

## TEST OF SPONTANEOUS ALTERNATION IN Y-MAZE

*Key-words: Working/Short-term/Spatial Memory, Alzheimer, Aging*

The test of spontaneous alternation measures **spatial working** (i.e. **short term**) **memory** in rats or mice <sup>(1,2)</sup>.

**Rationale** – Alternation is a spontaneous behavior which involves working memory. **Spontaneous alternation is decreased by amnesic drugs**. This **decrease** can be **antagonized** by a **drug which enhances memory**.

Scopolamine, a cholinergic receptor antagonist, induces an amnesic effect which can be paralleled with cognitive decline in Alzheimer disease. Scopolamine-induced **amnesia is reduced by drugs for treatment of Alzheimer’s** disease such as acetylcholinesterase inhibitors.

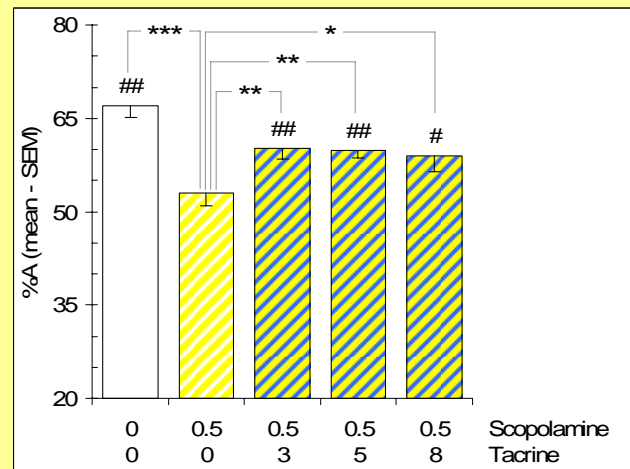
**Method** – The animal is placed for a 10-min session in a Y-maze made with 3 arms. The series of arm entries is recorded. An alternation is defined as the consecutive entry into each of the three arms of the maze.

- **The memory index** is the percentage of alternation: %A
  - %A > 50% in normal animals (injected with saline) shows that memory is present
  - %A ≈ 50% in animals treated with an amnesic drug
  - %A > 50% in animals treated with a combination of amnesic + promnesic drugs:
    - ⇒ **Amnesia is reduced by the promnesic drug**

**Example**

***Tacrine, an acetylcholinesterase inhibitor and anti-Alzheimer drug, reduces scopolamine-induced amnesia***

**Effect of Tacrine on Scopolamine-induced amnesia in Swiss mice (doses in mg/kg)**



Difference vs. 50%: # p < 0.01; ## p < 0.001  
 Difference vs. Scopolamine: \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001

**References;** 1. Maurice et al., Brain Res 647:44-56, 1994  
 2. Hefco et al., Eur J Pharmacol 474 :227-232, 2003