

keyword germ-free animals novel object recognition test aging streptozotocin (STZ) intestinal bacteria



Official website

Behavioral assessment in a sterile environment

In recent years, a relationship between brain function and intestinal bacteria has been reported. We are able to perform behavioral assessment of germ-free animals, which are widely used in intestinal bacteria research, in a sterile environment.

We will introduce the evaluation of cognitive function using a novel object recognition test in a sterile environment.

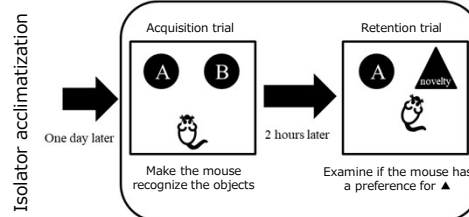
Novel object recognition test using aged germ-free mice

Animals used: Germ-free mice (C57BL/6N) at 72–75 weeks of age
Germ-free mice (C57BL/6N) at 8 weeks of age
SPF mice (C57BL/6N) at 72–75 weeks of age

Evaluation method: Novel object recognition test

Facility: Minamiyamashiro Laboratory, OrientalBioService, Inc.

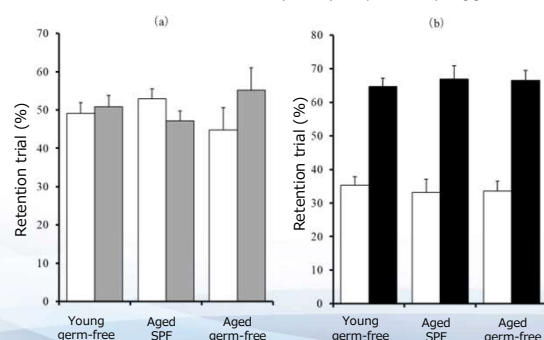
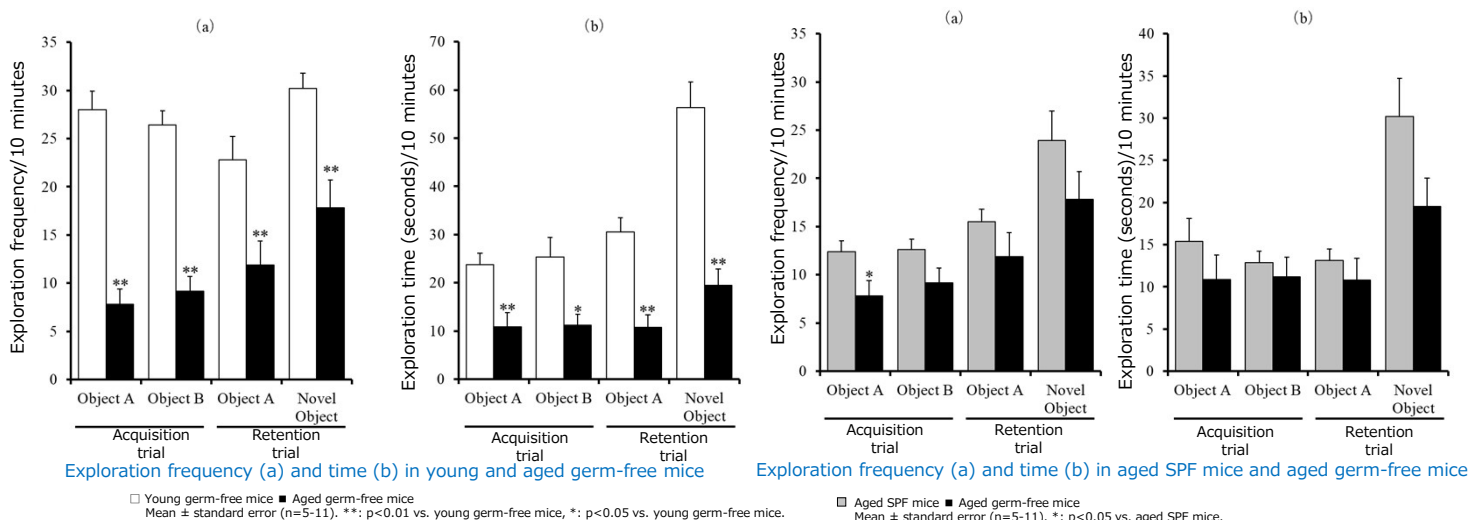
Test Schedule



Conducted in an isolator

Results

Compared to young germ-free mice, exploratory behavior was reduced in aged germ-free mice, but no difference in cognitive function was seen. No difference from aged SPF mice was seen in cognitive function in aged germ-free mice.



Percentage of exploration time to total exploration time in acquisition trials (a) and retention trials (b) in aged SPF mice, aged germ-free mice, and young germ-free mice

Legend: □ Object A □ Object B ■ Novel object
Mean ± standard error (n=5-11).

The paper has been published in Medicine and Pharmacology, Volume 77, Issue 1, published in January 2020, entitled "A trial of novel object recognition test using aged germ-free mice."

Novel object recognition test using streptozotocin-induced hyperglycemic germ-free mice

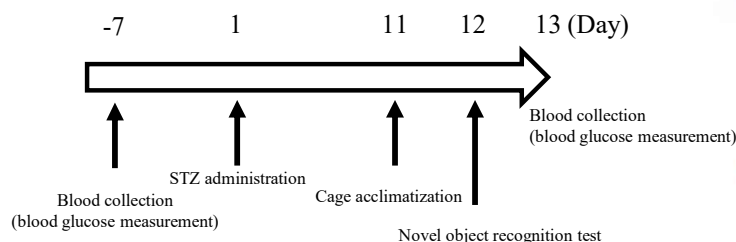
Animals used: Germ-free mice (C57BL/6N) at 8 weeks of age

Inducer: Streptozotocin (STZ)

Evaluation method: Novel object recognition test, blood glucose measurement

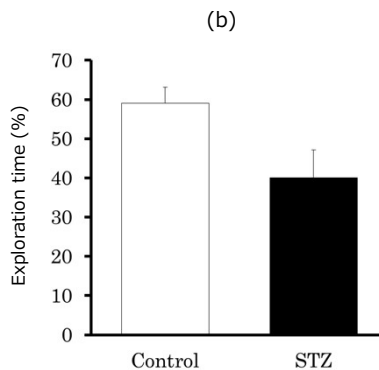
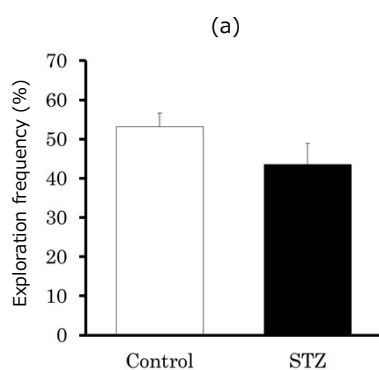
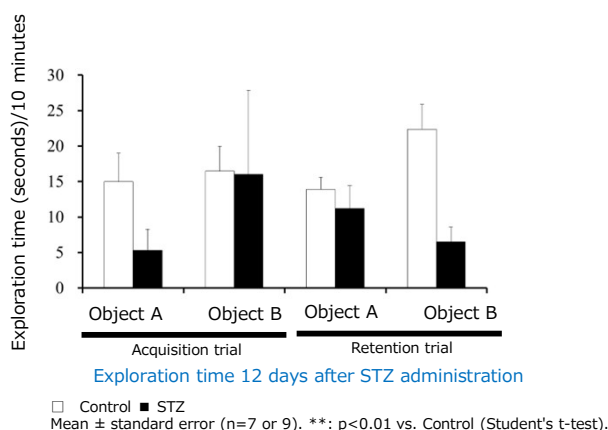
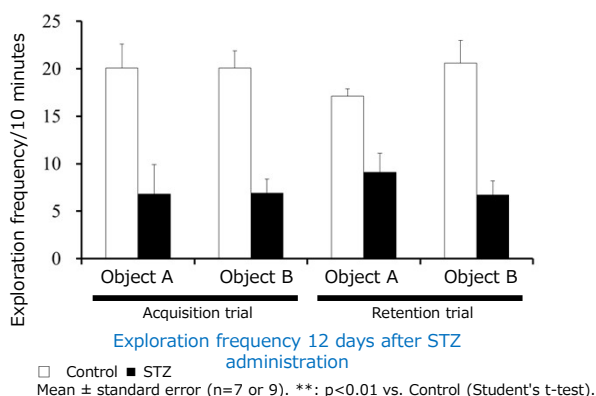
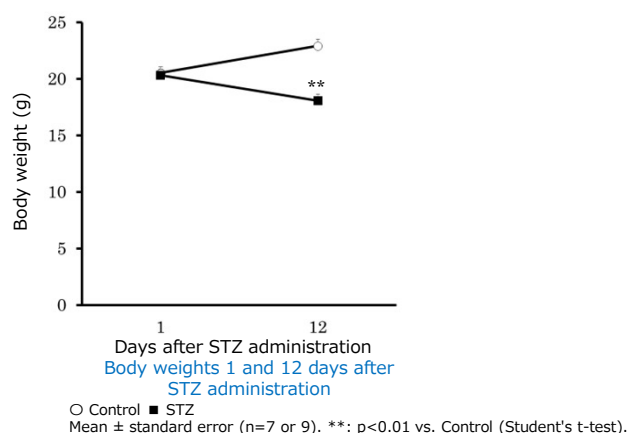
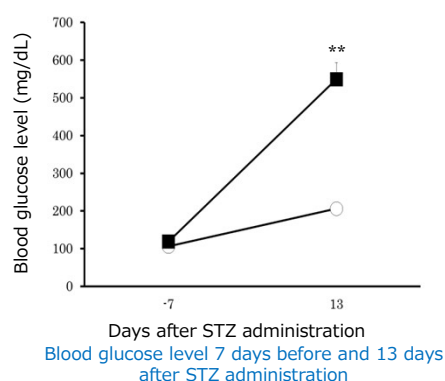
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Schedule of STZ administration and novel object recognition test



Results

Hyperglycemic mice were created by intraperitoneally administering STZ to germ-free mice. It has been reported that SPF mice exhibited cognitive impairment. In this study, a novel object recognition test was performed in a sterile environment, and it was confirmed that germ-free mice also exhibited cognitive impairment.



Percentage of exploration frequency (a) and exploration time (b) in the retention trial 12 days after STZ administration

□ Control ■ STZ
Mean ± standard error (n=7 or 9). **: p<0.01 vs. Control (Student's t-test).