

Streszczenie w języku angielskim

The purpose of the present study is to provide a theoretical introduction to the sexual behavior of the male rat as a model in biomedical and preclinical research. Classical behavioral parameters are compared with the emerging discipline focused on rat ultrasonic vocalization (USV). During highly appetitive sociosexual behavior, it is possible to detect all ultrasound subtypes classified so far belonging to two main groups, so-called 50-kHz, and 22-kHz. The well-studied neurobehavioral substrate of sexual behavior juxtaposed with the knowledge of acoustic emission properties of rats enables the use of ultrasound and sexual parameters in the form of a compiled parameter. This approach provides increased accuracy in describing biological processes in experiments and extend the applicability of models using the brown rat. The first article in the series presents classical parameters of sexual behavior and their changes corresponding with the progression of pathological conditions in preclinical models.

The second article of the series includes results from the experiments based on the anticipatory phase of sexual behavior and the ultrasonic vocalization which occurs during this phase. Results advance the model of anticipatory behavior by the precise manual analysis of the ultrasonic spectrum of each emitting individual. There has been demonstrated a positive correlation between the level of sexual motivation of male rats and the number of 50-kHz signals emitted by them. Additionally, there is presented a specific pattern in subtypes of ultrasounds emitted by rats, characterized by the lack of significant inter-concomitant differences. Taking together, it enables to use of the 50-kHz anticipatory vocalization as a reliable indicator of the sociosexual motivation level.

The third article of the series describes the new method of ultrasounds separation emitted during sociosexual interactions. It develops a previously described method, of analyzing the number of non-contact erections (NCE), by adding the USV parameter. This technique allows for more accurate measuring of the sexual arousal of both the male and the female. Furthermore, it implicates the possibility of using the USV of the transient frequency between 50-kHz and 22-kHz as a quantifiable and individual-assigned parameter. This type of ultrasound can be useful in measuring frustrate-like states in rats during sexual interactions and other types of social encounters. Adequate application of presented protocols could serve as a functional tool in psychopharmacological, neuropsychiatric and neurological, endocrinological, and other models of preclinical research, as well as in physiological experiments on sexual behavior.