

Intra-Ventricular Electrode Enhances Deep Brain and Cortical Stimulation

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Technology description

Summary

Electrical stimulation of the brain is useful in the treatment of conditions such as epilepsy, depression and obsessive compulsive disorder. Extradural stimulation of the motor cortex (EMCS) has proven effective in treating some cases of Parkinson's disease and may become an important treatment for movement disorders. Because both electrodes are located outside the dura mater, EMCS is less invasive but also less consistent than other techniques for stimulating the motor cortex, in part because the emitted current can only stimulate portions of the cortex. Re-orienting the electrodes could improve the efficiency of motor cortex activation by EMCS and enhance other forms of brain stimulation. This invention features an improved system for stimulating brain cells. One of the electrodes, preferably the anode, is located within a ventricle of the brain. The cerebrospinal fluid within the ventricle is highly conductive, effectively making the ventricle an extension of the anode. The opposing electrode (i.e., the cathode) is situated outside the ventricle, preferably outside the dura mater, with the portion of the brain to be stimulated located between the electrodes. The electrodes can then be energized at the appropriate frequencies and current levels to apply the desired stimulation. Because the ventricles are found close to the middle of the brain, this system better directs current to the structures of interest in electrical stimulation procedures, most of which are also centrally located within the brain.

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