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Social interaction and anxiety: the role of olfactory stimulation

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Abstract. Autism is a neurodevelopment disorder with impaired social communication and stereotypical behavior. Olfactory stimulation has interesting effects. By using the olfactory stimulation we can change social behavior and anxiety in mice.

Key words: autism, olfactory stimulation, social behavior, anxiety.

Conflict of interest. The authors declare the absence of obvious and potential conflicts of interest associated with the publication of this article.

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Autism is a prenatal disorder in development of the nervous system, the main characteristics of which are impaired social communication and the presence of repetitive and stereotypical behaviour, as well as often other concomitant abnormalities, such as anxiety, memory impairment, eating behaviour, vegetative disorders [1]. It has long been known that the sense of smell is one of the oldest senses. It is also known that due to olfactory stimulation it is possible to change behaviour [2]. But what will be the effect when applied to mice with experimental autism?

The study used laboratory animals: male CD1 mice aged 10 months from the control groups and groups with a model of experimental autism. An experimental model of autism was performed by subcutaneous injection of valproic acid at a dosage of 500 mg/kg to female pregnant mice. An olfactory stimulation was used (successive presentation of water, peanut butter and predators) and after 24 hours was assessed social behaviour (Open field test) and anxiety (Open field test, X-maze test).

Animals with autism and the control group with olfactory stimulation were compared, a tendency of reducing anxiety was revealed (decrease in freezing time in the closed safe parts of the X-maze test) and a significant reduction in the time spent in the peripheral (safe) zone and a decrease in the travelled distance (in meters) in Open field test. When assessing social behaviour was performed, a significant increase in the time spent with a social object and the number of entrances to the zone with it was revealed.

Thus, in assessment of behavioural responses of olfactory stimulation was found a downward trend to

decreasing in anxiety. Olfactory stimulation contributed to a more pronounced response to the appearance of a social object in control group and especially in group with experimental autism.

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