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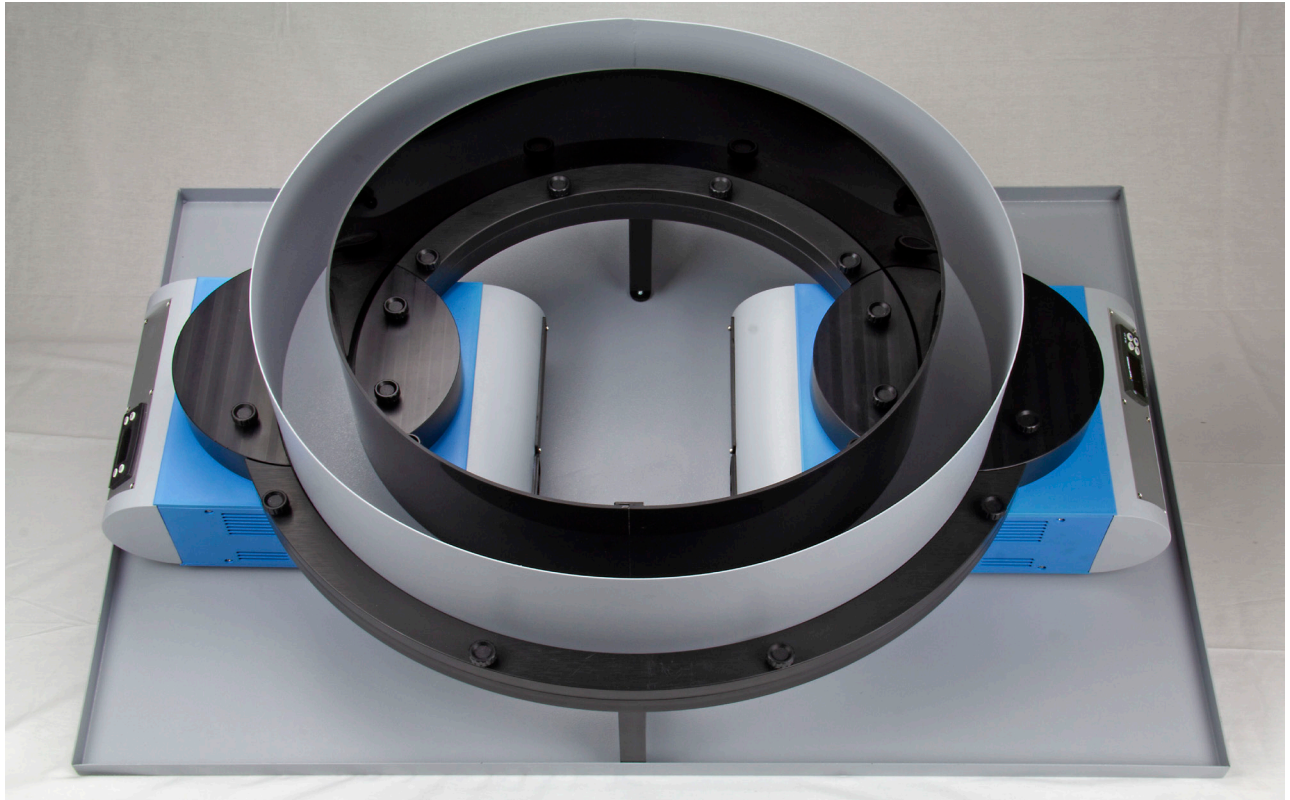
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PAIN and INFLAMMATION

# TGR Thermal Gradient Ring

for Mice

Cat. No. 35550



## General

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*).



## 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<sup>2</sup> ea.
- Test results automatically recorded via dedicated camera (included) & ANYmaze video-tracking software
- Including a set of 4 dual (visible/I.R.) lights

Ugo Basile: more than 25,000 citations

### 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.

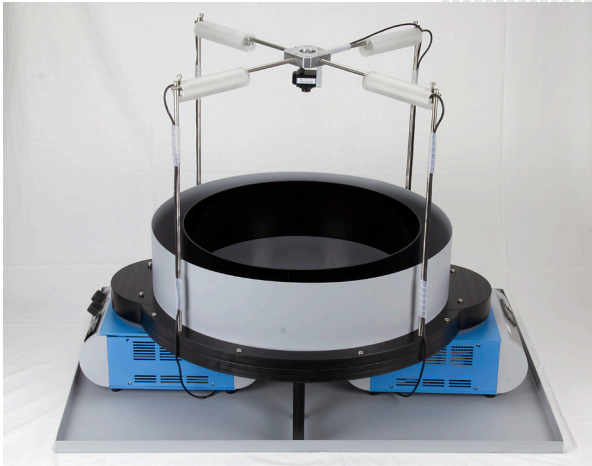
The new TGR (Thermal Gradient Ring) is suitable to test neuropathic pain, and allows discerning exploratory behavior from thermal selection behavior, providing a high degree of freedom, i.e. thermal choice, and eliminating experimenter bias.

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  $\Delta$  is proportionally distributed: in the protocol described in the method paper, where 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  $\pm$  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 50°C  
Heating/Cooling Unit : from 5°C to 50°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 : 12cm high  
Dimensions : 65x90x32(h)cm  
Weight : 47Kg  
Shipping Weight : 59Kg  
Packing : 82x71x57cm (wooden box)

### 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**