

Mechanism of Possible Biological Effect of Activated Water on Patients Suffering from Alzheimer's Disease

© Copyright 2003 by Dr. Igor V. Smirnov, Ph.D. and M.S., USA

In Alzheimer's disease, there is an overall shrinkage of brain tissue. In addition, the ventricles or chambers within the brain that contain cerebrospinal fluid are noticeably enlarged (see Figure 1). In the early stages of Alzheimer's disease, short-term memory begins to decline when the cells in the hippocampus, which is part of the limbic system, degenerate. The ability to perform routine tasks also decline. As Alzheimer's disease spreads through the cerebral cortex (the outer layer of the brain), judgment declines, and emotional outburst may occur, and language is impaired. Progression of the disease leads to the death of more nerve cells and subsequent behavior changes, such as wandering and agitation. The ability to recognize faces and to communicate is completely lost in the final stage. The stage of complete dependency of patient may last for years before he dies. The average length of time from diagnosis to death is 4 to 8 years, although it can take 20 years or more for the disease to run its course.

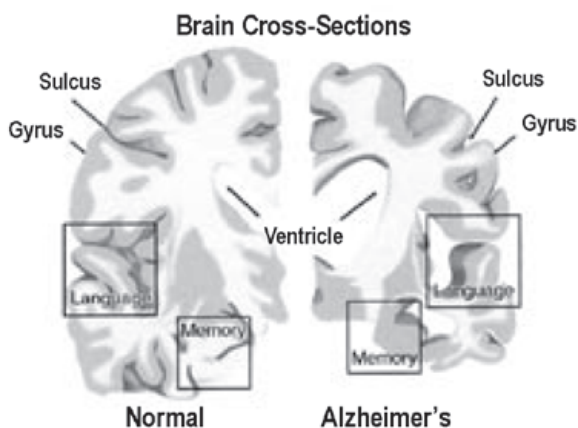


Figure 1. The cross-section on the left represents a brain from a normal individual, and the one on the right represents a brain with Alzheimer's disease.

One of the hallmarks of Alzheimer's disease is the accumulation of amyloid plaques between nerve cells (neurons) in the brain. Amyloid is a general term for protein fragments the body produces on a regular basis. Beta-amyloid is a fragment of a protein that is snipped

from another protein called amyloid precursor protein. In a healthy brain, these protein fragments would be broken down and eliminated. In the case of Alzheimer's disease, the fragments accumulate to form hard, insoluble plaques.

Another factor that leads to development of Alzheimer's disease is formation of abnormal neurofibrillary tangles in neurons. These primarily consist of a protein called tau, which forms part of a structure called a microtubule. The microtubule helps transport nutrients and other important substances from one part of the nerve cell to another. In the case of Alzheimer's disease, however, the tau protein is abnormal and the microtubule structures are collapsed.

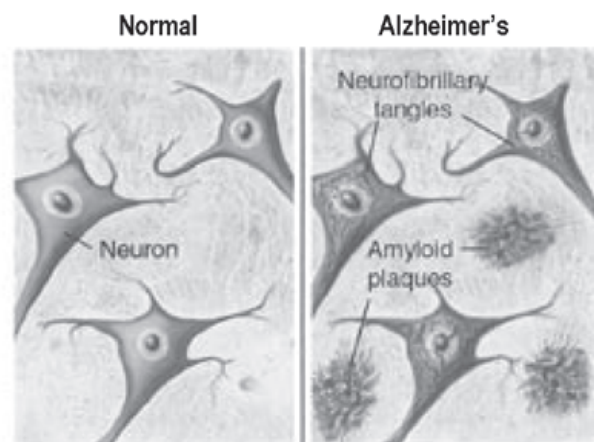


Figure 2. The formation of amyloid plaques and neurofibrillary tangles contribute to the degradation of the neurons in the brain and the subsequent symptoms of Alzheimer's disease.

The brain is a collection of about 10 billions neurons. Each neuron is a cell that uses bioelectrochemical reactions to receive, process, and transmit information. The structure of the neuron is designed to sum the input information from other neurons and trigger an action potential that will travel down the axon of the nerve to its destination where it will stimulate the next neuron. A neuron's dendritic tree is connected to a thousand neighboring neurons. Neuron consists of three main parts:

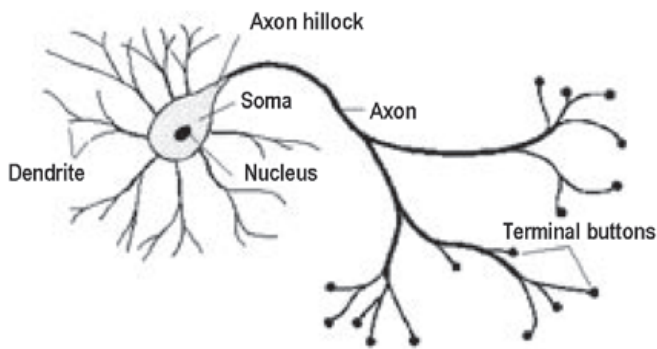


Figure 3. Schematic of a biological neuron.

Soma:

The cell body of the neuron where the nucleus is located;

Dendrites:

Tree-like structure of the cell which forms numerous fine connections with other neurons;

Axon:

The extension from the soma that transports the action potential to the next neurons. The axon makes up the majority of the length of the neuron and it is insulated by a myelin sheath, which is a special type of protein and a layer of structured water. The structured water layer is a liquid crystalline structure that prevents axon from possible damage. The insulation of the axon is very important for the proper carrying of electrical impulses, since axon fiber is the outgoing connection for signals emitted by the neuron.

The connection between two neurons takes place at synapse, where the process of the release of neurotransmitters and neuromodulators takes place. The signals reaching a synapse and received by dendrites are electrical impulses that accordingly are transduced into chemicals (*neurotransmitters*).

Two of the most common signs that a person is growing old are diminished motor skills and decreased mental ability. These signs are directly connected to a reduced capacity of the brain to control and absorb a key “communication chemicals” – neurotransmitters and neuromodulators. For instance, previous studies had shown that the number of dopamine receptors in the brain decreases with aging, and that diminished performance of cognitive skills are caused by abnormal dopamine release of neuron in the brain. One of the reasons for this neurological disorder is obviously the distortion of electrical impulses propagating via axon to synapse of neuron, since these signals control release of neurotransmitters in the brain. The possible reason for signal distortion is progressive destruction of the axon insulation (*liquid crystalline structure of water layer*) since the amount of structured water in the body dramatically diminishes with aging.

The recent studies prove that the aging process and the increase of fat content contribute to the decline of water content in the body. The average 45-year-old man has about 65%-70% of water in the body, and the water

content of the average 70-year-old man decreases to 45%-50%. With a help of magnetic resonance imaging instrumentation, it has been also found out that aging results not only in dehydration, but that intercellular water undergoes significant structural changes. The amount of biowater bound to biological macromolecules increases, and the amount of “free” structured water decreases. As a result the cells’ communication, nutrient delivery, detoxification, oxygenation and other biological functions, based on the dynamic activities of biowater, decline with age. The process of transduction of bioelectrical signals into biochemical reactions also declines, causing in its turn the break down of cells repair and replication system, and the metabolic efficiency of the body. The symptoms of Alzheimer’s disease can be described as a “sped-up” aging process in the brain. The decrease and significant structural changes of biowater in the brain affect the proper metabolic reactions, such as break down and elimination of amyloid protein fragments, and production of normal microtubule structures in neurons. It is reasonable to assume that the supply of the body with normal quota of structured water may prevent aging symptoms, and restore homeostasis of neurons in the brain.

Activated water is a liquid substance with pre-recorded molecular activities, that supports sophisticated mechanism required commanding the extraordinary complex and rapid cascade of intricate biochemical reactions in the body. A number of biological tests, including tests in vitro on cellular cultures and in vivo on plants, provide some evidence that the molecular structure of Activated water resembles the structure of biowater found in biological systems.

The latest research show that transitions in cytoplasm of the neuron’s body, produced by collective disassembling of big number of filaments and microtubules, as a consequence of nerve excitation and neuron’s body depolarization, are generated by quantum transitions of the coherent water clusters, localized in cytoplasm and in the microtubules of neurons. As a result of coherent water clusters transitions in the neuron’s cytoplasm induced by reversible osmotic equilibrium, the distribution of synaptic contacts on the surface of cells, and ionic channels activity is changed. Thus it can provide generation of strong nerve impulses propagating via axons, excite big numbers of other neighboring nerve cells, and stimulate the learning process associated with long-term and short-term memory formation, since these processes are related to synaptic contacts reorganization in the brain. These changes create the long-term and short-term memory formation in the brain. The volume and shape pulsation of electrical signals in neurons and dendrites that control production of neurotransmitters occurs due to reversible change of the intracellular water activity, and corresponding passive osmotic diffusion of biowater from the external space around neurons. Therefore, the plentiful supply of biowater is very

important for the support of the normal function of neurons in the brain. The ingestion of Activated water with molecular structure similar to biowater may prevent the dehydration of the brain tissue, and as a result eliminate the symptoms of neurological disorders.



Figures 4a and 4b. Before Activated water ingestion; after twelve months.

The positive effect of Activated water was observed on a patient suffering from a neurological disorder. Mr. Alex Shalita was diagnosed with Cerebral Palsy when he was 6 months old. It is a general consensus in the western medicine that Cerebral Palsy disease is not curable. Now Alex Shalita is 28 years old. He was ingesting Activated water for twelve months.

Alex's initial physiological state was as follows: Uncontrolled trembling and tension of muscles of the hands,

feet, and head. His mobility was significantly limited. He could not walk and perform very simple physical exercises. His cognitive functions were extremely limited. He could not read, write, or calculate. He did not remember his address, phone number or names of his relatives.

Within 12 months of Activated water ingestion, Alex showed significant improvement of his cognitive and physical abilities.

The first signs of improvement were observed after three months of Activated water ingestion. These signs of improvement included the termination of uncontrolled trembling of his feet. He began to walk and perform movements with his feet much better. Then the termination of uncontrolled trembling of his hands occurred, within the next three months of treatment. After six months the progressive termination of uncontrolled movement of his head was noticed.

His cognitive functions began to improve after six months of Activated water consumption. Now he can walk, run, perform physical exercises (*swim and play basketball*). He remembers his name, phone number, and address. He has begun to write, read and perform some simple calculations. ♦

REFERENCES

- Tom Scarff, *Neuron Structure of the Brain, MIDI HARDWARE, 2003.*
 Bob Sorensen, *Neuron Structure, Purdue Research Foundation, 2003.*
 Igor Smirnov, *Activated Water, Explore ! For the Professional Journal, Vol.11, Number 2, pp. 49-53, 2002.*