RIKEN Open Life Science Platform

(OLSP research project and outreach)

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OLSP Research Project

OLSP Research Project

- A call for proposals for supporting researches utilizing open data and enhancing research data re-usability, which aims to promote open science and to advance data-driven researches in life science field

- Conducted by the Life Science Data Sharing Unit, RIKEN Information R&D and Strategy Headquarters

- Targeting non-PI research and technical staffs in RIKEN

- Starting from FY2020, called in every fiscal year (5 terms done)

OLSP Research Project (categories)

[Category 1] Data publication type

- Call for plans by researchers / research groups that have already obtained data to be able to promote and improve other studies by using the collected data based on international recommendations in the target research fields.

[Category 2] Research proposal type

- Call for research proposals that can achieve any of the following items (1-4) in the background.
  1. Studies utilizing research data that the OLSP project collected and assigned its metadata.
  2. Studies to be achievable by the integration or the federation of the collected data and metadata.
  3. Promoting the open science for biology and medical sciences both in domestic and international.
  4. Development of tools that can improve the usability of the collected data

- After this research period (1 year), we expect to continue it by applying to other research grants including RIKEN Incentive Research Projects, KAKENHI or ACT-X.

OLSP Research Project (characterizations)

The OLSP Research Project is not different to other standard grants:

- Assign mentor(s) to each accepted project
  - Applicants can discuss with mentor(s) about the project
- Enough and sufficient budget is assigned
  - If additional budget can significantly improve the project, it can be assigned
  - But it is not allowed to use remaining budget for purchasing unnecessary items.

OLSP Research Project (awarded proposals)

- FY2020 (6 projects)
  - Dissection of the gene regulatory network involved in mammalian skin evolution via usage of OLSP metadata and reciprocal data integration (Jafar SHARIF, RIKEN IMS)
  - Knowledge systematization of COVID-19 infectious mechanisms for reducing aggravation (Yuki Yamagata, RIKEN BDR)
  - A model development for the accurate detection of individual abnormalities using comprehensive mouse clinical phenotypes at the individual level (Nobuhiko Tanaka, RIKEN BRC)
  - Cloud based open storage format for quantitative data of biological dynamics (Ken Ho, Koji Kyoda, RIKEN BDR)
  - Preparation of the image database for building a morphological cytopathology platform based on machine learning (Kazuhiro Sudo, RIKEN BRC)
  - 意思決定機構解明を加速する、仮想空間内課題進行中のゼブラフィッシュ成魚終脳のCa2+ イメージングデータおよび行動データの高付加価値化とその公開 (Makio Torigoe, RIKEN CBS)

- FY2021 (2 projects)
  - Development of up-to-date TSS reference and its tools for medical research applications (Masaki Morioka, RIKEN IMS)
  - Development of MOIRAI2 pipeline system – Expansion of computational resources through Hokusa-Sailing Ship (Akira Hasegawa, RIKEN IMS)

OLSP Research Project (awarded proposals)

- FY2022 (2 projects)
  - Construction of a Gene Expression Atlas Database in the Adult Zebrafish Brain (Towako Kajiyama, RIKEN CBS)
  - Development of network graph visualization tool for RIKEN MetaDatabase (Masaki Kato, RIKEN R-IH)

- FY2023 (2 projects)
  - Construction and use of an ontology-oriented assay database toward data-driven drug discovery (Seiji Matsuoka, RIKEN CSRS)
  - Development and construction of a data analysis pipeline for studying 3D genome organization (Hisashi Miura, RIKEN BDR)

- FY2024 (1 project)
  - TRIP-AGIS整備データ活用に向けた予備的研究 - 生成AIを用いたメタデータ推薦 (Masahide Maeda, RIKEN CBS)

- Total: 13 projects

OLSP Research Project (achievements)

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DOI: 10.1002/cne.25619

RESEARCH ARTICLE

An atlas and database of neuropeptide gene expression in the adult zebrafish forebrain

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https://doi.org/10.1002/cne.25619

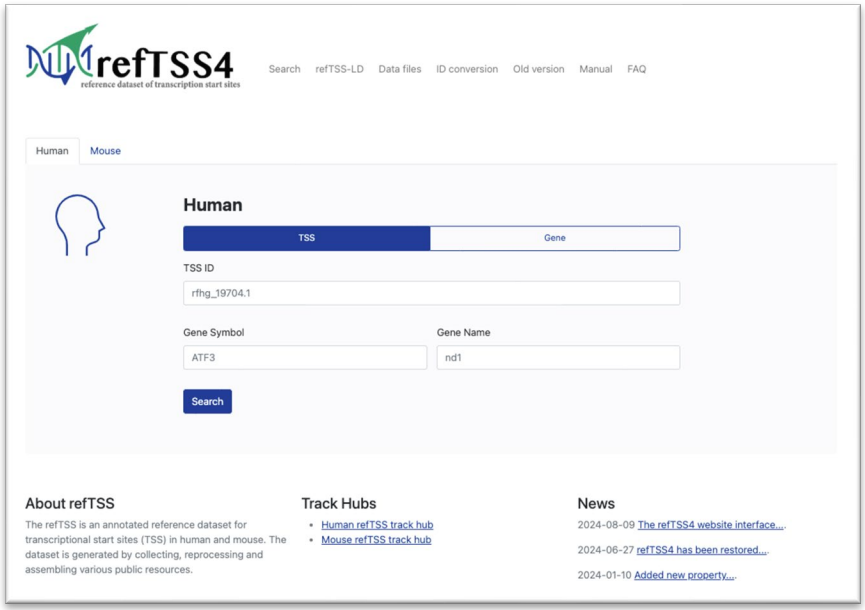
Database site: https://ssbd.riken.jp/azebex/

OLSP Research Project (achievements)

OLSP

refTSS4
reference dataset of transcription start sites

Latest transcription start site reference + TSS analysis tools



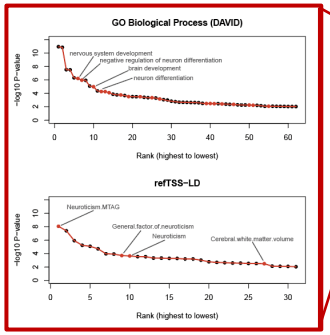
Previous Version

- TSS references
- Data Source
- Search Engine
- Manual and FAQ
- TrackHub

refTSS4 updates

- New TSS ID rule
  - Human: rfhg
  - Mouse: rfmm
- Additional TSS data: 892 files
- Additional annotation ENCODE cCREs (ELS, PLS)
- New genome version: mm39

refTSS-LD
reference dataset of transcription start sites



refTSS4 new feautures

- Enrichment Analysis (refTSS-LD: LD2, 5 TSSs, 7 TSSs, 1 TSSs, LD3, LD3, Trait A)
- ID conversion tool (hg.. → rfhg.., rfhg.. → Symbol)
- FANTOM5 TSS expression table
- refTSS USE-CASEs

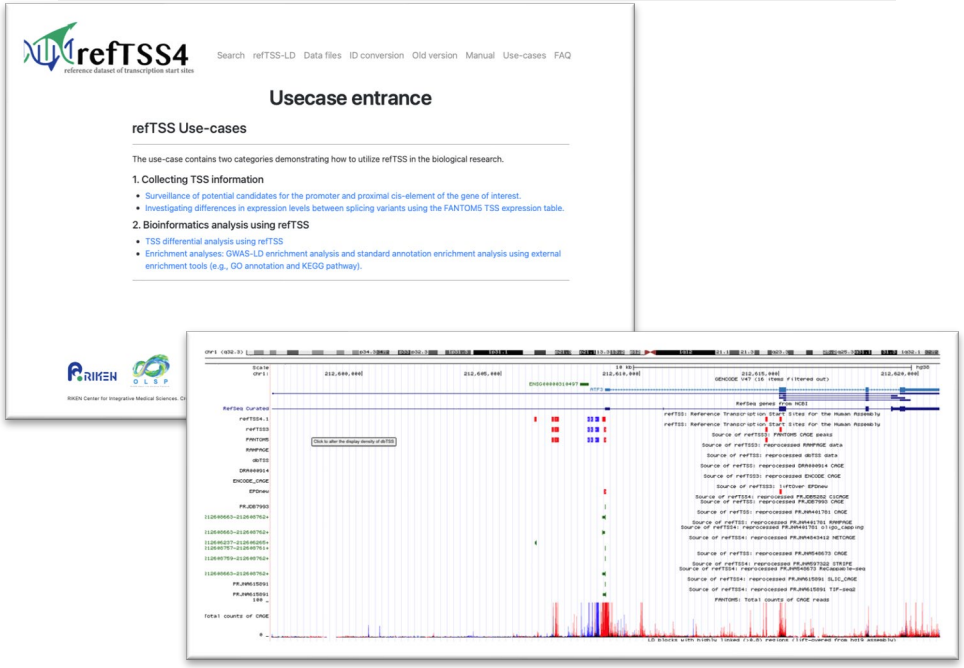
Advantage: Novel TSS analysis, “GWAS-LD enrichment analysis”

OLSP Research Project (achievements)

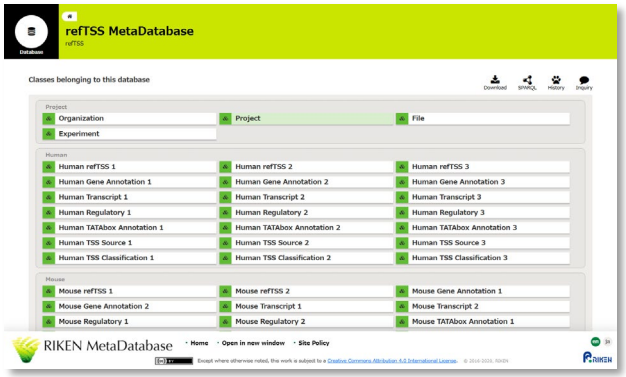
refTSS4
reference dataset of transcription start sites

Recent works (Updates on Feb 2025)

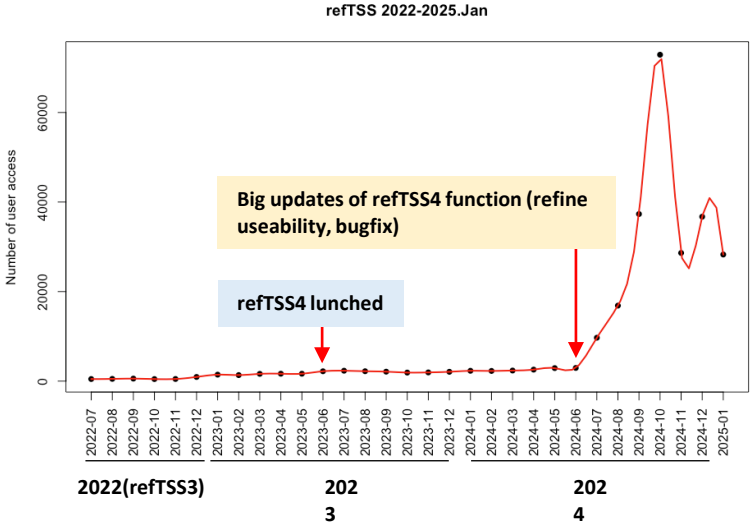
- Rich use-cases
- Updating UCSC Genome Browser track
- And more!



RIKEN META DATABASE



Access statistics



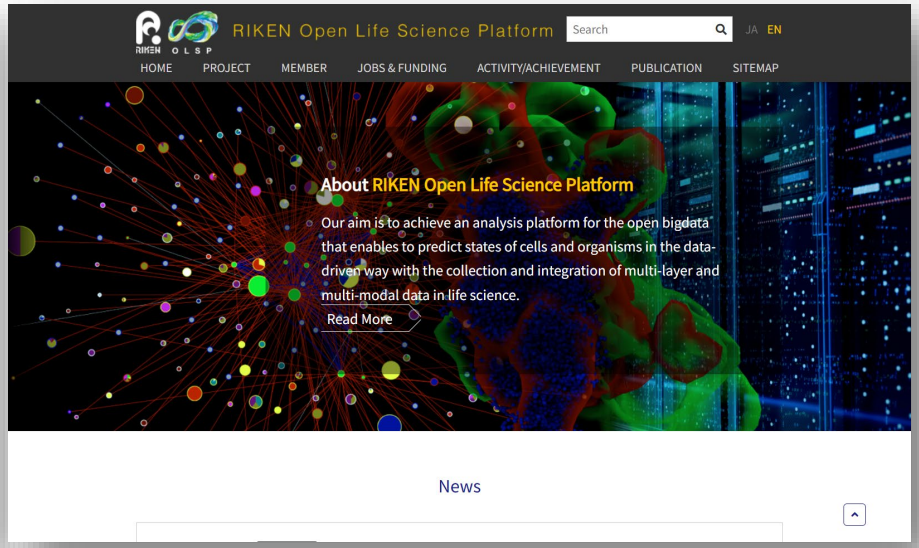
Outrearch

OLSP web site (https://olsp.riken.jp/)

- Projects
- News
- Open calls (grants and positions)
- Paper list
- Interview (from FY2023)
- RIKEN database guide (in prep., from FY2025)

Japanese site: https://olsp.riken.jp/

English site: https://olsp.riken.jp/en/



OLSP web site: interviews

Accelerating global sharing of bioimage data: Data publication generates a virtuous circle in life science

Laboratory for Developmental Dynamics, RIKEN Center for Biosystems Dynamics Research (BDR)

The Marmoset Gene Atlas: A tool for understanding the human brain and determining the mechanisms of psychiatric/neurological illness

Laboratory for Molecular Mechanisms of Brain Development, RIKEN Center for Brain Science (CBS)

The ever-transforming FANTOM Project: Building a database to fully utilize rapidly-increasing DNA/transcription data

Laboratory for Large-Scale Biomedical Data Technology, RIKEN Center for Integrative Medical Sciences (IMS)

Taking the helm in bioresearch with the world's largest store of bioresources and associated information

Integrated Bioresource Information Division, RIKEN BioResource Research Center (BRC)

ViBrism, a comprehensive gene expression database for the whole mouse brain — Visualizing invisible biological processes using image processing technology —

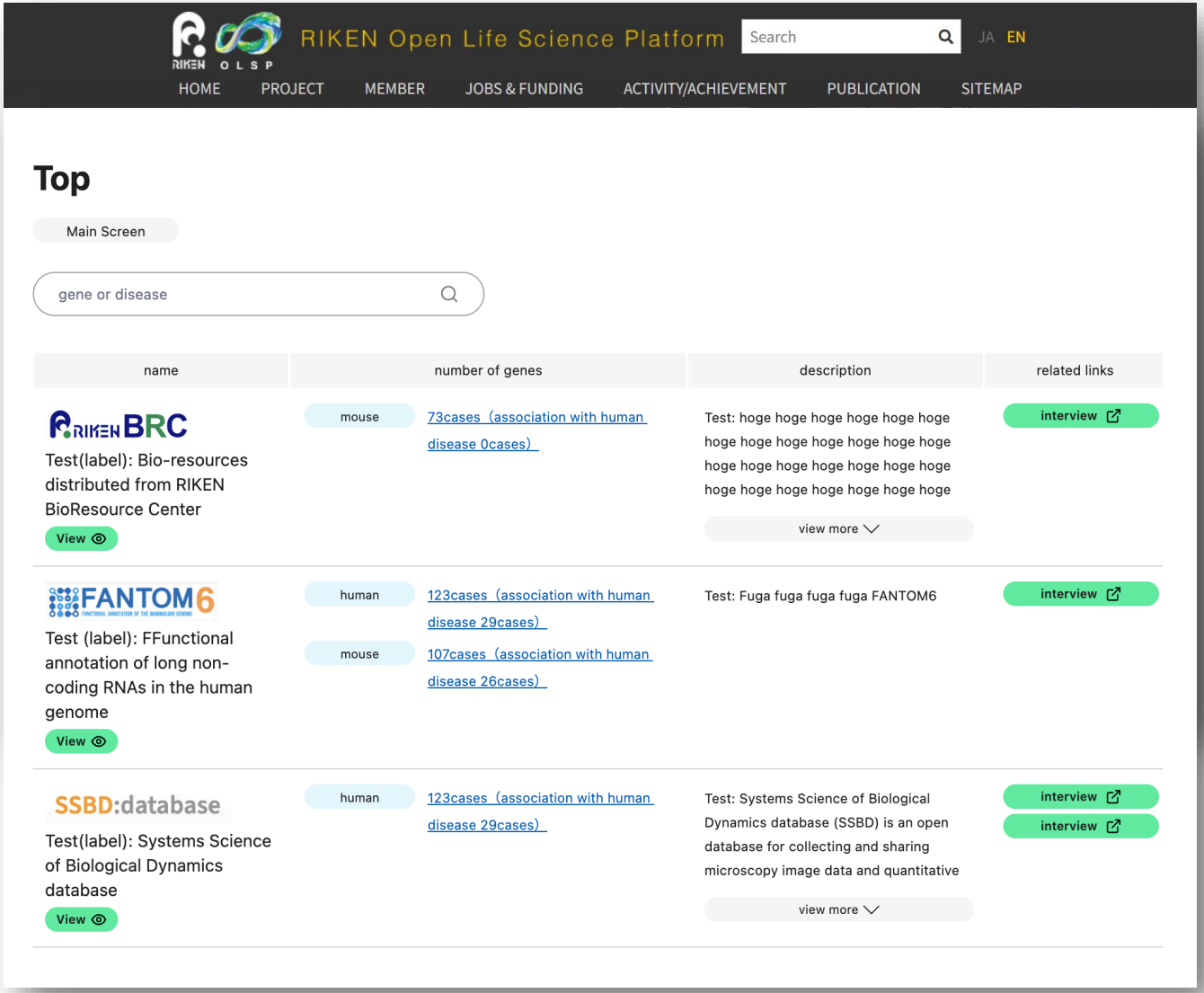
Image Processing Research Team,RIKEN Center for Advanced Photonics (RAP)

MetaboBank, a metabolomics repository — Creating the means for archiving and reusing metabolite data —

Metabolome Informatics Research Team, RIKEN Center for Sustainable Resource Science (CSRS)

Japanese/English interviews are available at the top page of the OLSP web site
https://olsp.riken.jp/ or https://olsp.riken.jp/en/

OLSP web site: database guide (illustration purpose)



OLSP events

- OLSP Workshop (in RIKEN internal)
  - Jan 20-21, 2020 (Kobe)
  - Apr 20,22, 2021 (Virtual)
  - May 12, 2022 (Virtual)
  - Jun 15-16, 2023 (Wako)
  - May 21, Jun 17, 2024 (Wako)

- Symposiums
  - OLSP Symposium (Jan 27, 2025, TODAY)
  - The 48th Annual Meeting of the Japan Neuroscience Society (日本神経科学大会) Jul 24-27, 2025 (Niigata)
  - Also planning in FY2025