Micro RNA for the treatment of stress related disorders (Cardio) (Yissum)

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MicroRNA-132 Potentiates Cholinergic Anti-Inflammatory Signaling by Targeting Acetylcholinesterase

Categories	Homeland Security, Biodefense, Nerve Gas treatment
Development Stage	Proof of Concept
Patent Status	US patent published
Market Size	Threat perception drives the governmental purchase of treatments for organophosphate (nerve gas) exposure. Governments, and in particular the U.S. Department of Defense, will continue to be the major purchaser of chemical warfare agent detection equipment and we expect the same may be true for treatments. In 2009, the U.S. Homeland Security Agency spent $3 billion on various biodefense activities with much of this going towards developing and stocking treatments for bioterrorist agents. Since the U.S. is projected to be the major purchaser of such technology, the worldwide market may only be slightly larger.

Highlights

- Therapies based on this technology are expected to provide therapeutic benefit to all organs and body tissue and because AM132 does not block AChE's hydrolytic activity, it may reduce the need for respiratory support in patients.
- AM132 will provide therapeutic benefit at much lower doses than current treatments and its production is expected to be lower in cost as well.
- AM132 is very stable, and easily stored in battlefield conditions.
- This technology has the potential to be used in other medical situations such as patients developing cholinergic crisis during anaesthesia.

Our Innovation

This technology involves a microRNA, (miR) -132 which blocks AChE expression and develops an antisense oligonucleotide to this miR, which elevates AChE in treated cultured cells and in systemically injected mice. Manipulating (miR) -132 levels is expected to produce the next generation treatment for OP poisoning and prophylactic for situations of excessive cholinergic crisis (e.g. in intensive care patients).

Key Features

- Reasonable cost of production with easily available materials.
- Excellent shelf life and ability to quickly expand stocks.
- Simple to administer and protects all organs.

Development Milestones

Researchers are currently preparing to prove the prophylactic and/or therapeutic effects of AM132 for OP poisoning in mice, and also seek to define the required dose and length of treatment regimen.

The Opportunity

- There is an opportunity to supply therapies based on this technology to government agencies (such as the U.S. Department of Homeland Security) which would store and use these therapies in the event of a release of organophosphate poisons. The technology's ability to provide a low cost and easily stored antidote should improve its appeal to these agencies.
- There is an additional opportunity to use therapies based on this technology to treat farm workers who may be exposed to organophosphates in countries where these materials are still in use as fertilizers.

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