

Is there convergence of inputs from the entorhinal cortex and CA1 in the subiculum?

Cappaert NLM\*/\*\*, Wadman WJ\*\*, Witter MP\*

\*VU Medical Center, Institute of Neuroscience, Amsterdam, \*\*University of Amsterdam, Swammerdam Institute of Life Sciences, Amsterdam

The subiculum and the entorhinal cortex (EC) are important structures in processing and transmitting information between the neocortex and the hippocampus. The subiculum receives information from the EC by way of two paths. In addition to a direct projection from EC to the subiculum, there is an indirect polysynaptic connection. The latter uses a number of potential pathways which all converge onto the final projection from the hippocampal field CA1 to the subiculum. It is currently not known whether both inputs from the EC, direct as well as indirect, interact in the subiculum.

In the present study, we investigated this question in *in vitro* brain slices of the rat, containing the hippocampus and the medial EC. The slices were stained with a voltage sensitive dye. Changes in membrane potential, exhibited as changes in absorption, were recorded with an optical imaging system.

To mimic the two inputs from the EC to the subiculum, stimulation electrodes were placed in the CA1 area and layer III of the medial EC. The response patterns evoked in the subiculum after electrical stimulation of either CA1 or layer III of the medial EC were compared with the response patterns after simultaneous stimulation of both areas (medial EC + CA1). A comparison of the added responses of the two single stimulations with the measured responses after simultaneous stimulation showed a significant difference in magnitude/amplitude between these two responses. We conclude that in the subiculum an interaction of the direct and the indirect information flow from the entorhinal cortex takes place.

N.L.M. Cappaert, Swammerdam Institute for Life Sciences, Section Neurobiology, University of Amsterdam, Kruislaan 320, 1098 SM Amsterdam, The Netherlands, t +(31) 20-5257625, e-mail [ncappaer@science.uva.nl](mailto:ncappaer@science.uva.nl)

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