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PAIN and INFLAMMATION

TGR Thermal Gradient Ring

for Mice

Cat. No. 35550

General

The TGR is a novel device for THERMAL PREFERENCE PHENOTYPING in mice, ac-cording to the method devised by Dr. Katharina Zimmermann.

A NOVEL DEVICE FOR
THERMAL PREFERENCE PHENOTYPING IN MICE
ACCODING TO ZIMMERMANN'S METHOD

Main Features

- New circular design, ID 45cm, OD 57cm: duplicate values, no border effects, no spatial cues
- Two heating devices on opposite sides, to establish a symmetric gradient
- Exact temperature gradient measured in real time by embedded thermocouples
- Thermal Insulated Ring-shaped Aluminum Runway
- 12 zones per side (specular), 40cm^2 ea.
- Test results automatically recorded via dedicated camera (included) & ANYmaze video-tracking soft-ware
- Including a set of 4 dual (visible/I.R.) lights

Ugo Basile: more than 25,000 citations

In recent years the cellular and molecular mechanisms of temperature sensing and thermoregulation are subject of intensive research.

To overcome limitations evidenced in other tests, we have designed a novel circular thermal gradient assay, for thermal preference phenotyping, based on the paper "Comprehensive thermal Preference Phenotyping in Mice using a Novel Automated Circular Gradient Assay", published by University Erlangen-Nuernberg (*see Bibliography, method paper).*

Rationale of the Test

The Thermal Gradient Ring is a novel device, which allows recording and analysis of **Comprehensive Thermal Preference Phenotyping in Mice**, according to **Katharina Zimmermann**'s method.

The new TGR (Thermal Gradient Ring) is suitable to test neuropathic pain, and allows discerning exploratory behavior from thermal selection behavior, providing a high degree of freedom, i.e. thermal choice, and eliminating experimenter bias.

The TGR is more sensitive than previous methods: the gradient setup is superior to 2-plate choice design (it reflects a more complex physiological environment, requires less time, less manpower, less mice). The circular design brings about duplicate values, no border effects and no spatial cues, for bias-free, reproducible data.

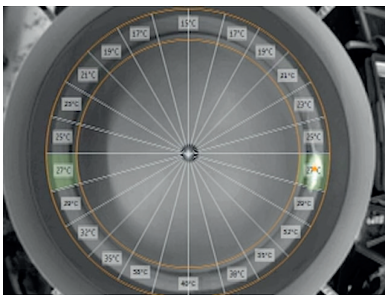
Instrument Description

The TGR consists of a **circular running track**, which provides a thermal gradient between the two extremes of a colder and a hotter zone in which the mouse is free to move. The Thermal Insulated Ring-shaped Aluminium Runway has an ID of 45cm and 57cm OD.

A heating and a heating/cooling device (based on the technology employed in UB Hot/Cold Plate), placed at the opposite sides of the ring, create a **symmetric thermal gradient**, controlled by 4 embedded thermocouples, measuring the temperature gradient in real time.

A stand positioned over the device holds the camera and 4 dual (visible/I.R. lights)

Experimental Configuration



Each side of the ring is divided into 12 zones, in which the temperature Δ is proportionally distributed: in the protocol described in the method paper, in which the two preset temperatures are respectively 15°C and 40°C, each sector represents an increment of 2.27°C.

Data Collection and Management

Recording and analysis of thermal preference behavior is accomplished by ANYmaze. Data output include:

- Preference Temperature time course ± SD
- Time lag to cover zones above a defined temperature (time course)
- Zone histogram

Ordering Information

35550 **TGR THERMAL GRADIENT RING**, complete assembly, including heating and heating/cooling devices, circular runway with circular enclosure, B/W USB camera 35550-035 and related support with dual (visible/I.R.) lights.

Videotracking

60000 **ANY-maze Software (full license is required)**

General

Controls: on the heater/cooler front panel, temperature read-out on LED display

Operating temperature:

Heating Unit	: from room temperature to 65°C
Heating/Cooling Unit	: from 4°C to 35°C
Temperature feedback :	Measured by 4 thermocouples, monitored by ANYmaze in real time
Detection:	**:** Via ANYmaze software
Power :	: Univ. input 85-264 VAC, 50-60Hz

Physical

Aluminum Runway	: ID 45cm, OD 57cm
Circular Enclosures	: 24cm high
Dimensions	: 87x64x64(h)cm
Weight	: 39Kg
Shipping Weight	: 57Kg
Packing	: 100x80x70cm (wooden pallet)

Bibliography

Method Paper:

- F. Touska Z. Winter, A. Mueller, V. Vlachova, J. Larsen and Katharina Zimmermann: "**Comprehensive thermal preference phenotyping in mice using a novel automated circular gradient assay**" J.Temperature, Vol 3 (1) **2016**
- Z. Winter, P. Gruschwitz, S. Eger, F. Touska and Katharina Zimmermann: "**Cold Temperature Encoding by Cutaneous TRPA1 and TRPM8-Carrying Fibers in the Mouse**" Front. Mol. Neurosci., **2017**