Small molecule therapeutics for the treatment of Alzheimer's disease through inhibition of PDE5

Current therapeutics for Alzheimer’s disease have limited efficacy and address the symptoms instead of altering the course of the disease. This technology presents new small molecule compounds that improve memory at nanomolar concentrations and are therefore strong therapeutic candidates for Alzheimer’s disease.

Small molecule compounds for treatment of Alzheimer’s disease are selective and effective at low doses

This technology describes small molecules that may be useful in the clinical management of Alzheimer’s disease. These molecules inhibit phosphodiesterase type 5 (PDE5), which is involved in cellular signaling processes. To date, therapeutic use of PDE5 inhibitors has been limited to treating erectile dysfunction and has not been extended to Alzheimer’s disease treatments due to a lack of selectivity and an inability to penetrate the blood-brain barrier. The small molecules presented in this technology are based on a structurally distinct chemical backbone that allows for both selectivity and transport across the blood-brain barrier, making them effective PDE5 inhibitors for the treatment of Alzheimer’s disease. They are effective at lower concentrations than existing PDE5 inhibitors. Inhibition of PDE5 in aged rodents and mouse models of Alzheimer’s disease using these small molecules led to improved memory.

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Applications:

- Therapeutic for the treatment of Alzheimer’s disease
- Design scaffold for the development of molecules to treat other neurological diseases and dementias for which inhibition of PDE5 may ameliorate cognitive defects – e.g. Parkinson’s and Huntington’s disease
Advantages:

• Selective treatment for Alzheimer's disease and erectile dysfunction
• Small molecules are easily transported across the blood brain barrier, making them a useful PDE5 inhibitor within the brain
• Can inhibit PDE5 at nanomolar concentrations

Patent Information:

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Related Publications:


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