

Hydrogel-based contact lens achieve prolonged, local drug delivery to the eye

With the support by the National Natural Science Foundation of China, the research group led by Prof. Jiang Gangbiao (蒋刚彪) at the Department of Pharmaceutical Engineering, College of Materials and Energy, South China Agricultural University, in collaboration with the research group led by Prof. Yuan Jin (袁进) at the State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Centre, Sun Yat-Sen University, recently reported a hydrogel-based hybrid theranostic contact lens for fungal keratitis, which was published in *ACS Nano* (2016, 10: 6464–6473).

Fungal keratitis is a severe ocular disease, which might cause ocular morbidity and blindness. Traditional treatment such as eye drops has very limited therapeutic efficacy because of poor bioavailability, whereas intraocular injection might cause serious side effects. Therefore, they designed and prepared a hybrid hydrogel-based contact lens. It comprises quaternized chitosan (HTCC), silver nanoparticles and graphene oxide (GO) nanosheets. They made good use of the hydrophobic and $\pi-\pi$ stacking interactions of GO with hydrophobic, antifungal properties of voriconazole (Vor) to achieve controlled released, prolonged, and local drug delivery to the eye. The results showed a significant therapeutic effect on fungal keratitis, therefore demonstrating the potential of hydrogel contact lenses-based drug delivery system in eye diseases therapy.

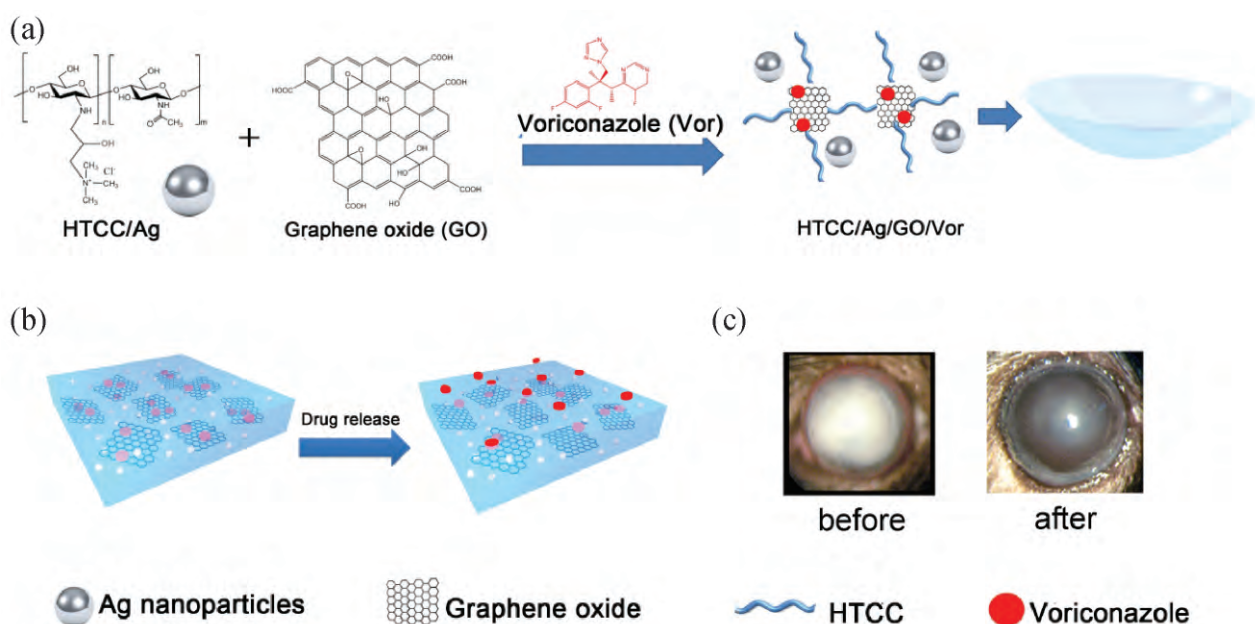


Figure (a) Synthesis of hydrogel-based hybrid theranostic contact lens (HTCC/Ag/GO/Vor); (b) schematic illustration of its controlled released, prolonged, and local drug delivery; (c) significant therapeutic effect on fungal keratitis by using theranostic contact lens.