



“Microscale Sensors and Systems for Tissue Engineering and Regenerative Medicine Applications”

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•Abstract: Tissue engineered constructs and organ on chip platforms are emerging platforms for drug screening applications. The use of three dimensional constructs created using human cells can potentially be used to obtain human patient responses to particular drugs and may serve as complementary alternatives to animal studies. Moreover, in order to have realistic models of *in vitro* human organ constructs, the physical and biochemical environments of the tissue constructs need to be monitored and validated with conditions akin to *in vivo* environments. As such there is an unmet need to develop microfluidic bioreactors or organs on a chip systems with integrated sensors which will provide information about the physical parameters such as pH, osmolarity, temperature, etc as well as the metabolic activity of cultured cells. Cell secreted biomarkers could be utilized to monitor the functionality of cells. The sensor systems are intended for continuous monitoring of the tissue environments for up to several weeks. Another area for niche applications of miniature sensors are in wound monitoring. Specifically chronic wounds of diabetic patients can be monitored using flexible sensors and if needed the wound could be intervened so as to prevent infection or further complications. In this talk, I will present two examples of sensor systems, (i) a smart bandage for wound monitoring, (ii) miniature physical and biochemical sensors for monitoring microfluidic organ constructs.

Biosketch: Mehmet R. Dokmeci received B.S. (with distinction) and M.S. degrees from the University of Minnesota, Minneapolis and the Ph.D. degree from the University of Michigan, Ann Arbor, all in Electrical Engineering. Dr. Dokmeci is currently an Instructor at Brigham and Women’s Hospital, Harvard Medical School, a position he has held since June 2011. Previously, he was on the faculty of the Electrical and Computer Engineering Department at Northeastern University. Before joining academia, he worked for 4 years at Corning-Intellisense Corporation, Wilmington, MA, developing MEMS-based products for the telecommunications and life science industries. He has extensively published in refereed journals and conferences in the areas of MEMS, BioMEMS, micro- and nanotechnology, and sensors. He is the author of 78 technical journal articles and 106 conference publications, has one edited book, four invited book chapters, and four patents. Dr. Dokmeci is also a long term member in the Institute of Electrical and Electronics Engineers (IEEE), Materials Research Society (MRS), American Chemical Society (ACS) and American Association for the Advancement of Science (AAAS). His group has received several awards for their research, including the Best Poster Award from the MRS Fall Meeting in 2007 and the Best Poster Award from the 8th IEEE International Conference in 2014



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