

M³ MultiMouseMonitor

Smart 24/7 surveillance of group housed animals



Product information

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BACKGROUND

Activity is a fundamental diagnostic parameter of animal behavior. Our MultiMouseMonitor provides accurate individual movement data with full automation. It is a unique solution for the long-term tracking and surveillance of animals living in groups.

MULTIMOUSEMONITOR

8 reader grid for Type III cages

MULTIMOUSEMONITOR XT

20 reader grid for Type IV cages

RFID TECHNOLOGY

The MultiMouseMonitor is based on advanced Radio-frequency identification (RFID) technology identifying and tracking an individual within a group of animals. All animals have to carry subcutaneous transponders. These transponders can be reused and are maintenance-free.

POWERFUL ANALYSIS SOFTWARE

Our powerful software calculates:

- Activity indices
- Spatial preferences
- Heat maps
- Roaming entropies

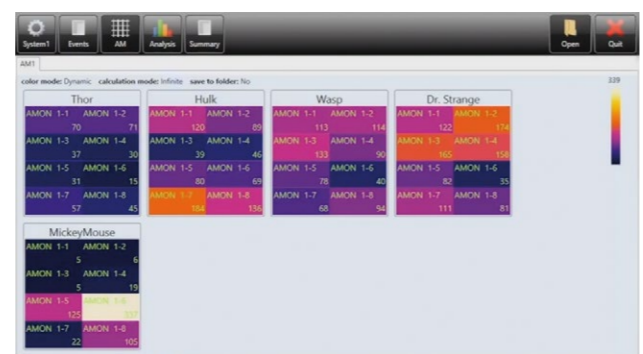
OPTION

Our M³ MultiMouseMonitor is available for Type III or Typ IV cages.

APPLICATIONS
Ideal for rat and mouse models of hyperactivity, movement disorders (i.e. ADHD, Parkinson), neuropathic pain, and arthritis

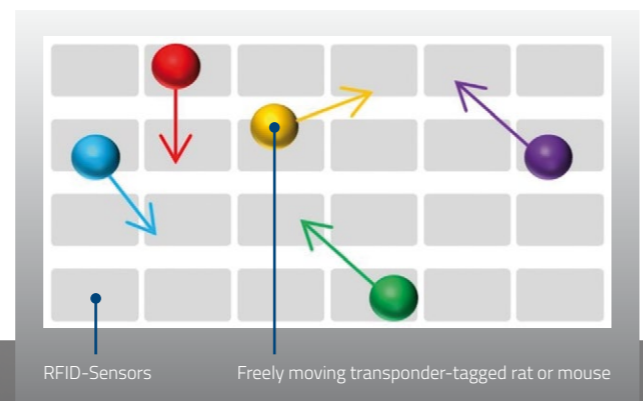
KEY FUNCTIONS

- Based on advanced RFID technology
- Fully automated, 24/7 for every tagged animal



Screenshot of analysis software

SCHEMATIC PRESENTATION OF MOVEMENT BY TRACKED ANIMALS LIVING IN A GROUP



PhenoSys MultiMouseMonitor for Individual Activity Tracking of Group-Housed Animals

Enhanced Physical Activity in Dark and Light Phase in a Group-Housed Rat Knockout Model

SETUP

A PhenoSys RFID-based MultiMouseMonitor was placed underneath a standard Type IV cage to automatically record individual activity of group-housed rats. The MultiMouseMonitor consists of 15 RFID-readers that cover the entire ground area of the cage.

EXPERIMENTAL PROCEDURE

Young female rats with a genetic knockout of a synaptic protein were used for this pilot study. A wild-type, a heterozygous and a complete knockout were housed as a group in the MultiMouseMonitor cage for 7 days. The animals carried passive, subcutaneous RFID-transponders for identification. RFID-readers continuously detect transponders in their vicinity and therefore track the location of any rat over time.

DateTime	RFID	Animal	Reader	Duration
11/21/2016 08:40:32.351	0415C477C0	#3 (KO)	R15	1648
11/21/2016 08:40:32.992	0415C483DD	#1 (WT)	R14	0
11/21/2016 08:40:33.032	0415C477C0	#3 (KO)	R4	1159
11/21/2016 08:40:34.097	046369DB88	#2 (HET)	R13	1668
11/21/2016 08:40:35.836	0415C483DD	#1 (WT)	R15	1718
11/21/2016 08:40:35.972	046369DB88	#2 (HET)	R10	3290
11/21/2016 08:40:37.533	0415C483DD	#1 (WT)	R12	0
11/21/2016 08:40:38.201	0415C483DD	#1 (WT)	R13	14881
11/21/2016 08:40:40.380	046369DB88	#2 (HET)	R15	0
11/21/2016 08:40:41.002	0415C483DD	#1 (WT)	R10	0
11/21/2016 08:40:41.943	0415C477C0	#3 (KO)	R4	2813
11/21/2016 08:40:42.929	0415C477C0	#3 (KO)	R7	514
11/21/2016 08:40:43.637	0415C483DD	#1 (WT)	R10	566

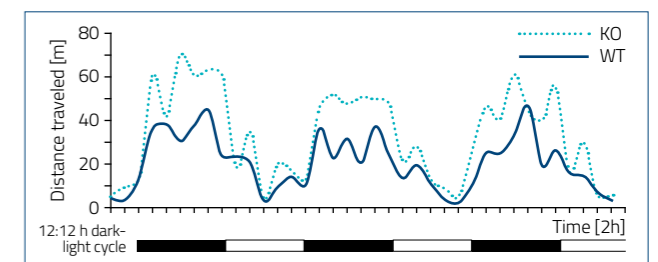
Primary data of PhenoSys MultiMouseMonitor. The readers detect the unique ten digit RFID-code of the transponder of an individual. The time point and the duration [ms] of the read interval is recorded. (A duration of „0“ equals a minimal read.)

CONCLUSION

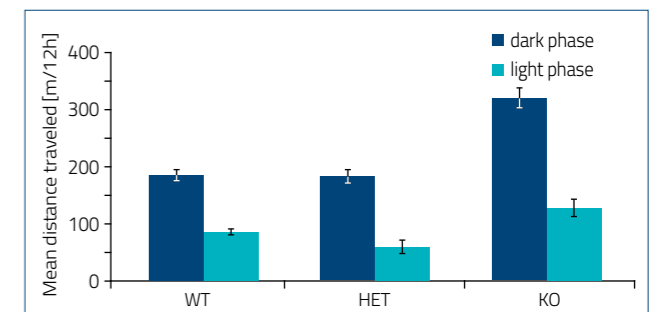
The PhenoSys MultiMouseMonitor is an effective method to detect activity parameters in rodents. It has the unique advantage over conventional methods that animals can be group housed while data is collected automatically and continuously for each individual.

RESULTS

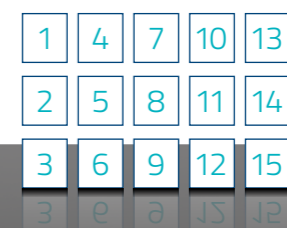
The position data of individual animals was used to calculate the distance covered by each rat. The plot of distance traveled over days represents the circadian activity pattern for each individual. The data from this pilot experiment reveals for the knockout rat during the dark phase a 73% longer distance traveled. During the light phase the distance is still 50% longer than in the wild type rat. The phenotype of the heterozygous animal seems to be unaffected.



Day/night activity pattern. Dark and light phases are indicated by black and white bars. Animals show high activity during the dark phase and reduced activity with the onset of the light phase.



Quantification of distance traveled. Data are mean values over 7 days and SEM.



PhenoSys MultiMouseMonitor with 5x3 RFID-reader matrix.





 **PHENOSYS**

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