Title (2)	:	**Nanoparticle-laden contact lens for controlled release of vancomycin with enhanced antibiotic efficacy**
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Abstract	:	Vancomycin is the last resort antibiotic for the treatment of severe bacterial keratitis. Its clinical application is limited due to its hydrophilicity and high molecular weight. To overcome this, this study aims to develop nanoparticles-laden contact lens for controlled ocular delivery of vancomycin. Polyvinyl alcohol (PVA) was used as encapsulant material. The nanoparticles had a negative surface charge and an average size of 147.6 nm. A satisfactory encapsulation efficiency (61.24%) was obtained. The release profile was observed to be slow and sustained, with a release rate of 1.29 µL mg−1 h−1 for 48 h. Five out of 6 test bacteria were suppressed by vancomycin nanoparticles-laden contact lens. Vancomycin is generally ineffective against Gram-negative bacteria and unable to pass through the outer membrane barrier. In this study, vancomycin inhibited Proteus mirabilis and Pseudomonas aeruginosa. Nano-encapsulation enables vancomycin to penetrate the Gram-negative cell wall and further destroy the bacterial cells. On Hohenstein challenge test, all test bacteria exhibited significant reduction in growth when exposed to vancomycin nanoparticles-laden contact lens. This study created an effective and long-lasting vancomycin delivery system via silicone hydrogel contact lenses, by using PVA as encapsulant. The antibiotic efficacy and vancomycin release should be further studied using ocular in vivo models.