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4D Printing: Advances in COVID-19 Therapies, Drug Delivery, Regenerative Medicine, and More

While advances in **biomaterials** have helped the lives of millions over the past century, it is clear that we are at a crossroads for the future of global healthcare. Considering the COVID-19 pandemic, constant struggles with cancer, and an emerging crisis in antibiotic resistant bacteria, to just name a few on-going healthcare problems, we need innovative ideas. Non-medical fields have advanced considerably in new material design, from using sensors to drive cars and touch screen pads for electronics. Innovation in biomaterials has been lagging behind. This presentation will cover some of the more innovative biomaterials that can meet today's challenges including the use of implantable sensors, **4D printed materials** in which material shape can be controlled remotely after implantation, **smart nanomaterials** that can seek out and passivate viruses and bacteria, and so much more. This presentation will also lay the foundation for what is needed for future biomaterial design, especially obtaining regulatory approval for interactive biomaterials



Recent Publications

1. H. Liu and T.J. Webster, "Nanomedicine for implants: A review of studies and necessary experimental tools," *Biomaterials* 28(2): 354-369 (2007).
2. L. Zhang and T. J. Webster, "Nanotechnology and nanomaterials: Promises for improved tissue regeneration," *NanoToday* 4(1): 66-80 (2009).

23rd International Conference and Exhibition on Pharmaceutics & Novel Drug Delivery Systems

February 21-22, 2022

WEBINAR

14th International Conference & Expo on Chromatography Techniques

3. E. Taylor and T.J. Webster, "Reducing infections through nanotechnology and nanoparticles," *International Journal of Nanomedicine* 6: 1011-1022 (2011).
4. J.T. Seil and T.J. Webster, "Antimicrobial applications of nanotechnology: Methods and literature," *International Journal of Nanomedicine* 7: 2767-2781 (2012).
5. A.A.D. Jones III, G. Mi, and T.J. Webster, "A status report on FDA approval of medical devices containing nanostructured materials," *Trends in Biotechnology* July 31, (2018).

Biography

Thomas J. Webster's (H index: 107; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department Chair from 2012 - 2019) Universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); and 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology).

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