

Special Issue: NCNN-2014

(National Conference on Nanoscience and Nanotechnology - 2014)

## Advancement in Ophthalmic Delivery of Drugs Through In-Situ Smart Polymers

Gurpreet Kour, Jhakeshwar Prasad, Ajazuddin, Amit Alexander, D. K. Tripathi

*Rungta College of Pharmaceutical Sciences and Research, Bhilai, Chhattisgarh, E-mail:  
Gurpreetkour002@gmail.com*[www.peertechz.com](http://www.peertechz.com)

Conventional ophthalmic solutions owing to pre-corneal elimination of the drug, drainage by gravity, nasolacrimal drainage, conjunctival absorption, and the absence of controlled release and of bioadhesive properties exhibit low therapeutic efficacy. These problems can be overcome by various strategies. One of such strategies is to use in-situ gelling systems prepared from polymers that exhibit reversible phase transitions (sol-gel) and pseudo plastic behavior to minimize interference with blinking. The in-situ gelling systems undergo phase transition due to various causes including- temperature, and pH in the pre-corneal region or the electrolyte composition of the tear film. Thus, researchers have developed different kinds of in-situ gelling polymers (eg. thermo, pH, and electrolyte responsive polymers), viscosity- increasing agents and isotonic agents. The in-situ gel forming polymeric formulations have several advantages such as sustained and prolonged action as compared to conventional drug delivery systems. In recent past, various polymers like poly(N-isopropylacrylamide)-chitosan(PNIAAm-CS), pluronic F127, N-isopropylacrylamide(NIPAM), butylacrylate(BA), poloxamer has been extensively studied for the efficient ophthalmic delivery of bioactives like timolol maleate (anti ocular hypertensive), methotrexate (antimetabolite and antifolate), fluconazole (antifungal), diclofenac sodium (NSAID) etc. This shows that smart polymers are doing well in the delivery of ophthalmic formulations. In this paper, we are compiling recent development in the field which will definitely help the scientists working in the same field.