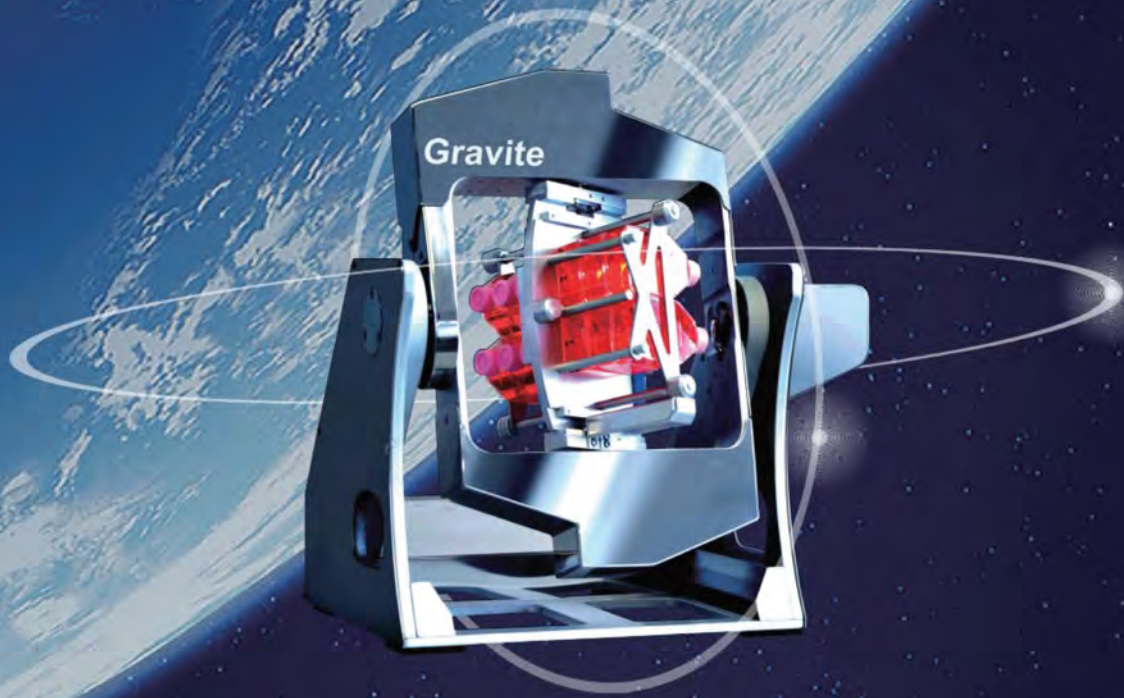


# Gravity controller **Gravite**®

NASA Kennedy Space Center introduced a gravity controller "Gravite®" for simulated microgravity device.



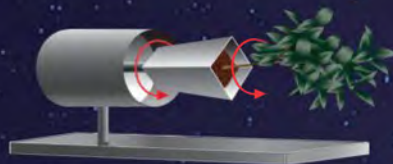
## GET THE UNIVERSE IN YOUR LAB.!!

Regenerative medicine, Space biology, Drug discovery, etc.

### Gravity Control Device Tools of Research and Development

The later of 19 century, developing "clinostat" originated from the research of gravitonic response of plants. This first "clinostat" was a rotating machine to rotate sample using one horizontal rotation axis to the ground (1D-clinostat) to inhibit unidirectional gravitational force loading.

Our Gravity Controller "Gravite®" is one of the 3D-clinostat. Gravite® is a multi-directional gravity device for simulating microgravity. By controlled rotation of two axes, a 3D-clinostat minimizes the cumulative gravity vector at the center of the device and makes  $10^{-3}$  G over time average. Moreover, Gravite® creates not only simulated microgravity environment as well as ISS but also hyper-gravity environment of 2-3G by centrifugal force from one axis rotation.



**SPACE BIO LABORATORIES**

since2005 [www.spacebio-lab.com](http://www.spacebio-lab.com)

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# Gravity controller Gravite®

Produced by Dr.LOUIS Yuge, Graduate School of Biomedical and Health Sciences, Hiroshima University

In stem cell therapy, stem cells are proliferated or induced differentiation to particular cells outside the body before grafting. In addition, stem cells are used to understand the mechanism of disease outbreaks.

To that end, we need to proliferate stem cells with undifferentiation state.

Human in space is bound to muscle atrophy and bone atrophy.

We focused on the inhibition of cell differentiation in microgravity environment to develop gravity controller "GRAVITE". You can culture cells in microgravity and hypergravity environment on the Earth using GRAVITE.

[www.spacebio-lab.com](http://www.spacebio-lab.com)

## point 1 COMPONENT



### Gravite Control Unit

Control and monitor the rotation of Main Unit.



### Gravite Main Unit

External and internal frame are rotated. Samples were mounted the center of device.

★Main Unit Size (WxDxH) : 425 × 420 × 445(mm)

★Weight : 13.5Kg ★Power Supply : AC 120V/60Hz

## point 2 FEATURES

### Microgravity (10<sup>-3</sup>G) Environment

Our original clinostat, GRAVITE®, is a multidirectional G-force generator controlling rotation of two axes simultaneously. This unique feature allows cancellation of cumulative gravitational vector at the center of the device to create 10<sup>-3</sup>G as same as ISS.



### Hypergravity (2-3G) Environment

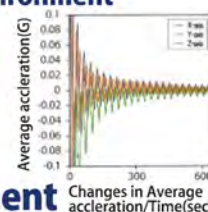
GRAVITE® can also rotate one axis to create 2-3G.

### Gravity Monitoring

GRAVITE® can monitor gravity using acceleration sensor in real time.

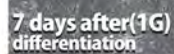
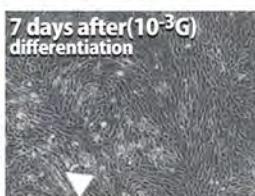
### Cell Culture Environment

GRAVITE® can setup in CO<sub>2</sub> incubator with 37 degrees C temperature and 95% humidity.



## point 3 EXAMPLE

### Myoblast differentiation was inhibited in 10<sup>-3</sup>G.



### Good Contamination



The Mold in 10<sup>-3</sup>G formed globular mass.

★1G Control

★Simulated 10<sup>-3</sup>G

## point 4 APPLICATION

### Regeneration Medicine

For research ★Research institution (University etc.)

For clinic ★Medical institution and Cell culture factory (auto / allo graft)

### Biology/Embryology

For research ★Research institutions (University etc.)

For pharmaceutical ★New drug for muscle and bone atrophy

### Protein Structural Analysis

For research ★Research institutions (University etc.)

For pharmaceutical ★New drug development

### ATTENTION

- "GRAVITE" is registered trademark of Space Bio-Laboratories, Co., Ltd..
- NASA Kennedy Space Center decided to introduce "GRAVITE".
- Please tell us your culture vessels in advance. The size is difference by every manufacturer. The cassette for vessel must adjust for your vessels.
- If you have questions, please contact us or your agent.
- Specification and appearance are subject to change without notice.



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