

# Details of Technology

Name of Technology	Functional analysis of arterial chemoreceptors using a gas environmental autoregulation chamber for living bodies	Agriculture, Forestry and Fisheries
Name/Post/Faculty	Yoshio Yamamoto / Professor / Veterinary Medicine Academic Group	
Key words	hypoxia, sensory reception	

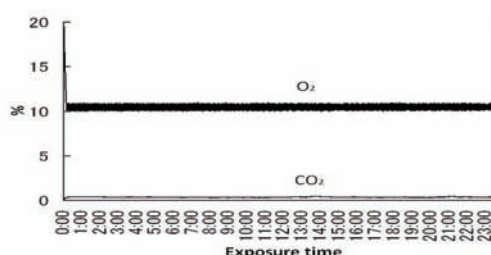
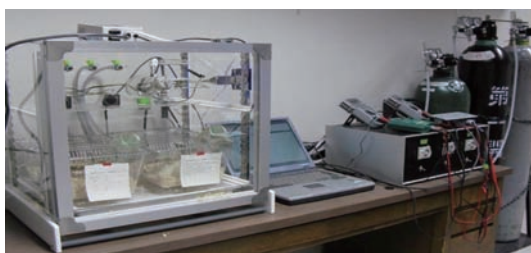
What kind of technology is this?

## outline

**In order to study on environmental adaptation in animals, a gas environmental autoregulation chamber for experimental animals was prepared. Rats were kept in the chamber for a certain period to examine the environmental adaptation of arterial chemoreceptors from the molecular and morphological aspects.**

### 【Research output contents】

In the chamber with a gas environmental autoregulation chamber for experimental animals, the concentrations of oxygen and carbon dioxide in the chamber can be adjusted freely by nitrogen, oxygen and carbon dioxide. The preparation cost of the chamber is low and the usage method is simple.



Using this equipment, it was found that the expression of tyrosine hydroxylase, catecholamine-synthesizing enzyme acting repressively on oxygen demand at hypoxia, was increased by exposing to hypoxia (10% O<sub>2</sub>) for a short time, about 12 hours. The result indicates that animals can respond to the hypoxia condition relatively early.

### What are its applications?

Equipment can be applied widely for the physiological analysis in the changes of the gas environment around animals. Hypoxemia occurs in new born babies, highland activities, exercise and diseases with vasoconstriction, so the technology can be applied for the basic researches on the changes in the body caused by these events.

### Related patents

### Related materials

Yoshio Yamamoto, Norie Yoshikawa, Tatsumi Kusakabe and Kazuyuki Taniguchi (2007). Histochemical changes in the carotid body by hypoxic exposure. The 112th Annual Meeting of the Japanese Association of Anatomists (Osaka), March.

Kouki Kato, Misuzu Yamada and Yoshio Yamamoto (2008). Enhancement of the expression of tyrosine hydroxylase in the carotid body by acute hypoxic exposure. The 145th Meeting of the Japanese Society of Veterinary Science (Sagamihara), March