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# The Application of Nanotechnology in Immune Checkpoint Blockade for Cancer Treatment

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## Abstract

Cancer immunotherapy, which could utilize the host's immune system to kill tumor cells, has great potential in long-term inhibition of tumor growth and recurrence compared to chemotherapy and radiotherapy. As we know, tumors exhibit powerful adaption to escape the destruction of immune system at the late stage of diseases due to overactivation of immune checkpoint pathways which function as natural "brakes" for immune responses. The newly emerging immune checkpoint inhibitors are regarded as the breakthrough for cancer immunotherapy as they can re-boost the host's immune system by restoring T cells function and promoting cytotoxic T lymphocytes (CTLs) responses. However, there is still scope for improvement in enhancing the clinical efficacy and reducing side effects of these immune modulators. In this review, we mainly introduce the basic mechanisms of the immune checkpoint pathways and outline the recent successes of immune checkpoint blockade (ICB) therapy in combination with nanoparticle delivery system. Furthermore, the underexplored

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