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Special Issue Reprint

Application of Nanomedicine in Immunotherapy: Recent Advances and Prospects

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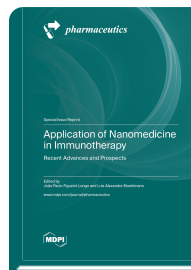
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Nanomedicine is a special medical field focused on the application of nanotechnology to provide innovations for healthcare in different areas, including the treatment of a wide variety of diseases, including cancer, infections, and auto-immune disorders. The field emerged during the 1980s, aligning with the approval of the first regulatory-agency-approved nanomedical oncological drugs. Additionally, nanotechnology has played a pivotal role in the development of mRNA vaccines utilized during the COVID-19 pandemic, further establishing its enduring significance in the domains of science and biomedical innovation. The reasons for the use of nanotechnology in biomedicine can vary but are mostly the protection and/or delivery of bioactive molecules to target tissues. The general idea is to create nanoscopic platforms that can interact differently with biological systems, either through pharmacokinetic modifications or through the preferential activation of some biological pathway. The intricate biomolecular interactions that underlie the functioning of the biological system take place within the nanoscale. So, nanoparticles can be designed to be similar in size to key biological structures like large biomolecules or small organelles, enabling them to interact with biological systems in unique ways, which can improve the effects of drugs used in the treatment of certain diseases. In other words, highly distinct and improved biological effects can emerge from such interactions.



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