METRIS

Vibes

Newsletter of Metris B.V. The Netherlands April 2006

Metris Vibes into Spring 2006

Introduction by CEO Ronald Bulthuis

Metris wishes all readers a joyful spring! We hope to built and expand our relationships with existing and future clients. In this *Vibes* we announce two new algorithms for LABORAS, scratching and purposeless chewing. Scientists can now detect and quantify these behaviors completely automatic.

The SPECIAL on the integration of the Laboras and Telemetry, includes interviews with the telemetry specialists Dr. Klaas Kramer and Dr. Bob Brockway, and highlights the first results with this method. Experts ackowlegde the advantages of simultaneous behavioral and physiological data acquisition all in the same animal! This means research becomes more powerful and efficient with less animals

Our new product SonoTrack for recording and analysing of ultrasounds, that was developed in cooperation with specialists from the field, will inspire you to use ultrasounds as an important parameter in research . Further, we report on the new product for the European market SleepSign for Animal, which is a powerful tool to analyse sleep stages.
We hope you will enjoy reading. Please do not hesitate to contact us at info@metris.nl.

Metris as solution provider

Metris is positioning itself more and more as a 'solution provider' making tools that assist researchers to answer their questions, instead of being a shop for lab tools. We strive to communicate with researchers about their practical problems or limitations and how to solve them. Metris has a teams of expert engineers to realise tailor-made solutions for you! We invite you to contact Metris at info@metris.nl to initiate fruitful discussion leading to smart solutions!

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Colophon

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IMPORTANT NOTICE:

Two New Algorithms for LABORAS

Engineers at Metris are continuously developing algorithms to automatically detect more behaviors of rats and mice. This development occurs in close collaboration with our clients. Clients collect reference data of the selected behavior with the LABORAS system, and trained observers of the client's laboratory and at Metris analyse the behavior from video. These data form the basis for the consecutive process of pattern recognition that leads to the development of new algorithms.

SCRATCHING in mice

Metris has released a new module to recognise scratching behavior in mice. This behavior is characterised by repetitive movements of one of the hindlimbs to scratch the abdomen. Engineers at Metris developed an algorithm that assesses scratching from the LABORAS sensor signals. Scratching is an important behavior in dermatology and allergy research.

PURPOSELESS CHEWING in rats

Rats may display chewing movements in the absence of food. This behavior is called purposeless chewing. It can be evoked pharmacologically. The induction or antagonism of purposeless chewing provides useful information about the mechanism of action of specific drugs. Metris' engineers could reach a correlation of 91% with observer registered large chewing movements, and a 79% correlation with the small chewing movements. For commercial information please contact Michel Schless at michel@metris.nl (commercial) or sales@metris.nl.

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Simultaneous BEHAVIOR and PHYSIOLOGY measurements: The integration of LABORAS and DSI TELEMETRY

SPECIAL

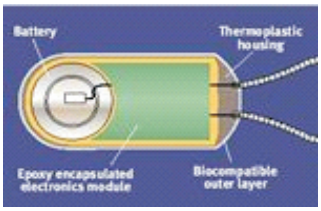
Metris b.v. is developing a package for the integration of LABORAS and Data Sciences International (DSI), telemetry data. This enables the researcher to simultaneous acquire and process behavioral and physiological parameters. Preliminary testing has shown that the two systems can function normally when used together. In this special you will find information about the use and possibilities of this integrated system. Dr. Klaas Kramer, The Netherlands, will give his expert opinion on the use of telemetry in combination with LABORAS. Marketing Director of DSI, Bob Brockway, USA, will share his view on the advantages of this integration for CNS research.

TELEMETRY measurements

With a telemetry system (Data Sciences International, DSI, USA) the experimenter can measure physiological data from conscious, freely moving laboratory animals. Animals receive an implantable transmitter by a surgical procedure. The transmitters monitor e.g. blood pressure, temperature, heart rate, ECG and transmit the digitized data via radio frequency signals to a nearby receiver. This data is collected using the Dataquest A.R.T. software package (DSI).

LABORAS measurements

LABORAS (Metris b.v., The Netherlands) is a validated, automatic system measuring the behavior and position track of freely moving rats and mice. Animals are placed in a macrolon cage on the triangular sensor platform (see photo). The sensor platform records the movements of the animal and transmits these via an electronics unit to a PC. Using pattern recognition techniques the onset and end of behaviors can be distinguished. The behaviors that are detected by LABORAS include locomotion, immobility, grooming, eating, drinking, rearing, climbing and hind-limb licking. At the same time the XY-coordinates are recorded that allow for the calculation of the distance moved, speed (max., average) and position distribution.



Left: Telemetry implants. Right: Schematic implant containing a battery and a reusable electronics module, enclosed in advanced biocompatible packaging.

Metris Vision on Data Integration

Combining LABORAS and TELEMETRY: 1 + 1 = 3 !

Requests from the field challenged Metris to start developing an integration package for simultaneous measurement and processing of behavioral (LABORAS) and physiological (DSI TELEMETRY) data. The parallel data acquisition greatly enhances the efficiency and quality of animal experiments. It reduces the number of experiments, it saves animals, time and money, and makes efficient use of equipment as compared to serial testing. It eliminates external variation and thereby enhances the power of experiments. It helps to establish causal relationships in data sets by direct time-matched coupling of several parameters from different biological systems- in one single animal. This leads to a better interpretation of biological processes than with the separate data.

Advantages of the integration between LABORAS and TELEMETRY:

1. **Increase efficiency of research:**
   - A Increase the information from a single animal
   - B. Reduce the number of separate or serial experiments
   - C. Increase overall research capacity (throughput)
   - D. Save animals, time and money
2. **Efficient use of equipment**
   - A. Replace several dedicated systems
3. **Increase quality of data by parallel testing**
   - A. Direct matching of behavior and physiology
   - B. Eliminating environmental and individual variation
   - C. Better understanding of biological processes
4. **Establishing meaningful relationships**
   - A. New insights in area of phenotyping transgenic animals
   - B. Measuring more independent parameters
   - C. Measuring various biological systems simultaneously
5. **Next step towards integration with more systems**

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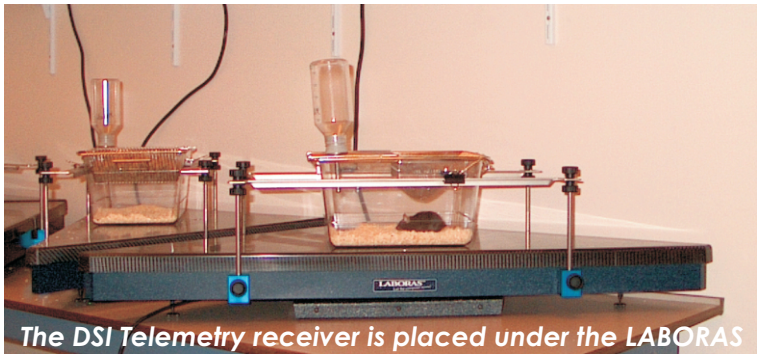
How to combine LABORAS and Telemetry in the Lab SPECIAL

As can be seen in the photo, the DSI telemetry receiver unit is placed under the LABORAS sensor platform. This does not obscure telemetry transmission. The animal with an implanted transmitter can easily be put into the cage of the LABORAS system. The two systems measure their data separately but on the same computer. The synchronized telemetry data (Dataquest A.R.T, DSI) is imported into the LABORAS software for further data processing and simple statistics.

- No hardware changes (users with existing systems must be able to combine systems)
- No interference between systems
- Software of both systems runs on one PC at the same time.



The DSI Telemetry receiver is placed under the LABORAS

Interested in integrating LABORAS and Telemetry? For commercial info please contact Michel Schless: michel@metris.nl

Metris is also interested in your opinion, expectations and wishes regarding the integration of LABORAS and Telemetry. Please inform us via info@metris.nl

For the integration of LABORAS and telemetry we are looking for researchers who are interested in participating in an advisory board for this project. It will not absorb much of your time (a few hours in total) and being a customer of Metris is not a criteria: all researchers are invited. Please send an e-mail to info@metris.nl

Combining telemetry with the LABORAS system provides a valuable tool for CNS applications"

Interview with Bob Brockway, Marketing Manager DSI, St. Paul (MN), US.

Why -in your opinion- is the integration of DSI-telemetry and LABORAS important?
I feel that DSI and Metris share a number of common customers and prospective customers that have an interest in combining physiologic telemetry data with a quantitative means of assessing various activities such as movement, eating, grooming, etc. This may be especially interesting as more researchers place increasing emphasis on the intended or non-intended impact of drugs on the central nervous system. Combining telemetry with the LABORAS system provides a valuable tool for CNS applications

What gain is there for the researcher?
The gain for the researcher is two-fold. First, there are researchers doing EITHER behaviour or physiologic monitoring, but perhaps have not considered adding complementary technologies to their studies. Second, there researchers doing BOTH behaviour and physiologic monitoring using separate studies (and separate animals). In both cases, integrating these systems provides a more comprehensive evaluation in a single experiment.

How does your company feel about the integration of the systems?
In recent years DSI has worked with a number of companies to provide more comprehensive solutions to our customer base. We are happy to see the LABORAS system compliment telemetry technology.

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Drawing better conclusions from your data with combined LABORAS + TELEMETRY

SPECIAL

Interview with Dr. Klaas Kramer, Dept. Animal Welfare, Free University Amsterdam, Laboratory of Animal Science, Utrecht University, The Netherlands.

Why do you think is the integration of LABORAS and TELEMETRY so important?

Simultaneous measurement of behaviour and physiological parameters will lead to better conclusions than we might draw from the separate data. Telemetry only is often not enough to define the effects of stress. We need the extra input from the behavioural parameters.

In which fields of research is this combined method useful?

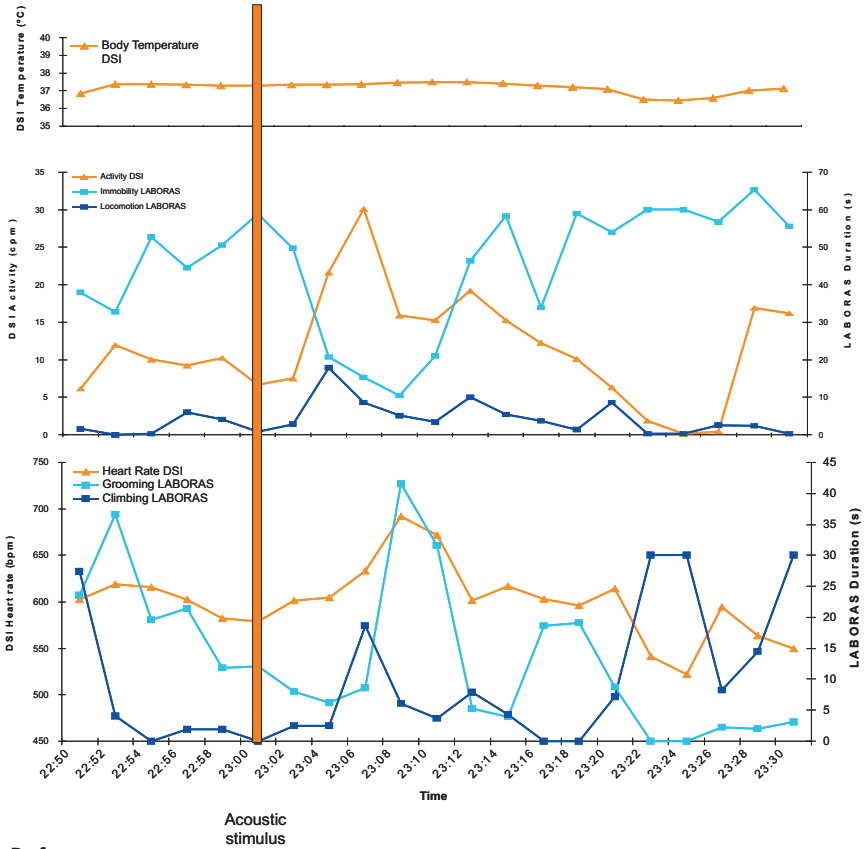
In animal welfare research, behavioural research, phenotyping transgenic mice, neuroscience and in general almost all fields of research with small laboratory animals.

What is the gain for the researcher? And the animals?

The researcher obtains a better understanding of the collected data and a reduction of the number of animals and experiments. For the animals with an implanted telemetry transmitter there is no extra discomfort when tested on LABORAS.

Did the combination LABORAS+TELEMETRY work well in your laboratory?

The first preliminary studies were very promising. We have just reported our follow-up experiment (figure below, where we used the combination of LABORAS with Telemetry to assess the effects of an acoustic stimulus.



What are your plans for future research with LABORAS and TELEMETRY?

We'll first wait for our data which we will collect in the coming half year. If both systems work well together we will increase our research in animal welfare. In general we want to know how small laboratory animals react on all kinds of laboratory procedures.

Results of the integration of LABORAS and Telemetry

First results indicate a reliable simultaneous collection of behavioural and physiological data on the same time scale. 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 (Sommer et al., 2005).

Reference

Sommer R, Meijer MK, Kramer K, Bulthuis R, Ohl F, Baumans V. Simultaneous collection of behavioural and physiological data in mice: integration of LABORAS with Dataquest A.R.T. Telemetry. Measuring Behaviour 2005.

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New Release SonoTrack Software

Last Vibes we introduced our SonoTrack system: a full spectrum ultrasound (15-100 kHz) recording and analysis system. Experts in the field of ultrasonic vocalisations (USV) are very enthusiastic to see that this system really opens possibilities that were closed with the former bat detectors based equipment. Data of experiments at different US companies were used to validate the system and user questionnaires revealed suggestions for improvements. Some customers opted to purchase a PC along with SonoTrack. This facilitated the installation and guaranteed an immediate startup.

The development for the SonoTrack software is progressing rapidly. We are finalizing the improvements on the user interface, USV counter sensitivity and data throughput. We expect to release the 1.1.0 version in April and we will issue a Service Bulletin for all customers to ensure proper installation and facilitate the use of present and future experiments.

We expect that the new possibilities of SonoTrack compared to existing and bat detector based systems opens the discussion on the use of ultrasounds as a significant experimental parameter. We are planning a user group meeting late 2006/early 2007 to exchange experiences with experts in the field of ultrasonic vocalisations. Ideas for improvements emerging during this workshop will be guiding the further development of the SonoTrack system. Our aim will be to make SonoTrack the premier instrument for ultrasound measurement and analysis in animal research.

METRIS visits ASIA

Metris at the Life Science Conference in Taipei, Taiwan, March 18-19

As part of a larger Asia trip, Metris was present at the largest Life Science conference in Taiwan on the invitation of Kuo Yang Inc. Scientists of universities and pharmaceutical companies were introduced to the LABORAS and SonoTrack systems, which were demonstrated at the conference. The trip also included a three day visit to different pharmaceutical R&D centres where the systems were demonstrated in ongoing animal experiments. This way Metris could show the value of the products.

Photo (left to right): Ronald Bulthuis, (Metris), Mr. Joe Kan (Kuo Yang), Mr. Paul Chuan (Kuo Yang), Michel Schless (Metris).

Besides Taiwan, Metris visits Korea, Japan and India. Read more about it in our next Vibes magazine. The trip through Asia underlines Metris' ambition to expand our presence in Japan and Singapore to more Asian countries.

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Introducing.....

Levon Bachdasarian, Technical Manager

Levon Bachdasarian is a signal analysis expert at Metris. He works on the development of new algorithms to detect new behaviors with the LABORAS system. He was born in Armenia and graduated from Yerevan State University, the Faculty of Radiophysics and Electronics. He has experience with different kinds of signals for industrial, as well as for health purposes. Weak signal elaboration and decryption played a significant role in his PhD thesis. Levon is an enthusiastic person eager to solve problems of clients. You may get in touch with Levon Bachdasarian through levon@metris.nl.

New Sales Agent for India

Metris is proud to announce a new distributor for India: Medi Analytika India Pvt. Ltd., Tel. 91 44 2446 0988, Fax. 91 44 2446 3931. Please contact mediana@vnsl.com or visit www.medianalytika.com.

Metris Event Calender

March	Annual Meeting of the Japanese Pharmacological Society
July 8-12	FENS, Vienna, Austria
July	Annual Meeting of the Japanse Society of Toxicology
Sep	Safety Pharmacology Society meeting,USA
Nov 14-18	Society for Neuroscience, Atlanta, USA
Nov	Biotechnische Dagen, The Netherlands

Metris sells 'SleepSign for Animal' in Europe

Metris portfolio extended with sleep stages analysis software

Metris and KISSEI America signed an agreement on the sales of the 'SleepSign for Animal' software for the European market. SleepSign is a strong tool that has proved its value in pharmacological research. The system can determine three predefined and three user defined sleep stages from EEG and EMG signals obtained by DSI telemetry.

In the future it is expected that SleepSign will be integrated with LABORAS and other telemetry parameters so that the user can measure and analyse data of the behavior (locomotion, eating, drinking, etc), physiology (heartbeat, bloodpressure, temperature etc) and sleep stages(wake, REM, NREM, etc) all in one experiment session.

Such an integration will provide maximum information from single animals. It is anticipated that integrated systems will set the standard in all *in vivo* research areas using rats and mice, e.g. phenotyping of genetically modified animals, behavioral physiology/pharmacology, safety pharmacology, toxicology and animal welfare studies.

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