

Current trends in polymer microneedle for transdermal drug delivery

Khater Ahmed Saeed AL-Japairi^a, Syed Mahmood^{a,b,®}, Samah Hamed Almurisi^c, Jayarama Reddy Venugopal^d, Ayah Rebhi Hilles^e, Motia Azmana^a, Subashini Raman^a

^aDepartment of Pharmaceutical Engineering, Faculty of Chemical and Process Engineering Technology, University Malaysia Pahang, Gambang 26300, Malaysia

^bCentre of Excellence for Advanced Research in Fluid Flow (CARIFF), University Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

^cDepartment of Pharmaceutical Technology, Kulliyah of Pharmacy, International Islamic University Malaysia (IIUM), Kuantan 25200, Malaysia

^dFaculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Gambang 26300, Malaysia

^eFaculty of Health Sciences, Department of Medical Science and Technology, PICOMS International University College of Medical Sciences, 68100 Kuala Lumpur, Malaysia

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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