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# Improved water solubility and corneal permeation of fluorometholone solid dispersion employing polymeric micelle systems

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The aim of this study was to increase solubility of Fluorometholone (FML) in water by solid dispersion using Soluplus® polymer for topical ocular application. The solid dispersions were prepared by solvent evaporation method in various FML: Soluplus® w/w ratios (1:7, 1:10, 1:15), and a physical mixture was also prepared at ratio of 1:10. FML solid dispersion (1:15) showed the highest saturation solubility and it was nearly 15-fold higher than the simple physical mixture. Physicochemical properties of raw materials, solid dispersions and physical mixture were characterized by differential scanning calorimetry, X-ray diffraction and Fourier transformation infrared spectrometry. The results showed the transformation of FML from crystalline to amorphous state in the solid dispersion form. Transmission Electron Microscopy imaging revealed that polymeric micelles of Soluplus® was formed in polymeric micelle. Flucon®, commercial product of FML showed significantly big particle size and high PDI values. On the other hand, solid dispersion showed relatively small and uniform particle size. *Ex vivo* permeation study was performed with porcine cornea tissues in Franz-diffusion cells. The permeation of FLM in solid dispersion was significantly higher than commercial product and physical mixture. In conclusion, the nano-sized solid dispersion of Soluplus® can be a potential strategy for ocular delivery of poorly water-soluble drugs.

## Biography

Gyubin Noh has completed his Bachelor's degree from Keimyung University, College of Pharmacy, Daegu, Republic of Korea in 2016. He is presently a MS-PhD candidate at College of Pharmacy, Keimyung University, Daegu, Republic of Korea. He is interested on transdermal drug delivery, biopharmaceutical delivery, microneedle, etc.

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