Three-chambered social interaction test

Widespread social interaction test!

Automatic detection of tip of nose
Measurement approaching behavior to stimulus
Uniform condition for stable data

This system is for measuring quantity for social behavior. *1, *2

At first, the test mouse is first placed in the middle chamber and allowed to explore for habituation.

After the habituation period, an unfamiliar stimulus, that had no prior contact with the subject mouse, is placed to a wire cage in one of the side chamber and test.
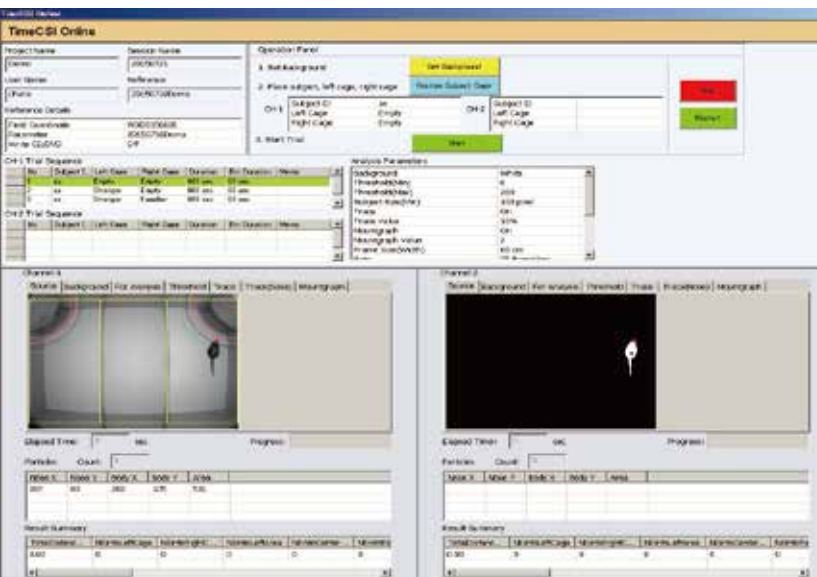
After the first session, subject mouse is tested whether the mouse shows social preference to new stranger or not. In this session, other unfamiliar mouse is placed in the chamber that had been empty in the previous session. Subject mouse can freely contact to both stimuli: already-investigated mouse (familiar), and the novel unfamiliar mouse (stranger).

By software of this system, you can automatically measure number of entry to surrounding of each wire cage and its cumulative duration. The software has a function for detecting position of nose automatically*3, so it would be helpful to judge whether subject approaches to wire cage can be judged as social contact to stimulus.
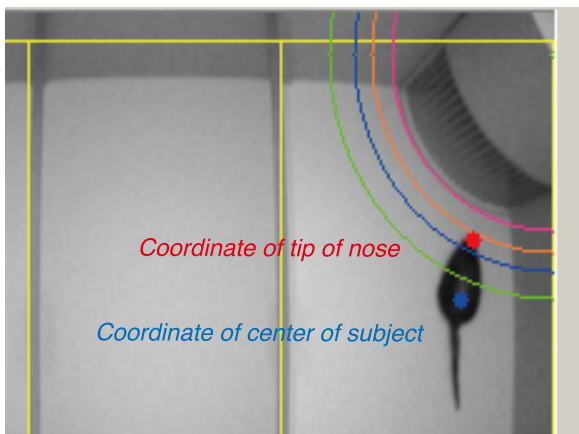
*1 This equipment is designed and developed by Dr. Jacqueline N. Crawley et al. of University of North Carolina (Presently: University of California).
Nadler, J.J., et al. (2004) Automated apparatus for quantitation of social approach behaviors in mice
Genes, Brain and Behavior 3: 303-314

*2 Please refer below paper published by Dr. Takumi et al. of Osaka Bioscience institute (Presently: RIKEN).
Nakatani, J., Tamada, K. et al. (2009) Abnormal Behavior in a Chromosome-Engineered Mouse Model for Human 15q11-13 Duplication Seen in Autism.
Cell 137, 1235-1246

*3 Title of the Inovation: image processor and program, Copyright holder: University of Tokyo, Patent number: Patent application 2012-170548,
Name of software: Automated detection software for direction of head of freely moving mouse

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★ Please understand that appearance & specification of this product may be changed for improvement without notice.

Three-chambered Social Interaction test

Coordinate of tip of nose

Coordinate of center of subject

By detecting coordinate of center of subject (shown in blue), cumulative staying duration, number of entry to surrounding area of each wire cage, and distance et al. can be measured by online.

By detecting coordinate of tip of nose of subject (shown in red), cumulative staying duration, number of entry, contact duration to wire cage per once et al. can be also measured by online.

By Offline, not only analysis parameters but definition of "surrounding" & "contact" also can be reviewed, and can re-analyze again and again.

● Example of representative data

■ Result file

- ・Traveled distance ・Moving speed ・immobile time
- ・Cumulative staying duration, entry number & distance of right and left chamber
- ・Cumulative staying duration, entry number & distance of surrounding wire cage
- ・Cumulative duration & number to contact to wire cage
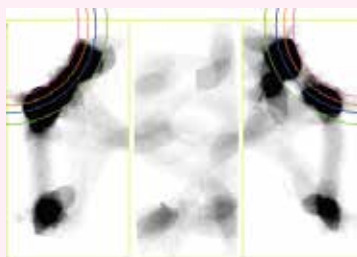- ・Average duration of contact to wire cage per once

■ XY data file
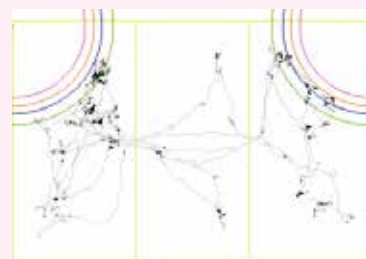### ■ Image file during analysis
■ Mount graph
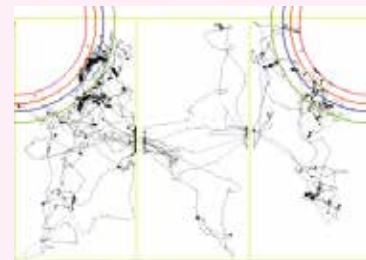### ■ Trace of center position
■ Trace of tip of nose

Mount graph: Depend on staying duration of subject, the staying position is shown darker and darker.
You can realize the position of subject obviously.

Trace of center position of subject A

Trace of tip of nose of subject A

● System configuration

① Software for image analysis with automated detection of direction of head

② Three-chambered SI box

③ Wire cage (for stimulus mouse)

④ Sound attenuating box with monochrome CCD camera, panel light with controller

⑤ Interface with start switch

⑥ Computer set for image analysis Windows 7 32bit
Data format: text file (tab delimited)

● **Panel light with controller (0 - 650 Lux)**
Uniform dim condition achieved

● **Three-chambered SI box**
You can draw it.
And it is washable.

● **Wire cage**
Subject can sniff stimulus from lower of wire cage, though cannot to do physical contact .