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UPDATE

The Memory-Enhancing Hormone

Hormones are chemical messengers that tell our organs and cells what to do.

Our neurological function is precisely controlled by hormones that synchronize organ and cell function.

Hormone imbalances play a direct role in the decline of cognitive functioning with aging.

In this article, we discuss a new, low-cost hormone that may be "the most potent memory enhancer yet found," according to an article in the *Proceedings of the National Academy of Sciences* (Nov. 6, 1995).

LEARNING AND MEMORY

Healthy young brain cells function as a fine-tuned circuit, efficiently producing energy and transmitting huge amounts of data throughout various regions of the brain.

Young brain cells working together in a coordinated fashion have the ability to acquire and store new information quickly (learning) and to retrieve this information instantly (as short-term memories).

Optimal cognitive function requires the occurrence of trillions of cellular metabolic reactions on a continuing basis throughout the brain.

Young brains function as if they were players in a well-conducted "orchestra", with each neuron performing its designated task at the right time.

Aging erodes the ability of the "conductor"-an essential hormone called pregnenolone to direct the synchronization of the trillions of brain cell reactions required to maintain youthful mental function. By restoring lost pregnenolone, learning and short-term memory can be improved dramatically!

BRAIN-BOOSTING NUTRIENTS

There are several classes of memory enhancing compounds that enhance cognitive function and protect against neurological aging.

The most common memory-enhancing nutrients are choline, lecithin and DMAE. These nutrients boost acetylcholine levels in the brain. Acetylcholine is a neurotransmitter that enables brain cells to communicate with each other. A deficiency of acetylcholine can predispose a person to a wide range of neurological diseases including Alzheimer's disease and stroke.

Another mechanism of memory enhancement involves boosting the energy output of brain cells. Aging causes a decline in the ability of neurons to take up glucose and to generate energy in the mitochondria (the power plants of the cell). This decline in energy production causes memory and other cognitive deficits and results in the accumulation of cellular debris that eventually kills brain cells. When enough brain cells have died from accumulated cellular debris, senility is usually diagnosed. Compounds that fit into the category of brain-cell energy-enhancers include piracetam, acetyl-L-carnitine, ginkgo, NADH, centrophenoxine, and phosphatidylserine.

Phosphatidylserine also plays an important role in maintaining the integrity brain cell membranes. The breakdown of brain cell membranes during aging prevents glucose and other nutrients from entering brain cells.

Free radical damage has been implicated as an initiator of DNA damage results in the breakdown of healthy brain cell metabolism. Scientists are now publishing articles that suggest that the consumption of antioxidants, especially vitamin E, may be able to reduce the risk of senility.

In order to take full advantage of increases in brain cell energy, elevated levels of acetylcholine, and enhanced brain cell membrane

function the synchronization of youth needs to be restored!

HORMONES AND BRAIN CELLS

Two hormones that help to coordinate brain cell activity are DHEA and pregnenolone.

The adrenal gland converts cholesterol into pregnenolone. Some pregnenolone is then converted into DHEA. Many published studies document DHEA's ability to protect and enhance neurologic function. Many Foundation members take DHEA because of its broad-spectrum anti-aging effects.

New studies show pregnenolone to be a *specific memory-enhancing hormone!* Pregnenolone maintains the "program" brain cells need to store and retrieve short-term memories.

Pregnenolone initiates the memory storage process by stimulating the enzyme *adenylate cyclase*, which is needed to regulate and activate other critical enzymes required for cellular energy.

Pregnenolone then regulates the timed-sequential flow of calcium ions through the cell membrane of calcium ion exchange has great formational content and may determine how memory is encoded by neurons.

Pregnenolone then modulates chemical reactions, calcium-protein bindings, gene activation, protein turnover, and the intra-cellular distribution of compounds and enzyme reactions involved in the storage and retrieval of memory.

As stores of pregnenolone (and DHEA) are depleted with advancing age, we see a marked and often dramatic decline in the neuronal synchronization required for optimal mental function.

Aging causes a severe deficiency pregnenolone and DHEA production.

THE PUBLISHED STUDIES

The scientific literature contains voluminous data on the neuro-protecting and neuro-enhancing benefits DHEA and pregnenolone.

While there are impressive human data on the neurological benefits of DHEA, recent animal studies show that pregnenolone may be a more effective memory-enhancing agent.

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