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Nanocarriers Role in Reversing Multi Drug Resistance

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A major hurdle to chemotherapy is development of multi drug resistance due to microenvironmental selection pressures. In this review we discuss the application of nanotechnology-based delivery systems to overcome MDR in solid tumors. Evidence from the literature illustrates the development of various types of engineered nanocarriers specifically designed to enhance tumor-targeted delivery through passive and active targeting. Moreover, multi-functional nanocarriers are developed to enhance drug delivery and overcome MDR by combination therapy with MDR modulators (e.g., with P-glycoprotein substrates), agents that regulate intracellular pH, agents that lower the apoptotic threshold (e.g., with ceramide). The combination approaches which involve the design of novel drug delivery systems with these MDR modulators look promising in overcoming various forms of multi-drug resistance and opens new horizons for cancer treatment.