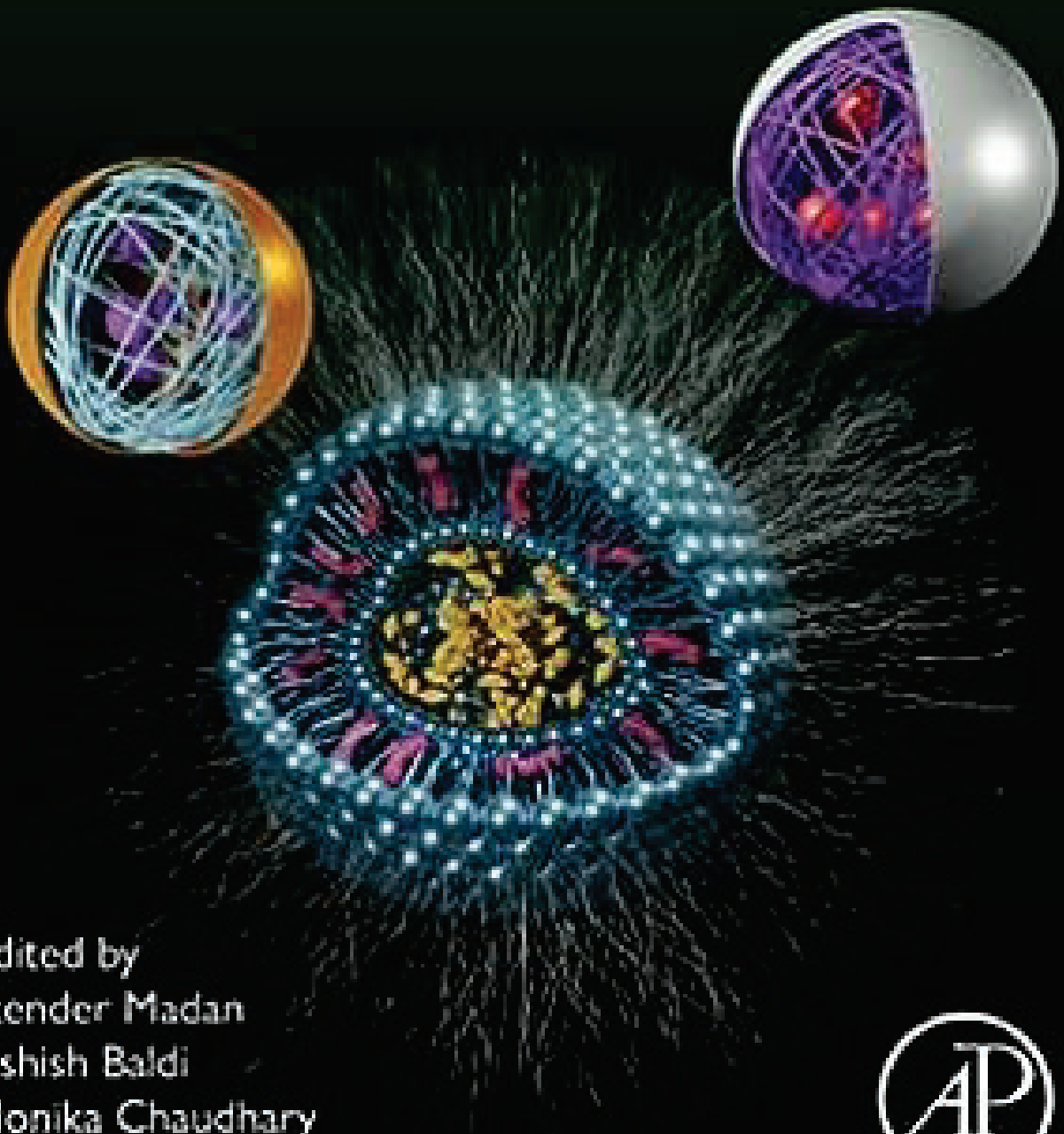
POLYMER-DRUG CONJUGATES

Linker Chemistry, Protocols and Applications



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Chapter 14

Antibody–drug conjugate: Emerging trend for targeted treatment

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1. Introduction

According to the World Health Organization, cancer ranks the foremost cause of death worldwide, contributing to approximately 10 million deaths in 2020. Every year, roughly four hundred thousand children develop cancer. Cancer can affect any part of the body, where lung, breast, colon, rectum, and prostate cancers are found to be the most common types [1]. The most common options of treatment are surgery, radiation, chemotherapy, and immunotherapy. Advanced treatment options to treat cancer include stem cell transplant, photodynamic therapy, hyperthermia, laser treatment, targeted treatment, etc. Among these, the most used treatment option is chemotherapy either separately or in addition to surgery or radiotherapy [2]. Almost 50% of all cancer patients undergo radiation therapy during cancer treatment. Radiation kills tumor cells or affects the genetic material of the cell thus hindering their capability to divide and replicate further, eventually leading to cell death. Radiation affects both tumor as well as normal cells [3]. Chemotherapy is a type of cancer treatment, which uses chemical agents to destroy tumor cells. Neoadjuvant chemotherapy and adjuvant chemotherapy are employed before and after surgery or radiation to shrink and kill the cancer cells, respectively. The main limitations with conventional chemotherapy include poor pharmacokinetics (PK) properties of the drug that eventually leads to a poor

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