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New hope for eradication of HIV from the body: The role of polymeric nanomedicines in HIV/AIDS pharmacotherapy

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Human immunodeficiency virus continued to be the greatest challenge and killer disease of the 21st century despite the advent of potent highly active antiretroviral therapy which are limited by their severe adverse effects, significant drug interactions, frequent dosing, limited bioavailability, and less access to viral reservoir sites like macrophages. Nano-medicines are becoming new hopes in avoiding these shortcomings of conventional antiretroviral drugs. The emphasis of this review is mainly the application of polymers based nanomedicines in pharmacotherapy of HIV/AIDS. Most of the studies to date on this area are in vitro and human clinical trials are totally missed. However, many interesting points are uncovered through this review like the possibility of achieving high intracellular concentration of drugs, very good antiretroviral activity, improved bioavailability, reduced toxicity and release of the drugs from nanocarriers for long time reducing the need for frequent dosing. Indeed, a lot of assignments left behind for researchers to overcome the challenges hindering the wider application of nanomedicines in treatment of HIV/AIDS.

Keywords: HIV/AIDS, Antiretrovirals, Nano-polymers, Nanomedicines