Title:	**Behavioral Phenotyping of T41B Male Mice**

Procedure	**Y-Maze Spontaneous Alternation**

Y-Maze Spontaneus Alternation

The Y-Maze is a test for spontaneous alternation in rodents. Spontaneous alternations is a behavioral test for measuring exploratory behavior. This test is based on the willingness of rodents to explore a new environment. Normal rodents will prefer to experience a different arm of the maze than the one they visited on their previous entry. Many parts of the brain including: hippocampus, septum, basal forebrain, and prefrontal cortex are involved in this task.

Two different Y-Maze apparatuses are available to measure the Spontaneous Alternation The large Y-Maze has 3 equal arms of 40 cm length, 8 cm width, and 15 cm height, attached at 120 degree angles. The small Y-Maze has 2 equal arms and 1 differing arm separated by 120 degree angles. The 2 equal arms have a dimension of 15.24 cm length, 12.7 cm height, and 7.62 cm width; the 1 longer arm has dimensions of 20.32 cm length 12.7 cm height, and 7.62 cm width. The small Y-Maze was used for this report.

Each arm of the maze is labeled as either arm A, B, or C. In each session, the animal is placed in arm B and allowed to explore the three arms for 5 minutes. Number of arm entries and number of alternations are scored live in order to calculate the percent alternation. The entry is considered when all four limbs are within the arm. The alternation percentage is calculated by dividing the number of alternations by number of possible triads x 100. The maze is cleaned with Virkon solution between animals to eliminate odor traces.

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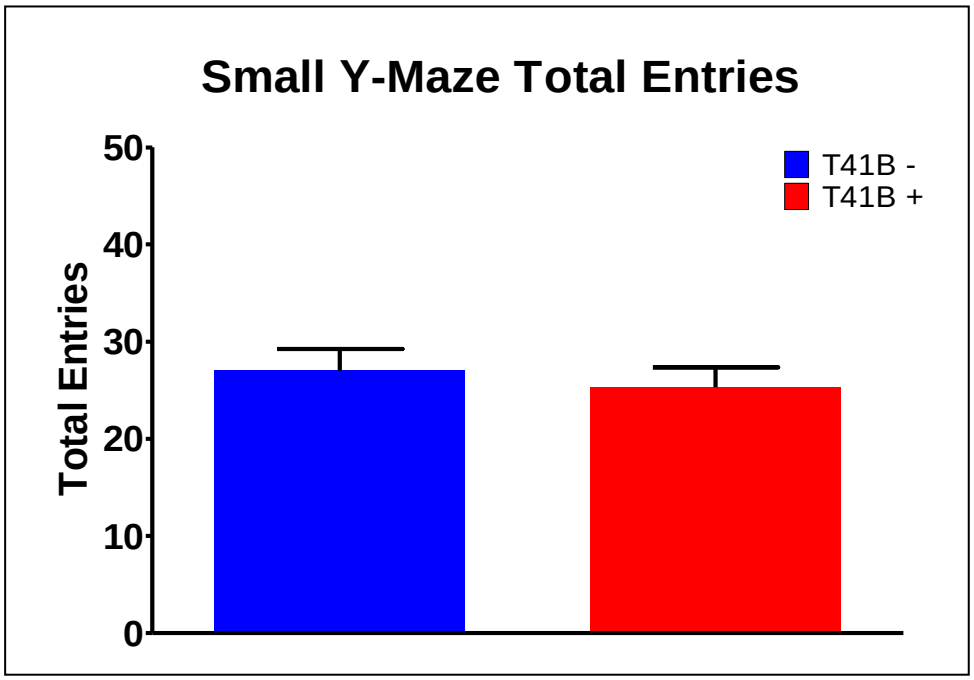
Species	Mouse
Strain	Thy1-hAPPLond/Swe+
Sex	Male
Age	9-12 months

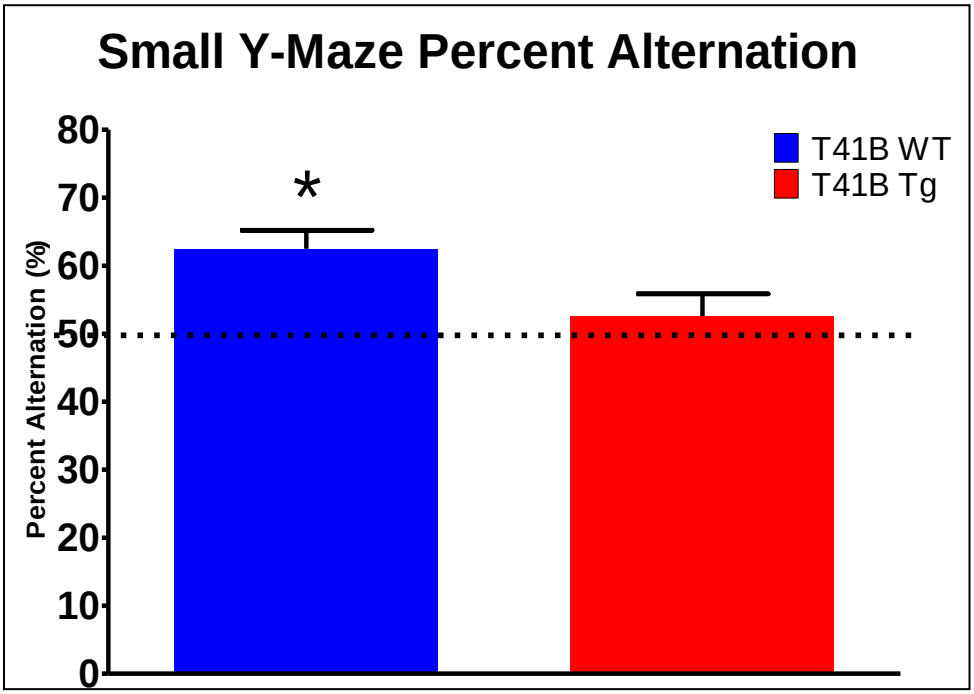
Subjects

Group	# of mice	Treatment
T41B - (Wt)	15	none
T41B + (Tg)	13	none

Small Y-Maze Data

ID#	Genotype	Total Entries	# of Alternations	# of possible Triads	% Alternation
1	WT	21	12	19	63.15789474
2	WT	29	17	27	62.96296296
3	WT	29	17	27	62.96296296
4	WT	34	21	32	65.625
5	WT	21	11	19	57.89473684
6	WT	22	11	20	55
7	WT	19	15	17	88.23529412
8	WT	20	10	18	55.55555556
9	WT	25	17	23	73.91304348
10	WT	25	16	23	69.56521739
11	WT	43	22	41	53.65853659
12	WT	24	13	22	59.09090909
13	WT	48	21	46	45.65217391
14	WT	20	13	18	72.22222222
15	WT	25	12	23	52.17391304
16	T41B	24	13	22	59.09090909
17	T41B	24	9	22	40.90909091
18	T41B	31	17	29	58.62068966
19	T41B	18	7	16	43.75
20	T41B	24	14	22	63.63636364
21	T41B	14	7	12	58.33333333
22	T41B	27	14	25	56
23	T41B	32	17	30	56.66666667
24	T41B	18	4	16	25
25	T41B	28	18	26	69.23076923
26	T41B	42	23	40	57.5
27	T41B	28	11	26	42.30769231
28	T41B	19	9	17	52.94117647





The percent alternation was analyzed using a one sample t-test to compare each group's percent alternation to a theoretical value of 50%. WT mice alternated at levels that were significantly above chance (50%), which Tg mice did not alternated at levels significantly above chance.

Conclusions

T41B Tg mice did not alternate at levels significantly above chance (50%) while their WT littermates did. This deficit suggests that T41B Tg mice have impaired spatial working memory.