SOCIAL RECOGNITION COGNITIVE TESTING IN A PIGLET MODEL

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ABSTRACT

According to the CDC, traumatic brain injuries (TBI) are a contributing factor to over 30% of injury-related deaths in the United States every year, with children aged 0-4 at the highest risk. Currently, there are limited therapy options available for the treatment of TBI and the resulting functional cognitive deficits, but human induced pluripotent stem cell-derived neural stem cells have recently become an option for therapeutic treatment. Due to similarities in brain structure and early development, we used a piglet model to develop a set of accurate, repeatable behavioral tests that quantify the cognitive state of normal piglets. One behavioral test that was developed is the 3-chamber social recognition test. The social recognition test measures sociability, or an inclination towards social interaction, and social memory, or the ability to distinguish between familiar and unfamiliar piglets. The experiment involved four piglets, aged five weeks old, and was conducted over a 10-day examination period. We found that the test piglet preferred social interaction with a stimulus piglet to interaction with novel object, thus exhibiting sociability. We also found that normal piglets were able to distinguish familiar pigs from unfamiliar piglets and preferentially interacted more with the novel, unfamiliar piglet, demonstrating a high level of social memory. The successful development of this behavioral test will allow us to assess functional cognitive deficits in our piglet model following TBI, along with potential improvements in cognition and behavior following therapeutic stem cell treatment.