Transcriptome analysis of gravitational effects on mouse skeletal muscles under microgravity and artificial 1 g onboard environment

Risa Okada^{1,2}, Shin-ichiro Fujita^{3,4}, Riku Suzuki^{5,6}, Takuto Hayashi^{3,5}, Hirona Tsubouchi⁵, Chihiro Kato^{5,7}, Shunya Sadaki⁵, Maho Kanai^{5,6}, Sayaka Fuseya^{3,5}, Yuri Inoue^{3,5}, Hyojung Jeon⁵, Michito Hamada⁵, Akihiro Kuno^{5,6}, Akiko Ishii⁸, Akira Tamaoka⁸, Jun Tanihata⁹, Naoki Ito¹⁰, Dai Shiba^{1,2}, Masaki Shirakawa^{1,2}, Masafumi Muratani^{1,4}, Takashi Kudo^{1,5}*, Satoru Takahashi^{1,5}*

¹Mouse Epigenetics Project, ISS/Kibo experiment, Japan Aerospace Exploration Agency (JAXA), Ibaraki 305-8505, Japan.

²JEM Utilization Center, Human Spaceflight Technology Directorate, JAXA, Ibaraki 305-8505, Japan.

³Doctoral Program in Biomedical Sciences, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki 305-8575, Japan.

⁴Department of Genome Biology, Faculty of Medicine, University of Tsukuba, Ibaraki 305-8575, Japan.

⁵Laboratory Animal Resource Center in Transborder Medical Research Center, and Department of Anatomy and Embryology, Faculty of Medicine, University of Tsukuba, Ibaraki 305-8575, Japan.

⁶Ph.D. Program in Human Biology, School of Integrative and Global Majors, University of Tsukuba, Ibaraki 305-8575, Japan.

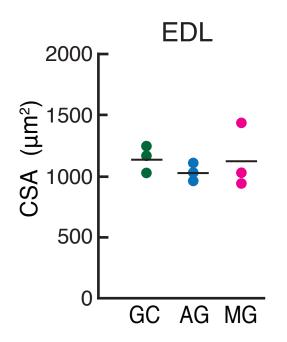
⁷Master's Program in Medical Sciences, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki 305-8575, Japan.

⁸Department of Neurology, Faculty of Medicine, University of Tsukuba, Ibaraki 305-8575, Japan.

⁹Department of Cell Physiology, The Jikei University School of Medicine, Tokyo, 105-8461, Japan.

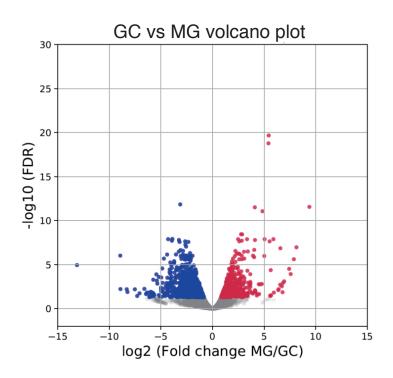
¹⁰Laboratory of Molecular Life Science, Institute of Biomedical Research and Innovation, Foundation for Biomedical Research and Innovation at Kobe (FBRI), Kobe 650-0047, Japan.

*Corresponding authors: t-kudo@md.tsukuba.ac.jp; satoruta@md.tsukuba.ac.jp.



Supplementary Figure 1.

Quantification of cross-sectional areas (CSAs) of EDL muscles in the GC, AG, and MG.



Supplementary Figure 2.

Volcano plots showing differentially regulated genes in the soleus muscle of GC and MG.

Supplementary Table 1

Gene lists of differentially expressed genes in the soleus muscle among MG, AG and GC.

Supplementary Table 2

Gene lists of differentially expressed atrogenes in the soleus muscle among MG, AG and GC.