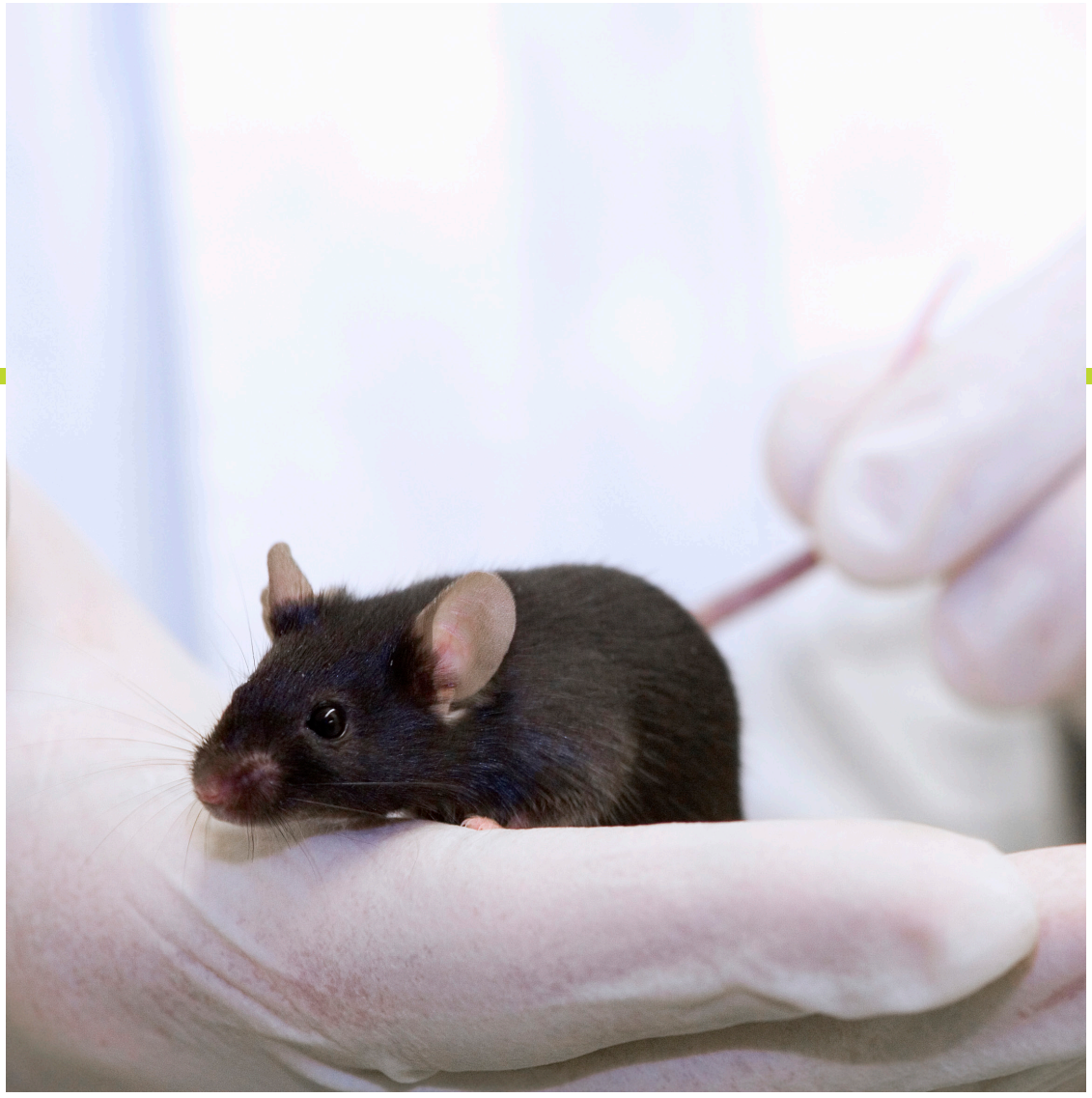


CatWalk XT & TBI mice

How to use CatWalk XT effectively for your own TBI models

A white paper by Noldus Information Technology

INTRODUCTION

TIMING MAKES ALL THE DIFFERENCE IN TBI

Timing is critical when assessing TBI symptomatology. Testing mice at an inopportune time (too soon following TBI surgery or waiting until deficits are no longer above the threshold for measurement) might result in missing a crucial timing window during which symptoms are detectable.

CatWalk XT has been used to successfully distinguish sham and TBI mice at 7 days post-injury (see recent publications). However, as motor deficits are highly injury dependent, you may need to adjust this time point to suit your injury model. Be sure to pilot test various time points post-TBI to ensure differences can be detected between sham and TBI subjects.

DOING GAIT ANALYSIS THE RIGHT WAY

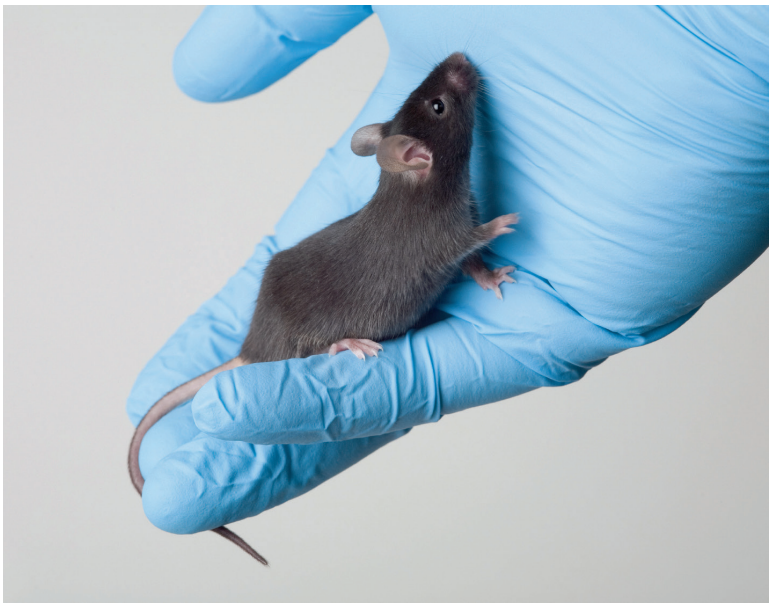
When you are performing research on TBI you need a system that can assess subtle motor deficits. CatWalk XT is the best tool for measuring gait in rodents. It is the most accurate and validated automated gait analysis system on the market. But how can you use CatWalk XT effectively for your own TBI models? In this white paper we go over a few tips.

TIPS & TRICKS FOR USING CATWALK XT FOR TBI MICE

1. HANDLE YOUR MICE OFTEN

As prey animals, mice are naturally cautious, and any additional stress can easily influence behavioral outcomes. To minimize this risk, we strongly recommend handling your mice before beginning any behavioral testing or surgical procedures. Familiarizing them with human contact, such as being gently picked up, held, or simply exposed to the presence of researchers, helps reduce anxiety. A mouse that is accustomed to handling is typically much calmer during testing than one that has had no prior interaction.

> Use a consistent testing protocol across all subjects to reduce variability and improve data quality. Test at the same time of day, and create a protocol template in CatWalk XT to ensure uniform set-tings across sessions.



It's also important to monitor and document any anxiety-related behaviors within the home cage, such as fighting, barbering, or excessive grooming. When such behaviors are observed, appropriate intervention is essential. For example, if fighting occurs, consider isolating and removing the aggressors to prevent further stress or injury.

2. PRACTICE MAKES PERFECT

Before starting any experiments with the CatWalk XT system, it's important to first become familiar with the equipment. While the software is user-friendly and intuitive, we recommend taking the time to run a few trial sessions with practice animals.

This helps ensure you're confident in operating the apparatus, setting up your protocols, and navigating the software interface. A short practice phase can go a long way in ensuring smooth and consistent data collection during your actual study.

3. KEEP THE ROOM FREE FROM SMELLS AND SOUNDS

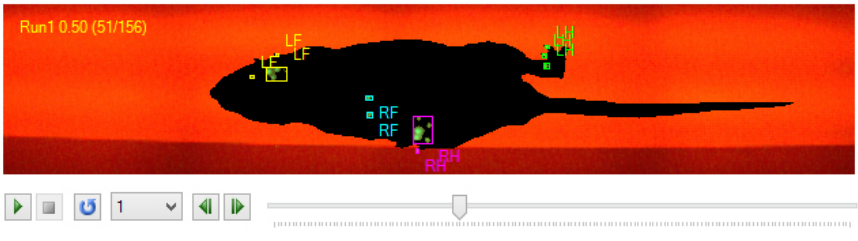
Mice have a highly developed sense of smell and can be easily distracted by unfamiliar scents, particularly those left behind by other animals. To minimize this, it's important to clean the CatWalk XT walkway between each subject. Lightly spray the walkway and surrounding walls with 70% ethanol, then wipe them down with a clean paper towel. This helps prevent interruptions caused by lingering odors and ensures more consistent performance during testing.

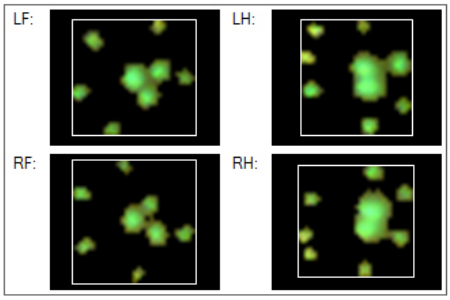
Additionally, keep conversation and background noise to a minimum. Mice are sensitive to sound and may instinctively freeze or pause if startled, which can affect their gait during a run.

4. NATURAL UNFORCED MOVEMENT

Rodents typically don't need an incentive to cross the CatWalk XT walkway. Instead, the system is designed to encourage natural, voluntary movement. This is achieved with the goal box at the end of the runway. This enclosure offers a clear incentive for the animal to move towards, as rodents want to naturally escape to a dark secluded space. This motivator reduces hesitation and helps you get consistent straight-line runs.

Other systems use either a treadmill or positive/negative reinforcement to force the animal to move. If you expose the animal to these reinforcements their behavior can change and therefore affect your results.





5. CATWALK XT IS FULLY AUTOMATED, BUT STILL CONTROLLED BY YOU

One key advantage of the CatWalk XT system is its ability to provide largely observer-independent analysis. After data acquisition, the software automatically classifies individual paw prints, saving time and effort. However, it's important to manually review each run to confirm accurate classification.

Issues can arise, especially in TBI models, when two paws land closely together or if feces appear on the glass during a run. These can confuse the software and lead to mislabeling. A quick manual check ensures the integrity of your data. CatWalk XT is no black box, so you always know where your data is coming from.

We are here to help you out.

Keep reading to find out more or contact us now to discuss your research goals.

Continue reading to learn more about:

- How CatWalk XT enables your gait research
- The ins and outs of researching locomotion
- The serveices Noldus provides

LEARN MORE

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