Reviewer's report

**Title:** Biomechanical properties of the cornea measured with an Ocular Response Analyzer and its association with anterior segment parameters including corneal volume and anterior chamber volume

**Version:** 1  **Date:** 1 February 2013

**Reviewer:** Ioannis Petropoulos

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Major Compulsory Revisions

1. Introduction, line 35. The authors should further explain what they define as “parameters have an uncertain correlation”. What is an uncertain correlation? Negative, positive, no correlation or controversial results?

2. Introduction, line 37. “Pentacam” is the commercial name of an anterior segment tomographer. Although an AST is usually termed as “Pentacam” amongst clinicians due to its wide use across Ophthalmology and Optometry, the authors should be accurate with terms in scientific writing and reporting. Also, as per the Ocular Response Analyser, details of the manufacturer should be given.

3. Introduction, lines 42-46, “Therefore, the aim of this study...really represent” The aim(s) of the study should be clearly stated. Although this is the case for this study the authors could improve the text with shorter sentences and maybe by defining a primary and secondary aim.

4. Introduction, lines 45-46 “and to...what they really represent”. Please re-define.

5. Methods, general, the authors should add a few lines on how the technique was performed. Environment, experimental settings on the equipment etc. Perhaps the authors could separate their methods in sections such as Subjects, Experimental procedure, Measurements, Statistical Analysis etc.

6. Methods, lines 72-75, although calculations are well explained they are repetitive e.g. “the average of P1 and P2 is the measure of IOP” and then “IOPg is only the average of P1 and P2”.

7. Methods, line 88. Please add results from Post-hoc analysis i.e. a short explanation on why P-value was maintained at 0.05.

8. Methods, line 116. “CRF was positively associated with the corneal thickness” the authors state elsewhere in the text “because CRF is designed for maximum correlation.” Is this stating the obvious? Please elaborate.

9. Discussion, lines 151-153, please provide further evidence on why some contradict other? Sampling methods, participant status, disease vs. no disease?
10. Discussion, lines 155-156, “the report showed...between them”. Why there was no association between them?

11. Discussion, line 162, what is the authors’ view about this? Why there was no association?

12. Discussion, lines 180-184, Is this a speculation? Although CH and CRF correlate with CCT can they directly impact on IOP? How has mean CH and CRF been defined as the “specific values”? Is this through population studies, if yes this needs to be acknowledged with the relevant citation, if not it needs to be discussed accordingly. It is confusing what the authors are trying to say.

13. Discussion, lines 191-194, how does the example of keratoconus fit into this study? As an example of altered biomechanical properties? Expand or remove.

14. Discussion, lines 195-197, “....for refractive surgery”. Add and cannot be extrapolated to larger populations or something similar.

15. Discussion, lines 195-197, further to identifying the limitation provide evidence to the reader on whether there are other large scale studies to compare findings from this study? Also acknowledge the statistical biases this limitation causes.

16. Discussion, lines 201-203, the conclusion is confusing. The authors have not explained what CH and CRF “really represent” as they also state in their aims. Are they markers of geometric and biomechanical properties of the cornea? Expand.

Discretionary revisions

3. Introduction, line 41 “However, as far as we know, there is no...” change to “however, to the best of our knowledge, there is no other study...” there are many similar points across the text which could improve.

1. Introduction, line 42, add “respectively” after anterior chamber volume.

2. Methods, line 84, “CH and CRF was made...” “was generated”

3. Discussion, line 149, valid point but needs improvement.

4. Discussion, general, add a suggestion for future studies.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I declare that I have no competing interests