EVALUATION OF TWO METHODS OF SKIN INTEGRITY CHECK IN A IN VITRO DERMAL **ABSORPTION STUDY WITH BENZOIC ACID USING RAT SPLIT-THICKNESS SKIN**

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ABSTRACT

In vitro dermal absorption studies offer a valid alternative for in vivo studies. Skin integrity check methods [permeability coefficient (Kp) of tritiated water and measuring of the invivo studies. Skin integrity evaluation is an essential part of the invivo studies. electrical resistance (ER) across the skin membrane) in an *in vitro* dermal absorption study allows for rapid selection of skin membranes for use in *in vitro* dermal regulatory studies. Three dose groups were used which included eight replicates from four donors (2 replicates/donor) per group in this study. Split-thickness between 340 to 380 µm) were placed in flow-through diffusion cells with 0.64-cm² exposure area and exposed at 32±1°C, at ambient humidity. All the skin membranes after skin integrity evaluation by both the methods were exposure time was 8h with post-exposure time was 8h and in the stratum corneum (at 24h) by using Liquid Scintillation Counter. Results of the group I show that rat skin membrane 3 H₂O-Kp values were between 0.397 x 10⁻⁴ cm/h to 1.18 x 10⁻³ cm/h to 1.18 x 10⁻⁴ Results of the group II show that rat skin membrane ${}^{3}H_{2}O$ -Kp values were between 0.347x10⁻³ cm/h to 1.64x10⁻³ cm/h and corresponding ER values were between 8-18 kΩ. In summary, both the methods of skin integrity check could provide simpler, quicker, cost effective and appropriate alternative to Kp method which radiolabelled material.

OBJECTIVE

The study was designed for evaluate the two skin integrity check methods [permeability coefficient] (Kp) of tritiated water and measuring electrical resistance (ER) across the skin membrane) in an *in vitro* dermal absorption study using benzoic acid as reference chemical through rat split-thickness skin.

EXPERIMENTAL PROCEDURE

8 replicates from 4 Rats per group (Wister, JRF Breeding colony).



RESULTS

Parameters

Coefficient (Kp) for ${}^{3}H_{2}O$ (cm/h)

Rec Rec Dig Electrical Resistance ($k\Omega$) Nu Tap Permeability lap CONCLUSION Receptor Fluid values in all the groups were comparable. In summary, both the methods of skin integrity check gave the comparable results; therefore use Skin of electrical resistance (ER) for skin integrity check could provide simpler, quicker, cost effective and appropriate alternative to Kp method which need radiolabelled material ($^{3}H_{2}O$). Tota

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	Group - I (Rat Skin)		Group - II		Group - III	
			(Rat Skin)		(Rat Skin)	
	Mean	SD	Mean	SD	Mean	SD
	8.9	2.2	13.4	2.7	11.7	3.1
	0.4 - 1	.2 x 10-3	0.4 - 0.9	x 10-3	0.34 - 1.6	5 x 10-3

Skin Integrity Data (Electrical resistance Vs Permeability Coefficient (Kp)

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Mass Ba	ance – Benzoic Acid				
Parameters	Group - I	Group - II	Group		
	(Rat Skin)	(Rat Skin)	(Rat S		
	Mean±SD	Mean±SD	Mean=		
eptor Fluid	45.36±13.79	43.79±10.83	41.27±		
eptor Compartment Wash	$0.60{\pm}0.47$	$0.73{\pm}0.71$	0.47 ± 0		
ested Skin	12.42±3.67	11.66±5.43	10.66±		
sorbed Dose	58.38±12.21	56.17±12.09	52.40±		
nber of Tape strips	2.418 ± 1.1	2.472 ± 1.2	2.324 :		
e 1	0.58 ± 0.56	$0.34{\pm}0.17$	0.54±0		
e 2	0.35 ± 0.42	$0.20{\pm}0.11$	0.37±0		
e 3+	$2.39{\pm}2.80$	$1.90{\pm}1.12$	2.23 ± 10^{-10}		
atum Corneum	3.32 ± 3.71	$2.44{\pm}1.20$	3.14±		
entially Absorbed Dose	60.77±11.81	58.07±11.66	$54.63 \pm$		
n Wash 8h	35.25±9.17	35.78±9.26	$37.31 \pm$		
n Wash 24h	4.71±1.43	3.95±0.76	4.27±		
nor Compartment Wash	$0.33{\pm}0.27$	1.38 ± 1.24	0.72 ± 0		
absorbed Dose	41.22±10.59	41.64±9.51	43.21±		
al Recovery	101.993.13	99.71±2.53	$97.84 \pm$		

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