



EBRAINS

The EBRAINS Data & Knowledge services: exploring synergies with EU's SciLake project

Open Science FAIR 2023, Madrid
Ingrid Reiten
University of Oslo
26.10.2023



Scope



Sci!ake

Human Brain Project

EBRAINS

*Horizon 2020 project
2013 - 2023*

*Digital research infrastructure
for brain-related research,
created by the HBP*

*Horizon Europe project
2023 – 2026*

*Included in the ESFRI
Roadmap 2021*

The EBRAINS Research Infrastructure

EBRAINS

Infrastructure About Focus areas News & events Contact

An open research infrastructure that gathers data, tools and computing facilities for brain-related research, built with interoperability at the core.

Get started ▶

Data

Find and share brain data, computational models and software.

Explore

Brain atlases

Modelling, simulation & computing

Validation & inference

Health research platforms

ebrains.eu

- EBRAINS delivers data and services for brain-related research

The **EBRAINS Data & Knowledge services** provide tools and resources to share, find and use neuroscience data to accelerate reproducibility, and connect the global research community.

The EBRAINS Data and Knowledge Services

For all of neuroscience data



The EBRAINS Curation team

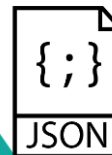
- Data and metadata management and release

Curation
service



Knowledge
Graph

Metadata
framework



**The openMINDS
metadata framework**

**The EBRAINS
Knowledge Graph**

- Metadata management system

- Standardized metadata annotations



The EBRAINS Knowledge Graph

CATEGORIES	
Project	124
Dataset	1004
Model	246
(Meta)Data Model	4
Software	210
Web service	13
Contributor	2083

EBRAINS KG Search, 21.09.23

- >1000 brain-related datasets
- >240 computation models
- >210 related software
- >2080 contributors

- 13 species

- A **repository and registry**: data is available via EBRAINS data storage*, or through external storage
- All research products are reviewed by **curators**

*FENIX Research infrastructure (<https://fenix-ri.eu/>)

EBRAINS Datasets

Title & versioning →

Authors →

DataCite DOI →

License →

Project →

DATASET

Anterogradely labeled axonal projections from the orbitofrontal cortex in rat (v1)

Kondo, H.; Olsen, G. M.; Gianatti, M.; Monterotti, B.; Sakshaug, T.; Reiten, I.; Leergaard, T. B.; Witter, M. P.

Overview

Data descriptor

How to cite

Get data

Publications

Specimen

Related resources

DOI: [10.25493/2MX9-3XF](https://doi.org/10.25493/2MX9-3XF)

License: [Creative Commons Attribution-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-sa/4.0/)

Ethics assessment: EU-compliant

Project: [The efferent connections of the orbitofrontal, posterior parietal, and insular cortex of the rat brain](#)

Custodians: [Witter, M. P.](#)

The project was initiated to determine the projections of the orbital frontal cortex (OFC) to the parahippocampal region in the rat, using the anterograde tracers biotinylated dextran amine (BDA) and Phaseolus vulgaris-leucoagglutinin (PHA-L). The anterograde tracers were injected into four subdivisions of OFC; the medial (MO), ventral (VO), ventrolateral (VLO) and lateral (LO) orbitofrontal areas. All brains were cut in the coronal plane at 50 μm thickness, and every 6th section was sampled for analysis. Complete series throughout the anterior-posterior extent of each brain form the core of the dataset, with a total of 26 animals successfully injected. Out of those 26, 18 were injected with BDA, 4 injected with PHA-L, and 4 injected with both BDA and PHA-L. Locations of all individual injection sites are annotated in the datasets. All sections are in the correct anterior-posterior order. The data show a topographically organized connectivity from OFC to parahippocampal areas in addition to all



Preparation:

- [in vivo](#)
- [ex vivo](#)

Experimental approach:

- [microscopy](#)
- [histology](#)
- [expression](#)
- [anatomy](#)
- [neural connectivity](#)

Please alert us at curation-support@ebrains.eu for errors or quality concerns regarding the dataset, so we can forward this information to the Data Custodian responsible.

← Preview image

← Standardized terms

EBRAINS Datasets

Title & versioning →

Authors →

The screenshot shows the EBRAINS dataset page for 'Anterogradely labeled axonal projections from the orbitofrontal cortex in rat (v1)'. The page is divided into a yellow header section and a white content section. The header section contains the dataset title and authors. The content section contains a sidebar with navigation options and a main area displaying the data descriptor. The data descriptor includes the title, authors, affiliations, and corresponding author information.

DATASET

Anterogradely labeled axonal projections from the orbitofrontal cortex in rat (v1)

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Related resources

data-descriptor_deedf9102269_OF... 1 / 7 103%

OPICome_OF | version: 1

DATA DESCRIPTOR

TITLE
Anterogradely labeled axonal projections from the orbitofrontal cortex in rat

AUTHORS
Hideki Kondo¹, Grethe M Olsen¹, Bruno Monterotti¹, Teri Sakshaug¹, Ingrid Reiten², Trygve B Leergaard², Menno P Witter¹

AFFILIATIONS

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2. Neural Systems Laboratory, Institute of Basic Medical Sciences, University of Oslo, Oslo, Norway

CORRESPONDING AUTHOR(S):
Trygve B. Leergaard: t.b.leergaard@medisin.uio.no

SUMMARY

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← Data descriptor

EBRAINS Datasets

Title & versioning →

Authors →

The screenshot shows a web browser window with a yellow header. The title is "Anterogradely labeled axonal projections from the orbitofrontal cortex in rat (v1)". Below the title, the authors are listed: "Kondo, H.; Olsen, G. M.; Gianatti, M.; Monterotti, B.; Sakshaug, T.; Reiten, I.; Leergaard, T. B.; Witter, M. P.". The main content area has a sidebar on the left with menu items: "Overview", "Data descriptor", "How to cite", "Get data", "Publications", "Specimens", and "Related resources". The "How to cite" item is highlighted with an orange underline. A callout box next to "How to cite" contains the citation text: "Kondo, H., Olsen, G. M., Gianatti, M., Monterotti, B., Sakshaug, T., & Witter, M. P. (2022). Anterograde visualization of projections from orbitofrontal cortex in rat (v1.1) [Data set]. EBRAINS. https://doi.org/10.25493/2MX9-3XF" and a "Download as bibtex" button. At the bottom of the page, there is a footer: "Please alert us at curation-support@ebrains.eu for errors or quality concerns regarding the dataset, so we can forward this information to the Data Custodian responsible."

← How to cite

EBRAINS Datasets

Title & versioning →

Authors →

DATASET

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Overview Filter by none

Data descriptor Group by none

How to cite

Get data

Publications

Specimens

Related resources

8990 files

- ext_d_cc17c126-dec2-486c-a23d-deedf9102269
 - F1
 - F10
 - F11
 - F13
 - F14
 - F16
 - F17
 - F18
 - F19
 - F20
 - F23
 - F24
 - F25
 - F29
 - F3
 - F30
 - F31
 - F33

Name: ext_d_cc17c126-dec2-486c-a23d-deedf9102269

Download dataset

By downloading the Dataset you agree to the [Terms of use](#)

Please alert us at curation-support@ebrains.eu for errors or quality concerns regarding the dataset, so we can forward this information to the Data Custodian responsible.

← Download data

EBRAINS Datasets

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Kondo, H.; Olsen, G. M.; Gianatti, M.; Monterotti, B.; Sakshaug, T.; Reiten, I.; Leergaard, T. B.; Witter, M. P.

Overview Kondo, H., & Witter, M. P. (2014). Topographic organization of orbitofrontal projections to the parahippocampal region in rats. *Journal of Comparative Neurology*, 522(4), 772–793. Portico. <https://doi.org/10.1002/cne.23442>

Data descriptor DOI: [10.1002/cne.23442](https://doi.org/10.1002/cne.23442)

How to cite Olsen, G. M., Hovde, K., Kondo, H., Sakshaug, T., Sømme, H. H., Whitlock, J. R., & Witter, M. P. (2019). Organization of Posterior Parietal–Frontal Connections in the Rat. *Frontiers in Systems Neuroscience*, 13. <https://doi.org/10.3389/fnsys.2019.00038>

Get data DOI: [10.3389/fnsys.2019.00038](https://doi.org/10.3389/fnsys.2019.00038)

Publications

Specimens

Related resources

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← Related publications

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Overview

Select the items of the tree to get more details about the individual elements.

- Specimen
 - Subject group SG_OFC-connectivity
 - Subject F1
 - Tissue sample collection F1_BDA
 - Tissue sample collection F1_PHAL
 - Subject F10
 - Tissue sample collection F10_BDA
 - Tissue sample collection F10_PHAL
 - Subject F11
 - Tissue sample collection F11_PHAL
 - Subject F13
 - Tissue sample collection F13_PHAL
 - Subject F14
 - Tissue sample collection F14_BDA
 - Subject F16
 - Tissue sample collection F16_BDA
 - Tissue sample collection F16_PHAL
 - Subject F17
 - Tissue sample collection F17_BDA
 - Subject F18
 - Tissue sample collection F18_BDA
 - Subject F19
 - Tissue sample collection F19_BDA

Specimen metadata

- Specimen
- Subject groups: 1
- Subjects: 26
- Tissue sample collections: 30
- Species: *Rattus norvegicus*
 - 26 subjects
 - 1 subject group
 - 23 tissue sample collections
- Sex: female
 - 26 subjects
 - 1 subject group
 - 23 tissue sample collections
- Strains: Sprague-Dawley
- Genetic strain types: wildtype

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← Specimen metadata

EBRAINS Datasets

Title & versioning →

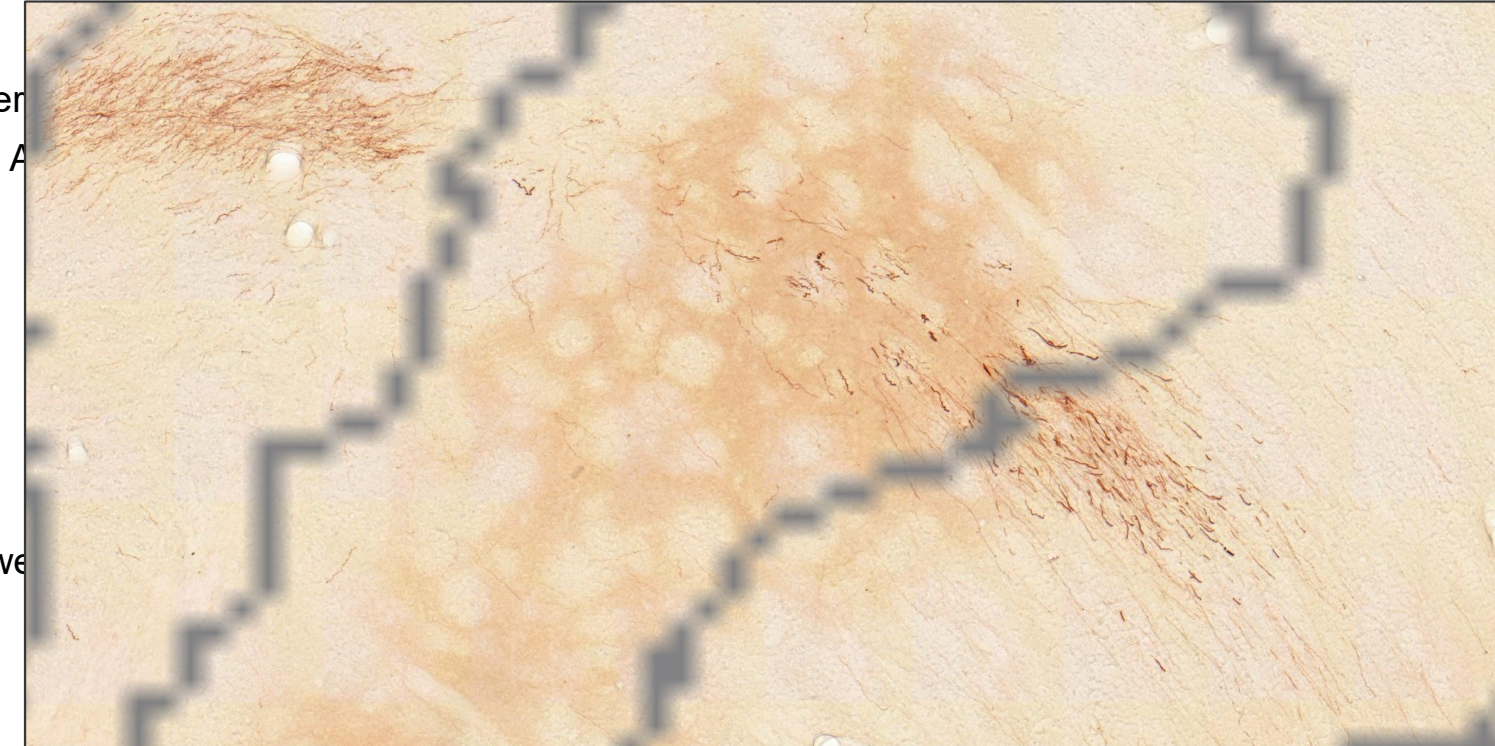
Authors →

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← Derived data

EBRAINS Datasets

Title & version



Standardized
ns

View

Caudate putamen

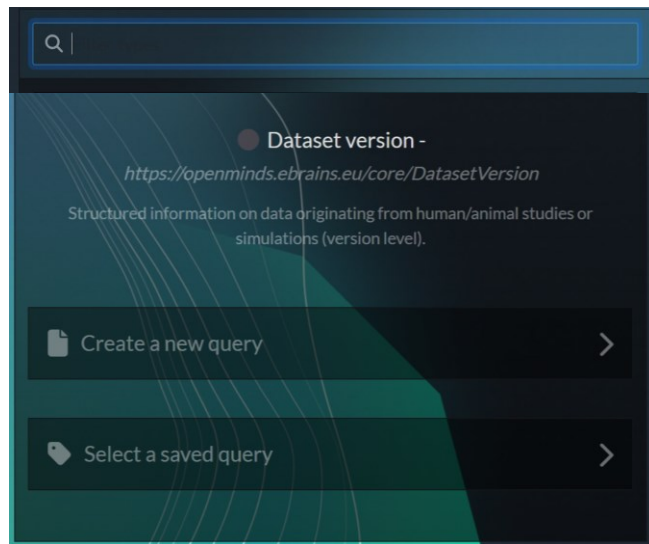


Interacting with the EBRAINS Knowledge Graph

Graphical user interface EBRAINS KG Search

search.kg.ebrains.eu/

Graphical user interface EBRAINS KG QueryBuilder



query.kg.ebrains.eu/

Programmatic interaction KG API

GET	/v3 /instances	Returns a list of instances according to their types	▼	🔒
POST	/v3 /instances	Create new instance with a system generated id	▼	🔒

core.kg.ebrains.eu/swagger-ui/index.html

KG core Python client library

```
pip install ebrains-kg-core
```



openMINDS-KG Python library






```
pip install fairgraph
```



github.com/HumanBrainProject/



Sharing data via EBRAINS

	Data provider	Curator
	Provide initial information about the dataset (size, ethics, study target, relevance, contributors etc.)	Review initial information (accept/reject)
	Provide data	Review data structure
	Provide metadata	Review metadata
	Provide a data descriptor	Review data descriptor
	Approve dataset release	Compile a dataset in the EBRAINS KG and release

Sharing data via EBRAINS



Data upload

Public



Copy data from an existing bucket



Copy



Upload
folder



Upload
files



Metadata submission

Introduction
Incomplete

Dataset part 1
Incomplete

Dataset part 2
Completed

Funding
Incomplete

Contributors
In progress

Experiments
Incomplete

Dataset authors*

Please list all authors who have contributed to the dataset, in the order you would like them to appear on the data publication. Please note that the list of authors may be different for this data publication as compared to a journal article based on the data.

This person is not available in the EBRAINS Knowledge Graph

Select a person from the EBRAINS Knowledge Graph:*



Data descriptor submission

Title: "This is the short name of the DSV" | version: X



DATA DESCRIPTOR

The EBRAINS Data Descriptor complements data shared through EBRAINS. A rich data descriptor improves the comprehension of your data and increases the chances of reuse. Please fill in all sections. You may use tables and figures (with captions) for improved readability where you see fit. References should follow the standard [Nature referencing style](#).

TITLE

Maximum 110 characters including spaces. No colons and parentheses.

The title should be descriptive for the presented data. The use of acronyms and abbreviations should be avoided where possible.

[Add the title here]

AUTHORS

Forename Surname¹, Forename Surname¹, and Forename Surname²

[Add author names here]

AFFILIATIONS

Please provide the affiliations for all authors. Format examples:

1. [institute](#) (working group) department, [university](#).city, country
2. department, organization, city, country)

[List each institution here]

CORRESPONDING AUTHOR(S):

Please name the corresponding author(s) formatted as:

Forename Surname: email@address

[List corresponding author information here]

SUMMARY

Maximum 220 words, no references.

Shortly summarise the content, provenance and usage potential of the shared data; include information about subjects, methods and materials, relevant study targets and in which context the data could be reused. Do not describe the research results, but describe purely the shared data. The summary should be written so it is readily intelligible to any scientist. Specialised terms should be explained concisely.

Example structure: Write one sentence about the origin of the dataset. Write one or two sentences that give an overview of the data. This could for example include the content of the dataset, the number of subjects and



EBRAINS as SciLake pilot

SciLake Mission:

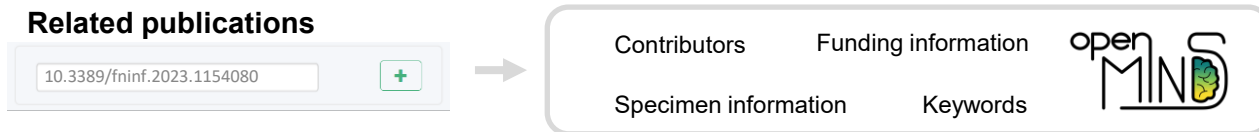
Create a scientific data lake by interlinking Knowledge Graphs
and raw scholarly content across scientific domains

- EBRAINS will implement and test SciLake developments and demonstrate the utility of the project
 - EBRAINS is an operative Knowledge Graph for the neuroscience domain
 - Guide SciLake in making their services relevant for the neuroscience community.
- Neuroscience data repositories could benefit from interlinking with publication-oriented resources



EBRAINS leveraging from SciLake developments

- Integration of SciLake's text mining tools to facilitate EBRAINS metadata submission and review



- Integration of SciLake's impact and usage indicators to deliver citation metrics for EBRAINS datasets

Dataset

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Overview


DOI: 10.25493/2MX9-3XF

Released: 2022-01-26

License: Creative Commons Attribution 4.0 International

Ethics assessment: EU-compliant

Project: The efferent connections of the orbitofrontal, posterior parietal, and insular



Citation metrics

- Citations 7
- Popularity TOP 10%
- Influence AVERAGE
- Impulse TOP 10%

Attention score

- Highlighted by 1 platforms
- 29 readers on Mendeley



Amplifying valuable research



- Integration with the AvantGraph analytics engine to achieve additional query functionalities and interoperability with the openAIRE graph

Acknowledgements



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Trygve Leergaard

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