Reviewer's report

**Title:** Quantitative T2 mapping to characterize the process of intervertebral disc degeneration in a rabbit model

**Version:** 1  **Date:** 10 November 2013

**Reviewer:** Lorin Michael Benneker

**Reviewer's report:**

In this study quantitative MRI techniques (T2 mapping) were used to assess degenerative biochemical changes in an experimental animal disc degeneration model (annulus stab model on rabbits (Masuda model). This specific MRI technique has been used in a clinical setting in humans and in ex-vivo studies (not referenced) but not in a live animal study that allows longitudinal correlation of T2 relaxation times and biochemical parameter for disc degeneration. The methods are well described and the data is sound, the results are new and should in my opinion be published. Statistical analysis is well performed, writing is OK.

I only have minor/discretionary revisions: I would encourage the authors to highlight more the limitations of the animal model used; the quick (3 weeks) degeneration induced by a stab injury is not comparable to the slow degeneration seen in humans, this is of importance and correlations to cell activity have to interpreted with caution. You should try not to use the term degenerative cascade for this animal stab model; this term is reserved for the slow degenerative process in humans, starting with NP dehydration as a result of impaired nutrition and cell senescence. I also would encourage to discuss the enzymatic induced in-vitro degeneration models where T2 mapping was also used for correlation with parameters of degeneration. These studies (Chan, Malonzo; see below) support your results and should be referenced.

I also consider the study from Hoppe et al. better suited as reference as Stelzeneder (ref 11) as axial T2 maps were correlated to other degeneration classifications and clinical symptoms (Stelzeneder compares to facet joint degeneration).


Hoppe S, Quirbach S, Mamisch TC, Krause FG, Werlen S, Benneker LM. Axial T2 mapping in intervertebral discs: a new technique for assessment of

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**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