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Proceedings Paper:

Yang, X (2015) How Natural Bone Formation can Inform Functional Bone Tissue Engineering - Biomimetics. In: Tissue Engineering - Part A. 2015 4th TERMIS World Congress, 08-11 Sep 2015, Boston, Massachusetts, USA. Mary Ann Liebert , S38 - S38.

<https://doi.org/10.1089/ten.tea.2015.5000.abstracts>

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How natural bone formation can inform functional bone tissue engineering - biomimetics.

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Abstract:

To engineer functional bone tissues for the restoration of bone lost is still a big clinical challenge. The choice of ideal scaffolds, suitable cells, proper inductive factors and mechanical simulation/microenvironment or the best combination of these basic elements are still not fully optimized. The efficacy of current approaches on enhancing healing of fracture non-union and critical bone defect cannot yet meet the clinical need. Thus, it is the time to look the 'past, present' and inform the 'future' of functional bone tissue engineering. This talk will cover the topics from fundamental bone development, fracture healing, bone remodelling to current progress on bone tissue engineering both *in vitro* and *in vivo*. It aims to emphasize the importance of 'biomimetics' for functional bone tissue engineering and add more educational value to the congress. The talk will end up with some questions for open discussion with research students and junior scientists, such as 1) what we can learn from natural bone formation and fracture healing? 2) What the current challenges are regarding to cell sources, scaffolds, delivery methods? 3) What is the bottle neck for clinical translation; 4) What do you think about the future directions?

Acknowledgements: XY was partially funded by UKIERI and EU FP7- 'SkelGEN' under grant agreement n° [318553].