

Activity 3: Metadata Analysis using GLDS-38

Curricular Unit Teacher Materials

Instructions: Navigate a web browser to [NASA GeneLab: Open Science for Life in Space](https://www.nasa.gov/genelab)

Once on the site, click on **Data Repository** and search for **GLDS-38**.

GLDS-38

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

Search Filters (GeneLab Only)

Project Type Factors Organisms Assay Type Clear

Show Only:
☐ Studies With Visualizations

Page 1 of 13 (Total Studies: 320) Next >
Studies Per Page: 25

Transcriptional profiling of livers from mice flown on Rodent Research Reference Mission-1 (RRRM-1)

| Organisms | Factors | Assay Types | Release Date | Description |
|--------------|---|-------------------------|--------------|---|
| Mus musculus | Spaceflight Age Duration Euthanasia Location Dissection Condition | transcription profiling | 26-May-2021 | In the Rodent Research Reference Mission (RRRM-1), forty female BALB/cAnNTac mice were flown on the International Space Station. To assess differences in outcomes due to age, twenty 10-12 week-old and... |

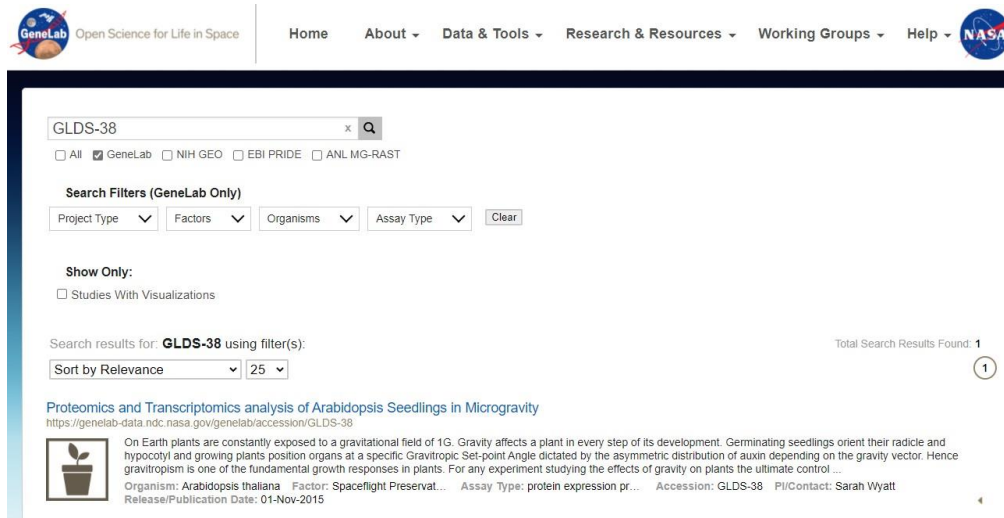
GLDS-379

Transcriptional profiling of roots and shoots from Brachypodium distachyon seedlings flown on the ISS

| Organisms | Factors | Assay Types | Release Date | Description |
|-------------------------|---|-------------------------|--------------|---|
| Brachypodium distachyon | Spaceflight Accession Organism Part | transcription profiling | 29-May-2021 | Most major cereal grain crops are monocots. Yet, most investigations of plant adaptation to the spaceflight environment have been carried out on the dicotyledonous model plant, Arabidopsis thaliana. I... |

GLDS-375

This will bring you to the study that we will be analyzing in this curricular unit, [Proteomics and Transcriptomics analysis of Arabidopsis Seedlings in Microgravity](#).



Click on the hyperlink that corresponds to the study “[Proteomics and Transcriptomics analysis of Arabidopsis Seedlings in Microgravity](#)”.

1. According to the **Study Description**, what is one of the fundamental growth responses in plants? What is the ultimate control for any experiment studying the effects of gravity in space?

Gravitropism

Microgravity in space

2. What is the model organism for this study?

Arabidopsis thaliana

3. In the **Samples** section under **Factor Value**, what two groups are being compared in the study? What is being compared?

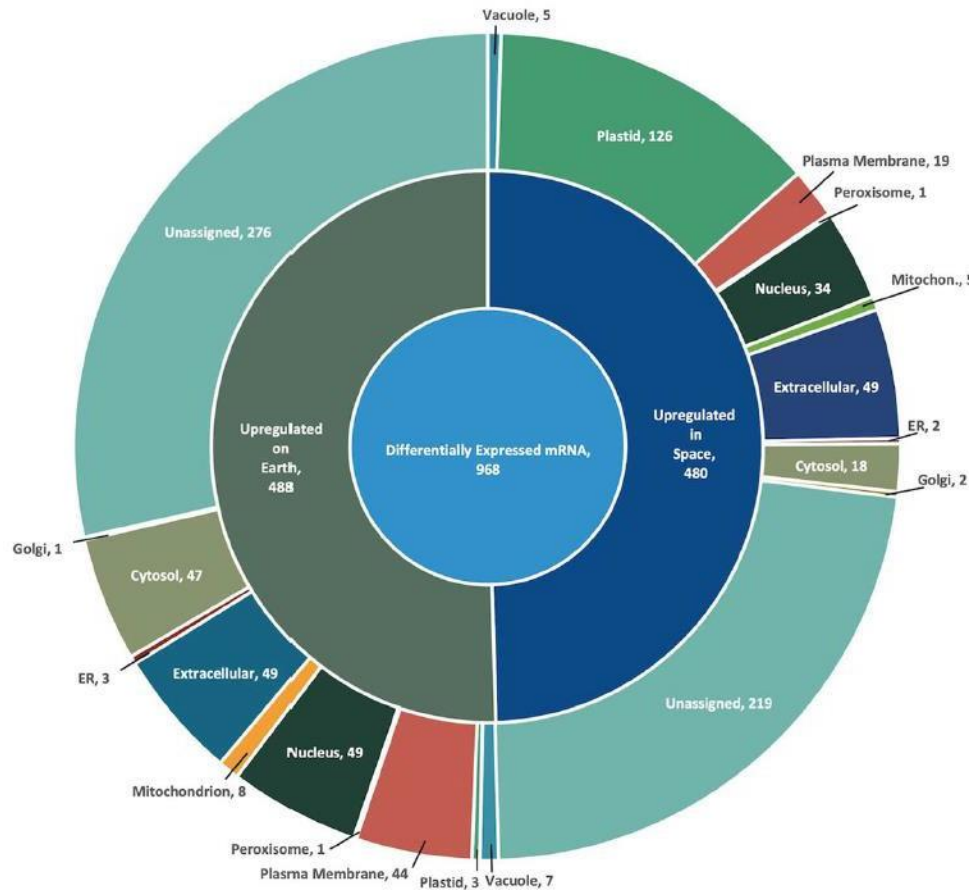
Possible Answers: Spaceflight and ground control (conditions) OR RNAlater or liquid nitrogen (preservation method)

4. Under the **Protocol** section, how was nucleic acid extracted? What platform was used to sequence it?

Extracted using RNeasy Plant mini extraction kit

Sequenced using Illumina HiSeq 2500

5. Look at the figure below.



The figure shows an overview of transcripts differentially expressed during spaceflight. How do the upregulated in space compare to those on earth?

Answers will vary

Example: More plastid genes are upregulated in space than on Earth

AUTHOR

Monique Salazar, iMater Preparatory Academy (Hialeah, FL)

Edited by GL4HS Staff