Biomineralized collagen for bone regeneration

Propositions

1. Synthetically biomineralized collagen in the form of flat membrane can undergo resorption by human osteoclasts. (This thesis.)

2. A combination of complementary analyses is necessary to accurately identify and quantify resorption events on rough and geometrically complex surfaces: osteoclast morphology, calcium content in cell culture medium, and material surface morphology after cell removal. (This thesis.)

3. The extent of osteoclastic resorption of biomineralized collagen can be increased by increasing its stiffness and/or by introducing cobalt ions. (This thesis.)

4. A co-culture setup involving bone forming and bone resorbing cells is necessary to evaluate the extent to which biomineralized collagen can take part in the bone remodeling process.

5. The structural organization of collagen and nanocrystalline hydroxyapatite occurring during the biomineralization process is a key aspect of bone biomimetics.

6. Building a macroporous, three-dimensional construct from dense, compact biomineralized collagen is a current challenge in bone biomimicry.

7. It is a challenge to identify *a priori* which physicochemical characteristics of a biomaterial are important in the context of biomimetic *in vitro* studies.

8. Continued research into bone biomimetics benefits both the fundamental bone biology knowledge and the development of strategies for bone regeneration.

9. Publicly available experimental data is derived from an unknown amount of unpublished data.

10. Sharing of publicly funded research should break free from the publishing industry yoke.