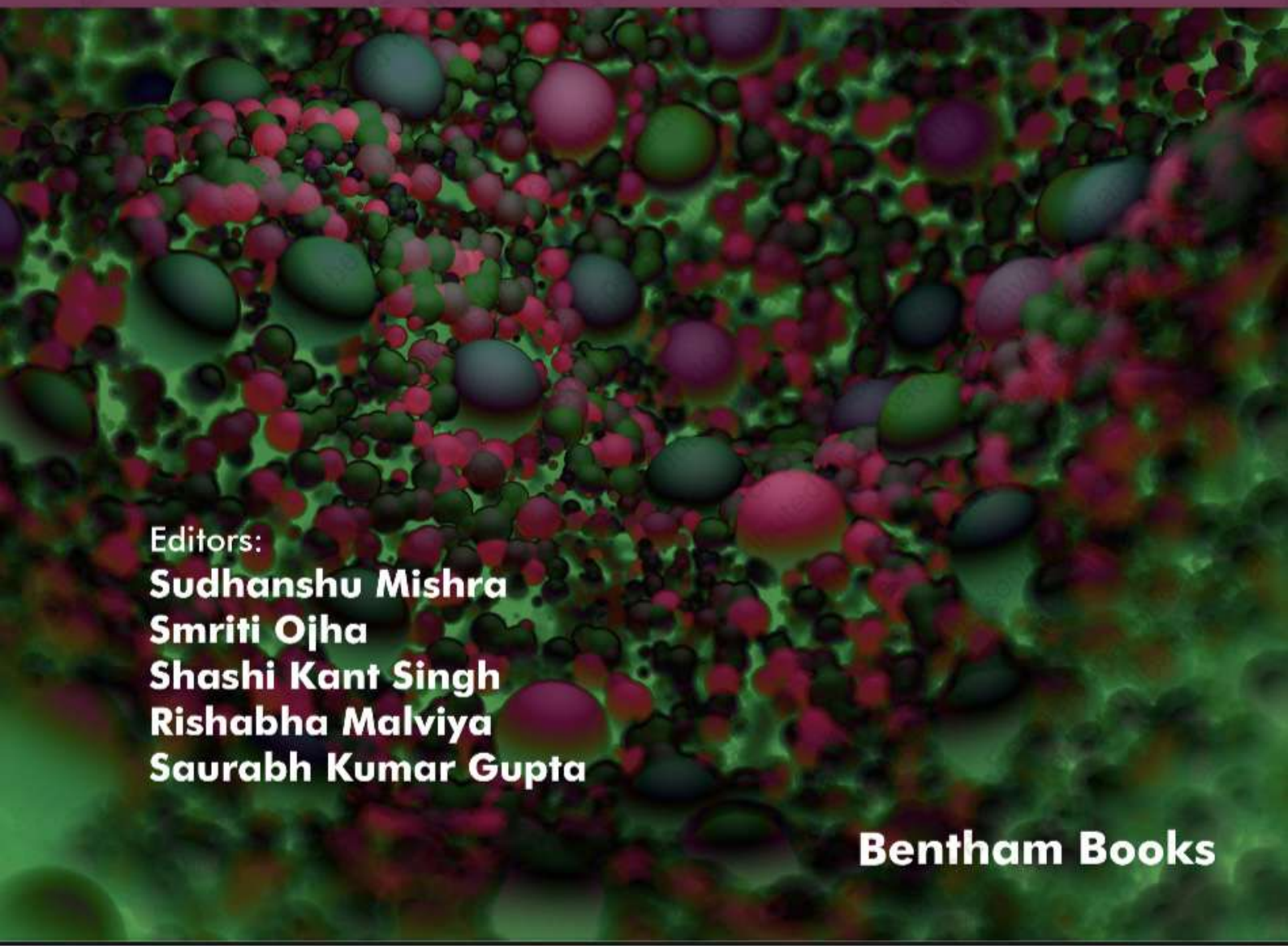
BIOPOLYMERS AS THERAPEUTIC ADJUVANTS

INNOVATIONS AND ADVANCEMENTS



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CHAPTER 5

Biopolymer-based Chemotherapeutics: Combination Therapies and Synergistic Effects

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Abstract: Applications of nanotechnology have increased the importance of research and nanocarriers, which have revolutionized medication delivery in recent years to treat a range of diseases, including cancer. Due to its multidrug resistance to several chemotherapeutic treatments, cancer, one of the most dangerous diseases in the world, has drawn the attention of experts. Scientists have created a different way to deliver chemotherapeutic drugs to the desired location while reducing side effects and enhancing delivery efficacy on healthy cells by incorporating them into nanocarriers such as synthetic polymers, nanotubes, micelles, dendrimers, magnetic nanoparticles, Quantum Dots (QDs), lipid nanoparticles, nano-biopolymeric substances, *etc*. Nanotechnology applications have made research and nanocarriers—which have recently transformed drug delivery to treat a variety of illnesses, including cancer—even more crucial. One of the most deadly illnesses in the world, cancer, has caught the attention of scientists because of its multidrug resistance to several chemotherapeutic therapies. By integrating chemotherapeutic drugs into nanocarriers like synthetic polymers, nanotubes, micelles, dendrimers, magnetic nanoparticles, Quantum Dots (QDs), lipid nanoparticles, nano-biopolymeric substances, *etc*., researchers have developed an alternative method of delivering these medications to the intended site while minimizing side effects and improving delivery efficacy on healthy cells. Preclinical and clinical research on cancer treatment has yielded promising results. Biopolymers stand out as viable options for anticancer nano drug delivery systems due to their exceptional biocompatibility. Moreover, the presence of ligands in some biopolymers that are naturally present on the surface of human cells enables active targeting.

Keywords: Biopolymers, Chemotherapeutics, Drugs, Nanocarrier, Nanotechnology.

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