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Ex vivo permeation model for drug delivery in snakes

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Enrofloxacin (1-cyclopropyl-6-fluoro-7-(4-ethyl-1-piperazinyl)-1,4-dihydro-4-oxo-3-quinoline carboxylic acid) was used as the test drug. Enrofloxacin is an antibiotic belonging to the fluoro-quinolone family and is commonly administered to snakes. For the transdermal drug vehicle, Pentravan® cream, an oil-in-water emulsion that uses liposomal technology to ensure reproducible transdermal penetration of active ingredients was used. Prior to initiating the experiment, it was important to consider the optimal area of shed snake skin for enrofloxacin application. Previous studies concluded that the back (dorsal) of shed snake skin, which is thicker than shed belly (ventral) skin, is the best option for drug-permeation studies. This formed the basis of our decision to select the back of the shed skin of *Python molurus bivittatus* to study the permeation of enrofloxacin. Overall, the goal of the study was to develop the transcutaneous route as a simple viable route for the administration of drugs, including antibiotics, such as enrofloxacin, in herpetological medicine. This would facilitate simple effective treatments especially in cases where extended periods of drug therapy are required. The results showed that transcutaneous passage of enrofloxacin in reptiles, or at least in *Python molurus bivittatus*, is feasible. This observation will most probably extend to other molecules, including key therapeutics administered to snakes through less straightforward means. A key implication of such a result is that this would facilitate simple effective treatment by snake owners, especially in cases where extended periods of drug treatment are required.

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