

BEHAVIORAL TESTING ON PIGLETS TO ASSESS COGNITIVE DEFICITS OF A TRAUMATIC BRAIN INJURY

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ABSTRACT

Traumatic brain injury (TBI) affects over 150,000 children per year and is a leading cause of neurological disability and death during childhood. There are limited treatments available, but recently induced pluripotent stem cell-derived neural stem cells (iNSCs) have shown potential as a regenerative option. Due to similarities to children in brain formation and development, we have chosen to use a piglet model to 1) develop applicable and quantifiable behavioral tests to assess cognitive function, 2) quantify cognitive deficits after sustaining a TBI and 3) determine the effectiveness of iNSC treatment in reducing cognitive deficits after TBI. To assess cognitive function we will use a spatial plus T-maze test and an object recognition test. The spatial plus T-maze test will assess learning and spatial memory. Piglets will start from a north or south arm and can enter both the east and west arms, with only one arm being baited. We expect the piglets to find the reward by using extra-maze visual cues, not motor memory. The object recognition test will test spontaneous trial-unique memory. Piglets will be exposed to two similar objects within an arena for 10 minutes. After a 10-minute delay, piglets will be reintroduced to one familiar and one novel object. Time spent with each object will be measured. We expect the piglets to prefer the novel over the familiar object, based on the piglets' memory of the familiar object. The successful development of these behavioral tests will enhance our ability to assess cognitive function in piglets.