

Development of Current and Next-Generation Biomedical Materials

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Biomaterials science 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 biomedical materials, 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. This talk reviews the current status of the field of biomaterials, and highlights new developments in biomedical materials. The talk will provide an overview of medical applications of biomaterials, and will describe current classes of biomaterials, including metals, ceramics and glasses, and polymeric materials. The talk will then discuss the next generation of biomedical materials, including surface-modified biomaterials, smart biomaterials, bioactive materials, biomimetic materials, patterned biomaterials, and tissue engineering and regenerative medicine. There are numerous opportunities for chemical engineers to develop novel biomedical materials that will improve and save lives.

Reference:

S. K. Bhatia and S. R. Bhatia, "Biomaterials," *Encyclopedia of Chemical Processing*, 2nd Ed. (2005).