

Chapter A: Introduction

Life-threatening diseases, such as cancer, heart disease, autoimmune disease, and obesity will hopefully be eliminated sometime in the relatively near future. However, mysteries and diseases of the mind will likely remain unsolved for a longer time. Daily activities of learning and memory retrieval, thinking and thought, and perception all stimulate a feeling of mind. Without learning and memory, thinking and thought, as well as perception, are not enough to recognize self-existence and will not stimulate a feeling of mind. For the past several decades, we have studied learning and memory, thinking and thought, and the sensibility of perception in experimental animals in order to unlock the mysteries of the mind, particularly with regard to aging. By unlocking these mysteries, a greater understanding of how the brain can age gracefully can be achieved.

Chapter B describes the progression of age-related brain changes, including deposition of N^ε-(carboxymethyl) lysine (CML), deterioration of micro-vessels, and neuronal cell death in the entorhinal cortex and CA3 area of the hippocampus in rats at 60 weeks of age. Toki-Shakuyaku-San (TSS, a traditional Japanese medicine) treatment reverses the progression of age-related brain changes in rats. The use of TSS to study memory in this Chapter is also discussed.

Chapter C describes the progression of age-related brain changes, which cause deficits in learning and memory and increases the perception of anxiety, in mice at 60 weeks of age. However, similar to that found in rats, these changes are reversible. TSS treatment reverses the progression of age-related brain changes and improves memory loss in aging mice. When mice reach the age of 100 weeks, they demonstrate considerably poor perception and memory; these mice do not respond well to TSS treatment for improving perception and the retrieval of memory. These findings suggest that the progression of age-related brain changes ranges from reversible to permanent in mice at 100 weeks of age. Similar reports in Alzheimer's patients are described, in which patients respond well to TSS treatment, demonstrating improved cognitive and non-cognitive symptoms when they are in the mild to moderate stages