

Direct Subjective Refraction

Investment opportunity in the field of Ophthalmology
Oct. 2019

A revolution in the most common optometric procedure

Summary

Market: Ophthalmic industry; Optometry/Ophthalmology practices.

Fully functional prototype:

- defocus wave generator
- chromatic stimulus
- clinical protocol

Validated in 30 patients

Technological developments finished (100% compatible with SimVis Gekko by 2Eyes Vision)

Time to market: 1 year

1 patent (owned by CSIC)

Hot topic and press release in ARVO 2019

Scientific Article in preparation

Quick and accurate solutions for subjective refraction

Subjective refraction is the gold standard method to measure the refractive error of an eye. The method has not evolved much in the last decades and it is usually tedious and long for both the eye care professional (ophthalmologist/optometrist) and the patients. Different

objective methods have tried to make the procedure quicker, but, despite the progress, practitioners still rely on conventional subjective refraction methods to evaluate the refractive error. Unluckily, these subjective methods require an eye care professional interpreting the



answers of the patient and entails time consuming strategies to reduce the impact of accommodation in the measurement.

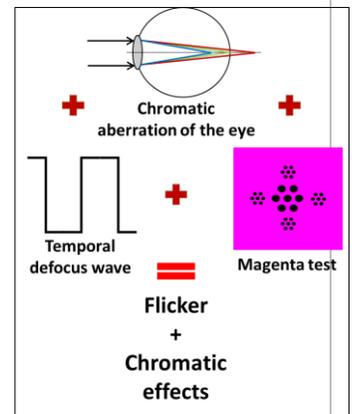


Technology

Progress. VIOBIO has 20-yr background in investigating the optical properties of the normal and treated eye (i.e., by refractive surgery, contact lenses CLs, intraocular lenses IOLs), having established itself as world leader in the area. VIOBIO has developed tools for real visual simulation of ocular corrections, combining psychophysical tools with Adaptive Optics to investigate the benefit of corrections, and the interactions of optics and neural factors in visual perception. A new instrument for simulation of multifocal corrections has been developed.

1 Patent. 1) P190451-ES, protects the concepts.

Current state of technology. A fully functional see-through hand-held prototype, based on low-cost optical elements has been manufactured. It allows inducing programmable temporal defocus waves. The first measurements and validations of the DSR approach have demonstrated better accuracy and speed in finding the spherical equivalent. ARVO Vancouver May 2019. TFM UCM Sept 2019.



@VioBio_Lab



Subjective refraction procedure is crucial in regular clinical practice. This method will optimize time and accuracy in optometry.

Investment proposal

Business Idea.

Commercialization of an ophthalmic instrument to assess the refractive error of an eye, performing a subjective refraction. This low cost instrument will be set up in ophthalmology and optometric practices to choose the optimal ophthalmic compensation for each patient and to optimize timing and reducing uncertainty during the whole process.

Target Market. Optometry & Ophthalmology practices; Manufacturers of ophthalmic corrections.

The market for ophthalmic corrections is huge nowadays, as there are 10.000, 75.000 & 36.000 practising optometrists in Spain, Europe & US.

Investment needs.

- + 1 year research project hiring 1 optometrist for:
 - Development of astigmatism induction and correction (angle and magnitude)
 - Development of a DSR method for astigmatism (stimulus and procedure)
 - Clinical validation (volunteers and patients)
- + Additional mechanical re-engineering and industrialization; Regulatory

approvals; Market analysis; Business development.

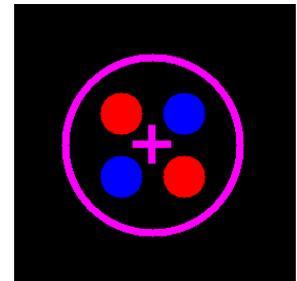
Revenues. Revenues from sales expected in an early phase after product launch.

Added value. Optometry and ophthalmology practices rely on subjective refraction to prescribe the final compensation of the refractive error of patients. The communication between practitioner and patient is crucial. A practitioner is needed to guide the patient and to interpret his responses in order to obtain the best compensation. This time-consuming procedure might lead to inaccurate results in busy or inexperienced practitioners. The time taken per DSR measurement is 4-times slower than the conventional refraction.

Also, the direct subjective refraction is not affected by accommodation, reducing uncertainty in the method.

Potential competitors

- Digital phoropters using classical methods including Adaptica
- Objective Autorefractors including Quick-See, still considered by practitioners and approximation



Visit: www.vision.csic.es

Follow us! 
@Viobio_Lab

Contact: Dr. Carlos Dorronsoro (cdorronsoro@io.cfmac.csic.es)

Visual Optics and Biophotonics lab
Instituto de Óptica. Spanish National Research Council - CSIC.
Calle Serrano 121, 28006, Madrid, Spain
(+34) 91 561 68 00