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Self emulsifying drug delivery system (SEDDS) applied to rectal delivery for absorption enhancement of class III BCS drug

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SEDDS (self emulsifying drug delivery system) is commonly used for absorption enhancement of poorly soluble active pharmaceutical ingredients (APIs). However, when generating *in situ* a nanoemulsion, beside common absorption via drug passive diffusion, additional mechanisms like lymphatic absorption of nanodrops can occur. The aim of our work was to evaluate, whether a SEDDS formulation can improve the bioavailability of highly soluble, but weakly permeable drug (class III of Biopharmaceutical classification system, BCS). An additional challenge was to adapt the formulation to rectal route, where the quantity of physiological liquid for emulsion reconstitution is limited. Ceftriaxone was used as a model drug of BCS III API. Reportedly, ceftriaxone rectal absorption is very low, about 3%, if not accompanied by an absorption enhancer. From previous studies (Roche's personal communication), sodium chenodeoxycholate was chosen as optimal absorption enhancer for all tested formulations. To define the formulation, a screening of oily vehicles, surfactants and co-surfactants was performed using ternary diagrams. The formulation was further optimized by 23 full factorial design. The impact of formulation on dissolution rate, size of droplets after reconstitution and time necessary for reconstitution were considered. *In-vivo* bioavailability of the selected SEDDS formulation was further assessed in rabbits and compared with oily suspension and IV route.

Biography

Tina Kauss completed her PharmD at University of Bordeaux and Master's in Pharmaceutical Technology and Biopharmacy at University Paris 11. She also completed her PhD in 2007 at Bordeaux's University, followed by 3 years of Post-doctoral studies in Pharmaceutical Development (Pharmaceutical Technology, Biopharmacy and Analytical Chemistry). Since 2011, she is working as an Assistant Professor of Pharmaceutical Technology and Biopharmacy at the University of Bordeaux. She has published 16 papers in reputed journals of Pharmaceutical Development.

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