Many of the major breakthroughs and paradigm shifts in medicine to date have occurred due to innovations in materials and/or application/implementation of materials science in clinical medicine. Artificial heart valves, implantable cardiac devices, limb prosthesis, cardiovascular stents, orthopedic implants, and artificial skin are just a few examples of the numerous applications of materials science in modern-day medicine. The past two decades have seen the emergence of some of the most exciting avenues for innovation in clinical medicine, with materials as its core and including: sustained drug delivery systems, gene therapy, regenerative therapies, and targeting technologies primarily for imaging and tumor targeting. The tremendous development of new materials in recent years has been driven to a large extent by needs in these emerging areas. Nanotechnology promises to take materials innovation to another level through ground-up design of probes and systems that precisely deliver information to cells and tissues on demand, which when combined with microfabrication technologies have the potential to revolutionize the detection and treatment of diseases and rectification of damaged tissue. Some of the emerging examples of this promise include lab-on-a-chip, pharmacy-on-a-chip, and synthetic liver substitutes. This symposium will cover a wide range of topics that represent this multifaceted intersection of the state-of-the-art in material science and medicine.

Two of the symposium sessions will be in honor of Prof. Robert Langer, Institute Professor at the Massachusetts Institute of Technology in recognition of his pioneering work in developing polymer-based localized chemotherapy, which has revolutionized the way cancer is treated, and significantly impacted the treatment of brain cancer. His leadership role in nurturing sustained release systems and tissue engineering into mature materials-based disciplines will also be recognized.

Abstracts are solicited in (but not limited to) the following areas:

- Biomaterials design and surface engineering
- Biomimetic systems
- Delivery across biological barriers
- Drug delivery systems for anti-cancer therapy
- Imaging probes and agents
- Targeted delivery of therapeutics
- High-throughput screening of biomaterials for gene therapy and tissue
- Smart materials for in vivo applications
- Microfluidic devices for manipulating cellular function
- Nonviral vectors for gene therapy
- Minimally invasive regenerative therapies

Two poster sessions are tentatively planned: one on **Biomaterials and Drug Delivery** and a joint poster session with Symposium DD: **Materials in Tissue Engineering**, including regenerative medicine. An oral joint session with Symposium FF: **Nanofunctional Materials, Structures, and Devices for Biomedical Applications**, is also being considered.

**Invited speakers include:**

- Guillermo Amer (Northwestern Univ.), Dennis Discher (Univ. of Pennsylvania), Peter Fratzl (Max-Planck-Inst.-Golm, Germany), John Gore (Vanderbilt Univ.), Ola Hermanson (Karolinska Inst., Sweden), Robert Langer (Massachusetts Inst. of Technology), David Lynn (Univ. of Wisconsin-Madison), Ivan Martin (Univ. of Basel, Switzerland), David Mooney (Harvard Univ.), Niren Murthy (Georgia Inst. of Technology), Roumen Pankov (Sofia Univ., Bulgaria), and Kathryn Uhrich (Rutgers Univ.).

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