

## Opportunity

To accelerate the development of this innovation, through licensing or direct investment, contact

Dr Anna Malinovitch

E: [anna.malinovitch@unimelb.edu.au](mailto:anna.malinovitch@unimelb.edu.au)

# ADMiER: Acoustically-Driven Microfluidic Extensional Rheometry

For rapid and accurate diagnosis of dry eye disease

## The Technology

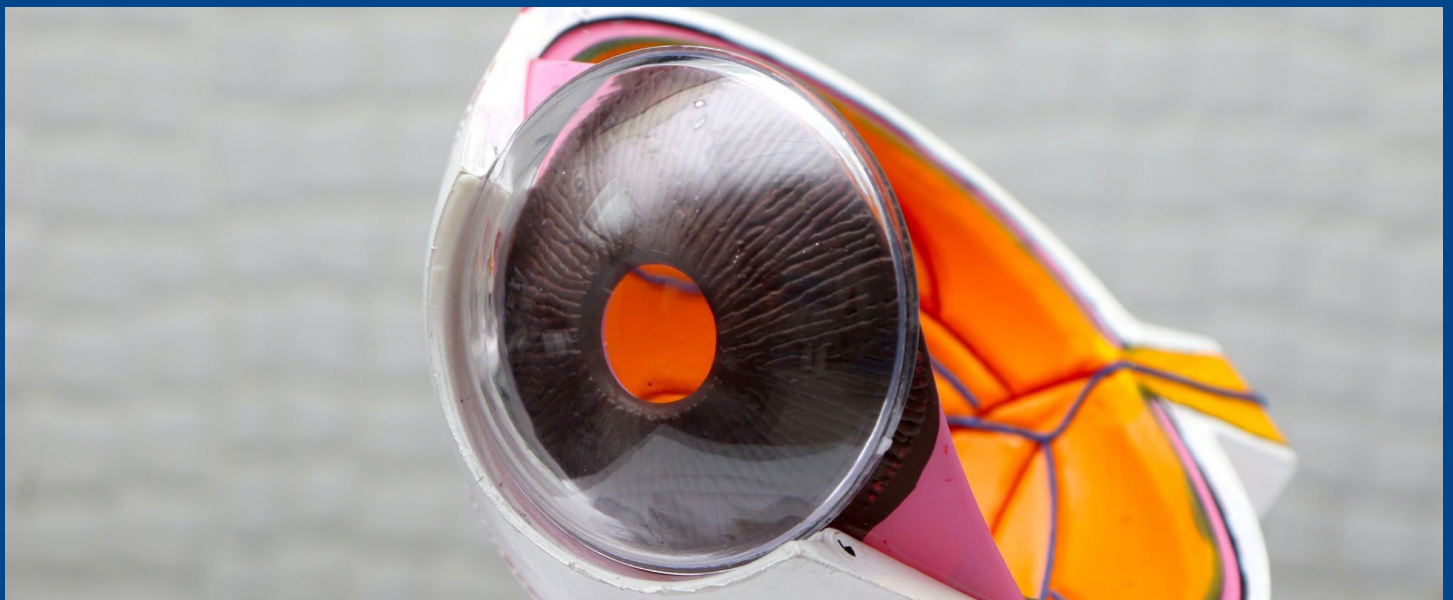
- An in-vitro diagnostic device to rapidly and accurately identify and subtype dry eye disease from a microlitre tear droplet.

## Market Need

- Dry eye affects 1 in 5 adults; it is the most common indication for medical eye care in developed countries, with societal costs estimated at more than \$USD 5 billion a year in the USA alone.
- Eye care clinicians struggle to diagnose dry eye disease as current clinical methods are manual, time-consuming and inaccurate.

## Solution

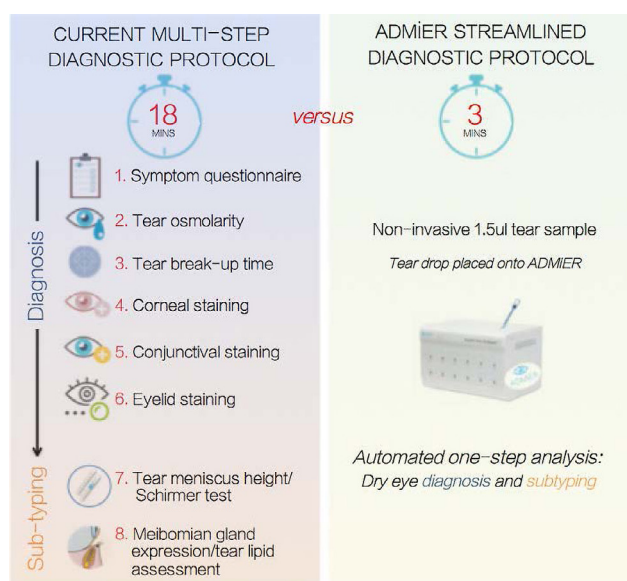
- ADMiER is a point-of-care technology that rapidly determines the viscoelasticity (stretchiness) of a collected microlitre tear sample to accurately identify dry eye and its subtypes (aqueous-deficiency and evaporative dry eye).



## Market Need

Every year in the US and the European Union, an estimated 120,000 eye care clinicians will spend up to 18 minutes attempting to diagnose dry eye across 32 million patient consultations. With current methods, up to 80% of diagnoses will be inaccurate and lacking essential details about the dry eye subtype to inform treatment. This is the most significant barrier to dry eye patients achieving optimal outcomes.

Our voice of customer analysis indicates that ophthalmologists and optometrists are actively willing to pay for a solution that rapidly, accurately and reproducibly identifies and subtypes dry eye disease. Our engagement with the pharmaceutical industry also confirms a need for robust endpoints to support dry eye drug development. There are currently no satisfactory solutions available to meet these needs.



*Dry eye diagnosis. The current, gold-standard clinical protocol to diagnose dry eye disease takes an estimated 18 minutes of chair-time, requiring at least eight unique tests. Replacing these invasive and time-consuming approaches with ADMiER to achieve a complete diagnosis in just 3 minutes will vastly improve the efficiency of identifying dry eye disease in eye care practice, and lead to enhanced clinical outcomes for patients through more accurate disease characterisation. Overall, this is estimated to save clinicians approximately 130 hours a year, equivalent to approximately \$70,000 a year based on the average billing rate of optometrists.*

## Solution

ADMiER is a simple, rapid, highly accurate and patient-preferred in vitro diagnostic solution for dry eye disease. We foresee ADMiER becoming a workhorse for ophthalmic practitioners, and a standard of care for diagnosing dry eye. ADMiER is a major advance over existing methods as it is:

- **Simple to use:** a one-step analytical system to both diagnose and sub-type dry eye;
- **Rapid:** provides a diagnosis in one-sixth of the time of standard clinical tests;
- **Inexpensive:** device manufacture will exploit economies of scale relating to mass nano-fabrication;
- **High accuracy:** 80% sensitivity and 86% specificity for dry eye diagnosis;
- **Patient-preferred:** 92% of patients tested with ADMiER preferred it to standard clinical tests.

## Technology and IP Status

This technology provides a novel approach for assessing tear film integrity for clinical diagnosis and monitoring of dry eye disease, using acoustically-driven microfluidic extensional rheometry to quantify the viscoelastic properties of the tears.

Advantageously, dry eye can be evaluated based on calculation of a physical parameter to capture the health of an individual's tear film. This technology is predicted to have a major impact on enhanced clinical diagnostics for dry eye in ophthalmic practice.

### IP Status:

National Phase Patent Entry (PCT/ AU2017/050900) – 2019. Patent granted in Australia, US and Japan; Patent pending in Europe and Canada.

### Description of patent:

This invention relates to a method and device for evaluating dry eye disease in a human or animal subject.

### Commercialisation:

University of Melbourne retains the exclusive right to commercialise the IP underpinning ADMiER.

<b>Tech name and number</b>	2016-022 - Method and use of a device for diagnosing dry eye disease (DED)
<b>Research Leads</b>	A/Prof Laura Downie (UoM), Prof Leslie Yeo (RMIT)
<b>Publications</b>	McDonnell A, Lee J-H, Makrai E, Yeo LY, Downie LE. Tear film extensional viscosity is a novel potential biomarker of dry eye disease. <i>Ophthalmology</i> . 2019; 126(8):1196-8.
<b>Patents</b>	National Phase Patent Applications in Australia, Europe, US, Canada and Japan: patent granted in AU, US, JAP. International Publication NO.: WO 2018035569 A1, priority date 24 August 2016.
<b>Keywords</b>	Dry eye disease, DED, IVD, MedTech, Optometry, Point-of-care, Ophthalmology, Tear Film, Biomarker, Eye Care

