

TITLE

**Nanotechnology
for regenerative
medicine: Increasing
tissue growth,
decreasing infection,
and inhibiting
inflammation**

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This presentation will summarize studies which have demonstrated enhanced *in vitro* and *in vivo* tissue growth on nanostructured metals, ceramics, polymers, and composites thereof compared to currently-used (nano-smooth) implants. Tissue growth to be emphasized will consist of bone, cartilage, vascular, skin, bladder, nervous system, and other tissues. These results strongly imply that nanomaterials may improve tissue regeneration compared to what is being implanted today. This review will also focus on a fundamental explanation of why tissue growth is enhanced on nanostructured compared to conventional tissue engineering materials summarizing a wide range of research efforts, including those which have already received FDA approval for implantation. In addition, recent studies on the use of nanoparticles to reduce infection and inflammation will be presented. Thoughts on the necessary future studies for the field of nanotechnology and tissue engineering to progress will also be presented.

Biography

Thomas J. Webster is an associate professor for the School of Engineering and Department of Orthopaedics at Brown University. His degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995) and in biomedical engineering from Rensselaer (M.S., 1997; Ph.D., 2000). Prof. Webster has graduated over 51 post-doctoral students and thesis completing B.S., M.S., and Ph.D. students. To date, his lab group has generated 8 textbooks, 48 book chapters, 233 invited presentations, at least 343 peer-reviewed literature articles and/or conference proceedings, at least 504 conference presentations, and 24 provisional or full patents. His research has formed 6 companies.