



## Formulation and Evaluation of Hydroxypropyl Methylcellulose Based Topical Gel Loaded with Ganciclovir

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**SUMMARY.** The study aimed to formulate topical gel to enhance the bioavailability of ganciclovir. Formulations were designed using central composite rotatable designed (CCRD) approach. The prepared formulations were subjected to various evaluation parameters including compatibility studies, permeation studies, surface morphology, X-ray diffraction and rheological studies. Considerable values of flux ( $6.531 \pm 0.008$ ) have indicated significant increase in permeability of ganciclovir. Surface morphological studies have shown uniform mixing of the drug and excipients, and the claim was reinforced by the findings of XRD. Kinetic modeling has declared that the Korsmeyer-Poppas model was the dominating, predicting the diffusion type of mechanism of drug release. Conclusively, the permeable topical gel is better choice for the delivery of ganciclovir through topical route.

**RESUMEN.** El estudio tuvo como objetivo formular un gel tópico para mejorar la biodisponibilidad de ganciclovir. Las formulaciones se diseñaron utilizando un enfoque de diseño giratorio compuesto central (CCRD). Las formulaciones preparadas se sometieron a varios parámetros de evaluación, incluidos estudios de compatibilidad, estudios de permeación, morfología superficial, difracción de rayos X y estudios reológicos. Valores considerables de flujo ( $6,531 \pm 0,008$ ) han indicado un aumento significativo en la permeabilidad del ganciclovir. Los estudios morfológicos de la superficie han mostrado una mezcla uniforme del fármaco y los excipientes, y la afirmación se vio reforzada por los hallazgos de XRD. El modelo cinético ha declarado que el modelo de Korsmeyer-Poppas era el dominante, prediciendo el tipo de difusión del mecanismo de liberación del fármaco. En conclusión, el gel tópico permeable es una mejor opción para administrar ganciclovir por vía tópica.

**KEY WORDS:** *ex-vivo* studies, permeability, skin irritation studies, surface morphology, X-ray diffraction.

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