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IMPROVEMENT OF THE RETINAL DELIVERY OF EYEDROP CONTAINING LIPOSOMES BY CHITOSAN MODIFICATION

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ABSTRACT

Intravitreal injection is well-known commonly used way to deliver drug to the retina whereas repeated injections involve potential risks of complications. We have previously reported that the potential of liposome containing eyedrops as a novel system for delivering drugs to the retina.¹⁾ The purpose of this study was to improve the drug delivery efficiency to the retina by chitosan-modification of liposomes. Hydrophobic fluorescence probe of coumarin-6 was used as a model compound to assess the intraocular behavior of liposomes after eyedrop administration in mice.

To estimate the delivery efficiency to the retina, magnitude of fluorescence emission in the inner plexiform layer (IPL) of the retina was quantified using ImageJ software. The fluorescence intensity of non-modified liposomes showed the maximal value at 30 min, thereafter pronounced decrease was observed up to 60 min. On the other hand, chitosan-modified liposomes showed the higher intensity whole range of the period after the administration compared to that of non-modified liposomes. The corneal images suggested that the longer residence time by chitosan-modification reflected an enhancement of retinal delivery. Besides, the liposomes tested in ocular cells showed little cytotoxicity. The chitosan-modification of liposomes may advance the delivery efficiency of hydrophobic compounds to the retina.

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