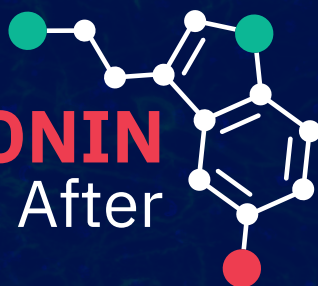


MAX
DELBRÜCK
CENTER

SEROTONIN
20 Years After



June 30 – July 1, 2023

MDC.C, Max Delbrück Center,
Berlin-Buch, Germany



www.mdc-berlin.de/serotonin-20-years-after



Poster No. 21

New promising rodent model for bioacoustic testing of positive/negative arousal in laboratory conditions

Anna Klenova^{1*}, Ilya Volodin¹, Olga Ilchenko², and Elena Volodina³

¹ Lomonosov Moscow State University, Russia

² Moscow Zoo, Russia

³ A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Russia

* Presenting author

Both audible and ultrasonic (USVs) vocalizations may reflect the increase of discomfort in mammals. However, the use of USVs to determine the level of emotional arousal in most common model species, laboratory mice and rats, is difficult. The reason for this lies in the behaviour: both adult mice and rats rarely emit USVs during simple experimental procedures. Therefore, often researchers estimate only one single variable (call rate) and only in pups, which have imperfect thermoregulation and actively produce USVs when isolated from warm nest.

But some other rodents produce USVs much more actively, that makes them excellent models for neuropsychologists. The yellow steppe lemming *Eolagurus luteus* is one of few such species in which USVs can be induced easily in any age and sex in the unified situation of novelty during short-term isolation. This is a diurnal Arvicolinae species of about 100 g weight, that easily breeds and lives in captivity. Here we examined 36 (19 male, 17 female) adult yellow steppe lemmings for presence of USVs during 8-min experimental trials including 2-min test stages of increasing discomfort: isolation, touch, handling and body measure. We found that 33 of 36 individuals vocalized at isolation stage, i.e., without any human impact. For 14 (6 male and 8 female) individuals, a repeated measures approach revealed that increasing discomfort from isolation to handling stages resulted in increase of call power quartiles and fundamental frequency, whereas call rate remained unchanged. We discuss that, in adult yellow steppe lemmings, the discomfort-related changes of USV fundamental frequency and power variables follow the common rule as the audible calls of most mammals.

These data contribute to research focused on searching the universal acoustic cues to discomfort in mammalian USVs and suggest that the yellow steppe lemming potentially represents a very perspective wild-type rodent model for biomedical research.