Webster Nanomedicine – Advancing the Clinical Translation of Novel Bionanotechnologies

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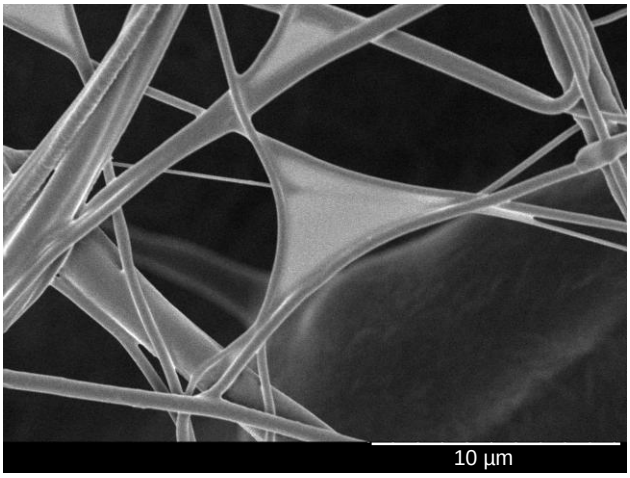
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Abstract Body:

The Webster Nanomedicine Laboratory is a multidisciplinary research group which utilizes fundamental principles of chemical engineering, biomedical engineering, and pharmaceutical sciences towards the implementation of novel bionanotechnologies in next-generation healthcare solutions. Current research projects within the group are diverse in both topic and scope, and specifically include the following: (1) the design of nanomaterials which can interact with living systems for enhanced spatiotemporal control over therapeutic release, (2) the design of osteogenic, micro-nanofibrillar scaffolds capable of treating musculoskeletal defects with reduced bacterial infection, (3) the design of implantable polymeric depots for the synergistic delivery of therapeutics and redox-active nanomaterials, (4) the design of liposomal-carriers capable of passivating capillary endothelium and entraining within wound site interstitium for persistent drug-delivery, (5) the design of self-assembling scaffolds over multiple length-scales as biomimetic extracellular matrices, and (6) the study of physical and biological synthesis pathways for the production of nanomaterials with novel surface coatings. In addition to improved therapeutic effect, practical application serves as the principal driving-force behind each of these studies; and, as such, biological safety, process scalability, and federal regulation are all considered and addressed within the course of each research project. This approach has proven highly successful, as the laboratory has conducted research leading to multiple FDA-approved products, numerous licensed patents, and a plethora of original research articles and reviews which have advanced the field of nanomedicine. The Webster Nanomedicine Laboratory is currently operating in coordination with academic, federal, and industrial partners to develop an international program of research and scholarship.

Image:



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Biography:

Dr. Thomas J. Webster's 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). He is currently the Department Chair and Professor of Chemical Engineering at Northeastern University in Boston. His research explores the use of nanotechnology in numerous applications. Specifically, his research addresses the design, synthesis, and evaluation of nanophase materials as more effective biomedical devices. He has completed extensive studies on the use of nanophase materials to regenerate tissues and has graduated/supervised over 109 visiting faculty, clinical fellows, post-doctoral students, and thesis completing B.S., M.S., and Ph.D. students. To date, his lab group has generated over 10 textbooks, 48 book chapters, 306 invited presentations, at least 403 peer-reviewed literature articles, at least 567 conference presentations, and 32 provisional or full patents. His H index is 47. Some of these patents led to the formation of 9 companies. His research on nanomedicine has received attention in recent media publications including MSNBC, NBC Nightly News, PBS DragonFly TV, and ABC Nightly News via the Ivanhoe Medical Breakthrough Segment. His work has been on display at the London and Boston Science Museums. He is the founding editor-in-chief of the International Journal of Nanomedicine (the first international journal in nanomedicine which in five years has achieved an impact factor of 4.97), serves on the editorial board of 15 additional journals, has helped to organize 23 conferences emphasizing nanotechnology in medicine, and has organized over 53 symposia at numerous conferences emphasizing biological interactions with nanomaterials. He also recently chaired the 2011 Annual Biomedical Engineering Society (BMES) Conference and has organized numerous symposia for AIChE, IEEE, MRS and ASME Annual Meetings. He has received numerous honors including, but not limited to: 2002, Biomedical Engineering Society Rita Schaffer Young Investigator Award; 2003, Outstanding Young Investigator Award Purdue University College of Engineering; 2005, American Association of Nanomedicine Young Investigator Award Finalist; 2005, Coulter Foundation Young Investigator Award; 2006, Fellow, American Association of Nanomedicine; 2010, Distinguished Lecturer in Nanomedicine, University of South Florida; 2011, Oustanding Leadership Award for the Biomedical Engineering Society (BMES); and Fellow, American Institute for Medical and Biological Engineering (AIMBE, representing the top 2% of all medical and biological engineers).

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