

Osteoblast Differentiation and Bone:

Relevant proteins, regulatory processes and the vascular connection

PROPOSITIONS

- 1.** For the development of biomarkers for osteoporosis it is crucial to first characterize the bone tissue and the cells that synthesize it, the osteoblasts (*this thesis*).
- 2.** Proteomics studies have limited potential when protein fractionation is not contemplated (*this thesis*).
- 3.** 10% of bone extracellular matrix (ECM) proteins hold more biological information than the remainder 90% (*this thesis*).
- 4.** The ECM produced by osteoblasts contains potent osteoinductive properties and is a strong determinant of MV-dependent osteoblast mineralization (*this thesis*).
- 5.** Vascular calcification by VSMC is not a facsimile of osteoblast differentiation and mineralization (*this thesis*).
- 6.** Bone is a fossilized organ containing within its ECM information from past biological activities.
- 7.** Mass spectrometry-based proteomics is a revolutionary research tool delivering data beyond our level of comprehension. Thus, studying proteomes is rediscovering biological complexity.
- 8.** Bioinformatic resources are a potential source of bias for researchers.
- 9.** Bone mineral density (BMD) measurements are not an ideal method to diagnose osteoporosis because they overlook the most important determinant of bone tissue quality, the organic ECM content.
- 10.** In Portugal there is potential without conditions for developing it. In the Netherlands there are conditions waiting for people with potential.
- 11.** People often ask me when I will stop smoking. Maybe I should ask them back when they will stop eating junk food.

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September 5th, 2012