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विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

BITS Pilani
TECHNOLOGY
ENABLING
CENTRE
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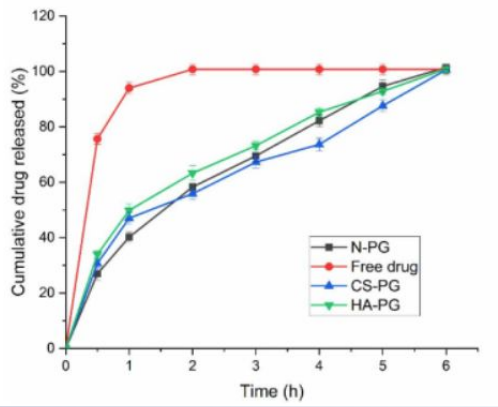
PENDING

(IN202111017452) Topical formulation comprising tofacitinib and preparation thereof



NEED

Autoimmune skin diseases like psoriasis and eczema affect over 120 million people worldwide, causing chronic inflammation, pain, and skin damage. Current treatments often fail due to poor skin absorption, frequent relapses, and severe systemic side effects. But what if the drug could work exactly where the disease starts—without harming the rest of the body?

TECHNOLOGY OVERVIEW

A new topical formulation embeds tofacitinib, a JAK inhibitor, into a surface-modified lipid nanocarrier to treat inflammatory skin conditions. Engineered to penetrate deeper skin layers without entering the bloodstream, it offers targeted therapy with reduced toxicity and higher bioavailability—without altering existing drug structures or treatment protocols.

TECHNOLOGY KEY FEATURES

Delivers 0.05–0.1% tofacitinib via lipid nanocarriers sized 50–250 nm, coated with glycosaminoglycans. Achieves 2.5–7.5% drug loading and -25.5 to -30.2 mV zeta potential, enhancing skin penetration and drug stability—offering precise, low-dose treatment with fewer side effects.

Read more here

MARKET ANALYSIS

India's topical drug delivery market is projected to grow at a CAGR of 6.5%, reaching $2.3B by 2033. Globally, the transdermal drug delivery market is expected to hit $87.4B by 2033 at a CAGR of 7.8%. Growth is driven by demand for non-invasive treatments, chronic disease burden, and biologic drug limitations. (Source: IMARC, Future Market Insights)

Target Industries

Pharmaceutical manufacturers focusing on novel dermatology drugs and biosimilar formulations; formulation technology providers advancing nanocarrier platforms for drug delivery; healthcare R&D enterprises working on autoimmune therapies and precision topical treatments for chronic skin disorders.

AT A GLANCE

- SDG 3 (Good Health and Well-being), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production)

Technology is available for licensing/ co-development.

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