Biomaterials
Session co-chairs: Debra Auguste, City College of New York, and Ashok Raichur, Indian Institute of Science, Bangalore

Biomaterials represent an expansive area of materials that can either be derived from or designed to mimick a naturally-occurring substance. A particular obstacle has been the use of materials in providing greater access or manipulation of biological components. The speakers that we have assembled have designed and evaluated systems that allow greater insight and manipulation into the realms of medical technology.

Current challenges in medicine rely upon the ability to deliver molecules for sustained periods in precise locations. Dr. Katti will introduce the major obstacles facing the field of drug delivery. Using specific examples, he will demonstrate how materials are employed to achieve therapeutic objectives.

Dr. Banerjee's research constitutes a change in direction by incorporating self-assembled and stimuli-responsive systems. Such novel materials may be triggered by internal or external means, incorporate imaging modalities, and facilitate localized delivery. These responsive materials also find use in regenerative medicine applications.

Another method to alter the biodistribution of proteins, is to use targeted drug delivery. Dr. Pun will address methods to localize drugs within specific areas in an effort to achieve the most benefit with minimal side effects. Dr. Pun will summarize how to identify peptides that target cancer cells and how to overcome obstacles in cancer drug delivery.

Dr. Santini will conclude the session with a discussion on how to translate disruptive biomaterial technologies into novel therapeutic applications. Using specific examples from his personal experience in the start-up of several biomedical ventures, Dr. Santini will review current challenges in bringing biomaterial research to commercialization.

Overall, we plan to showcase complementary and emerging areas that are at the forefront of new therapeutic applications. Engineered biomaterials for drug delivery may provide the technical advance needed to impact major global health issues, from cancer to malaria. Key lessons in entrepreneurship will help identify opportunities to bridge the gap from bench to bedside.