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ABSTRACT

The increasing prevalence of microbial infections and associated skin diseases underscores the urgent need for innovative topical antibacterial dosage forms. While systemic therapies such as tablets, capsules, and injections are widely available, their application is often limited to systemic use, leaving a critical gap in effective topical treatments. Semi-solid dosage forms, notably ointments, are commonly employed for dermatological conditions; however, issues of biocompatibility, irritation, and limited efficacy persist. This research is dedicated to the formulation and development of a metronidazole organogel, a novel semi-solid delivery system designed to enhance clinical application and therapeutic outcomes for topical infections. Organogels demonstrate superior biocompatibility, reduced irritation, and favorable physicochemical properties, making them an attractive alternative to conventional ointments. The study aims to optimize the organogel formulation for improved drug delivery, patient compliance, and dermatological efficacy, thereby addressing the limitations of existing therapies and advancing the standard of care for skin infections. Through systematic evaluation of formulation parameters, organogel characteristics, and antibacterial activity, this work seeks to establish a promising platform for the next generation of topical antimicrobial agents