

LABORAS™
Let the computer score!

QUALIFIED
ALGORITHM

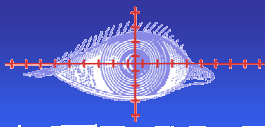
Head Shakes in rats



The LABORAS system

- ∇ When a rat is shaking its head (but not the whole body) in a short and firm way the behavior is called **head shake**.
- ∇ Head shakes are part of the natural behavioral repertoire, but they can greatly be stimulated by **specific drugs**.
- ∇ Pharmacologically induced head shakes are considered a **stereotyped behavior** (repetitive, high frequency), often combined with the **wet dog shakes** behavior.
- ∇ The induction or antagonism of head shakes provides useful information about the **mechanism of action** of specific drugs.
- ∇ Metris' engineers reached a **correlation of >80%** with observer registered head shakes. The head shakes detection algorithm can be combined with the wet dog shakes algorithm in one experiment.

For commercial information please contact sales@metris.nl.



Behavior name

Head Shakes (sometimes also called Head Twitches)

Description of behavior

The headshake behavior is a prominent part of the behavior of most mammalian species.

The behavior can best be characterized by a rapid sequence of radial (rotational) movements of the head, during which the head rotates about 45 degrees in each direction from the level position or normal position of the head. Often the head tends to move left and right at the same moment.

The duration of a headshake (or headshake reflex) is normally very short, lasting from 0.15 to 0.3 seconds. Sometimes the headshake is shorter, from 0.1 to 0.15 seconds and is then often referred to as a head twitch. In mice where this behavior is in general faster and shorter, it is more often called a head twitch than a headshake.

When the behavior occurs the rat often moves its body up from its normal position. With other words the rat will be higher at its 4 paws at the end of the headshake.

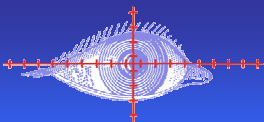
The movement of the head during a headshake often extends until the shoulders of the animal or slightly beyond the shoulders depending on the intensity of the headshake. In such situations a small part of the body of the animal might also move during the headshake.

Context to other behaviors

The behavior often occurs together with another behavior called “Wet Dog Shakes”. This behavior is called after the movement of a dog that makes this movement to get rid of water on its fur.

When the combination of a headshake and wet dog shake occur, the sequence is a headshake followed by a wet dog shake, but never the other way around. The combination of a headshake and wet dog shake can also be considered as a separate behavior, because in temporal sense there is no resting time in between the two behaviors. Sometimes the two behaviors occur (partially) at the same moment and are overlapping in time.

For more information on wet dog shakes, refer to WDS description.



Pharmacological relevance

When the headshaking in rats occurs in the absence of obvious extraneous stimuli, the headshake behavior is generally considered as an abnormal behavior.

In laboratory tests the headshake behavior is often induced in rodents using 1-[2,5-dimethoxy-4-iodophenyl]-2-aminopropane, abbreviated to DOI. It's a Hallucinogen that activates 5HT-2 receptors.

Novel drugs are being tested on rats that are treated with DOI to investigate if the drugs antagonizes the DOI induced headshakes in rats. Applications are for example the evaluation of potential antipsychotics and potential treatments for Tourette's Syndrome.

Postural patterns

