

A REVIEW ON TRANSDERMAL DRUG DELIVERY USING MICRONEEDLES: CURRENT RESEARCH AND PERSPECTIVE

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Abstract. *The paper presents a review on transdermal drug delivery using mechanical enhancer – microneedles. The paper overviews the delivery mechanism, the main delivery methods utilizing the microneedle array, the frequently used materials for the fabrication process, geometrical and shape considerations as well as the current pre-clinical and clinical applications of the microneedles array. Finally, we express our point of view regarding the perspectives in the field of transdermal drug delivery using mechanical enhancer.*

Keywords: transdermal drug delivery, microneedles, vaccine

1. Introduction

Currently medical professionals have a wide range of drug administration modalities to choose from and individualize the therapeutic schemes according to patients' needs. Oral route is one of the preferred methods of drug delivery owing to its non-invasive nature. However, the major disadvantage of this method is the impossibility of adequate peptide or protein delivery caused by the highly acidic gastric secretions, the first-pass effect of the liver or the intestine. These aspects, which contribute essentially to a lower bioavailability of the administered drugs are related to the alteration, destruction or reduced absorption of the macromolecular drug. [1, 2] One classical example is the one of Insulin, which cannot be administered orally leading to the need of a parenteral route and to negligence in treatment. [3, 4] Although the preferred delivery method is the oral route due to its non-invasiveness nature, the inability to achieve a maximum bioavailability of protein or peptide macromolecules has been considered when

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