

Materials for Medicine

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Biomaterials have improved the lives of millions by providing material solutions to biomedical problems. The development of new medical materials is a multidisciplinary endeavor, incorporating chemical engineering, medicine, biology, chemistry, materials science, bioengineering, and biomechanics. The past few years have witnessed an explosion in the field of biomaterials, with an expansion of both the compositions and the applications of medical implant materials. As the prevalence of chronic diseases such as diabetes, cardiovascular disease, and neurodegenerative disease increases, there will be an even greater need for innovative biomaterials. Biomaterials have been applied in a variety of clinical disciplines, including cardiovascular medicine, orthopedics, and ophthalmology, and new materials are in use or under development for virtually every organ system in the body. This session will review the current status of the field of medical materials, and highlight new developments in medical biomaterials.

Traditional biomaterials have been designed from polymers, ceramics, and metals. The next generation of biomaterials will incorporate biomolecules, therapeutic drugs, and living cells. Innovative new biomaterials, including surface-modified biomaterials, smart biomaterials, bioactive biomaterials, and tissue engineered materials, will have improved properties of biocompatibility, tunability, and biological functionality. Successful development of new biomaterials will require an increased understanding of cell-material interactions, as well as better model systems for the biological environment.

