

Effects of Intraseptal Orexin-SAP on Spatial Memory

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of the highest concentration, we restricted our analysis of the behavioral effects of orexin-SAP to the two lower concentrations.

Rats treated with either 100 or 200 ng/ μ l were impaired at learning the location of the platform in the water maze (Figure 2). Although mean escape latencies decreased across days for all groups, the rate of learning was slower for rats treated with orexin-SAP as compared to control rats (Figure 2A). Analysis of the first trial of each session was used to assess effects on long-term memory (*i.e.*, 24-hr retention). Rats treated with either dose of orexin-SAP demonstrated a pronounced impairment of long-term memory (Figure 2B). Performance on probe trial for day 4 confirmed the impairments observed on platform trials, but performance on probe trial for day 11 was not different between groups. In summary, orexin-SAP administered into the MS-DB resulted in a dose-dependent loss of GABAergic and cholinergic SH neurons with a greater damage occurring to GABAergic neurons than cholinergic neurons. Rats treated with 100 and 200 ng/ μ l of orexin-SAP were impaired in learning the water maze task with pronounced impairment of long-term retention. These results contrast with our previous studies using intraseptal kainic acid administration, which does not impair performance on the water maze or radial maze. The different behavioral results are especially interesting when one considers that 100 ng/ μ l orexin-SAP preferentially damages GABAergic SH neurons, similar to the damage produced by kainic acid. So far, the effects of these compounds have only been assessed on cholinergic and GABAergic SH neurons. Current studies are attempting to identify the effects of orexin-SAP and kainic acid on non-cholinergic, non-GABAergic MS-DB neurons. Identifying neuronal populations that are differentially affected by these two toxins will help to highlight other MS-DB neurons that may be involved in learning and memory. In conclusion, these studies demonstrate that orexin afferents to the MS-DB may play a role in modulating memory processes. The results, together with those from previous studies, also suggest an important role of noncholinergic, non-GABAergic MS-DB neurons in spatial memory.

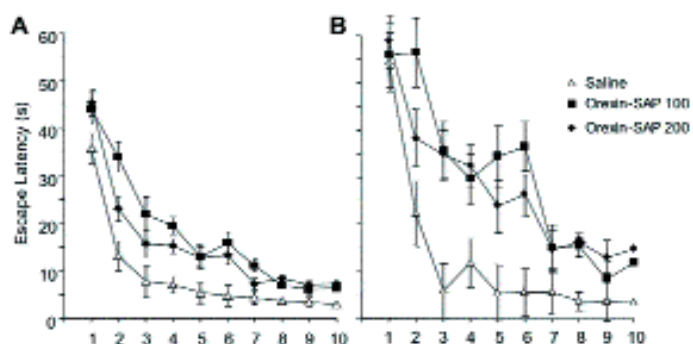


Figure 2. Mean escape latency for daily sessions are shown in Figure 2A. Orexin-SAP significantly impaired the acquisition of a water maze task. No difference was found between the two groups receiving orexin-SAP. Mean escape latency for the first trial of each daily water maze session is shown in Figure 2B. Although no difference was observed on the first trial of the first session, rats treated with orexin-SAP took significantly longer than the saline-treated group to reach the hidden platform on the first trial of subsequent sessions. No difference was observed between rats treated with the two concentrations of orexin-SAP.

References:

- Gerashchenko *et al.* (2001) *Brain Res* 913:106-155.
 Pang *et al.* (2001) *Hippocampus* 11:814-827.
 Smith, HR and Pang KCH (2005) *Neuroscience* 132:261-271.
 Wu *et al.* (2002) *J Neurosci* 22(17):7754-7765.
 Wu *et al.* (2004) *J Neurosci* 24(14):3527-3536.

Society for Neuroscience
 November 12-16, 2005
 Washington DC
 Booth #2829



Upcoming Events

Cell Biology
 December 10-14, 2005
 San Francisco, CA
 Booth #1814

Buy Me Some Peanuts...

Advanced Targeting Systems took the afternoon off and set out for the Padres ball game. Half the fun of a ball game is all the food, so some (who shall not be named) attempted to consume a different food each inning. Others settled for a hot dog, cracker jacks, or hot coffee to keep away the chills. Yes, even in sunny San Diego it can get a little chilly (okay, we may be weather wimps!) Regardless of weather, food or bone-jarring action, all had a great time at the park.



Pictured left to right: Leonardo Ancheta, Kristen Hartman, Brian Russell, Amalia Dingman, Rick Marlinga (Thea's husband), Thea Marlinga, Darlene Martineau (Doug's wife), and Douglas Lappi. (Photo taken by Denise Higgins)

We would also like to wish a fond farewell to Thea Marlinga. In our last issue of *Targeting Trends* we shared our experience on Master Chief Rick Marlinga's submarine. The Marlingas, along with their two children, Charlotte and Sam, will be moving in December to Chicago to continue serving and protecting our country. We will miss you, Thea!