



Ross Group Distinguished Speaker
School of Materials Science
and Engineering
Oklahoma State University

**ENGINEERING PERSONALIZED RESORBABLE
DEVICES FOR EXTENSIVE BONE REGENERATION**

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New York University

Wednesday, March 13, 2019, 11:00–12:00 Noon
Room 153, Helmerich Research Center
Oklahoma State University
526 North Elgin Ave, Tulsa, OK 74106

SPEAKER

ABSTRACT

Over 2 million long bone fractures are treated in the United States every year. Although most bone fractures heal spontaneously there is no “gold standard” for promoting bone regeneration in those segmental bone defect due to trauma or infection, devastating medical problems leading to significant disability. The cost of care for initial reconstructive procedures can surpass \$50,000 and hundreds of thousands of dollars over time. The development of custom 3D printed biomaterial scaffolds that can fit and fill large bone defects may provide a novel solution and coating these scaffolds with agents designed to promote more rapid and complete bone healing may increase the efficacy of prosthetic scaffolds in healing segmental bone defects.

The application of 3D printing to fabricate personalized bone-forming degradable constructs, composed of calcium- and phosphate-based bioactive ceramic, which would allow rapid bone formation and regenerated bone growth along adjacent structures during skeletal development/remodeling would be an ideal treatment option for reconstructive surgeons, as it would: minimize or eliminate the need for procurement of donor bone and its associated morbidity; and limit increased cost of care. The development of such a treatment option for any skeletal defect would be an unprecedented advance in bone reconstructive surgery for both growing children and adults.

Dr. Lukasz Witek has been an Assistant Professor in the Department of Biomaterials at New York University (NYU) since September 2018. He earned his BSci in Biology at Temple University in 2008 and MSci in Biomaterials Science from New York University in 2011. Dr. Witek defended his PhD in Chemical Engineering in 2015 at Oklahoma State University under the guidance of Prof. James E. Smay. Upon completion of his PhD studies, he re-joined NYU’s Department of Biomaterials as a post-doctoral fellow and Director of Craniomaxillofacial Orthopedic Biomaterials Regenerative Applications Lab, focusing on 3D printing for regenerative medicine applications. Dr. Witek has authored/co-authored over 35 journal articles, served as guest editor for multiple journals as well served as chair of the individual sessions at International Associate of Dental Research (IADR) and Society for Biomaterials (SFB).



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