

# Simultaneous collection of behavioural and physiological data in mice: integration of LABORAS with Dataquest A.R.T. telemetry



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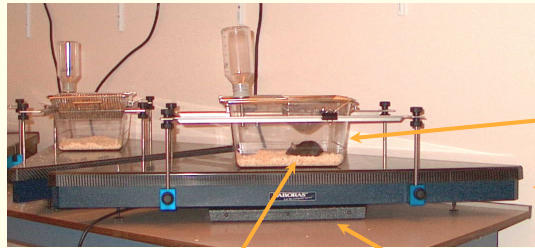
## INTRODUCTION AND AIM

Although a growing number of tools is available for the reliable registration of either behavioural or physiological parameters in small animal models, up to now an integrated measurement of these parameters is not possible. In order to provide simultaneous collection of behavioural and physiological parameters, we looked at the possibility to integrate the automatic behaviour registration system LABORAS (Metris B.V., Hoofddorp, The Netherlands) with the Dataquest A.R.T. telemetry system for hands-off measurement of physiological parameters (Datasciences International, St. Paul, MN, USA).

## EXPERIMENTAL SET-UP

### Integrated set-up:

Previous tests have proven that the telemetry signals are not disturbed by the LABORAS platforms.



Animal with transmitter

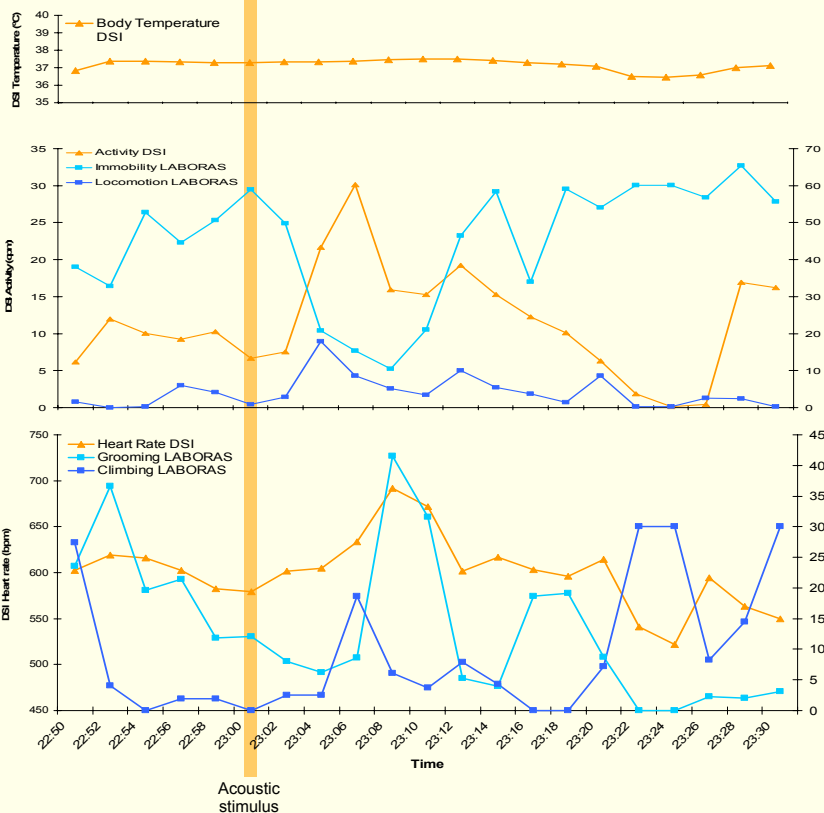
DSI receiver

Mak.II cage

LABORAS platform

Four female C57BL/6Jlco mice (5 months old), implanted with DSI telemetry transmitters (TA10ETA-F20) in the abdominal cavity, were placed on the integrated system for five days in a conventional animal room with a 12/12h day/night cycle (lights on at 07:00h). 60 hours after the onset of data acquisition an acoustic stimulus (alarm tone of mobile telephone) was given to see, whether the stimulus response would be detected by both systems. Parameters: LABORAS measured locomotion, immobility, climbing, grooming, drinking and eating. Dataquest A.R.T. provided data on heart rate, body temperature and activity.

## RESULTS



No effect on body temperature was found after acoustic stimulation.

### Activity:

Stimulation temporarily reduced immobility (light blue) / increased activity (yellow, dark blue) in C57BL/6 mice, indicating a flight reaction in response to the unknown tone.

### Arousal:

The short-term elevation of heart rate and grooming behaviour indicates a stimulus-induced increase in arousal.

Each graph represents the average of four mice starting 10 minutes before the onset of the acoustic stimulus until 30 minutes afterwards.

The yellow column indicates the time point of acoustic stimulus.

## CONCLUSIONS

First results indicate a reliable simultaneous collection of behavioural and physiological data on the same time scale. The integrated set-up allows for the identification of a stimulus-induced flight response in C57BL/6 mice, being confirmed by increased arousal. Effects on body temperature were not found but might be more subtle. The combined monitoring of behavioral (LABORAS) and physiological (Dataquest A.R.T.) parameters can be expected to be of high use in laboratory research using small animal models.