

Biobone Symposium

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Development of Organic-Inorganic Composite Gels for Applications in Regenerative Medicine

Abstract: Calcium phosphate ceramics and bioglasses possess the inherent capacity to stimulate bone formation, which has prompted widespread use of these bioceramics in orthopedics and dentistry. These bioceramics have been incorporated into organic matrices for several decades, but the emergence of nanotechnology has accelerated progress in the development of organic-inorganic nanocomposites for applications in regenerative medicine. This presentation will focus on the development of injectable composite gels composed of biopolymer matrices mineralized with bioceramic nanoparticles. To this end, various novel approaches will be presented, including i) the development of hybrid nanocomposites composed of calcium-binding matrices and calcium phosphate nanoparticles and ii) the design of colloidal composite gels made of protein nanoparticles and calcium phosphate or silicate-based nanoparticles.

Bio: Dr. Sander Leeuwenburgh studied Materials Science and Engineering at Delft University of Technology where he graduated at the Laboratory of Inorganic Chemistry in 2001 (cum laude). He obtained his PhD degree at the Radboud University Medical Center in 2006 (cum laude). He was appointed as assistant professor at the same university in 2008. From August 2009 until December 2010 he was visiting scholar at the Department of Biomaterials at Kyoto University Medical Hospital (Kyoto, Japan). During his scientific career he received several awards and grants from organisations such as the Dutch Technology Foundation (NWO VENI and VIDI) and the Dutch Self-Healing Materials Program. He supervised 7 PhD students and published more than 80 papers.