

Current trends in polymer microneedle for transdermal drug delivery

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ABSTRACT

Transdermal drug delivery using microneedles is increasingly gaining interest due to the issues associated with oral drug delivery routes. Gastrointestinal route exposes the drug to acid and enzymes present in the stomach, leading to denaturation of the compound and resulting in poor bioavailability. Microneedle transdermal drug delivery addresses the problems linked to oral delivery and to relieves the discomfort of patients associated with injections to increase patient compliance. Microneedles can be broadly classified into five types: solid microneedles, coated microneedles, dissolving microneedles, hollow microneedles, and hydrogel-forming microneedles. The materials used for the preparation of microneedles dictate the different applications and features present in the microneedle. Polymeric microneedle arrays present an improved method for transdermal administration of drugs as they penetrate the skin stratum corneum barrier with minimal invasiveness. The review summarizes the importance of polymeric microneedle and discussed some of the most important therapeutic drugs in research, mainly protein drugs, vaccines and small molecule drugs in regenerative medicine.

KEYWORDS: Skin; Transdermal route; Microneedle; Polymeric needles; Drug delivery

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