Australian National University

TECHNICAL SUMMARY

Age-Related Macular Degeneration (AMD) Therapies

AMD is the leading cause of blindness in the developed world predicted to affect 288 million people worldwide by 2040. The more common form, atrophic AMD, accounts for 90% of all AMD patients and has no known cure or therapy representing a major gap in the market. Researchers from The Australian National University (ANU) are developing a potential therapy using key microRNA molecules found within extracellular vesicles of the retina. Using their state-of-the-art LED-based photo-oxidative damage model of AMD, the researchers have discovered that the use of microRNA may be a viable therapy for retinal degeneration and have identified extracellular vesicles as key delivery vehicles for this protective molecular cargo. The benefits of here may extend to beyond the retina and into the brain as a therapy for similar neurodegenerative diseases. The potential use of microRNA as a diagnostic is also being explored.

Potential benefits

> **"Natural" delivery vehicles:** Extracellular vesicles are produced by virtually every cell type and have an innate ability of crossing the blood-brain-barrier and blood-retinal-barrier.
> **Multi-targeted:** MicroRNAs can bind and repress the translation of multiple RNA targets within the same biological pathway.
> **Modifiable:** Extracellular vesicles can theoretically be engineered to be tissue-specific opening the doors for systemic delivery.
> **State-of-the-art model:** The photo-oxidative damage model was developed at the ANU and mimics many of the key pathological features of atrophic AMD.
> **Applications across central nervous system:** Retinal degenerations, such as AMD, share similarities with other common neurodegenerative diseases therefore allowing for cross-disease applicability.

Potential applications

> Ophthalmology
> Neurodegeneration
> Therapies
> Diagnostics
> Pharmaceuticals

Opportunity

ANU is seeking engagement with industry partners to work collaboratively to further develop, optimise and advance these treatment methodologies and technologies. Industry partners interested in the photo-oxidative damage model are also encouraged to get in contact.

IP status

The IP, materials and methodology discussed in this summary are owned by the ANU.

Key research team

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Therapeutics

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Diagnostics

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