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Mechanism of Nanoparticulate Delivery System via Ocular Site

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Controlled and sustained delivery of ophthalmic drugs continues to remain a major focus area in the field of pharmaceutical drug delivery with the emergence of new, more potent drugs and biological response modifiers that may also have very short biological half-lives. The anatomy, physiology, and biochemistry of the eye render this organ highly impervious to foreign substances. A significant challenge to the formulator is to circumvent the protective barriers of the eye without causing any tissue damage. In ocular drug delivery, the physiological constraints imposed by the protective mechanisms of the eye lead to poor absorption of drugs with very small fractions of the instilled dose penetrating the cornea and reaching intraocular tissues. The benefits of having the drug in the form of a nanoparticulate suspension are reduction in the amount of dose, drug release for a prolonged period of time, higher drug concentrations in the infected tissue, longer residence time of nanoparticles on the cornea surface, reduction systemic toxicity of drug.