

Tracing fast roads towards bone regeneration

Citation for published version (APA):

Cámera Torres, M. (2021). *Tracing fast roads towards bone regeneration: strategies to augment the bioactivity of additive manufactured scaffolds*. [Doctoral Thesis, Maastricht University]. Gildeprint Drukkerijen. <https://doi.org/10.26481/dis.20210913mt>

Document status and date:

Published: 01/01/2021

DOI:

[10.26481/dis.20210913mt](https://doi.org/10.26481/dis.20210913mt)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

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Propositions

Accompanying the dissertation

Tracing fast roads towards bone regeneration: Strategies to augment the bioactivity of additive manufactured scaffolds

by

María Cámaras Torres

Maastricht, 13th September 2021

1. The use of 3D melt extruded additive manufactured (ME-AM) scaffolds in the clinics would allow a more reliable, functional and affordable treatment of bone non-unions, compared to current gold standards. (Impact of this thesis)
2. The viscosity or density of the cell seeding media can be adjusted to maintain cells in suspension and promote homogeneous attachment to 3D ME-AM scaffolds. (This thesis)
3. Cell attachment to negatively charged plasma treated 3D ME-AM scaffolds is possible without serum protein mediation. (This thesis)
4. Biological studies need to be accompanied by technological development to ultimately achieve a high degree of similarity between native tissues and biofabricated constructs. (L. Moroni et al. Nat Rev Mater. 2018)
5. The bulk density of rGO incorporated into 3D ME-AM scaffolds is not trivial, as it will determine the scaffold printability, conductivity and physicochemical properties. (This thesis)
6. Happy cells are the starting point to happy biomedical research.
7. A suboptimal ion exchange dynamics between the scaffold and the culture medium can reduce the osteogenic potential of hydroxyapatite based ME-AM scaffolds. (This thesis)
8. Antibiotic loaded 3D ME-AM scaffolds inhibit bacterial growth locally while supporting osteogenesis. (This thesis)
9. Distinct loading conditions influence the development of macroscopically diverse bony structures *in vivo* with carefully tailored shapes, mechanical properties, and spatial distributions. (MM Stevens, Materials Today, 2008)
10. It's all about being in the right moment, in the right place, with the right person.