

## The Emerging Transdermal Drug Delivery System

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The transdermal drug delivery(TDD) offers a variety of significant clinical benefits over other dosage forms. Because TDD offers controlled release of the drug into the patient, it enables a steady blood-level profile, reducing the systemic side effects and improving the efficacy over other dosage forms. In addition, because transdermal patches are user-friendly, convenient, painless, and offer multi-day dosing, it is generally accepted that they offer improved patient compliance.

The first transdermal patch, scopolamine patch, was approved by FDA in 1981. The US transdermal market approached \$1.2 billion in 2002. TDD has become a successful and viable dosage form. However TDD is a limited technology in the aspect of the pharmaceutical industry and not suited clinically for all drugs. And the skin barrier limits the number of drugs that can be delivered by passive diffusion from an adhesive patch.

Over the past decade, there were many significant innovations in TDD technologies like as thermal, iontophoresis, sonophoresis and microporation TDD. The opportunities for TDD have been greatly expanded through the application of new formulation technologies and active TDD systems. The TDD technologies enabled us to choose macromolecules, proteins, peptides, carbohydrates and ionization compounds for TDD.