

特別講演 4

Oroxylin A, a flavonoid isolated from *Scutellaria baicalensis*, in the cognitive processes

Kwang Ho Ko, Ph.D

College of Pharmacy, CHA University

Three stages are involved in the learning and memory processes including acquisition, consolidation, and retrieval phases. A compound which improves such cognitive processes would be useful for the treatment of memory deficits in patients. The presentation will be focused on the flavonoids, especially oroxylin A. Oroxylin A is a flavonoid and was originally isolated from the root of *Scutellaria baicalensis* Georgi., one of the most important medicinal herbs in traditional Chinese medicine. In the present studies, we wanted to investigate the effects of oroxylin A on memory processes in mice. In the acquisition study, the step-through latency time of the groups treated with oroxylin A alone increased more than vehicle-only control group ($P < 0.05$). Moreover, the group of mice treated with oroxylin A (5 mg/kg) alone alternated more than the vehicle-only treated control group without any changes in the number of arm entries ($P < 0.05$). Memory consolidation is a process that acquired information converts to solid thing to retrieve during recalling time. Oroxylin A improved the retention performances administered by 0 h, 1 h, and 3 h after training in the passive avoidance task, suggesting that 0 h, 1 h, and 3 h post-training administrations of oroxylin A affected memory consolidation and the changes of consolidation-related intracellular signaling processes. Oroxylin A increased BDNF expression in the hippocampus 6 h after drug administration, and phosphorylation of CaMKIV and CREB were involved in that process. In addition, oroxylin A (5 mg/kg) significantly reversed chemically induced cognitive impairments (scopolamine and diazepam) in mice by passive avoidance and the Y-maze testing ($P < 0.05$). Oroxylin A also improved escape latencies in training trials and increased swimming times and distances within the target zone of the Morris water maze ($P < 0.05$). Furthermore, oroxylin A (100 μ M) was found to inhibit GABA-induced inward Cl^- current in a single cortical neuron. Recently, we observed that sub-chronic administration of oroxylin A increases neurogenesis in the SGZ of the hippocampal DG region. These results suggest that the cognitive enhancing activities of oroxylin A may be associated with the enhancement of cholinergic activities via GABA_A receptor antagonism or the increases in hippocampal neurogenesis.