

# The effect of Thai herbal medicine on learning and memory mechanisms and vascular dementia

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The brain is a very critical organ that plays crucial roles in all most all body functions such as sensation, movement, language, and thought. Among all the functions, learning and memory are the fascinating ones, and have a lot of impact on human behaviors both normal and abnormal. Learning is the process in which the new information is acquired whereas memory is the process in which that previously acquired knowledge is stored and maintained for later use. The stored knowledge will then be the basic building blocks for behavior formation, demonstrating the intricate links between these brain functions. There are many conditions and diseases that will affect learning and memory such as Alzheimer disease, vascular disease, and post-traumatic stress disorder. The two most common types of memory impairment found in patients are Alzheimer's disease (AD) and vascular dementia (VaD). However, not only that most of the medicines for these conditions are imported from foreign countries, but the pathophysiology of the diseases is also far from known. Our laboratory is interested in the enhancing effect of Thai herbal medicine on mechanisms of learning and memory performance, and the possible therapeutic effect on pathogenic mechanisms of vascular dementia. The animal models of vascular dementia were tested with behavioral training protocol – Morris Water Maze. Functions of the hippocampus, which is the brain area located in the medial temporal lobe and is important for the acquisition (learning) and maintenance of memory, were determined by electrophysiological study of long-term potentiation (LTP), a synaptic mechanism underlying memory formation. The hippocampus and other related brain structures were further examined by immunohistological studies. Other techniques such as stereotaxic drug infusion and molecular techniques would also be employed in order to unlock the pathophysiology of the disease and to search for Thai herbal medicines that might yield benefits to vascular dementia patients.

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