I defended my PhD in at the Department of Biomaterials, University of Gothenburg with a thesis entitled "*Osteocytes as indicators of bone quality – Multiscale structure-composition characterisation of the bone-implant interface*" which recently received the prestigious "Årets avhandling vid institutionen för kliniska vetenskaper 2017" award at Sahlrenska Academy, University of Gothenburg.

Osteocytes comprise up to 95% of all bone cells, reside within confined spaces called lacunae, and are interconnected through an extensive canalicular network. My thesis looks at osseointegration in terms of bone quality, with emphasis on the osteocyte lacuno-canalicular network in relation to compositional and ultrastructural patterns at intermediate/late healing. A series of investigations was undertaken to study osteocyte lacunae on the forming bone surface, hypermineralised lacunae of apoptotic osteocytes, autogenous bone fragments within healing sites, bone formed adjacent to surface modified implants, and bone formed within macroporous implants using a range of analytical microscopy and complementary spectroscopic techniques. A directional relationship was found between osteocyte lacunar shape and the underlying bone surface. The physico-chemical environment of the lacunar space is, however, different from the surrounding bone matrix, resulting in formation of magnesium whitlockite, rather than apatite. Connectivity between osteocytes within unintentionally generated autogenous bone fragments and *de novo* formed bone on their surface indicates a regenerative capacity of osteocytes. Laser-ablation creates a hierarchical micro- and nanotopography on titanium implants and enhances their biomechanical anchorage. Osteocytes attach directly to such surfaces, while mineralised collagen fibril organisation at bone-implant and bone-osteocyte interfaces is remarkably similar. More osteocytes are retained in the vicinity of Ti6Al4V surface as manufactured by electron beam melting than machined Ti6Al4V. Osteocytes also attach to CoCr, thus indicating a favourable osteogenic response of a material widely considered inferior to Ti6Al4V.

I currently hold a two-year postdoctoral scholarship from Svenska Sällskapet för Medicinsk Forskning (SSMF).

Full text:

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