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Novel approaches in drug delivery

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As research has developed strongly over the years, many newer methods of treatment have emerged. One of such methods is the novel drug delivery system (NDDS) that has greatly improved the efficacy of target and treatment. The advantages of NDDS over the conventional drug pathways include the provision of a longer drug delivery system over a therapeutic range, decreased biotoxicity, increased half-life of the drug, minimal wastage of drug, accurate target area and increased biocompatibility. NDDS can be categorised based on usage methods, such as sustained, rate pre-programmed, targeted and localised. Nanoparticle drug dispersions have proved to be highly promising in tackling newer illnesses with a predictable outcome. The new-found methods that have been implemented are using resealed erythrocytes, niosomes, lymphocytes, transdermal induction, etc. For example, niosomes are microscopic lamellar structures that are a mixture of non-ionic surfactants. They perform as an alternative to liposomes as suspended colloidal controlled release systems through continuous circulation, which are easily delivered through intravenous pathways and are enzyme-specific. They find applications in intramuscular, intravenous, peroral and transdermal drug delivery. Sonophoresis, another effective method, as the name suggests uses ultrasonic energy that increases the absorption rate for transdermal delivery into the skin. Ultrasound at various frequencies in the range of 20 kHz–16 MHz with intensities of up to 3W/cm2 has been used for sonophoresis. They are found to be useful in medicine ranging from physiotherapy to facial correction (removal of pigmentation, acne, etc.). While the list is considerably large, the sheer ingenuity of NDDS will be highly useful in the future of medical technology that may include but not pertain to gene therapy, genetic engineering, vaccination and so on.

Keywords: Niosomes, Drug delivery, Disease, Target site, Novel drug delivery system, Drug pathway

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