Reviewer’s report

Title: Bovine Explant Model Of Degeneration Of The Intervertebral Disc

Version: 1 Date: 7 November 2007

Reviewer: Mauro Alini

Reviewer’s report:

General

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Roberts et al. present a new model how potentially new medical substances can be tested in a relatively cheap and reproducible way in a bovine caudal disc model. The use of coccygeal discs of large animal models such as cattle and sheep seem feasible model systems for the human disc according to recent literature. They are more human-like in terms of absence of notochordal cells and in terms of disc dimensions.

I generally find it an interesting paper. However, there might be some concern the authors did not consider.

The paper presents two different relatively easy and straightforward protocols how space maybe generated by enzyme digestion to enable injection of larger volumes of test-substances into the nucleus pulposus of the caudal bovine discs. A description of the biomechanical properties of these new partially damaged discs is missing. Enzyme-treated discs resemble nucleotomized discs even after one week. Is the disc integrity still given for future experiments?

Under which culturing conditions can these enzyme-treated discs be kept alive in organ culture? Can these discs be cultured under free-swelling conditions and if so, will these conditions be “close” to the human situation? In other words, can these discs be still mechanically loaded and if yes under which pressure?

Toluidine Blue staining (Figure 3B) shows large differences in metachromasia, indicating loss of proteoglycans. However, there are no apparent differences in water content between enzyme-treated and control discs (Figure 5, second column). The result from histology is in agreement with DMMB/dry weight but not with water content. How can this discrepancy be explained?

Detailed remarks.
p.9 first sentence. 2mls correct to 2ml.

Fig.4. It would be nice to have the scale bars added to the images.

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Discretionary Revisions (which the author can choose to ignore)

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

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' below