A novel behavioral bioassay for preclinical testing and characterization of CNS agents (Ramot)

code: 2-2009-11

Ilan, Emeritus Golani, T.A.U Tel Aviv University, Life Sciences, Zoology
Yoav Benjamini, T.A.U Tel Aviv University, Exact Sciences, School of Mathematical Sciences
Ehud Fonio, T.A.U Tel Aviv University, Life Sciences, Zoology

Background

Animal models of human diseases of the CNS occupy a central role in drug discovery yet these models fail to yield new insights and efficacious drugs for the treatment of these diseases, in a field having a collective economic cost of over $40 billion per year. The number of CNS drugs reaching approval is decreasing despite the huge resources invested in pharmaceutical R&D. A main reason for this failure is that existing behavioral methods for analyzing animal models of CNS disorders do not measure the relevant parameters that would characterize the beneficial effects and the side effects of drugs that influence behavior.

The study of rodent free (as opposed to forced) exploration provides a unique opportunity to understand and measure the effects of pharmacological and genetic manipulations on free complex behavior of animal models of human diseases of the CNS. While there are several systems and methods that measure rodent behavior, none studies the developmental moment-to-moment dynamics of unforced behavioral growth processes in terms of animal-centered kinematic variables that are replicable across laboratories.

The Invention

Our team, including zoologists, statisticians, and computer scientists have developed a new hi-res bioassay for preclinical testing and characterization of CNS agents, extracting key animal-centered parameters of behavior via computerized tracking and measurement of free exploration. The features that distinguish our system and method from other existing systems and methods are: elaborate data preparation for analysis and a methodology that secures *replicability of results across laboratories*, and exposes *active management of kinematic variables*. Our measured parameters are carefully designed, animal-centered building blocks of behavior. They are selected on the basis of an in-depth understanding of the mouse's functional world. These quite unexpected and unusual parameters reflect the animal's cognitive and emotional state and its information processing capacity; therefore they are most prone to be affected by drugs that act on respective CNS structures that mediate these states.

Unlike all other existing systems we expose and quantify the rich and highly organized developmental dynamics of self regulated behavioral growth. The dynamics of this process before and after genetic manipulation and/or pharmacological treatment can now be readily measured by our system, articulating the effects of potential CNS drugs on behavioral growth and decay processes.

Stage of Development

A standard gradient reference scale for the growth and/or decay of behavior has been developed and software for its algorithmic measurement has been developed; Studies of drug effect on behavioral growth dynamics are in progress.

Patent Status

See: WO/2010/032247) System and method for analyzing exploratory behavior (approaching National stage).

Contact for more information:

Inbal Landsberg ✉, BD life sciences, 04-6364069

Ramot at Tel Aviv University Ltd. P.O. Box 39296, Tel Aviv 61392 ISRAEL
Phone: +972-3-6406608
Fax: +972-3-6406675