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(57) Abstract :

Abstract Capecitabine embedded microneedle formulation The present invention relates to a microneedle-based transdermal drug delivery system comprising Capecitabine. The invention provides a dissolving microneedle array fabricated from biocompatible and biodegradable polymers, wherein Capecitabine is incorporated within the microneedle matrix. Upon application to the skin, the microneedles penetrate the stratum corneum and dissolve within the skin, enabling controlled and sustained release of the drug. The formulation exhibits high drug entrapment efficiency and provides sustained release of Capecitabine over an extended period. The invention further includes a validated reverse-phase high-performance liquid chromatography (RP-HPLC) method for quantification of Capecitabine in the formulation. The developed microneedle system offers a minimally invasive, patient-friendly, and effective alternative for transdermal delivery of anticancer drugs with improved patient compliance and reduced dosing frequency.

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