Reviewer's report

Title: Bone Regeneration: Current Concepts and Future Directions.

Version: 2 Date: 22 February 2011

Reviewer: Britt Wildemann

Reviewer's report:

This review article gives a very good overview regarding the current concepts for bone regeneration. It summarizes the different clinical approaches and gives also information on experimental therapies. The benefits and disadvantages of the strategies are mentioned allowing a critical assessment of the therapies.

- Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

1. Further illustrations of the article content or tables would improve the manuscript.

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

2. BMPs and other growth factors, last sentence:
The authors should rewrite the last sentence because it is unclear what they try to express with this statement.

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

3. The authors should give more information regarding the importance of mechanical stability and the role of mechanical stimulation on the regeneration process.

4. The chapters “Scaffolds..” and “Tissue engineering” have quite are large overlap. The authors should focus in the “Scaffold” section more on different scaffolds and substitutes and exclude the combination with cells. This is part of the section “Tissue Engineering”.

5. TE, last para: the discussion about BMPs should be transferred to the BMP section.

6. Fig. 1 needs improvement.
I. The authors must give a more detailed description of what is presented in the Figure.
II. They should highlight the experimental therapies, to allow the reader a discrimination between clinical and research approaches.
III. They should explain if this is a flowchart that a surgeon should follow to stimulate bone regeneration. If yes, what is the option if the mechanical stability is adequate but no healing occurs?

Minor issues not for publication

The authors should write in vivo/in vitro/ex vivo throughout the MS in italics.

Introduction, 4th para (page 4): please correct inttamedullary to intramedullary BMPs and other..., 2nd para (page 8): please give the year of BMPs approval, and not only state “currently”.

Systemic enhancement, 2nd para (page 16): please add the abbreviation for receptor activator of NF-κB ligand

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