

INTRODUCTION

With the recent launch of the Tannenbaum Open Science Initiative at the Montreal Neurological Institute (MNI) [3,5], efforts to globally disseminate data have begun. Using the LORIS data management platform [1], a internal centralized repository will be scaled to include full institutional data, and will culminate with an open portal of heterogeneous data. The goal will be to ensure replicability and transparency across research laboratories. The initiative will begin by combining the existing imaging and biobanking repositories into a single centralized LORIS repository to:

- promote data sharing and collaboration
- support sophisticated querying
- optimize use of existing data and research tools
- enhance hypothesis generation for studies in neuroscience
- improve patient care by maximizing their contributions to research.



METHODS

Detailed workflows have been created to facilitate acquisition, storage, and analysis of imaging, biobanking, clinical and genetic data. Such procedures:

- ensure consistency with data collection standards [2].
- provide the foundation for data sharing
- ease interoperability between platforms (including MRI scanners and LIMS systems)

This combination links biospecimen and imaging data (as well as genetic and clinical information) in a single data-hosting platform. Utilizing the LORIS Data Query Tool [4], sophisticated queries can aggregate this heterogeneous data for analysis.

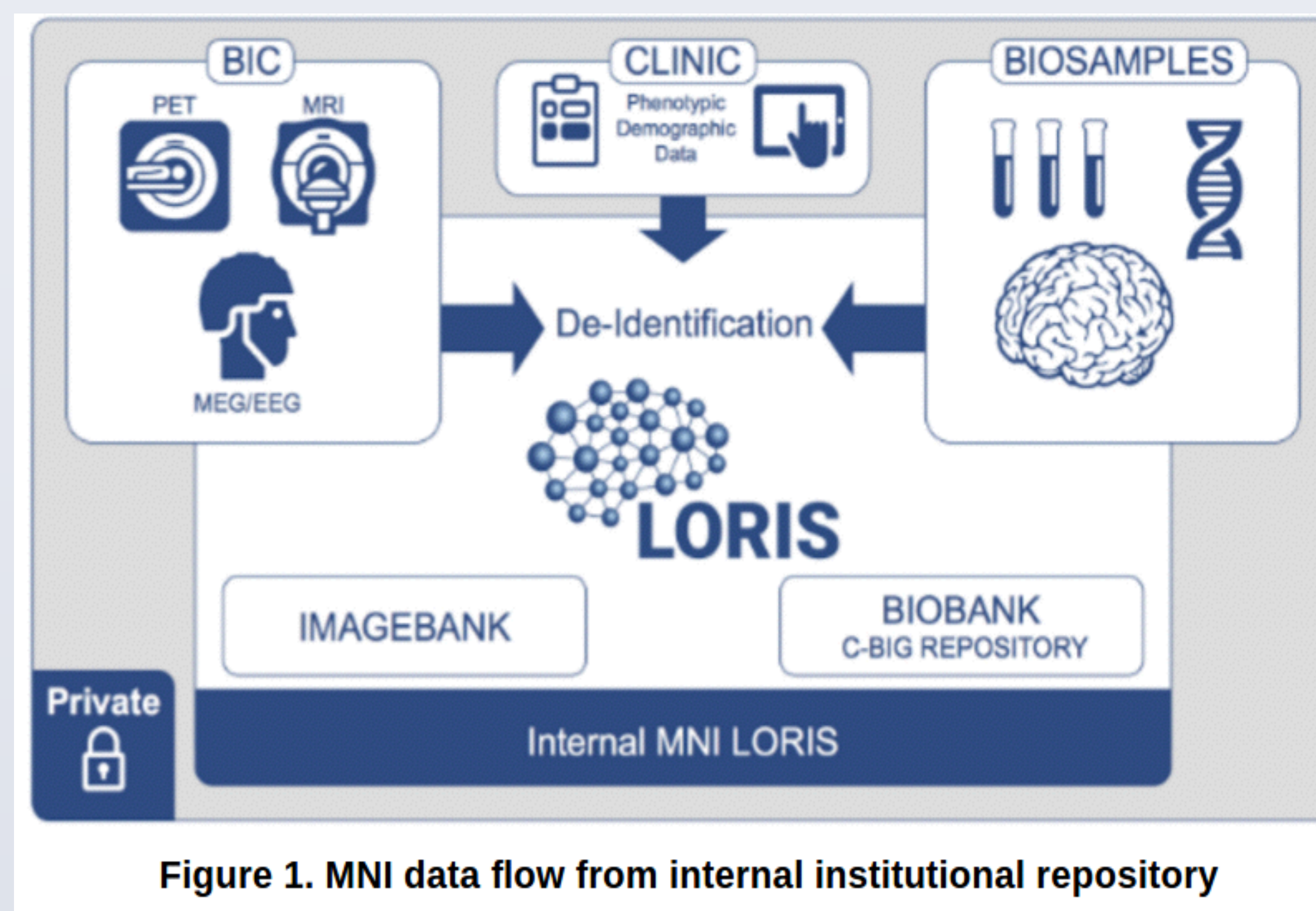


Figure 1. MNI data flow from internal institutional repository

RESULTS

The LORIS repository makes heterogeneous data available for visualization, quality control, and download/export, including all MRI images, raw or processed, (with plans to add MEG and PET), biospecimen data (blood, saliva, skin, muscle and nerve biopsies, whole brains, and cerebrospinal fluid), clinical and genetic outputs. The initial implementation extends to more than 1000 MRI studies, with over 130 patients currently registered within the biobank. Future plans include scalability plans to house petabytes of data, and will be accessible and queryable in the same repository.

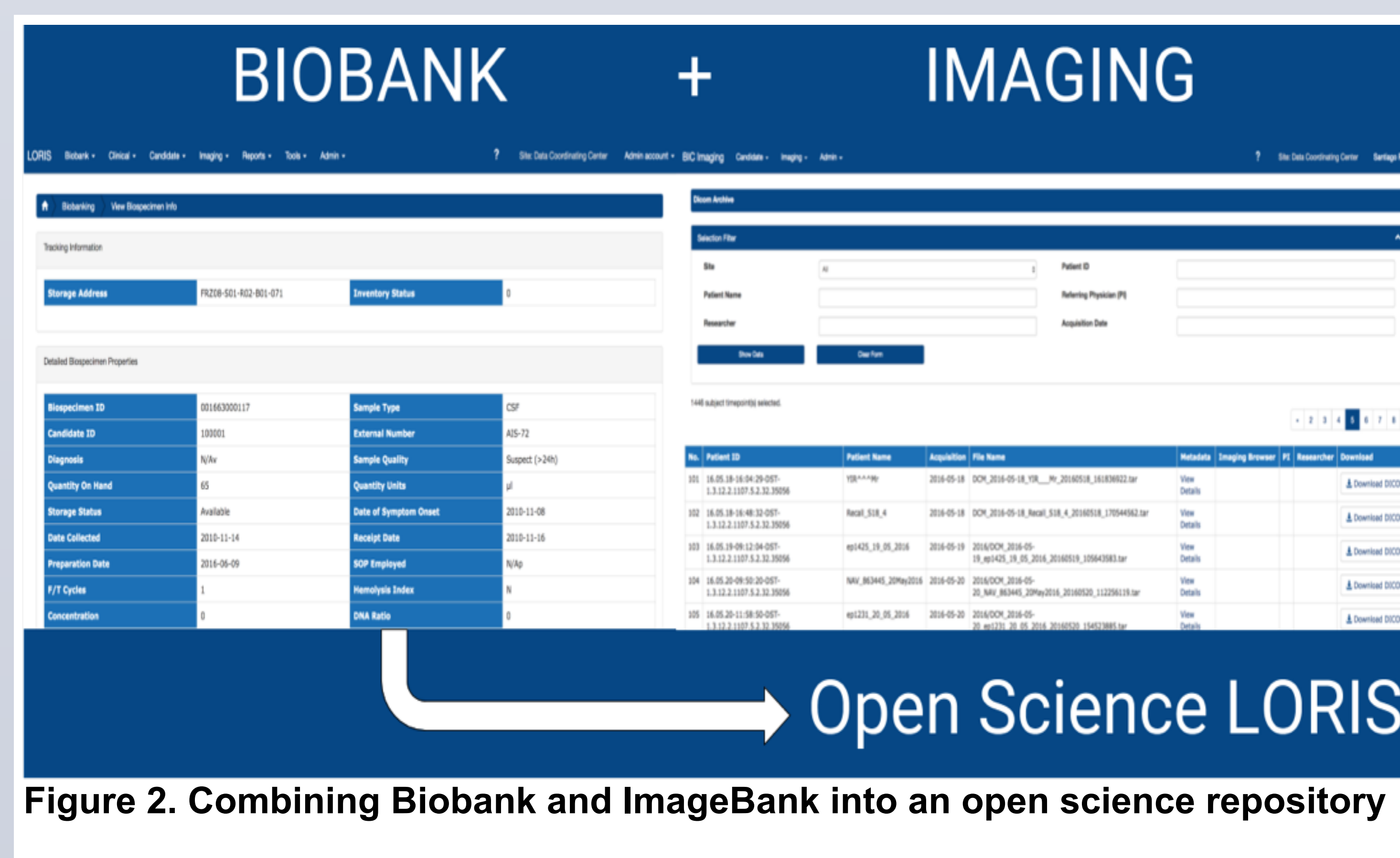


Figure 2. Combining Biobank and ImageBank into an open science repository

CONCLUSIONS

Data collected by investigators in multiple studies span data types from many domains, including behavioural measures, biosamples, genomics, and multimodal brain imaging. Having access to this data in a systematized, queryable way creates investigative opportunities for researchers. As the project develops and is opened to the public, the diversity of the data and the analytic tools within LORIS can significantly improve replicability and transparency of brain research.

REFERENCES

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