A standardized FAIR data protocol to make rat brain imaging datasets more reproducible and interoperable

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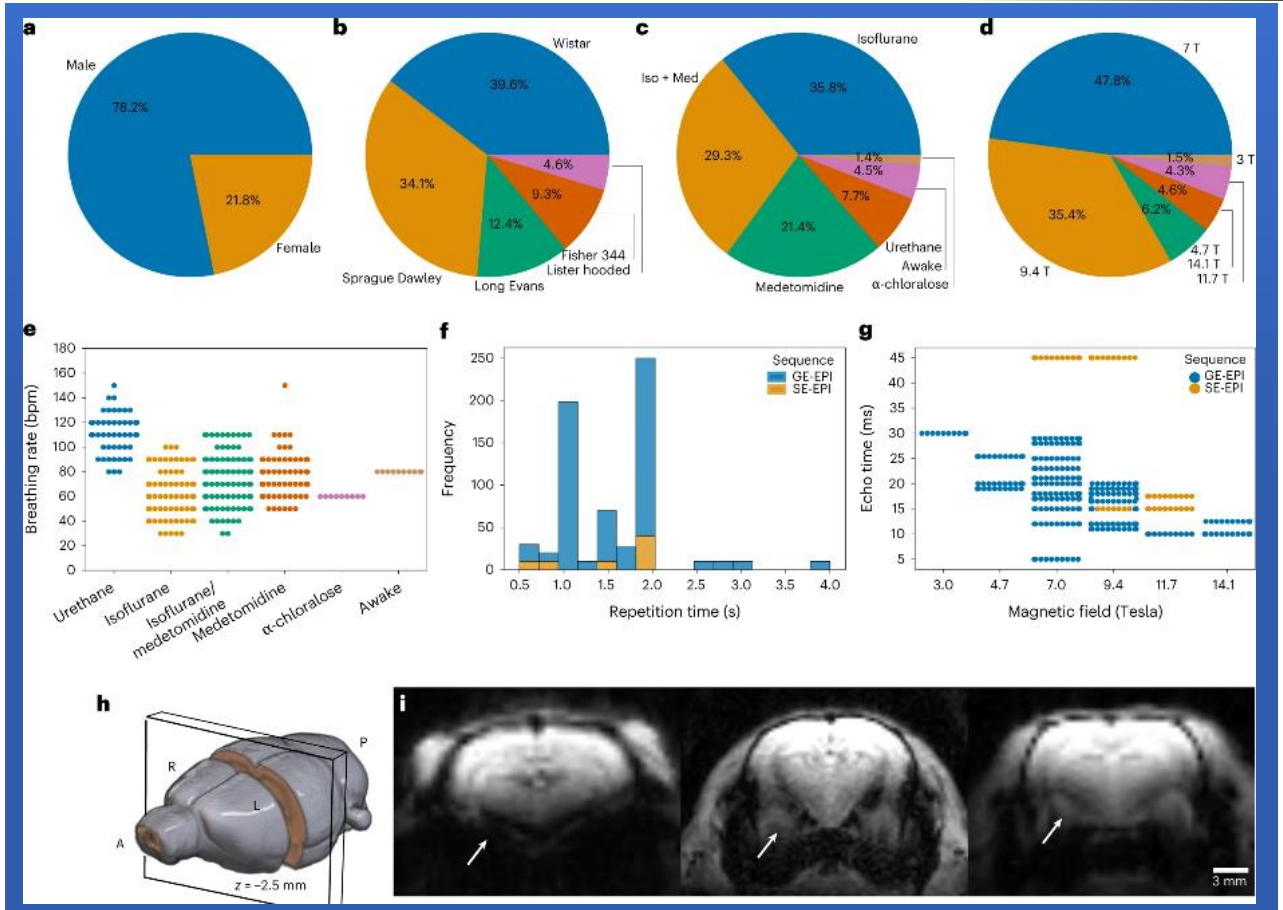
Researchers at the MagLab's Advanced Magnetic Resonance Imaging and Spectroscopy (AMRIS) facility at the University of Florida's McKnight Brain Institute participated in a multi-institution study that developed methods to make rat brain imaging datasets more **Findable**, **Accessible**, **Interoperable**, and **Reusable**.

Rat brain imaging data are typically collected under a variety of conditions (e.g. different rat sex, strain, anesthesia, breathing rate, or magnetic field strength) that make it difficult to combine and compare different datasets. In this study, the authors aggregated 65 rat brain functional magnetic resonance imaging (fMRI) datasets from 45 institutions collected under a broad variety of conditions. *These data were designated as the MultiRat collection and used to develop an optimized consensus protocol and reproducible data analysis pipeline to be used by researchers for rat brain fMRI experiments*. A StandardRat collection of 21 datasets taken from the MultiRat collection was prepared based on this protocol.

By using the optimized StandardRat protocol created by the authors, researchers can ensure their datasets can be effectively reused by others. This advancement will facilitate large-scale rat neuroimaging studies across multiple institutions, greatly increasing the current and future availability of high-quality rat brain fMRI data. *The adoption of these FAIR data protocols will improve researchers' ability to study rat brain functional connectivity and to make new discoveries using datasets from a variety of prior experiments*. The authors have openly shared the datasets, consensus protocol, and reproducible data analysis pipeline in the OpenNeuro database and GitHub to maximize their value for the neuroscience community.



A variety of factors such as sex, strain, anesthesia, magnetic field strength, and breathing rate can affect the results of an fMRI scan. Image reprinted from original citation.

Facility and instrumentation used: Advanced Magnetic Resonance Imaging and Spectroscopy (AMRIS), 750 MHz/89 mm Bruker Avance III HD

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Data Citation: MultiRat dataset (https://doi.org/10.18112/openneuro.ds004114.v1.0.0); StandardRat dataset (https://doi.org/10.18112/openneuro.ds004116.v1.0.0)

Software Citation: RABIES: Rodent Automated Bold Improvement of EPI Sequences (https://github.com/CoBrALab/RABIES)