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# Dimebon Enhances Hippocampus-Dependent Learning in Mouse Models of Appetitive Y-Maze and Inhibitory Step-Down Memory Tasks in Mice

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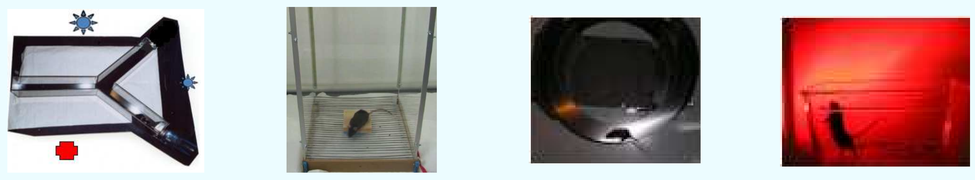
## INTRODUCTION

Dimebon, a compound recently proposed for a treatment of Alzheimer's disorder[1,2], was suggested to have memory enhancing properties in pre-clinical studies[3,4]. Dimebon increased memory scores[3,4,5] and enhanced neurogenesis[5] in rats.

We aimed to investigate the procognitive effects of dimebon, and to study whether repeated or acute intraperitoneal injection of this compound, at doses known to increase memory (respectively 0.1 and 0.5 mg/kg), affect learning scores in appetitive (Y-Maze) and inhibitory (step-down avoidance) tasks in 3-month-old C57BL/6N mice. Additional O-maze, novel cage, open field and water consumption tests were carried out to address possible non-specific effects of dimebon on parameters of drinking, anxiety and exploration/locomotion[6].

Y-maze apparitus | Step-down avoidance | O-Maze | Novel Cage



## RESULTS

### 1) Subchronic treatment with dimebon accelerates learning and increases duration of drinking behaviour in an appetitive memory task in C57BL/6N mice while thirst and behaviours in other tests were not affected

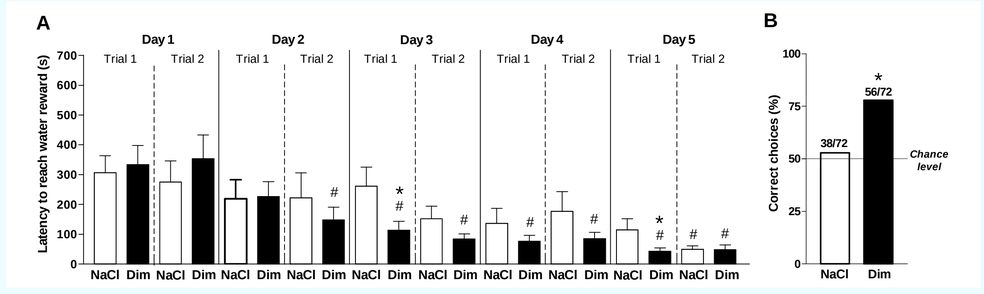



***Figure 1 :*** *Daily administration of dimebon (0.1 mg/kg) decreases latency to reach the reward (A), and increases the percentage of correct choices for the arm with the filled bottle (B) in the Y-Maze in C57BL/6N mice. NaCl: vehicle-treated group, Dim: dimebon-treated group.*

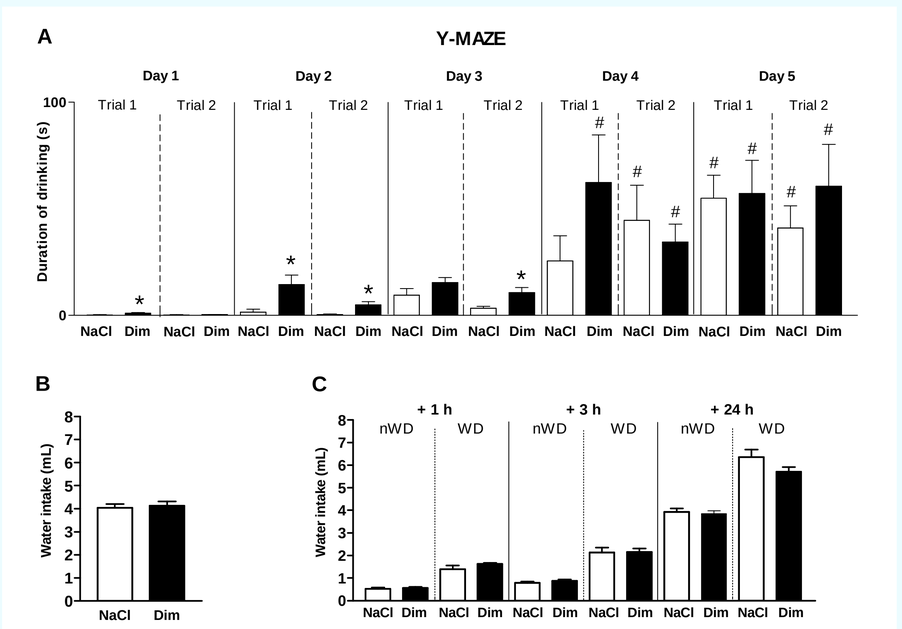



***Figure 2 :*** *Duration of drinking was significantly higher in dimebon-treated group than in control group (A) while water intake is not affected by repeated (B) or acute (C) treatment with dimebon independently of water deprivation. WD: water-deprived, nWD: non-water-deprived.*

### 2) Bolus treatment with dimebon at the dose 0.5 mg/kg increases the performance in an inhibitory memory task in C57BL/6N

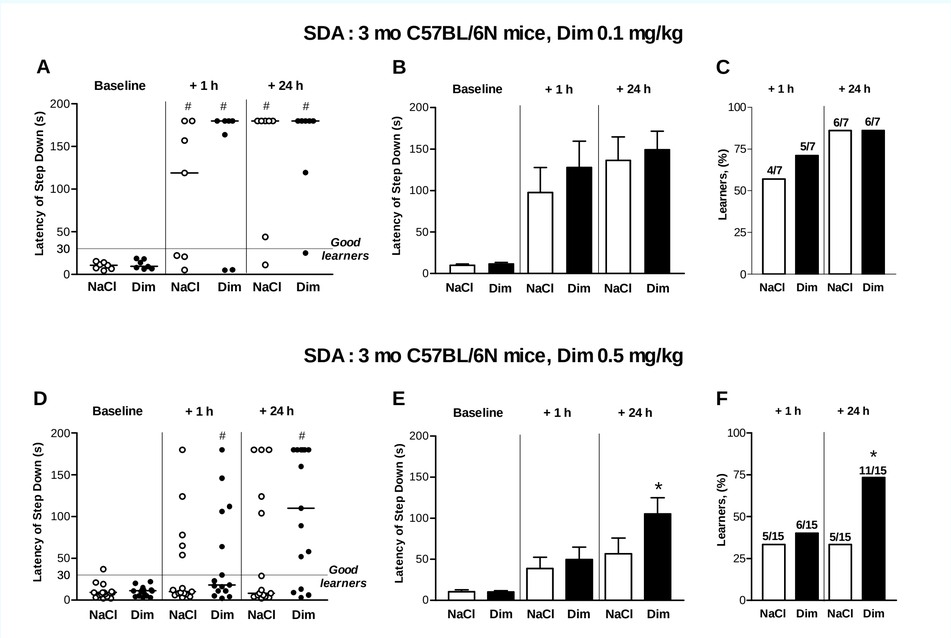



*Figure 3 : C57BL/6N mice acutely treated with dimebon at the dose of 0.5 mg/kg showed significantly increased latencies of step down (E), as well as significantly higher percentage of good learners (F), 24h after training in comparison to the vehicle-treated group. A lower dose of dimebon (0.1 mg/kg) did not affect the scores of learning in C57BL/6N (B,C).*

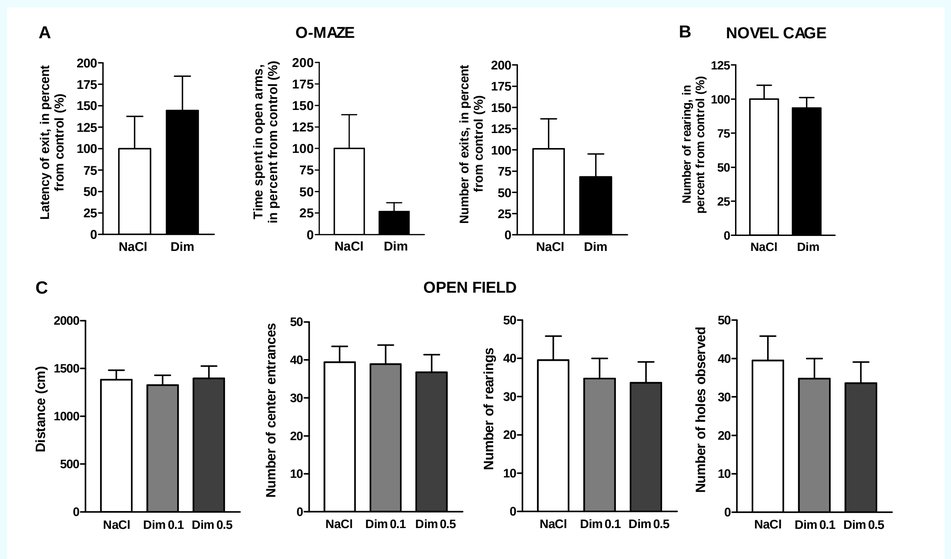



*Figure 4 : Mice repeatedly treated with dimebon did not differ from vehicle-treated animals in the O-maze (A), the novel cage (B), and in the open field (C) tests.*

## CONCLUSIONS

- Administration of dimebon via repeated (0.1 mg/kg) and acute (0.5 mg/kg) i.p. injections respectively increases learning scores in Y-Maze and step-down avoidnace tasks in C57BL/6N mice.
- Acute treatment with dimebon at the dose 0.1 mg/kg did not affect learning scores
- No effects of 3-day administration with dimebon were observed on the parameters of thirst, anxiety, and exploration/locomotion in 3-month-old C57BL/6N mice
- Dimebon enhances hippocampus learning in both appetitive and inhibitory tasks in C57BL/6N mice

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