STUDYING SOCIAL WITHDRAWAL IN A MOUSE MODEL OF AUTISM SPECTRUM DISORDERS USING THE VISIBLE BURROW SYSTEM

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Social withdrawal is an early symptom of a wide variety of neuropsychiatric diseases, such as schizophrenia, depressive disorders, Alzheimer's disease and autism spectrum disorders (ASD) (Paine et al., 2016). Social withdrawal involves a number of behaviours, including deficits in social interaction, low social approach and repetitive behaviors with restricted interests, which are the core symptoms of ASD (McFarlane et al., 2010). Mouse models with behavioural phenotypes resembling these core symptoms offer an experimental approach to better investigate ASD. Between these models, the BTBR inbred mouse strain shows robust behavioural phenotypes with analogies to the diagnostic symptoms of ASD (Pobbe et al., 2010).

The aim of the present work was to study social withdrawal in mice using a new behavioural paradigm, the Visible Burrow System (VBS). The VBS mimics a natural environment, with male and female rodents housed together in an enclosure where an open arena is connected to a continuously dark burrow system that includes 4 boxes connected by corridors. In this study, mixed-sex colonies of BTBR and control mice have been investigated.

Results showed marked differences between BTBR and control mice, in terms of social interactions as well as non-social behaviours, pointing out the advantage of the use of VBS to study social group behaviour dynamics that naturally occur in a mixed-sex colony.

In conclusion, considering the paucity of objective measures to longitudinally study social withdrawal characteristics, this new social housing model appears to be a powerful tool to investigate social withdrawal aspects that may be relevant in ASD.

Paine et al. (2017) Behav Brain Res. 317: 542-552.

McFarlane et al. (2008) Genes Brain Behav. 7: 152-63

Pobbe et al. (2010) Behav Brain Res. 214: 443–449.