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Forced Swim Test
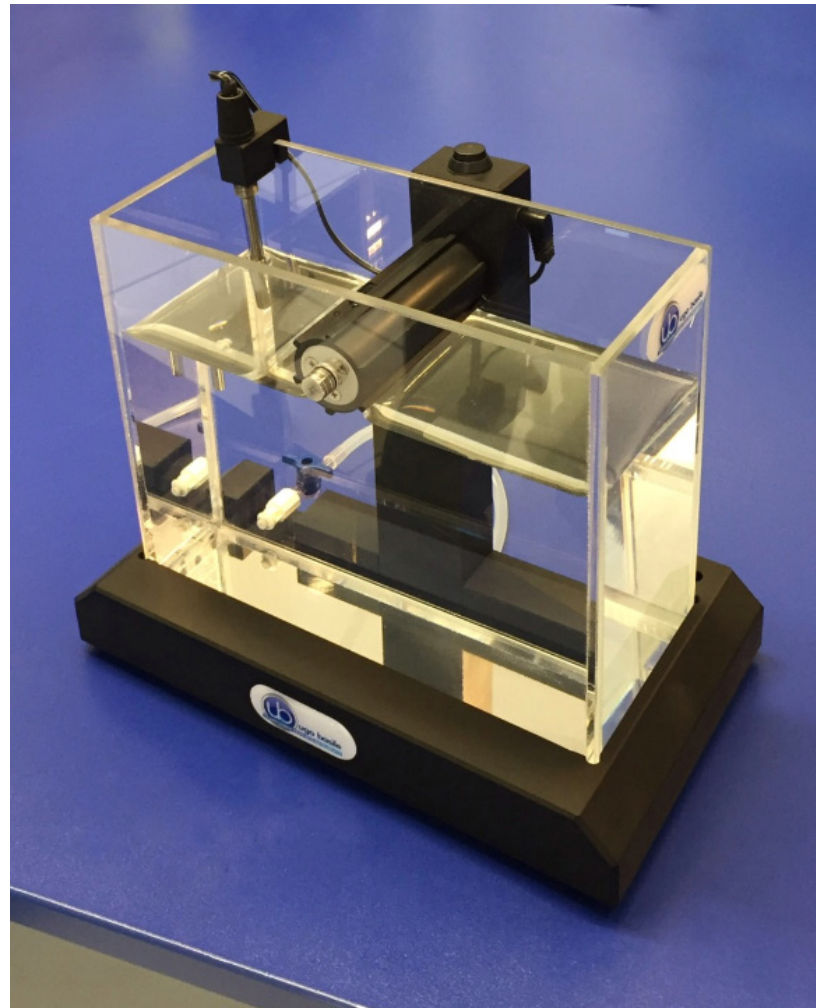## with Water Wheel

Cat. No. 40803

General

The **NEW Forced Swim Test with Water Wheel** automatically scores active escapes and eliminates the subjectivity of immobility measurements. Automatically scored wheel rotations directly correspond to active escape attempts.

In 1977, Porsolt introduced the Forced Swim Test (FST), a behavioral test used for screening antidepressants (see bibliography).

Rodents are placed in an acrylic cylinder filled with water, from which they cannot escape. The animal's natural response is to attempt escape, measured by active swimming. After several unsuccessful attempts, the rodent learns that it cannot escape and becomes immobile. Increased immobility time is associated with behavioral despair and other depression-like behaviors.

Although the Porsolt Forced Swim Test remains one of the most widely used behavioral test for screening antidepressants, significant criticisms of the Porsolt FST interpretation have been made, in particular, maintaining that the method lacks objectivity in evaluating immobility (due to experimenter's subjectivity) and does not successfully screen 'false positive' drugs.

FOR MICE

FOR STUDIES ON
- Depression
- Antidepressants
- Mood
- Behavioral Despair

Main Features
- Compact and user friendly
- Automate up to 40 tests, simultaneously
- Eliminates subjectivity of immobility measurement
- Connects to ANY-maze for automated scoring and completed data analysis
- Continuous water temperature feedback

Ugo Basile: more than 25,000 citations

Rationale and Outline of the Procedure

"*A depressed state can be induced in mice by forcing them to swim in a narrow cylinder from which they cannot escape. After a brief period of vigorous activity the mice adopt a characteristic immobile posture which is readily identifiable*" (Porsolt et al.).

In other words, mice forced to swim in a restricted space rapidly cease moving and become lethargic. Porsolt et al. named this phenomenon '**behavioral despair**', and demonstrated that antidepressants selectively reduced the immobility.
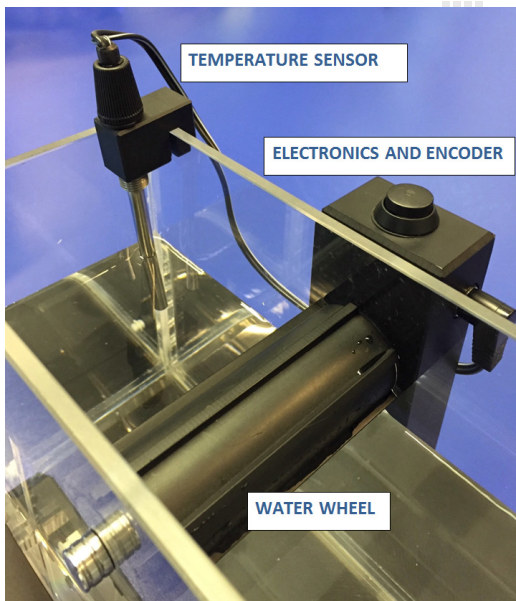
The modification suggested by S. Nomura et alia in their paper of 1982 involves a **small water wheel set in a water tank, to provide an objective measurement (number of rotations)** and overcome the bias intrinsic to Porsolt's method.

In the habituation phase, the rodent is left for 5 minutes to explore the tank, and will identify the wheel as a possible escape way. The wheel rotates freely. During the test proper: mice turn the wheel vigorously and when they give up attempts to escape from the water, the wheel stops revolving and the number of rotations are recorded.

"*… this water wheel test is more appropriate as screening test for antidepressants than Porsolt's test with regard to both objectivity and specificity.*" (Nomura et al.)

Instrument Description

The apparatus consists of a transparent water tank dimensioned 20(w)x8(d)x18(h)cm. A water wheel is positioned in the center of the tank.

TEMPERATURE SENSOR

ELECTRONICS AND ENCODER

WATER WHEEL

The water wheel has a diam. of 3.5cm and is 8cm wide; six 0.5cm paddles are evenly positioned on the wheel surface.

The tank should be filled with water at 25°C, with the wheel just resting on the water surface. A temperature sensor, which can be placed on either side of the tank, provides a feedback on the actual temperature.

The number of rotations (Clockwise and Counter Clockwise) are scored by a precision rotation encoder.

A drain is provided on the bottom of the back wall, to adjust water levels and empty the tank without moving the device. The tank can be easily disassembled and conveniently cleaned.

Data Recording and Analysis

The FST device connects to the PC via a USB cable provided as standard. Several 40803s can be connected to the same PC via a USB hub.

A **Forced Swim specific mode of ANY-maze (60000-FST)**, also included in the full license, collects the information from the electronics (encoder & temperature sensor), automatically scores number of rotations and performs statistical analysis.

Ordering Information

40803   **Forced Swim Test,** complete. Including with rotation encoder & temperature sensor

60000-FST **ANYmaze Module for FST**

Specifications

Power Supply :	USB (connection to PC)
Scoring :	via rotation encoder
Data collection & analysis :	via ANYmaze FST module

Physical

Dimensions	24(w)x12(d)x21(h)cm
Weight	2.4Kg
Shipping Weight	3.5Kg
Packing	29x26x29cm

Bibliography

Method Papers

● S. Nomura et alia: "**A New Behavioral Test for AntiDepressant Drugs**" Eur. J. Pharmacol. 83, 171-175, *1982*

● R.D. Porsolt et alia: "**Behavioral Despair in Mice: A Primary Screening Test for Antidepressants**" Arch. Intl. Pharmacodyn. 229(2), 327-336, *1977*

● R.G. Browne: "**Effects of Antidepressants and Anticholinergics in a Mouse "Behavioral Despair" Test**" Eur. J. Pharmacol. 58(3): 331–334, *1979*