BIOSEB
In Vivo Research Instruments

ANXIETY & DEPRESSION DISORDER • LEARNING - MEMORY - ATTENTION - ADDICTION • PHARMACOLOGY & PHYSIOLOGICAL PARAMETERS • SURGERY & STEREOTAXY EQUIPMENT • METABOLISM

THE ONLY FULLY AUTOMATIC SOLUTION IN THE WORLD FOR RUNNING A SIMPLE AND OBJECTIVE DESPAIR TEST ON MICE

Bioseb's Tail Suspension Test setup with cages and camera

BIO-TST4 : Reinvented Tail Suspension Test

INSTRUMENT OVERVIEW

The Tail Suspension Test (TST) was developed as an alternative to the Porsolt Forced Swimming test. Mice, suspended by the tail using tape (a painless method), innately attempt to escape from this adversive situation. However, following failed attempts, they experience a kind of despair and become immobile. The magnitude of immobility is considered to be correlated with the depressive-like state of the subjects and is significantly decreased by antidepressants. The TST was described in the 80's by Steru & al. and allows fast evaluation of drugs' (anti-depressants, sedatives) psychotropic effects: a classic and painless research test for anxiety & depression.

Our TST is **the only fully automatic system in the world!** Based on the "ITEMATIC-TST" (Steru, 1987), it uses both strain gauges and video recording. No pain is induced: the mouse's tail is simply stuck to the sensor using tape. The original design has been modified, adapted and improved for Porsolt & Partners Pharmacology Co in 2000. It can hold 3 mice in 3 separate compartments and features adjustable floor height and anti-climbing plates for C57 strain mice.

Bioseb's TST provides animals' randomization, measurement of up to 6 animals in one run, direct computation of "Immobility", "Energy" & "Power in Motion". Definitions can be adjusted to your protocol. The energy is a unique way to differentiate between passive swinging and active struggling. The power in motion is an additional discriminating calculation giving an indication of the strength of the mice.

HOW DOES IT WORK?

The measuring principle is based on the **quantity of movement generated by a mouse trying to escape** from its suspension. During the test, the movements analyzed in terms of activity (active/non-active), energy and power developed over time. As human observation is time consuming and tedious, our TST automates the entire experiment.

The operator prepares the mices' home cages and pieces of tape to suspend them. Once the experiment has been setup in the software and the list of animals randomized, the operator suspends each single mouse according to the randomization shown on the screen. Each channel is started individually by pressing a specific key on the computer so that each mouse is suspended the same amount of time (something impossible with a system based solely on video).

When the run is finished, mice are removed and the operator is prompted to suspend the next batch of mice. After the experiment, the whole batch can be analyzed: statistics on averages, minimums, maximums and standard deviations are computed in seconds. Data is also presented within minutes for both the groups and individual animals.

KEY FEATURES

- Fully automatic and operator-independent
- Includes 4 randomization types the animal list
- Measurement of up to 6 animals in the same run
- Full control of the calibration
- High predictability for antidepressant effects in humans
- Based on innate behaviours and despair models
- Widely used and validated in literature
- Simple to set up and use
- Replay possible with other parameters
- Short-lasting experiment (usually 6 minutes)
- Optional video recording to adjust the activity threshold

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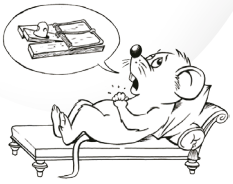
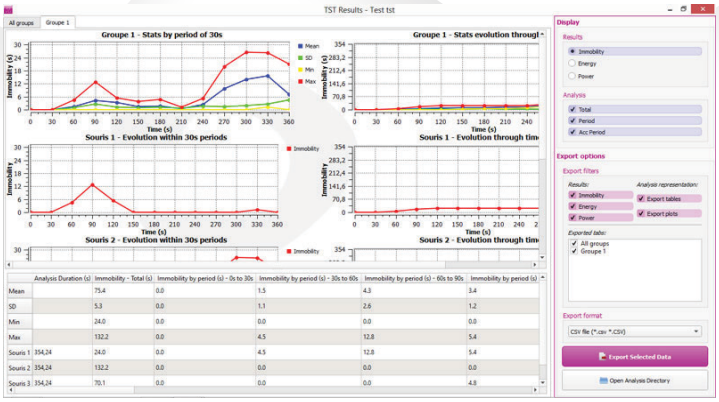
BIO-TST4: Tail Suspension Test - Reinvented - Automatic



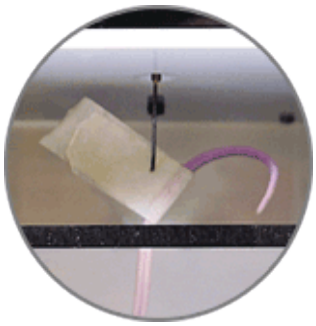
DEDICATED SOFTWARE

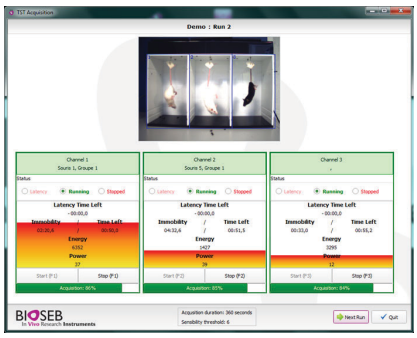
The brand new software for Bioseb's Tail Suspension test is based on direct acquisition from the strain sensors, as well as video monitoring. It is **powerful, yet flexible and user-friendly**.



- Just **one screen** is needed to set up all parameters: number of animals, thresholds, starting/ending times of the measuring period.
- The animal list can be edited, exported, or imported from Excel or CSV format directly.
- The «Randomization» module defines the order of the different «dosed» animals with their groups.
- During the test, a bargraph displays energy and the **real-time computation of results**.
- The results for immobility time, energy value and power during the mobility period are displayed via graphs and numerical tables.
- Data files are saved and protected in a GLP-compatible format.
- **Replay of past experiments is always possible**, allowing testing of different parameters.
- Possibility to discard the result of a particular animal (for example if the subject falls down during the test), in order to secure traceability.
- A manual scoring module used together with a camera can be used to determine the type of threshold the operator should set in the system.

PAINLESS TAPE METHOD, SOFTWARE SCREENSHOT





DOMAINS OF APPLICATION

- Depression & anxiety
- Drug screening
- Basal depressive-like state phenotyping
- Studies on behavioral abnormalities
- Behavioral effects of pharmacological compounds
- Antidepressant efficacy on chronic stress models
- Sleep and mood disorders
- Studies on serotonin aspects
- Acupuncture and dopamine
- Behavioral effects of genetic manipulations

HIGHLIGHTHED BIBLIOGRAPHY Exhaustive list on our website

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Altered skeletal muscle mitochondrial biogenesis but improved endurance capacity in trained OPA1-deficient mice, Journal of Physiology (2013), Caffin F. et al., DOI: 10.1113/jphysiol.2013.263079

Early postnatal motor experience shapes the motor properties of C57BL/6J adult mice, European Journal of Neuroscience (2013), Serradj N. et al., DOI: 10.1111/ejn.12311

TECHNICAL SPECIFICATIONS

Number of animals	1-3 mice if one set of cages is used, 1-6 mice if 2 sets of cages are used
Hardware	Stainless steel, Black and white PVC
Power	110-230 Volts- 9 volts DC
Dimensions	50 x 15 x 30 cm for a set of three cages
Acquisition sampling rate	200 Hz for the sensors, 15 images/second for the camera

ORDERING INFORMATION

Reference	Description
BIO-**TST4**	For mice

SUPPLIED WITH

- 1 or 2 sets of 3 cages together with power supplies and USB cables
- 1 software license (USB dongle with product ID tag)
- Optional HD USB camera and its tripod and USB cable

FOR MORE INFORMATION, VISIT OUR WEBSITE: WWW.BIOSEB.COM/TST

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