Symposium: The Significance of Voluntary Exploration to Monitor Emotional Behavior of Rodents

Oliver Stiedl

Behavioral Neuroscience Group, Center for Neurogenomics and Cognitive Research,
Neuroscience Campus Amsterdam, VU University, Amsterdam, The Netherlands
oliver.stiedl@cncr.vu.nl

ABSTRACT

In this symposium we will provide examples from research approaches in rodents demonstrating the importance of voluntary choice and decision-making under baseline stress-free conditions for emotional behavior. These novel approaches allow for substantially improved interpretation of performance changes as opposed to currently used standardized behavior tests. Emotion cannot be measure directly but instead has to be inferred indirectly from behavioral and concomitant physiological (e.g. neural, autonomic) adjustments. Standard anxiety tests and fear learning tasks are characterized by human interference that affect emotional behavior and may bias the experimental outcome. This is particularly relevant for tests that depend on locomotor activity-derived measures as index of fear and anxiety. In response to this dilemma, we will discuss current methodological pitfalls and provide insights into our concepts and used methodological approaches including choice behavior with multiple measures extending to aspects of the organization of behavior (actualgenese: the moment-to-moment dynamics of behavior). Thus, human interference is largely excluded in these experiments while the duration of experiments is extended to several days. These novel approaches follow the main features of natural exploratory behavior starting out from a safe home base and driven by the motivation to investigate novel areas. The motivation for exploration is generally the drive to find resources or reproductive needs while facing the risk of the unknown e.g. potential predators. Exploration implies novelty detection and thus a discrimination from what is known and what is new. The distinction between exploration and cognition is not sharp. The same can be said for the distinction between for instance anxiety and exploration. Thus, home cage observations that involve the activation of different motivational systems are an appropriate setting for assessing the integration of different motivational systems.

SYMPOSIUM CONTENTS

Fear Conditioning in an Automated Home Cage (DualCage) Environment

Oliver Stiedl Anton W. Pieneman & René F. Jansen (VU University, Amsterdam, The Netherlands), Christian Gutzen & Stephan Schwarzer (Biobserve, Germany).

Spontaneous Behavior in The Home Cage: A New Test Environment for Measuring Neuropathic Pain

Berry Spruijt, Raymond C. de Heer & Johanneke E. van der Harst (Delta Phenomics, The Netherlands)

An Automated Maze for Studying Working Memory and Decision-Making in Rodents

Jeansok Kim (University of Washington).

Genetic Dissection of Motor Activity Levels and Avoidance Behavior in The Home Cage; Translational Phenotypes for Mood Disorders

Martien Kas & Annetrude (J.G.) de Mooij-van Malsen (UMC Utrecht, The Netherlands), Berend Olivier (Utrecht University, The Netherlands).

Understanding Exploratory Behavior Step by Step

Ilan Golani, Ehud Fonio & Yoav Benjamini (Tel Aviv University, Israel).