TECHNOLOGY

Muscarinic Antagonists for the Treatment of Depression

OVERVIEW

Summary

The disclosed technology describes the utilization of muscarinic antagonists for the treatment of depression. Muscarinic antagonists are a class of compounds that block muscarinic acetylcholine receptors to ameliorate symptoms of depression. The disclosed invention identifies specific compounds effective against depressive disorders while preserving cognitive faculties. With depression affecting millions globally and existing antidepressants often associated with adverse side effects, there is a high demand for new treatment modalities.

Market

Depression is a global affliction, with the World Health Organization estimating that over 264 million people suffer from depression worldwide. The economic burden of depression is substantial, with the global market for depression treatments estimated to be worth approximately $17.2 billion in 2021. Current antidepressants, although efficacious for some, are often associated with adverse side effects, including cognitive impairment.

This technology's unique position in the market lies in its selective muscarinic antagonism. By mitigating depressive symptoms without compromising cognitive function, it fills a significant treatment gap. Muscarinic antagonists provide a fresh approach to depression treatment, diverging from traditional antidepressants like SSRIs and SNRIs. The compounds claimed in the patent offer specificity, potentially leading to more targeted and effective treatments with fewer side effects.

Technology

Muscarinic antagonists' function by blocking muscarinic acetylcholine receptors. These receptors play a vital role in modulating neurotransmitter activity, influencing mood regulation and emotional well-being. Muscarinic receptors, particularly M1 and M2, are implicated in various central nervous system functions. By blocking these receptors, muscarinic antagonists can modulate neurotransmitter activity, which is often dysregulated in depressive disorders. Traditional muscarinic antagonists, such as scopolamine, have been known to cause memory and cognitive impairments due to their anticholinergic properties.

This technology introduces novel compounds that selectively antagonize muscarinic receptors, exhibiting antidepressant properties without inducing cognitive impairment. The inventors have disclosed specific muscarinic antagonists, including CJ2100, CJ2126, CJ2162.1, CJ3007, CJ2174, L687306, CJ3018, CJ2165.1, CJ2159.3, and CJ2173.1. Rat studies demonstrate that these compounds are more effective than scopolamine in countering the bradycardic effects of muscarinic agonists, as observed in cardiovascular studies. Additionally, they showed promise in behavioral studies by effectively reducing discriminative stimulus and rate-decreasing effects, like scopolamine. In preclinical indicators of potential antidepressant activity, these novel muscarinic antagonists were as effective as scopolamine in decreasing immobility in the forced swim test.

The specificity and targeted action of these muscarinic antagonists offer the potential for more effective treatments with a reduced side effect profile compared to traditional antidepressants. By precisely targeting muscarinic receptors, these compounds hold the promise of providing relief to individuals suffering from depression while minimizing unwanted side effects.

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CATEGORIES

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ATTACHMENTS

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