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Nanotechnology in drug delivery system

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Nanotechnology could be defined as the technology that has allowed for the control, manipulation, study, and manufacture of structures and devices in the "nanometer" size range. These nano-sized objects, e.g., "nanoparticles", take on novel properties and functions that differ markedly from those seen from items made of identical materials. The small size, customized surface, improved solubility, and multi-functionality of nanoparticles will continue to open many doors and create new biomedical applications. Indeed, the novel properties of nanoparticles offer the ability to interact with complex cellular functions in new ways. Therefore, nano delivery systems hold great potential to overcome some of the obstacles to efficiently target a number of diverse cell types. This represents an exciting possibility to overcome problems of drug resistance in target cells and to facilitate the movement of drugs across barriers (e.g., BBB). The challenge, however, remains the precise characterization of molecular targets and ensuring that these molecules only affect targeted organs. Furthermore, it is important to understand the fate of the drugs once delivered to the nucleus and other sensitive cells organelles.

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