

LABORAS™

Automated Behaviour Classification & Tracking based on Force Analysis

LABORAS is a powerful system that fully automates the behavioral scoring of small laboratory animals like rats and mice.

LABORAS determines a detailed ethogram of animals (without any human observation) and provides in-depth tracking information. The system does not use video or infrared beams. Researchers can monitor many independent parameters in a single experiment; thereby reducing costs and experimental lead time; minimizing wastage of animals and resources; increasing efficiency and throughput.



- Detection of more than 18 behaviors along with all tracking information
- Completely non-invasive and home-cage system, minimizing stress on animals significantly
- Enables high throughput and long duration testing
- Enables measurements in complete darkness (no infra-red or light required)
- In-depth results are available immediately after tests, enabling faster and efficient decision making
- Modular and multifunctional system supporting a wide variety of animal models and experiments



Automatic detection of Behaviors in Mice and Rats:

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|------------------------|------------------------|--|--|
| ■ Locomotion | ■ Eating | ■ Hindlimb Licking – Formalin test (rats only) | ■ Startle and Freezing – Fear Conditioning (mice only) |
| ■ Immobility | ■ Drinking | ■ Wet Dog Shakes (rats only) | ■ Social Interaction (mice only) |
| ■ Rearing | ■ Scratching | ■ Head Shakes and Head Twitches (rats only) | ■ Light Dark Preference (mice only) |
| ■ Climbing (mice only) | ■ Circling | | ■ Purposeless Chewing (rats only) |
| ■ Grooming | ■ Seizures (mice only) | | |

Automated Tracking information and other parameters:

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| ■ Position (X,Y) | ■ Position Distribution |
| ■ Speed (Avg., Max.), Distance Travelled | ■ Energy Consumption (Physical Activity Index) |

Application Areas: Drug Development (Pre-clinical), Safety Pharmacology, Efficacy Pharmacology, Pharmacodynamics Assay Development, Phenotyping, etc.

Research Areas: CNS (Neurodegenerative diseases, Brain disorders etc.), Dermatology, Inflammation, Metabolism, Safety studies, Pain research, etc.



Automated behavior recognition and motion tracking

LABORAS test	RESULT
Target discovery for future drug development	
Behavioral phenotyping transgenic mice	Full ethogram & motion tracking
Drug Development : Lead finding & optimization	
Primary observation test	Adverse drug effects
Open field test	Sedative/stimulant properties, Anxiolytic properties
Light-dark test	Anxiolytic properties Sedative/stimulant properties
Marble burying test	Anxiolytic properties Sedative/stimulant properties
Sociability test	Social preference
Preferences tests	Eg. Place preference, avoidance behavior
Memory tests	Cognitive enhancement
Pain test: hind limb licking (formalin induced)	Analgesic properties
Dermatology / Allergy test (scratching)	Skin protective effects
Drug Development: Pharmacological mechanism of action	
Induction or suppression of <ul style="list-style-type: none"> • hyper- or hypolocomotion • polydipsia • grooming • scratching • climbing • turning/circling behavior • wet dog shakes, head shakes, head twitches • seizures (tonic-clonic, barrel rolls) • oral dyskinesia (chewing) 	Pharmacological efficacy of (potential) leads: agonist - antagonist
Safety Pharmacology / Toxicology	
Telemetry & Behavior	Integrated cardiovascular, CNS and behavioral data (BP, HR, EEG, full ethogram)
Chronic toxicology test	Chronic behavioral effects, sensitization
Feeding / drinking test	Hypo- or hyperphagia; Hypo- or polydipsia
Natural behavior & animal welfare research	
Home cage behavior - longterm	Full ethogram & motion tracking Sleep-wake patterns
Circadian rhythm - longterm	
Cage enrichment test	Preference for eg. bedding type, objects

Unique Features of LABORAS

Multi Purpose test system:
LABORAS can be used for a variety of different tasks (see table on the right) and can be applied in several stages of the drug development process.

More experiments in less time with fewer animals:
LABORAS increases the throughput and reduce lead time of your experiment, reducing the number of animals and the efficiency of your research.

Standardization of tests:
LABORAS is a valuable tool to standardize behavioral measurements, including disciplines falling under GLP regulations.

Quality of data:
LABORAS is free of observer bias and provides the same data independent of laboratory and training level of the observers.

Detection of fast and short behaviors:
LABORAS detects behaviors that are extremely difficult or impossible to score consistently, such as very short or fast behaviors.

No light or video required:
LABORAS doesn't use video and can therefore be used in absolute darkness. LABORAS only generates 1MB of data per hour per cage.

In development

Automatic classification of Scratching in rats

Scratching is a behavior that is frequently used as an important parameter in several types of research, including CNS and dermatology related research. With this new model Metris will offer a completely non-invasive way of quantifying scratching behaviour which amongst others will lead to significant lead time reduction and high quality results for the "itch research community"

Light Dark cage for Laboras

The Light Dark test is used to assess anxiety. The main measure of this test is the preference of the animal for dark, enclosed places over bright, exposed places. Parameters that will be determined are Time spend in the light and dark sections of the cage. Entries in the light and dark sections and latency time to the dark section. The dark section consists of a removable red-transparent box that will appear as a dark area for the animal.

The Light Dark test will further expand the variety of tests and animals' models that can be performed with the Laboras equipment.



Automatic classification of Dyskinesia in rats

Dyskinesia is a disease with a complex pattern of behaviors, that is difficult to score in an objective way by human observers. Dyskinesia is often divided in the following categories of behaviours: Locomotive Dyskinesia (Lo), Limb Dyskinesia (Li), Orolingual Dyskinesia (OL) and Axial Dyskinesia (Ax).