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## Age-Induced Alterations in Hippocampal Function and Metabolism.

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### Abstract

As the nervous system ages, a variety of changes occur in metabolism supporting glial and neuronal function, resulting in greater susceptibility to disease conditions. Changes with aging in the metabolic unit (i.e., neurons, glial cells and blood vessels) have been reported to include alterations of vascular reactivity, impaired transport of critical substrates underlying metabolism, enhanced reactive oxygen species production and alterations in calcium signaling. Some diseases are focused on the elderly, particularly cerebral ischemia, cognitive limitations, iatrogenic hypoglycemia, malignant brain tumors (i.e., glioblastoma), and Alzheimer's disease, partly due to metabolic alterations with aging. These metabolic changes with aging are discussed in light of primary theories of aging of the brain, which include mitochondrial, calcium dysfunction and enhanced oxidative damage. Here we focus on metabolic changes with aging which can influence the susceptibility of the brain to ischemia and cognitive function. Lastly, we describe treatment possibilities for these abnormal responses to aging, particularly the topic of caloric/dietary restriction, and possible mechanisms underlying this treatment direction.

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