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Nanoparticle eye drops enhanced the ocular penetration

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We will introduce a method for enhancing the ocular penetration of eye drops using nanoparticles of hydrolyzable dye. The corneal barrier functions in ocular globe predominantly restrict the permeation of eye drops administrated. The barrier functions consists in epithelial tight junctions, as well as an opposite polarity environments of lipophilic epithelium and hydrophilic stroma, which restrict the compound permeation into cornea physicochemically. We found that there was the size effect on ocular penetration of eye drops. Namely, nanoparticles of hydrolyzable dye attained a greater than tenfold higher (ca. 50-fold) ocular penetration than that of micron-sized particles. Furthermore, not only the size effect, but also an *in vivo* hydrolysis reaction of dyes of nanoparticle was found to be an important factor for enhancing the ocular penetration of eye drops. We think that the using nanoparticle of hydrolyzable compounds is an effective approach for enhancing the ocular penetration of eye drops.

Additionally, we will introduce the preparation method of drug nanocrystals using Nano Spray Dryer B-90. The target drugs were steroid and calpain inhibitor. The calpain inhibitors are promising drug for curing intractable diseases such as glaucoma and Alzheimer's disease, in viewpoint of neuron protection.

Biography

Koichi Baba has completed his Ph.D. from Tohoku University (Japan) and postdoctoral studies from State University of New York at Buffalo (USA). He is the Endowed Chair Associate Professor of the department of visual regenerative medicine. His major research is on Nano-materials and ophthalmology. His current work and interest are drug nanocrystal applications.

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