

ASSESSMENT OF SPONTANEOUS TRIAL-UNIQUE MEMORY USING A PIGLET MODEL

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ABSTRACT

People throughout the world, especially children ages 0-4, suffer from traumatic brain injuries (TBIs) that often result in death or permanent disabilities. No treatments are currently available to address the short and long term neurological deficits that often result from a TBI. In an effort to better assess the cognitive changes that take place after TBI and the effectiveness of different types of TBI treatments, we designed an object recognition test to allow us to evaluate and quantify spontaneous trial-unique memory in a more translatable piglet model. We hypothesized that the normal piglets would be able to differentiate between familiar and novel objects and show a preference toward the novel objects. Four landrace piglets underwent behavioral testing on two separate days, seven days apart. In this test, one piglet was placed in an arena, with two similar objects and was allowed to explore the arena for 10 minutes. The piglet was removed from the arena for 10 minutes and then returned to explore the two objects, one familiar and one novel, for another 10 minutes. Time spent with each of the objects was recorded. The piglets initially spent equal time with the two similar objects, but then spent significantly more time with the novel object than the familiar object. This demonstrates a high level of spontaneous trial-unique memory. The results of this test will allow us to quantitatively assess cognitive changes in memory a piglet with a TBI and monitor the effectiveness of different treatments.