

Polymer nanomedicine: From 4D printing to novel nanostructured surface features

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Abstract

4D printing (where the 4th dimension is time), is revolutionizing medicine as it enables the control of internal biomaterial shape through external control. 4D printed polymeric materials are being explored for on-demand drug delivery, increased shapes and sizes to increase pressure on juxtaposed bone to increase bone growth, and so much more. Further, numerous in vitro and in vivo studies have demonstrated greater tissue growth, decreased infection, and inhibited inflammation on a wide range of polymers with nanostructured surface features. Such surface features are made to mimic those found in nature to possess a surface energy attractive for promoting select initial protein adsorption to control subsequent cell response. Further, equations have been developed to predict the dimensions of polymeric nanoscale surface features to promote tissue growth. This invited talk will cover all of the above and discuss future directions necessary for the field of polymer nanomedicine to continue to excel.

Biography

Thomas J Webster's (H index: 100) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995) and in biomedical engineering from RPI (Ph.D., 2000). He currently serves as the Art Zafiropoulo Endowed Professor of Chemical Engineering at Northeastern University. He has formed over a dozen companies who have numerous FDA approved medical products currently improving human health. Prof. Webster is a fellow of numerous societies and is a SCOPUS highly cited researcher (top 1% citations for materials science and mixed fields) and a World Top 2% Scientist by Citations (PLOS).

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