Transcutaneous drug delivery in reptiles

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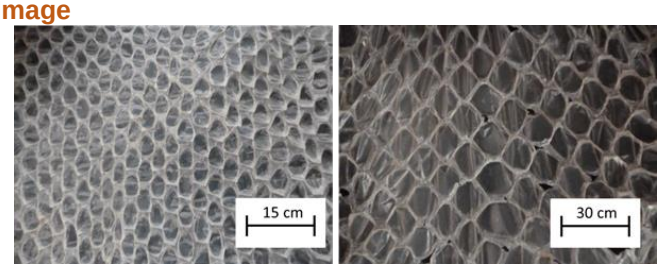
Abstract (300 word limit)

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 fluoroquinolone 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* in order to study the permeation of enrofloxacin (Figure 1). 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.

Image



1A **1B**

Figure 1. Scale: hinge ratio *Python molurus bivittalus*: close to the back of the head (**1A**); close to the tail (**1B**).

Recent Publications

1. Czys, I.; Salvi, J.-P.; Tucrotté-tassel, A.; Kirilov, P.; Perrot, S.; Pignon, C.; Pirot, F.; Falson, F.; Boulieu, R. Development of a HPLC method for the determination of enrofloxacin and ciprofloxacin in reptile plasma after transdermal delivery, Int. J. Pharmacy 5, 571–576 (2015).
2. Kirilov, P.; Tran, V.H.; Ducrotté-Tassel, A.; Salvi, J.-P.; Perrot, S.; Heftek, M.; Boulieu, R.; Pirot, F. Ex-vivo percutaneous absorption of enrofloxacin: Comparison of LMOG organogel vs. pentravan cream. Int. J. Pharm. 498, 170–177 (2016).
3. Ducrotté-Tassel, A.; Kirilov, P.; Salvi, J.-P.; Tran, V. H.; Doré, V.; Marignac, G.; Pignon, C.; Perrot, S.; Boulieu, R. *Ex-vivo* permeation of enrofloxacin through shed skin of Python molurus bivittatus, as evaluated with a Franz cell. Journal of Drug Delivery Science and Technology 36, 89-94, (2016).
4. Ducrotté-Tassel, A.; Kirilov, P.; Salvi, J.-P.; Czyz, I.; Doré, V.; Marignac, G.; Pignon, C.; Boulieu, R.; Perrot, S. Detection of Enrofloxacin after single-dose percutaneous administration in *Python Regius*, *Boa Constrictor Imperator*, and *Acrantophis Dumerili* Journal of Exotic Pet Medicine 26, 263-269, (2017).



Biography

Plamen Kirilov is received Ph.D. degree from the University of Toulouse, France in 2007, he followed as Postdoctoral Associate in Skin Center Laboratories and he joined the Faculty of Pharmacy of Toulouse, as a Training Associate Professor in 2011. In the meantime, he was a researcher at the High School of Chemistry in Rennes and Nancy, France. Dr Kirilov has a keen interests and expertise in the fields of semisolid forms, dispersions and rheology of complex systems. Currently he holds the position of an Associate Professor in the University of Lyon where he is researching "Human and veterinary pharmaceutical technology".

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Notes/Comment