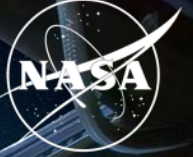


# NASA's Biological and Physical Sciences Division Enable Open Science

National Aeronautics and  
Space Administration



**AGU 12/13/2024**

**A Vision for What's Next: NASA's  
Evolving Data, Software, and Science**

**Amanda Saravia-Butler, Ph.D.**

**NASA GeneLab Science Lead**

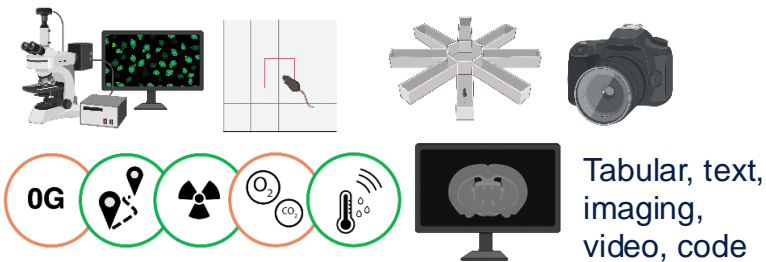
**Contractor: Amentum**

**Biological & Physical Sciences**





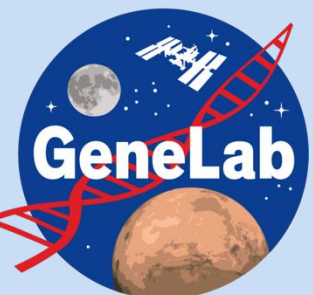
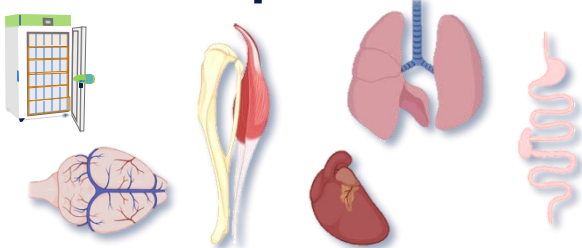
## Physiological/Phenotypic/Imaging/ Environmental Telemetry Data



## Molecular/Omics Data



## Biospecimens



## NASA Open Science Data Repository (OSDR)

[nasa.gov/osdr/](https://nasa.gov/osdr/)

- Single Submission Portal (BDME)
- User Interface/Website Tool for RDSAs (Research Data Submission Agreements)
- Workspace
- Maximally Open Access with Necessary Controls for Sensitive Data
- Data Maximally FAIR
  - Findable, Accessible, Interoperable, Reusable
  - Transparency, Inclusivity, and Reproducibility

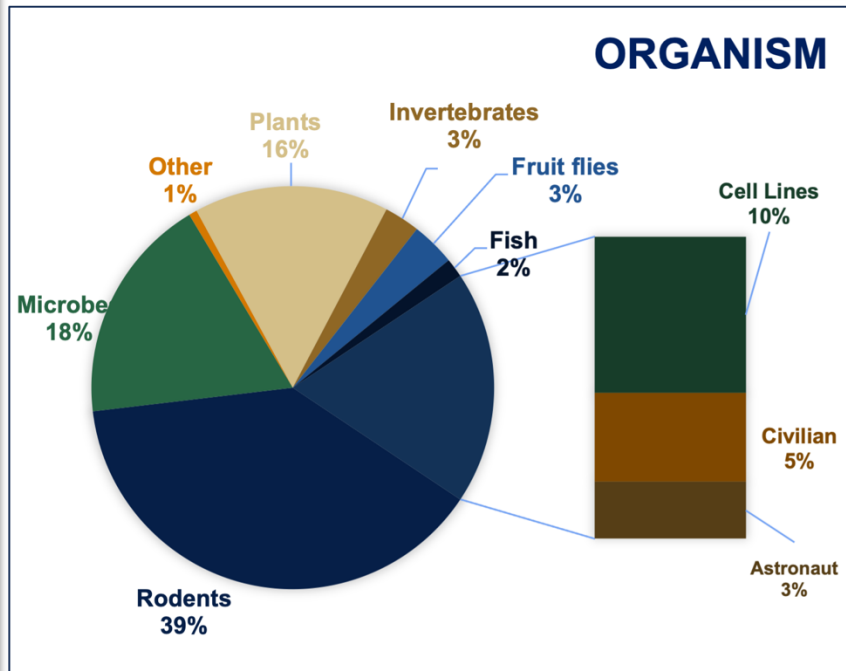
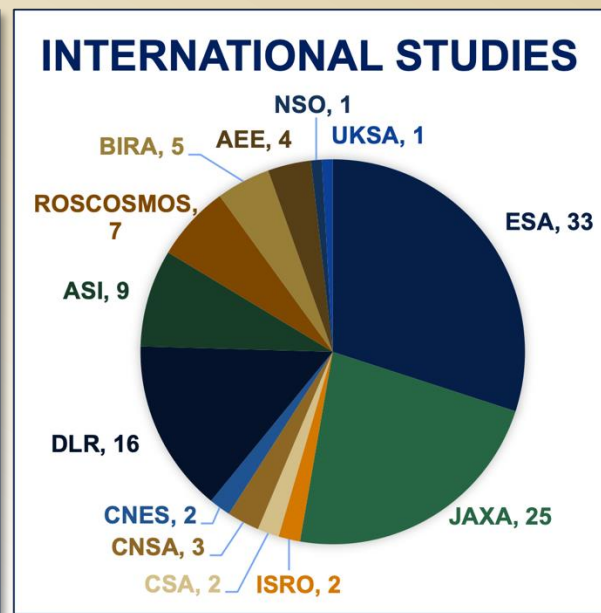
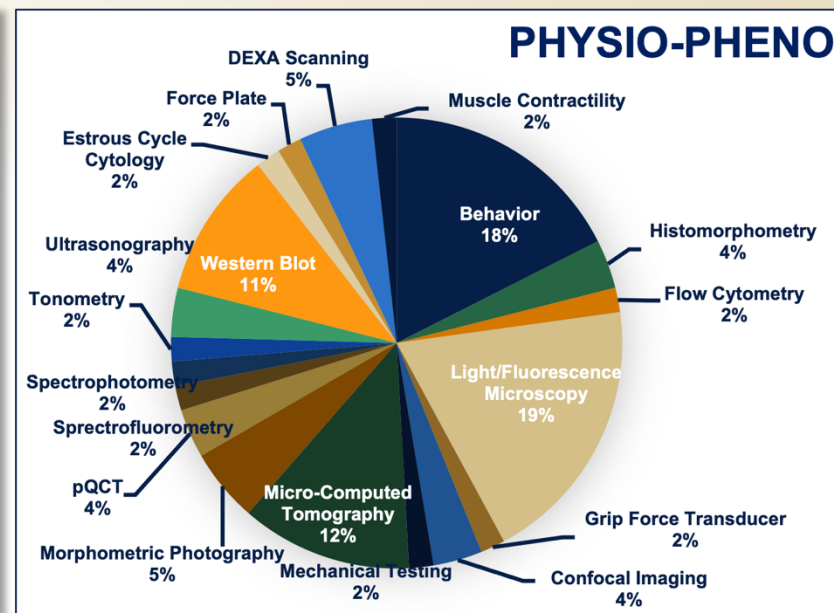
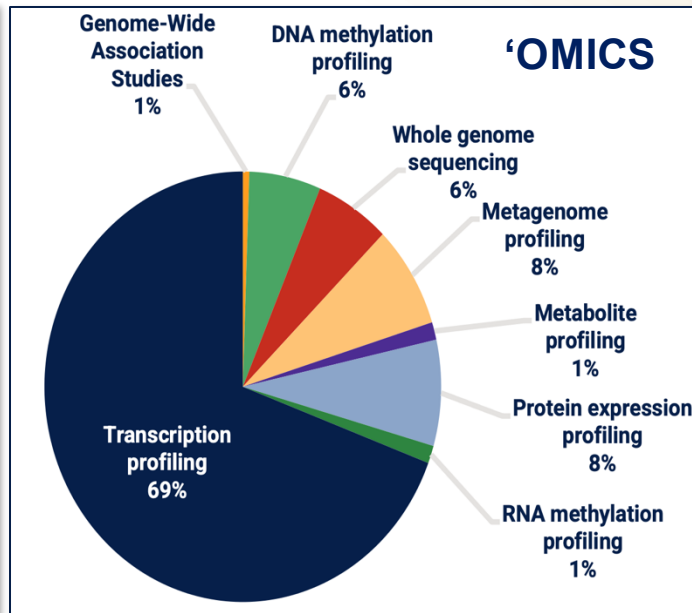
522  
Studies

973  
Datasets

45  
Species

>80  
Assays

>210TB  
Data



### USAGE METRICS (12 MO)



COUNTRY	ACTIVE USERS
United States	48K ↑1,90...
India	1.7K ↑654...
China	1.2K ↑910...
United Kingdom	593 ↑329...
Canada	542 ↑530...
Germany	472 ↑604...
South Korea	470 ↑571...




[OSDR Home](#) [About](#) [Data & Tools](#) [Research & Resources](#) [Services](#) [Working Groups](#) [Engage with Us](#) [Help](#)

## Open Science Data Repository

The NASA Open Science Data Repository (OSDR) enables access to space-related data from experiments and missions that investigate biological and health responses of terrestrial life to spaceflight. The goal of OSDR is to enable multi-modal and multi-hierarchical fundamental space life science data be reused toward basic science, applied science, and operational outcomes for space exploration and knowledge discovery. These data include 'omics, phenotypic, physiological, behavioral, hardware, environmental telemetry; raw, processed; tabular, text, code, bioimaging, and video.

[Learn More About OSDR](#)



## Explore and Contribute



### Open Science Data Repository

Search and upload spaceflight datasets

[Explore the Data Repository](#)



### Submit Data to OSDR

Have space-relevant data to submit?

[Contribute via the Submission Portal](#)



### Join OSDR AWG's

We look forward to collaborating with you!

[Interested in participating in an AWG?](#)



- PIs can submit data through BDME.
- Allows efficient input of sample and assay level metadata alongside data files.
- Metadata inputs connected to controlled and normalized ontology.
- Tailored to specialized needs of spaceflight samples.
- Used for both omics (GeneLab) and non-omics (ALSDA) data submissions.

The screenshot displays the 'Description' tab of the BDME submission portal. The top navigation bar includes 'Description' (highlighted with a red circle), 'Samples', 'Assays', 'Protocols', 'Files', and 'Study Validations'. The main content area is divided into several sections:

- Study Design Descriptor:** Includes a 'Space Flight' button.
- Factors:** Includes a 'spaceflight : Space Flight' button.
- Project Details:** Includes fields for 'Project Type', 'Funding Source(s)', 'Flight Program', and 'Experiment Platform(s)', each with a 'Set' button.
- Experimental Factors:** A table showing factors like 'space station' and 'Space Flight' with their descriptions and ontology links.

Red dashed lines and arrows indicate the flow of data from the 'Project Details' section to the 'Experimental Factors' table. A red circle highlights the 'Project Type' dropdown menu, which is shown in a separate window with options: 'Spaceflight Study', 'Ground Study', and 'High Altitude Study'. Another red circle highlights the '+ Add factor' button in the 'Experimental Factors' table.

The screenshot displays the NASA Open Science for Life in Space (OSDR) dashboard. The top navigation bar includes 'Home', 'About', 'Data & Tools', 'Research & Resources', 'Working Groups', and 'Help'. The main content area shows the status of a study (OSD-742) as 'Submitted'. A red box highlights the 'Preview' button in the top right corner. Below the status message, a red box highlights the 'Generate New Link' button and the URL: <https://osdr.nasa.gov/bio/repo/data/studies/OSD-742/preview/5hPDDjNQdSLMYcqCoPyzi6N7rEgpJwpX>. The bottom section shows the 'Current Version: None' and 'Next Version: 1' for the dataset link: [OSDR Data](#) and the DOI: [10.26030/kj2q-wc45](#).



OSDR Home About ▾ Data & Tools ▾ Research & Resources ▾ Services ▾ Working Groups ▾ Engage with Us ▾ Help ▾

## Open Science Data Repository

The NASA Open Science Data Repository (OSDR) enables access to space-related data from experiments and missions that investigate biological and health responses of terrestrial life to spaceflight. The goal of OSDR is to enable multi-modal and multi-hierarchical fundamental space life science data be reused toward basic science, applied science, and operational outcomes for space exploration and knowledge discovery. These data include 'omics, phenotypic, physiological, behavioral, hardware, environmental telemetry; raw, processed; tabular, text, code, bioimaging, and video.

[Learn More About OSDR](#)

## Explore and Contribute



### Open Science Data Repository

Search and upload spaceflight datasets

[Explore the Data Repository](#)



### Submit Data to OSDR

Have space-relevant data to submit?

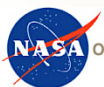
[Contribute via the Submission Portal](#)



### Join OSDR AWG's

We look forward to collaborating with you!

[Interested in participating in an AWG?](#)



## Open Science Data Repository Search


Sort By: Release Date

Items per page: 25

1 – 25 of 435



Study

OSD-385

[Persistence of Escherichia coli in the microbiomes of red Romaine lettuce \(Lactuca sativa cv. 'Outredgeous'\)- does seed sanitization matter?](#)

Organisms	Factors	Assay Types	Release Date	Description
Microbiota	Treatment Seed Sanitization Tissue	Amplicon Sequencing	19-Apr-2024	Seed sanitization via chemical processes removes/reduces microbes from the external surfaces of the seed and thereby could have an impact on the plants,health or productivity. To determine the impact ...

Highlights: *cgene*


Study

OSD-580

[Transcriptional profiling of heart tissue from mice flown on the RRRM-2 mission](#)

Organisms	Factors	Assay Types	Release Date	Description
Mus musculus	Spaceflight Age Euthanasia Location	transcription profiling	03-Jan-2024	In the Rodent Research Reference Mission (RRRM-2), forty female C57BL/6NTac mice were flown on the International Space Station. To assess differences in outcomes due to age, twenty 12 week-old and twe...

Highlights: *cgene*


Study

OSD-576

[Transcriptional profiling of tibialis anterior muscle from mice flown on the RR-23 mission](#)

Organisms	Factors	Assay Types	Release Date	Description
Mus musculus	Spaceflight	transcription profiling	12-Dec-2023	The objective of the Rodent Research-23 mission (RR-23) was to better understand the effects of spaceflight on the eyes, specifically on the structure and function of the arteries, veins, and lymphati...

Highlights: *cgene*


Study

OSD-524

[Ionizing radiation induces transgenerational effects of DNA methylation in zebrafish](#)

Organisms	Factors	Assay Types	Release Date	Description
Danio rerio	Ionizing Radiation Generation	DNA methylation profiling	31-Aug-2023	Ionizing radiation is known to cause DNA damage, yet the mechanisms underlying potential transgenerational effects of exposure have been scarcely studied. Previously, we observed effects in offspring ...



### General Search Filters

Data Source

- ☒ GeneLab
- ☒ ALSDA
- ☐ NIH GEO
- ☐ EBI PRIDE
- ☐ ANL MG-RAST

Data Type

- ☒ Study
- ☐ Experiment
- ☐ Subject
- ☐ Biospecimen
- ☐ Payload

[Show more](#)

### Study Search Filters

Project Type

- ☐ Ground
- ☐ Spaceflight
- ☐ High Altitude

Assay Type

- ☐ Amplicon Sequencing Assay
- ☐ Bisulfite Sequencing
- ☐ ChIP-Seq
- ☐ Behavior (Gait)
- ☐ Gel Electrophoresis

[Show more](#)

Organism

Description

Experiments

Payloads

Missions

Protocols

Samples


Assays

Publications

Files

Version History

Visualization



420.51 GB

OSD-666

Version 3

Transcriptional profiling of right quadriceps femoris muscle from mice flown on the RR-23 mission

Study

GeneLab ID: GLDS-605

DOI: 10.26030/7c15-jm96

Cite this Study

Description

Description

The objective of the Rodent Research-23 mission (RR-23) was to better understand the effects of spaceflight on the eyes, specifically on the structure and function of the arteries, veins, and lymphatic vessels that are needed to maintain vision. To this end, twenty male, C57BL/6J, 16-17 weeks-old mice were delivered to the International Space Station (ISS) on SpaceX-21 in a single transporter, transferred to two rodent habitats, and maintained in microgravity for 38 days. Flight mice were then returned to Earth alive (January 13th, 2021). After splashdown in the Atlantic Ocean, mice were transported to Kennedy Space Center via helicopter. The 20 Flight, 20 Habitat Ground Control (HGC), and 20 Vivarium Ground Control (VGC) mice were removed from Rodent Transporters (Flight and HGC) or vivarium cages (VGC), placed into shipping containers, and flown to Texas A and M University. There, mice underwent post-flight procedures, before euthanasia and tissue collection. Flight, HGC and VGC animals were euthanized and dissected on Jan 14th, 17th or 20th of 2021, respectively. Right quadriceps femoris muscle samples were preserved by immersion in liquid nitrogen and stored at -80C until RNA was extracted, and libraries generated and sequenced (target 60 M clusters per sample, PE 150 bp). This dataset features 9 samples from the Flight group, 9 samples from the Habitat Ground Control group, and 9 samples from the Vivarium Ground Control group.

Factor(s)

Factor	Ontology: Concept
Spaceflight	Space Flight

Organism(s)

Mus musculus

Assay(s)

Measurement	Technology	Device Platform
transcription profiling	RNA Sequencing (RNA-Seq)	Illumina

Project

Payload Identifier	RR-23
Project Title	Effects of Microgravity on Ocular Vascular Hydrodynamics
Project Type	Spaceflight Study
Flight Program	International Space Station (ISS)
Experiment Platform	Rodent Flight Hardware (Transporter and Habitat)

Submitted Date:  
26-Sep-2023

Initial Release Date:  
18-Oct-2023



# Enabling FAIR Science: Metadata Curation



## Samples

### Controlled, Standardized Ontology / Terminology

Select Export Columns

Source Name	Sample Name	Characteristics: Organism	Characteristics: Strain	Characteristics: Genotype	Characteristics: Animal Source	Characteristics: Material Type	Factor Value: Spaceflight	Characteristics: Sex	Characteristics: Age at Launch	Protocol REF	Parameter Value: habitat	Parameter Value: duration	Parameter Value: light cycle	Parameter Value: Enrichment material
RR-23_F2	RR23_R-Quad_FLT_F2	Mus musculus	C57BL/6J	Wild Type	Jackson Laboratory	Right quadriceps femoris	Space Flight	Male	16-17 week	Animal Husbandry	Rodent Flight Hardware (Transporter and Habitat)	38 day	12 h light: 12 h dark. Lights on at 7:00 GMT	Hut
RR-23_F3	RR23_R-Quad_FLT_F3	Mus musculus	C57BL/6J	Wild Type	Jackson Laboratory	Right quadriceps femoris	Space Flight	Male	16-17 week	Animal Husbandry	Rodent Flight Hardware (Transporter and Habitat)	38 day	12 h light: 12 h dark. Lights on at 7:00 GMT	Hut
RR-23_F4	RR23_R-Quad_FLT_F4	Mus musculus	C57BL/6J	Wild Type	Jackson Laboratory	Right quadriceps femoris	Space Flight	Male	16-17 week	Animal Husbandry	Rodent Flight Hardware (Transporter and Habitat)	38 day	12 h light: 12 h dark. Lights on at 7:00 GMT	Hut
RR-23_F5	RR23_R-Quad_FLT_F5	Mus musculus	C57BL/6J	Wild Type	Jackson Laboratory	Right quadriceps femoris	Space Flight	Male	16-17 week	Animal Husbandry	Rodent Flight Hardware (Transporter and Habitat)	38 day	12 h light: 12 h dark. Lights on at 7:00 GMT	Hut

## Assays

### Controlled, Standardized Ontology / Terminology

Assay Name: transcription profiling - RNA Sequencing (RNA-Seq)

Technology Type: RNA Sequencing (RNA-Seq)

Technology Platform: Illumina

Select Export Columns

Sample Name	Protocol REF	Parameter Value: QA Instrument	Parameter Value: QA Assay	Parameter Value: QA Score	Extract Name	Protocol REF	Parameter Value: Spike-in Quality Control	Parameter Value: Spike-in Mix Number	Protocol REF	Parameter Value: Library Selection	Parameter Value: Library Layout	Protocol REF	Parameter Value: Read Depth	Parameter Value: rRNA Contamination
RR23_R-Quad_FLT_F2	Nucleic Acid Extraction	Agilent 4200 TapeStation	Agilent RNA ScreenTape Assay	8.4 RINe	RR23_R-Quad_FLT_F2	Spike-in Protocol	ERCC ExFold RNA Spike-In Mix	Mix 1	Library Construction	Ribo-depletion	PAIRED	GeneLab raw data processing protocol	101335022 read	0.61 percent
RR23_R-Quad_FLT_F3	Nucleic Acid Extraction	Agilent 4200 TapeStation	Agilent RNA ScreenTape Assay	8.3 RINe	RR23_R-Quad_FLT_F3	Spike-in Protocol	ERCC ExFold RNA Spike-In Mix	Mix 1	Library Construction	Ribo-depletion	PAIRED	GeneLab raw data processing protocol	98135600 read	0.5 percent
RR23_R-Quad_FLT_F4	Nucleic Acid Extraction	Agilent 4200 TapeStation	Agilent RNA ScreenTape Assay	7.7 RINe	RR23_R-Quad_FLT_F4	Spike-in Protocol	ERCC ExFold RNA Spike-In Mix	Mix 1	Library Construction	Ribo-depletion	PAIRED	GeneLab raw data processing protocol	106203766 read	0.52 percent
RR23_R-Quad_FLT_F5	Nucleic Acid Extraction	Agilent 4200 TapeStation	Agilent RNA ScreenTape Assay	7.9 RINe	RR23_R-Quad_FLT_F5	Spike-in Protocol	ERCC ExFold RNA Spike-In Mix	Mix 1	Library Construction	Ribo-depletion	PAIRED	GeneLab raw data processing protocol	105949962 read	0.69 percent

# Enabling FAIR Science: Omics Data Processing

Build consensus data processing pipelines with the scientific community

Raw Sequence Data

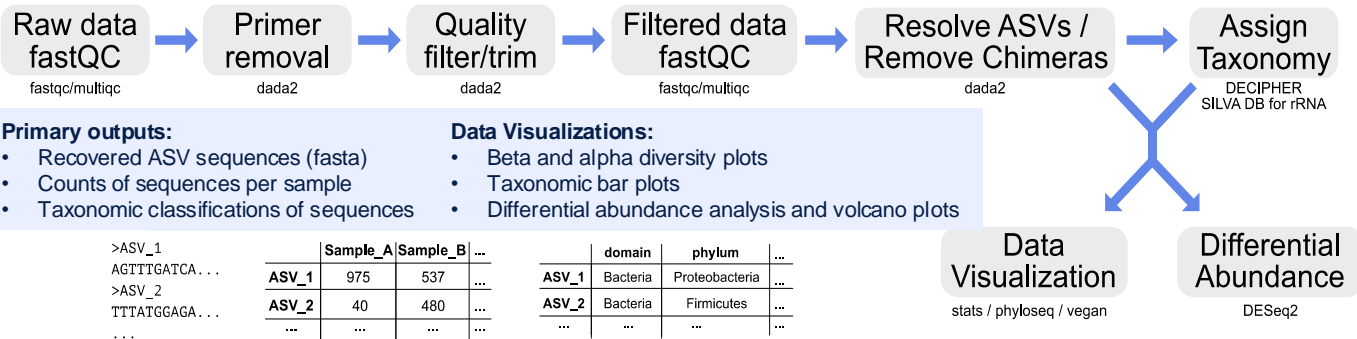
```
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AATATCAGTGATATTTAGAAACCATAGTAAGCTAACTAATAATGGAATGGTTTAAATATCCTGTGACAAGTTAATGTGGATACTATGCGGTCTTCTTAA
+
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@A00654:12:HFY5YDSXX:1:1101:5466:1000_CCTCCCTCG 1:N:0:NGGAGAGT+TCCTACCT
GGCGGGTCTGAGCAAGAACCTCTGCCATCGCCGGCTCGGGACGGGAGGCCACCCGTGGCCGAGCACGCAGACCTGGATGAACCGAGGCTCGATGGGCTGGAC
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00654:12:HFY5YDSXX:1:1101:14109:1000_TGATCTACG 1:N:0:NGGAGAGT+TCCTACCT
TGTCACACAACCAGCTGTGCCTGTGCTATTGCAGTTACACAGTGTCACTACAACCACTGTGCCTGTGCTATTGCAGTTACACAGTGTCACTACAACCAGCAGAT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
```



Processed Amplicon Sequence Data: Differential Abundance Analysis

ASV_ID	family	genus	Group.Mean_(FLT)	Group.Mean_(GC)	log2FC_(FLT)v(GC)	stat_(FLT)v(GC)	padj_(FLT)v(GC)
ASV_16S_1	Tannerellaceae	Parabacteroides	38674.17	33866.03	0.19	1.16	0.51
ASV_16S_10	Lachnospiraceae	NA	382.22	1622.88	-2.09	-2.60	0.05
ASV_16S_100	Tannerellaceae	Parabacteroides	0.00	8.47	-5.62	-1.85	NA
ASV_16S_101	Erysipelotrichaceae	Holdemania	0.00	12.07	-6.13	-2.02	NA
ASV_16S_102	Tannerellaceae	Parabacteroides	8.23	0.00	5.53	1.82	NA
ASV_16S_103	Peptostreptococcaceae	NA	0.00	7.48	-5.44	-1.79	0.24

## Amplicon Sequencing Data



Files

Study Files Selected: 5

Download

Search Files

OSDR API

OSDR AWS s3

☐ OSD-137

☐ Study Metadata Files

☐ Histology

☐ RNA-Seq

☐ Whole Genome Bisulfite Sequencing

☒ GeneLab Processed RNA-Seq Files

☒ Differential Expression Analysis Data

☒ GLDS-137\_rna\_seq\_contrasts.csv 407.0 B Fri Feb 17 2023

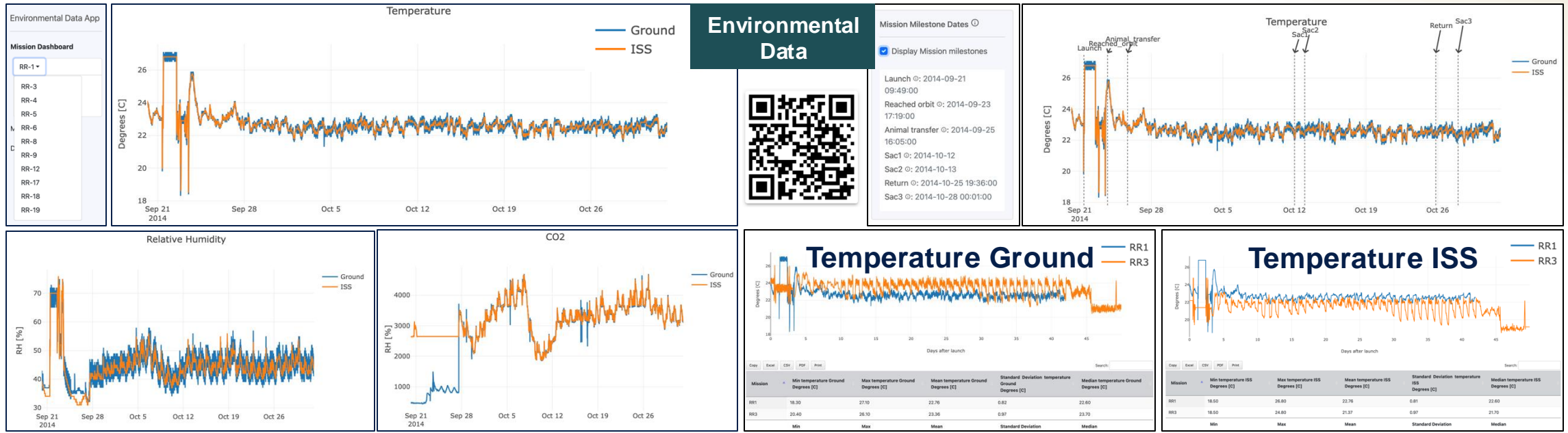
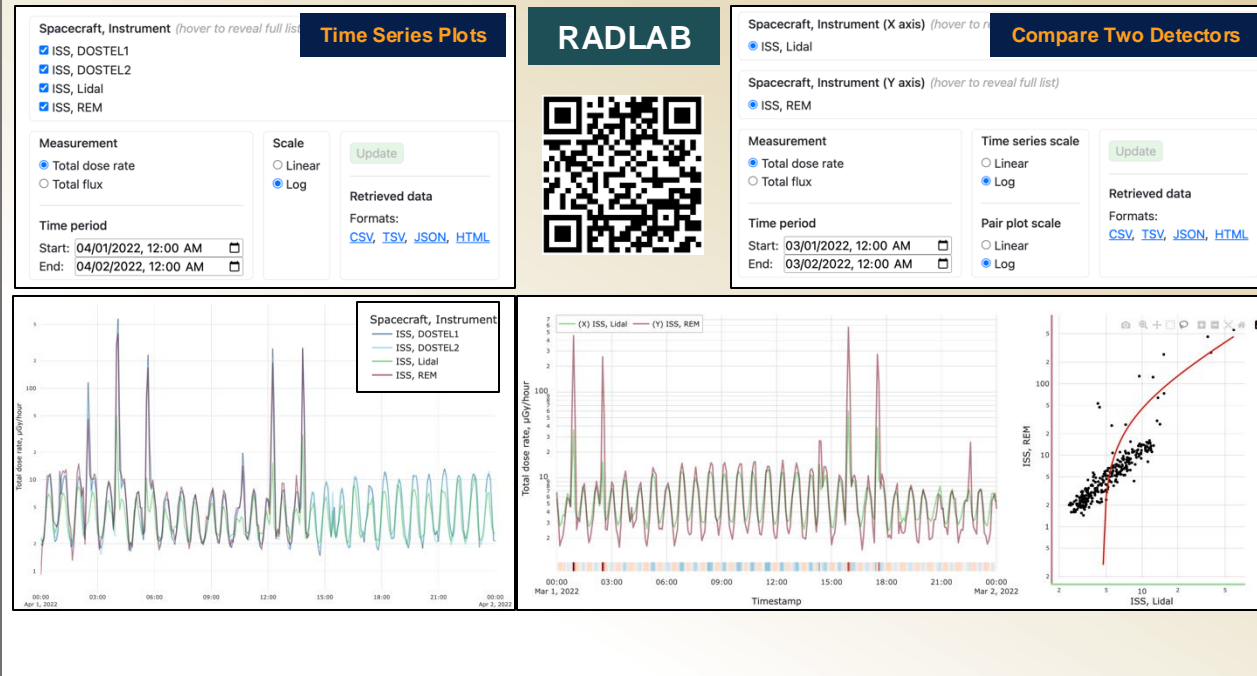
☒ GLDS-137\_rna\_seq\_differential\_expression.csv 25.5 MB Fri Feb 17 2023

☒ GLDS-137\_rna\_seq\_SampleTable.csv 855.0 B Fri Feb 17 2023

☐ Merged sequence data

☐ Trimmed sequence data

☐ Aligned sequence data





# Open Science Analysis Working Groups (AWGs)



[Join an AWG!](#)

## ANIMAL

226 members



## MULTI-OMICS

351 members



## MICROBIAL

216 members



## PLANTS

176 members



## AI/ML

323 members



## ALSDA

(Physiological/BioMedical)

224 members



## FEMALE REPRO

88 members



## HUMAN

39 members



## RADLAB

67 members



92

Enabled  
Publications  
linked to OSDR

109

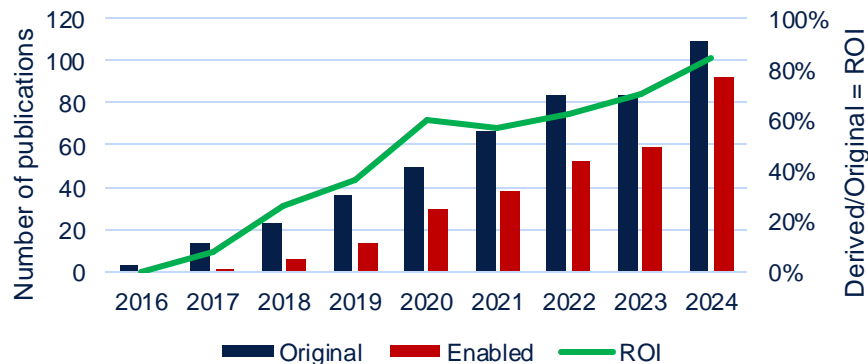
Original Publications  
linked to OSDR

150+

Datasets used in  
enabled publications



ROI grows faster than publications  
linked to original



## Collaborate on Data Mining/Publications



Cell Press Package 2020:  
The Biology of Spaceflight

<https://www.cell.com/c/the-biology-of-spaceflight>



Nature Portfolio Collection 2024:

Space Omics and Medical Atlas across orbits (SOMA)

<https://www.nature.com/collections/ebdbcahdgc>

# Physical Sciences Informatics (PSI)

<https://nasa.gov/psi>

**The new PSI Data Repository and Submission Portal was released in September 2024**

Key updates to the PSI Repository include:

- PSI utilized NASA OSDR infrastructure to develop a new data repository and user submission portal
- New look and layout, available investigations are visible as a scrollable list.
- The Submission Portal is a new tool to streamline the process of publishing new investigations.
- Improved data repository interface and new search capabilities
- To support the sharing of scientific information, each dataset has an assigned DOI.
- Version history is available for datasets



# PSI Focuses on 6 Research Areas

## Fluid Physics

The study of fluid motion and the associated transport of mass, momentum and energy to address critical space exploration needs for advanced life support systems, propulsion, and thermal control systems.



## Biophysics

Growing larger and more perfect protein macromolecule crystals for analysis, biomaterials/biofilms, and biofluids to sustain long duration human presence in space and improve quality of life on earth.



## Combustion Science

Obtain benchmark microgravity data to advance computational models for spacecraft fire safety and improved efficiency & reduced pollutant emission in practical terrestrial combustion.



## Fundamental Physics

Quantum Coherence & entanglement, quantum interferometry & precision measurement quantum matter & many-body systems.



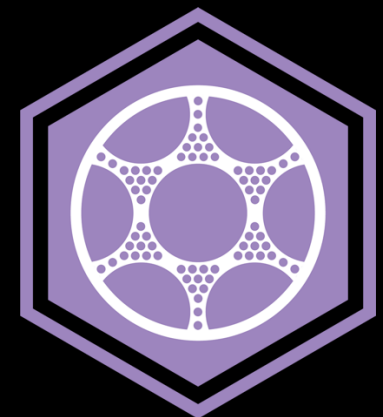
## Materials Science

Microstructural evolution, phase coarsening, and quantifying thermophysical properties to improve computational models and enhance material properties terrestrially and in space - Glasses & Ceramics, Granular Materials, Metals, Polymers & Organics & Semiconductors.



## Complex Fluids Soft Matter

Study of binary mixtures such as colloidal systems, liquid crystals, foams, gels, emulsions, and granular flows.







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Multimedia ▾

NASA+ **LIVE**[Home](#)[Data Repository](#)[Submission Portal](#)[Research Opportunities](#)[Awarded Research](#)[Image Gallery](#)[Resources ▾](#)

# Physical Sciences Informatics (PSI)



The Guided Submission directs Data Submitters through the process of creating a new investigation and offers the option of contacting a PSI Curator for more help.

NASA Physical Sciences Informatics Home Data & Tools My Dashboard

Welcome to Guided Submission

The Physical Sciences Informatics (PSI) system is a data repository that serves as a comprehensive physical sciences resource for reduced-gravity flight experiments and related ground-based studies. It accepts submission of information spanning six research areas in physical sciences: biophysics, combustion science, complex fluids/soft matter, fluid physics, fundamental physics, and materials science.

Please select

Create an Investigation

Contact PSI curation at msfc-psi-help@mail.nasa.gov

Preview provides a view of the Investigation page before publishing.

Investigation Description captures:

- Keywords
- Investigation Details
- Experiment Hardware

Investigation Files include:

- Raw and Analyzed Data
- Science Documents
- Reports and Presentations

NASA Physical Sciences Informatics Home Data & Tools My Dashboard Preview

PSI-10

Current Version: None  
Next Version: 1  
DATASET LINK: [PSI Data](#)  
DOI: [10.60555/w4zy-bt45](#)

Status

State Submitted

Submission Date 10-Sep-2024

Release Date 10-Sep-2025

Actions

User Management

Save Metadata

Reset Investigation

Investigation Keywords

Chemical Kinetics Dilution Ethylene Flame Growth Radiative Extinction  
Stoichiometric Mixture Fraction Thin Filament Pyrometry

Investigation Details

All fields with asterisks (\*) are required.

Project Type \* Microgravity Investigation

Flight Platform \* International Space Station (ISS)

Sponsoring Agency \* NASA + Add

Monitoring Center \* Glenn Research Center (GRC)

Funding Source(s) \* Set

Research Area \* Combustion Science

Sub-Research Area \* Gaseous Fuels

Investigation Start Date \* 01-14-1999

Investigation End Date \* Set

Investigation Acronym ACME/Flame Design

Experiment Hardware

ACME





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**Data Repository**

Submission Portal

Research Opportunities

Awarded Research

Image Gallery

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# Physical Sciences Informatics (PSI)







Researchers can filter the investigations by

- Research Area
- Project Type
- Keywords

Investigation Search Filters

Research Area

☐ Combustion Science
 ☐ Fundamental Physics
 ☐ Fluid Physics
 ☐ Materials Science
 ☐ Complex Fluids - Soft Matter
 ☐ Biophysics

Project Type

☐ Ground Investigation
 ☐ Microgravity Investigation
 ☐ Reduced Gravity Investigation

NASA Physical Sciences Informatics

Home Data & Tools

PSI Data Repository Search

Search Datasets

Sort By: Release Date

Items per page: 25

1 - 25 of 97

Investigation

PSI-8

Characterization of Biofilm Formation, Growth and Gene Expression on Different Materials and Environmental Conditions in Microgravity(SpaceBiofilms)

Research Area	Type	Objectives	Approach
Biophysics	Microgravity Investigation	1. To use microbial strains that are relevant to human spaceflight, and nosocomial infections that have also occurred in spaceflight, and substrata materials that are relevant to () spacecraft struct...	The Space Biofilms project, performed at t International Space Station, contributes to the understanding of microbial communitie in space by characterizing the morphology and gene expression of bac....

Highlights: PSI-8

Investigation

PSI-12

Growth of Large, Perfect Protein Crystals for Neutron Crystallography(Perfect Crystals)

Research Area	Type	Objectives	Approach
Biophysics	Microgravity Investigation	The Perfect Crystals investigation uses microgravity environment on the International Space Station to grow crystals of human manganese superoxide dismutase (MnSOD). This sheds light on how the antiox...	The Growth of Large, Perfect Protein Crystals for Neutron Crystallography investigation grows perfect, large-volume crystal suitable for neutron macromolecula crystallography of large unit cell prote...

Highlights: PSI-12

Investigation

PSI-4

Flow Boiling and Condensation Experiment Flow Boiling Module(FBCE FBM)

Research Area	Type	Objectives	Approach
Fluid Physics	Microgravity Investigation	The proposed research aims to develop an integrated two-phase flow boiling/condensation facility for the International Space Station (ISS) to serve as a primary platform for obtaining two-phase flow a...	The approach used in this project is to perform the following sequential series of tasks: 1. Provide detailed design and instrumentation requirements for the Flow Boiling Module (FBM). 2. Provide desi...

Highlights: PSI-4

New Investigation Records include:

- Navigation Menu
- Digital object identifier (DOI) upon creation
- Citation
- Version History

Search Bar

NASA Physical Sciences Informatics

Home Data & Tools

PSI-9

Version 1

Electrically Driven Liquid Film Flow Boiling in the Absence of Gravity(EHD)

Investigation

16.83 GB

DOI: 10.60555/18tc-8d56

Research Area: Fluid Physics

SubResearch Area: Electrowhydrodynamics

Cite this Investigation

Description

Experimental Table

Hardware

Representative Images

Data files and documents

Publications

Version History

Description

Project

Project Type

Microgravity Investigation

Proposal Title

Electrically Driven Liquid Film Flow Boiling: A Two-Phase Heat Transport Device Driven by Electric Conduction and Dielectrophoretic Mechanisms

Version History

Selected Version

Version 1

Updated Date: 25-Sep-2024

Changes: New data release

Files Added (184)

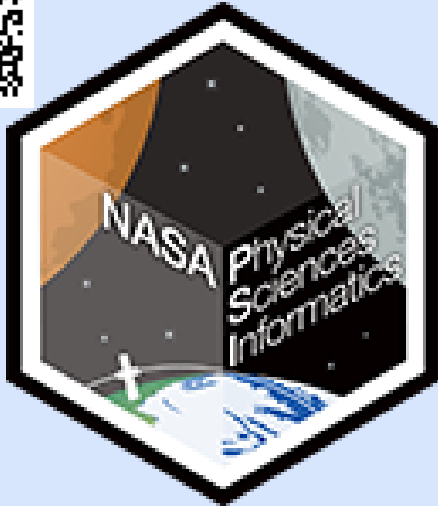
- PSI-8\_metadata\_PSI-9-ISA.zip
- PSI-9\_Science Documents\_EHD\_Data\_Guide.pdf
- PSI-9\_Science Documents\_SRD\_EHD.pdf

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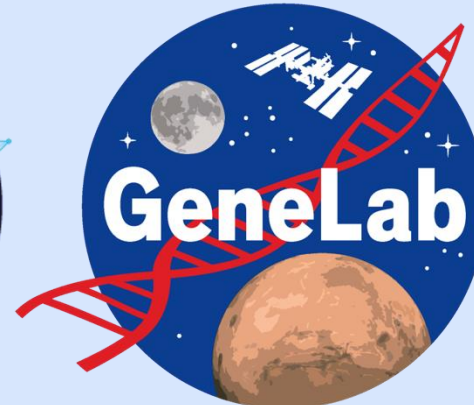
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