A Therapeutic Approach to Replace or Improve Deep Brain Stimulation

A method to enhance the effects of deep brain stimulation, thereby reducing harmful side effects, or avoiding the surgery altogether.

Problem Solved by This Technology
Deep brain stimulation (DBS) is an invasive surgical procedure used to treat a variety of disabling neurological symptoms and neurological movement disorders when medication does not provide relief. Electrode placement and chronic implantation are associated with risks that include bleeding, infection, cognitive impairment, and focal neurological dysfunction. Further, a common clinical problem is the decrease in efficacy of deep brain stimulation over time.

Applications
Dr. Nedergaard has discovered an important mechanism of DBS. The release of cytosolic ATP/adenosine plays a key role in the high-frequency-stimulation induced suppression of neuronal activity and tremor. This invention proposes two approaches to treat movement disorders using agents that lead to increased adenosine release, such as adenosine mimetics and modulators, adenosine agonists, and adenosine transport inhibitors. These agents can be used in conjunction with DBS to reduce the stimulation intensity, decreasing the tissue damage adjacent to the electrode, thereby prolong the beneficial effects of DBS used alone to replace DBS. Or these agents can be used alone to replace DBS.

Reference