

## Circling (mice and rats)

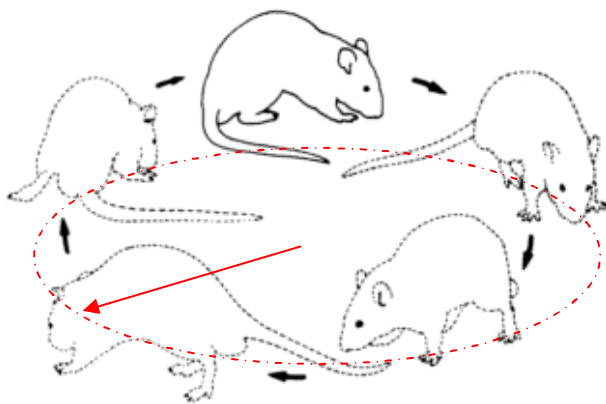
**LABORAS™**  
*Let the computer score!*

### Definition used for automated behavior recognition

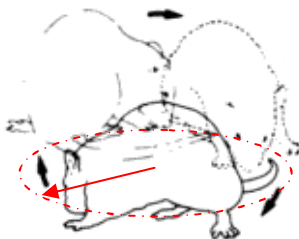
Circling or one of the synonymous terms turning, rotating, spinning, wheeling or cursive hyperkinesias all describe the active movement of a rat or mice in a circular direction. Circling is a readily measurable behavior that is exhibited by many organisms and that may indicate that a lateral preference is present for carrying out other behavioral functions.

The circling can be exhibited as a form of walking in a repetitive circling pattern, that might vary from wide circles to very small circles or turning (often referred to as tail chasing). The different circling forms often occur as a sequence and mostly occur as circles with a decreasing radius.

### Postural patterns



Unilateral walking in circles  
(clockwise or counter clockwise)



Circling with a small radius



Circling can become turning  
(tail chasing)

### Context to other behaviors

Circling is part of several stereotypical behaviors, and can be observed amongst others as part of locomotory dyskinesia, hyperkinesia, hyperactivity and ataxia often with a lateral preference.

### Pharmacological relevance

Circling is a readily measurable behavior that is exhibited by many organisms and that may indicate that a lateral preference is present for carrying out other behavioral functions. In this respect, it is similar to handedness, the best known human index of lateral preference. Most modern accounts of the determinants of lateral preference suggest that it occurs as a result of some functional lateralization of systems in the brain. Lateralization simply means that the two hemispheres are differentially proficient in controlling various behavioral activities. The significance of lateralization extends beyond the simple fact of brain asymmetry. Rather, it implies that certain features of behaviors that are controlled by asymmetric brain areas will vary according to the kind and degree of asymmetry that is present. Therefore circling behavior can be an important utility and an index of brain asymmetry and the relationship of this asymmetry to various aspects of behavioral function.

The analysis of behavioral asymmetries is a widely employed approach to investigate behavior in relation to functions of the brain. Out of the repertory of presently available measures, turning behavior is probably the one that has been examined the most. Spontaneous or conditioned turning may be used either as an independent variable to look for related asymmetries in the brain, or turning may be analyzed dependent on stimulation (electrical, chemical) or lesion of the nervous system. One of these lesion techniques is almost inevitably associated with the analysis of turning behavior, namely the unilateral 6-hydroxydopamine (6-OHDA) lesion of the nigrostriatal dopamine (DA) system, which serves as a unilateral model of Parkinson's disease.

### Parameters automatically determined by LABORAS

The circling module in LABORAS determines automatically the following parameters:

- Number of Clockwise (CW) circles
- Number of Counterclockwise (CCW) circles
- Average time in circle
- Average speed in circle
- Average circle perimeter

*For more information or other behaviors automatically detected by LABORAS, please visit the LABORAS page on our website.*

