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"Enabling Biotechnologies for Musculoskeletal Tissue Regeneration"

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Suddath Seminar room (IBB 1128)
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Abstract:

Musculoskeletal disorders are the most common cause of severe long-term pain and physical disability worldwide with an estimated cost to society of over \$200 billion per year in the USA alone. As the average age of the global population increases, the prevalence of chronic disabling musculoskeletal conditions will continue to grow and diminish quality of life. Furthermore, musculoskeletal injuries are a major cause of functional impairment in people of all ages. A primary goal of my research program has been to establish enabling technologies and new tissue regenerative strategies that will advance therapies for a wide range of high priority clinical problems such as osteoarthritis, soft tissue injuries, growth disorders, and severe limb trauma. We have, for example, developed and validated nondestructive 3D imaging techniques based on micro-computed tomography that have been broadly applied to aid in the quantitative evaluation of porous biomaterials and new approaches to engineering tissues. A team-based approach is emphasized that integrates fundamental science, engineering, and clinical translation to work towards significantly improving the treatment options for patients with musculoskeletal disorders or injuries. Finally, two distinct regenerative strategies will be presented in the context of developing translatable technologies for the treatment of severe limb trauma: 1) stem cell delivery and programming and 2) biologic delivery to stimulate endogenous repair.