Stephenson School of Biomedical Engineering
Seminar Series Presents

ENGINEERED MICROENVIRONMENTS TO GUIDE PROGENITOR CELL-BASED THERAPIES IN TISSUE REPAIR

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1:30 p.m.
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CEC, Rm. 100

BIO:

Kent Leach is Professor of Biomedical Engineering and Orthopaedic Surgery at University of California, Davis. He began his faculty position at UC Davis in 2005 after completing his PhD in chemical engineering at the University of Oklahoma and postdoctoral fellowships at the University of Michigan and Harvard University. He is a standing member on the Biomaterials and Biointerfaces study section for the National Institutes of Health. He is an Associate Editor for the Annals of Biomedical Engineering, the flagship publication for the Biomedical Engineering Society (BMES), and he serves on the America's Council for the Tissue Engineering and Regenerative Medicine International Society (TERMIS). He was inducted into the College of Fellows of the American Institute for Medical and Biological Engineering in 2017 and the Biomedical Engineering Society (BMES) Fellows Class of 2018. He has also received multiple teaching and mentorship awards based on his commitment to training the next generation of scientists. His research interests are focused on developing cell-instructive biomaterials for tissue engineering, applying transport principles for growth of engineered tissues, and translation from the bench to the clinic.

ABSTRACT:

Progenitor cells from the stromal tissue compartment, oftentimes called MSCs, have tremendous potential in cell-based therapies for tissue loss due to their multilineage potential, proangiogenic capabilities, and immune regulatory and anti-inflammatory capacities. Despite the promise of such cell-based therapies, the efficacy of this approach is limited by the high death rate and poor engraftment of cells in ischemic conditions. In our laboratory, we design strategies to optimize cell function, whether through preconditioning in specific microenvironments or transplanting with engineered materials to dictate cell function in situ. The characteristics of the material are key in guiding cell participation in tissue repair. In this talk, I will highlight ongoing efforts by our laboratory to engineer systems and strategies to treat large bone defects and accelerate wound closure. I will also provide examples of engineered biomaterials to enhance cell survival and instruct cell function.

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