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Abstract for Neural-Prosthetics Power Point

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Neural Prosthetics

Some of the many types of neural prosthetics are ones working on specifically the hippocampus region of the brain. The hippocampus is located in the medial-temporal lobe of the brain (medial meaning towards the center of the body and temporal meaning towards the temporal bone in the skull). The main functions of the hippocampus include: declarative memory (memory of events and things that can be described well by the person), converting short term to long term memory, and memory of basic skills (things you would not expect someone to forget).

Damages to the hippocampus come in a few varieties. The first is disease. Diseases like Alzheimer's and Parkinson's diseases break down the tissue in the hippocampus damaging the person's ability to remember events, people, and places. Other damages to the hippocampus include damages from blunt trauma and damages from personal choices made by the individual. Any blunt trauma could cause bruising which could also lead to either retrograde amnesia or anterograde amnesia. Retrograde amnesia is the inability to recall things that were stored in your declarative memory. Anterograde amnesia is the inability to transfer things from the short-term memory to the long-term memory. Personal choices such as smoking marijuana also have an effect on the hippocampus part of the brain. Cannabinoids reverse the immediate pattern of the hippocampus. This could

include changing something like the process in retrieving short-term memory to someone having trouble remembering something happening 5 minutes ago. This confusion deteriorates the cells which can cause damage and memory loss over time.

Neural-Prosthetics, also called biotech implants or brain chips, are microchips attached to multi electrode arrays that can easily mimic the neural function and complete the circuit. The electrodes are placed on either side of the damaged section of the hippocampus and the electrodes accept the brain impulses converting them to binary and then back to electric impulses within the hippocampus completely bypassing the damaged region of the lobe.

This technology has been successfully used and practiced in a number of different mammals including rats (most widely practiced) other rodents and most recently primates. This technology is expected to begin being practiced on humans in the next five years which means this technology should be available to the public shortly after.

Sources of Information

<http://neural-prosthesis.com/index-1.html>

<http://serendip.brynmawr.edu/exchange/node/1808>

-Knowledge acquired in high school and college level anatomy classes

also, see power point for image sources