



APPROACHES FOR POTENTIATING THE EFFECTS OF PIPERINE



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Piperine is an alkaloid found in several species of *Piperaceae* family that are traditionally used as spices. Its nutraceutical properties have been investigated in recent years and this compound has attracted scientific attention, as many research have shown its antioxidant, anti-inflammatory, anticancer, immunomodulatory, antibacterial, antifungal antispasmodic, analgesic, with the number of confirmed actions constantly rising.

The low water solubility and strong pungency of piperine can present a limitation to reaching its full potential. Although piperine has mostly been regarded as bioavailability enhancer and has been formulated in various complex formulations, both in combination with other bioactives, and therapeutics, recent studies also focus to formulation of individual piperine, in order to increase its bioavailability, and solubility.

This work sums up the most employed approaches for potentiation of the effects of piperine, presented in Fig. 1. Among presented approaches, most use nano- and micro-emulsification, polymer (protein- or polysaccharide-) based carriers, or complexation and conjugation with certain molecules as techniques generally employed for improvement of bioavailability of low-soluble bio-actives. According to our research, piperine has been formulated, and investigated after complexation with cyclodextrine, loaded into nanocapsules and liposomes, in solid dispersion, solid lipid nanoparticles and microemulsion with self-emulsifying drug delivery system and even bile-salt based nanovesicles.

CONCLUSION

Although cyclodextrin complexation is most used technique for improving bioavailability of piperine to date, it is expected that forthcoming methods will be directed to various nanotechnology tools. In addition, it is expected that methods will be modelled according to the need of specific target/site of action, thus enabling targeted delivery of this active substance.

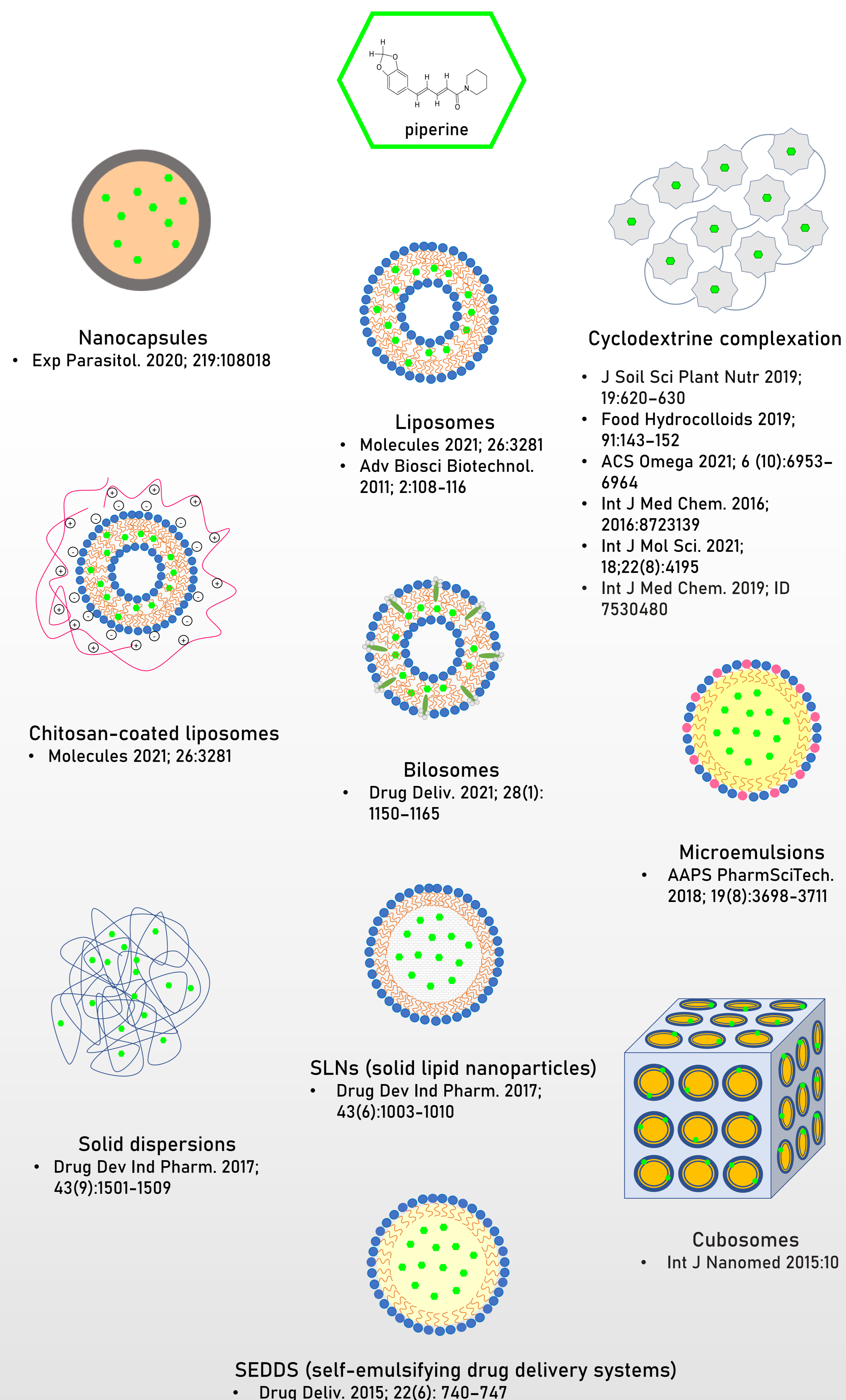


Fig 1. Overview of used methods of potentiating piperine effects.