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Two Decades of Commercializing Nanotechnology for Medical Devices: Real Products Helping Real Humans

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The Charnley hip implant revolutionized medicine returning motor function to millions. Over the decades since the Charnley hip implant was first introduced to medicine, numerous researchers have tried to improve the functionality of hip implants from changing chemistry, geometry, surface texture and even using injectable chemistries. This talk will summarize some of the more promising advances, in particular what has been seen with nanotechnology (or the use of materials with at least one dimension less than 100 nm). Specifically, increased bone formation, decreased infection and reduced inflammation have all been observed by employing nanoscale surface features (and without drugs) on the traditional Charnley implant regardless of chemistry. This talk will cover such results emphasizing those which have received FDA approval and are currently helping hundreds of patients return to an active lifestyle. Moreover, this talk will discuss the fundamental reasons why nanotechnology is so promising in orthopedic medical device applications.

Biography:

Thomas J. Webster's (H index: 86) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995) and in biomedical engineering from Rensselaer Polytechnic Institute (M.S., 1997; Ph.D., 2000). Prof. Webster has graduated/supervised over 149 visiting faculty, clinical fellows, post-doctoral students and thesis completing B.S., M.S. and Ph.D. students. He is the founding editor-in-chief of the *International Journal of Nanomedicine* (pioneering the open-access format). Prof. Webster currently directs or co-directs several centers in the area of biomaterials: The Center for Natural and Tropical Biomaterials (Medellin, Colombia), The Center for Pico and Nanomedicine (Wenzhou China) and The International Materials Research Center (Soochow, China). He regularly appears on NBC, CNN, MSNBC, ABC News, National Geographic, Discovery Channel and BBC News talking about science and medicine. He has received numerous honors and is a current fellow of AANM, AIMBE, BMES, NAI and FSBE.