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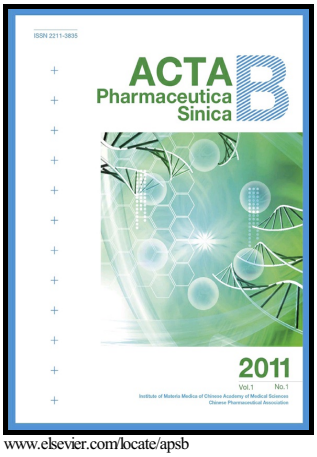

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Review

Parenteral nanosuspensions: a brief review from solubility enhancement to more novel and specific applications

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Abstract Advancements in *in silico* techniques of lead molecule selection have resulted in the failure of around 70% of new chemical entities (NCEs). Some of these molecules are getting rejected at final developmental stage resulting in wastage of money and resources. Unfavourable physicochemical properties affect ADME profile of any efficacious and potent molecule, which may ultimately lead to killing of NCE at final stage. Numerous techniques are being explored including nanocrystals for solubility enhancement purposes. Nanocrystals are the most successful and the ones which had a shorter gap between invention and subsequent commercialization of the first marketed product. Several nanocrystal-based products are commercially available and there is a paradigm shift in using approach from simply being solubility enhancement technique to more novel and specific applications. Some other aspects in relation to parenteral nanosuspensions are concentrations of surfactant to be used, scalability and *in vivo* fate. At present, there exists a wide gap due to poor understanding of these critical factors, which we have tried to address in this review. This review will focus on parenteral nanosuspensions, covering varied aspects especially stabilizers used, GRAS (Generally Recognized as Safe) status of stabilizers, scalability challenges, issues of physical and chemical stability, solidification techniques to combat stability problems and *in vivo* fate.

KEY WORDS Parenteral; Nanosuspension; Stabilizer; *In vivo* fate; Solidification; Scalability

Running title: Parenteral nanosuspensions and novel applications of parenteral nanosuspensions

Abbreviations:

ADME, absorption distribution metabolism elimination; ASEs, aerosols solvent extractions; AUC, area under curve; BBB, blood–brain barrier; BCS,