Targeted drug delivery using focused ultrasound-induced blood-brain barrier opening

Delivering therapeutics into the brain to treat neurological disorders is a challenge. The blood-brain barrier, or BBB, is a natural barrier to keep foreign disease-causing agents out of the brain, but this also prevents most therapeutics from getting in. For treatment of disorders of the brain, such as neurodegenerative diseases like Alzheimer’s and Parkinson’s, a method to deliver therapeutics to the source of the disease is needed. This technology is a method to enhance drug delivery across the BBB using ultrasound-activated microbubbles. This method reversibly opens up pores in the BBB, allowing for targeted drug penetration into the brain through the intranasal cavity.

Method for drug delivery across the blood-brain barrier for effective treatment of neurological disorders

This technology allows for effective drug-delivery for neurological therapeutics. Using this technology, scientists may have greater access to different types of drugs that may be developed for neurological disorders, since a major constricting factor in drug-development is the drugs ability to penetrate the BBB. With intranasal delivery, this technology will also decrease side effects associated with drugs in circulation and the quantity needed compared to intravascular delivery.

The method of using microbubbles activated by focused ultrasound enhancing drug penetration from intranasal cavity across the BBB has been shown in mice.

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Applications:
- Drug-delivery method for Alzheimer’s disease
- Drug-delivery method for Parkinson’s disease
- Breakdown of specialized tissue, such as the BBB or pathological tissue structures, for therapy delivery
Advantages:

- Improves effectiveness of therapeutics
- Allows for targeted treatment of neurological disorders

Patent information:

Patent Pending

Tech Ventures Reference: IR CU14367, IR CU14035

Related Publications:


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