

# JAX® *In Vivo* Services

## Sample Morris Water Maze Study

JAX® *In Vivo* Services can perform a variety of flexible and customizable studies for biomedical researchers. This sample protocol describes the use of the Morris Water Maze to study learning or memory impairment.

The Morris Water Maze is used to test hippocampus-dependent learning including acquisition of spatial memory, long-term memory, and long-term spatial memory. It is also used to test general learning (non-spatial). Areas involving learning or memory function include:



**Alzheimer's Disease • Aging & Dementia • Traumatic Head Injury & Stroke  
Seizure Disorders • Stress • Women's Health & Menopause  
Cognitive Delays & Down Syndrome • Sleep Disorders**

### Sample Study Design:

For phenotyping, six male and six female test mice, plus matching wild-type (WT) controls, will be transferred to The Jackson Laboratory *In Vivo* Services and allowed to acclimate for one week. They will be housed three per cage with *ad libitum* access to standard chow and water.



- Morris Water Maze acquisition of spatial memory test (five to 15 days of testing with up to five tests per day, each test consisting of two runs)
- A run begins with mouse placed in pool of opaque water containing a hidden rescue platform and ends when the mouse climbs onto the platform
- Outcomes & Analysis
  1. Latency to platform (max = 60 seconds)
  2. Swim distance
  3. Average swim speed
  4. Exploration pattern

**Contact us today:**



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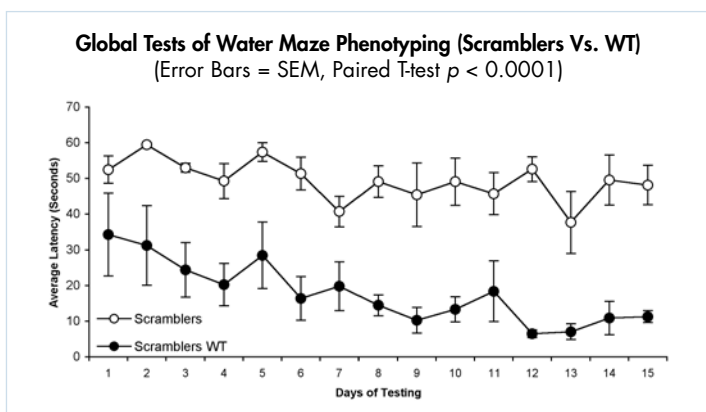
## Procedures and Timeline:

Acquisition of Spatial Memory Test						
Day	-7 to 0	1	2	3	4	5
Activity	Acclimation	one to five tests, two runs each	one to five tests, two runs each	one to five tests, two runs each	one to five tests, two runs each	one to five tests, two runs each

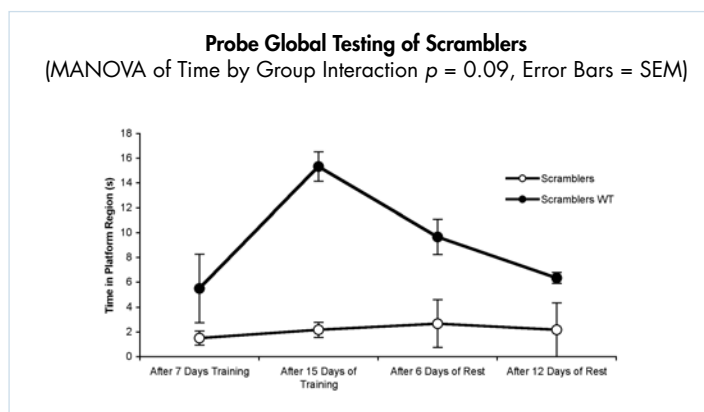
## Representative Results:

### Genetic Model of Cognitive Deficit: Scrambler (STOCK A/A-*Dab1*<sup>scm</sup>/), 002043

Scrambler mice have a mutation in the *Dab1* gene resulting in, among other brain abnormalities, a major disorganization of the hippocampus. As can be seen from the data below, the Morris Water Maze testing allows for the discrimination of wild-type and mutant based on memory acquisition and retention.



**Acquisition of Spatial Memory:** Testing of Scrambler or wild-type female mice for acquisition of spatial memory over 15 days.



**Testing of Memory:** Spatial Probe Trial of Scrambler or wild-type female mice for retention of memory at six and 12 days post-training.

## Other Procedures to Consider for Your Study:

Dosing	Dosing can be performed IP, IV, SC, PO, high pressure tail vein, osmotic minipumps (SC or IP), SC drug pellets, in the food or water
Spatial Probe Trial	This optional protocol is performed the day after the acquisition phase for up to five runs for the one test. The mouse is placed in the same pool of water with the platform removed, and the percentage of time spent in each quadrant of the pool is analyzed
Reversal Test for Working Memory	This optional protocol is performed the day after the acquisition phase for up to five runs for the one test. The mouse is placed in the same pool of water with the platform moved to the opposite quadrant. The latency to the platform in the new location and exploration patterns are analyzed
Motor Function / Activity	Locomotor activity assessed to rule out confounding motor impairment
Terminal Blood Chemistry	For pharmacokinetics
Histology and Slides	Slide preparation with interpretation for phenotyping

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