Title: A spherical treadmill system to train head-fixed adult rats

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PII: S0165-0270(17)30436-3
DOI: https://doi.org/10.1016/j.jneumeth.2017.12.018
Reference: NSM 7924

To appear in: *Journal of Neuroscience Methods*

Received date: 22-3-2017
Revised date: 21-12-2017
Accepted date: 21-12-2017

Please cite this article as: Miguelez Fernández Anabel MM, Burman Ariel, Martínez Cáceres Alfredo I, Mininni Camilo J, Zanutto B Silvano, Lew Sergio E.A spherical treadmill system to train head-fixed adult rats.*Journal of Neuroscience Methods* https://doi.org/10.1016/j.jneumeth.2017.12.018

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Submitted to: Journal of Neuroscience Methods

HIGHLIGHTS

- We present a novel spherical treadmill suitable to train adult rats
- The sphere freely rotates supported by 3 bearings and its movement is video tracked
- Head-fixation is used to facilitate acute electrophysiology and imaging recordings
- We designed a training protocol that gradually introduces animals to head-fixation
- Adult Long Evans rats were successfully trained ain an auditory discrimination task

ABSTRACT

Background

While spherical treadmills are widely used in mouse models, there are only a few experimental setups suitable for adult rats, and none of them include head-fixation.

New Method

We introduce a novel spherical treadmill apparatus for head-fixed rats that allows a wide repertory of natural responses. The rat is secured to a frame and placed on a freely rotating sphere. While being head-fixed, it can walk in any direction and perform different motor tasks.

Comparison with Existing Methods