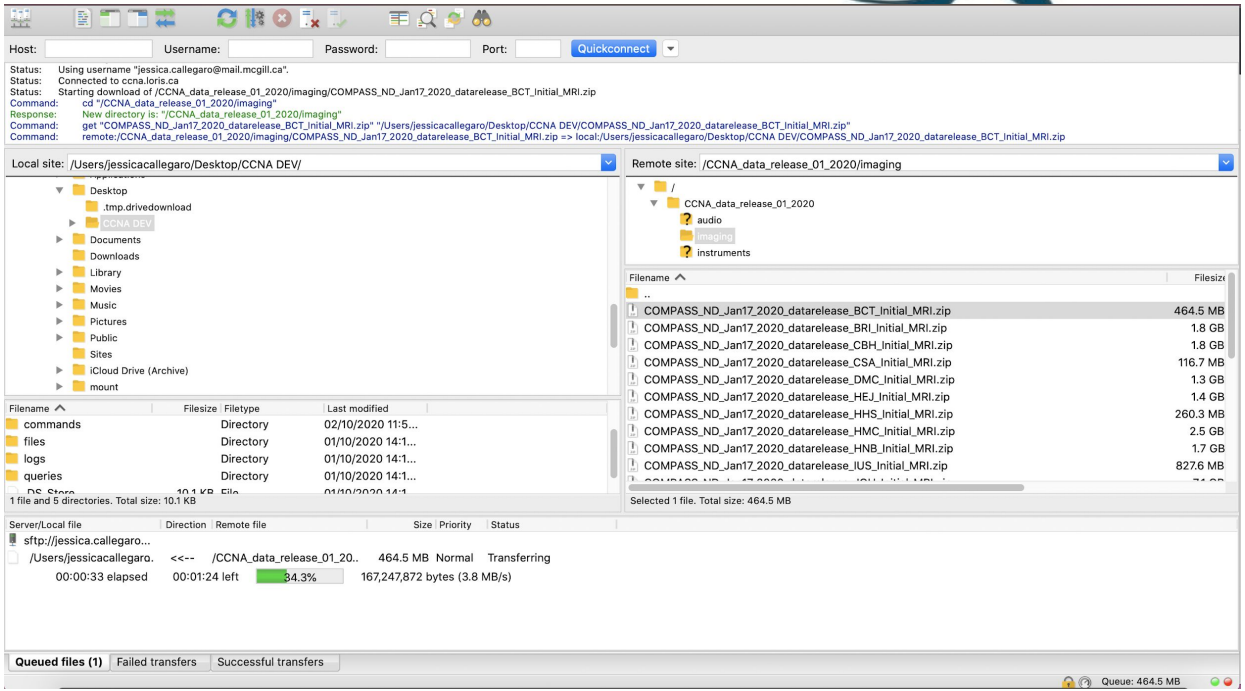


ProFTP/sFTP


Request an account on https://ccna.loris.ca/login/request-account/
Request data access through data access module
Download Data
Query/download all datasets
DQT
Download non-imaging Packaged datasets
Data Release Module
Download imaging datasets
ProFTP

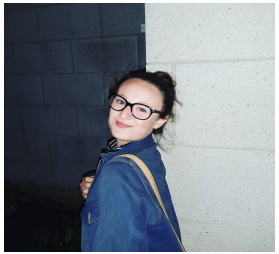
Accessing Files Using FileZilla

- An SFTP server is used to securely transfer large data files over a remote system to users based on permission.
- Easy setup and configuration of FileZilla client using LORIS credentials.
- Gain access to and download CCNA data release files.



Acknowledgement

CCNA LORIS Dev Team



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Questions

You can email us at ccna@mcin.ca if you have any further questions!

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