SAPIENZA
UNIVERSITÀ DI ROMA

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Conference & Exhibition

UMG
Dubium sapientae initium

MONITORING OF SKIN RESPONSE FOLLOWING THE TOPICAL ADMINISTRATION OF VESICULAR DRUG DELIVERY SYSTEMS

ADDLab

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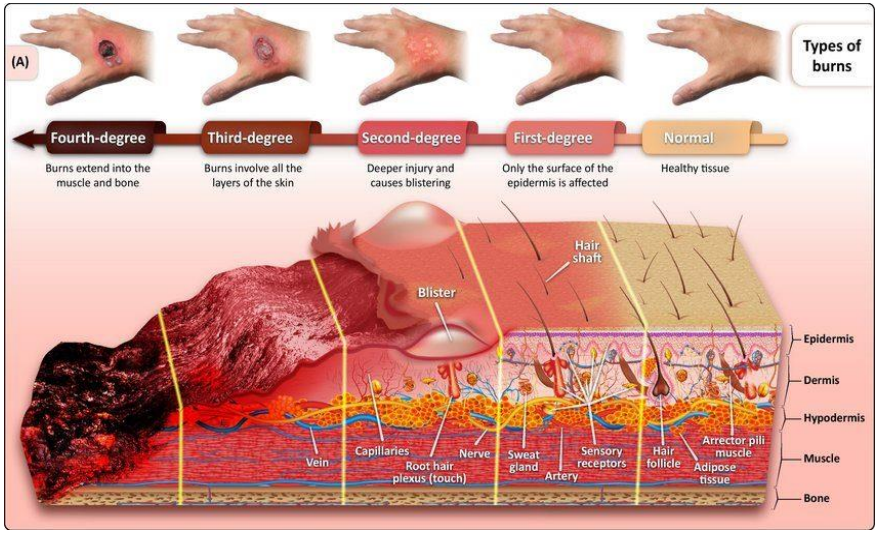
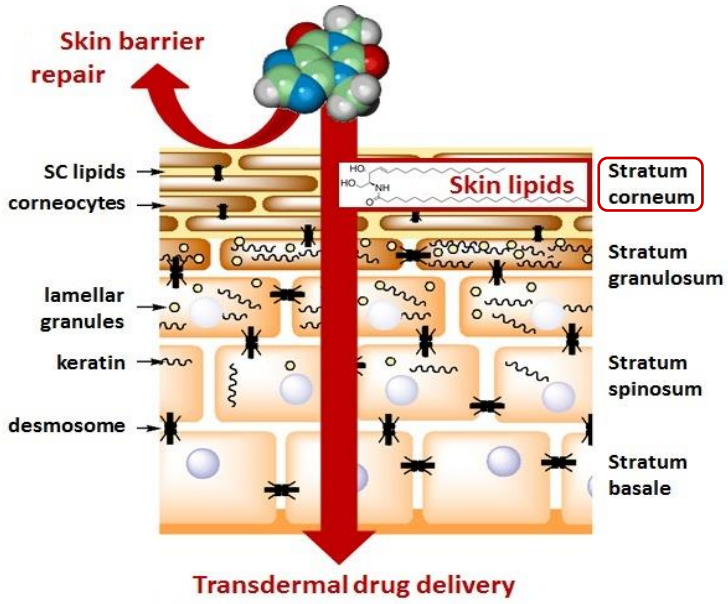
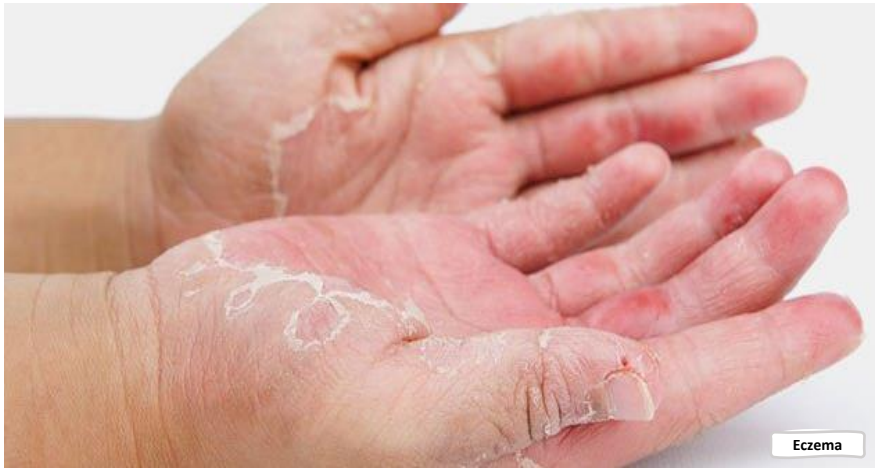
THE SKIN-EGO

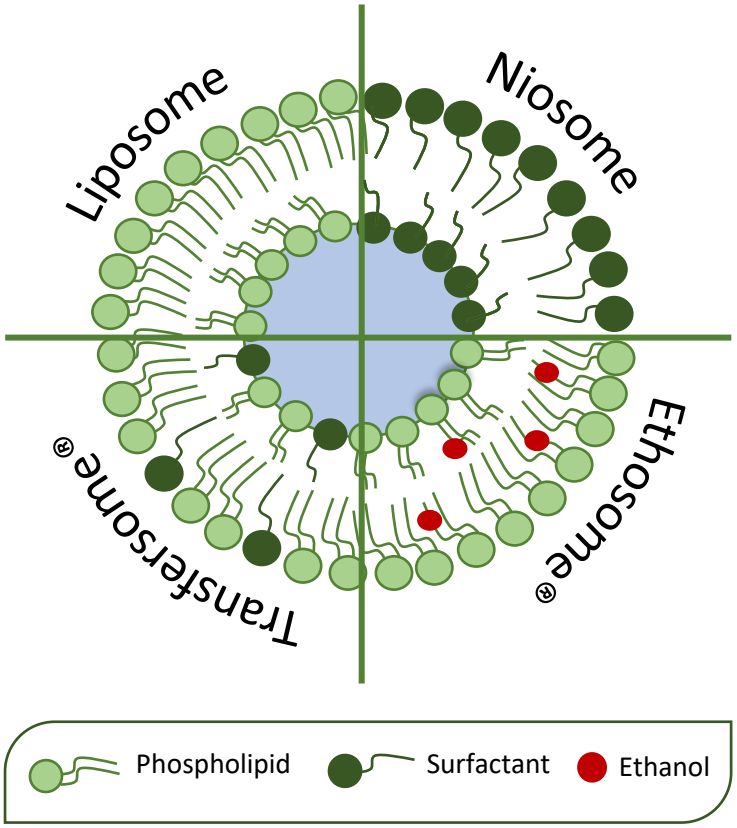


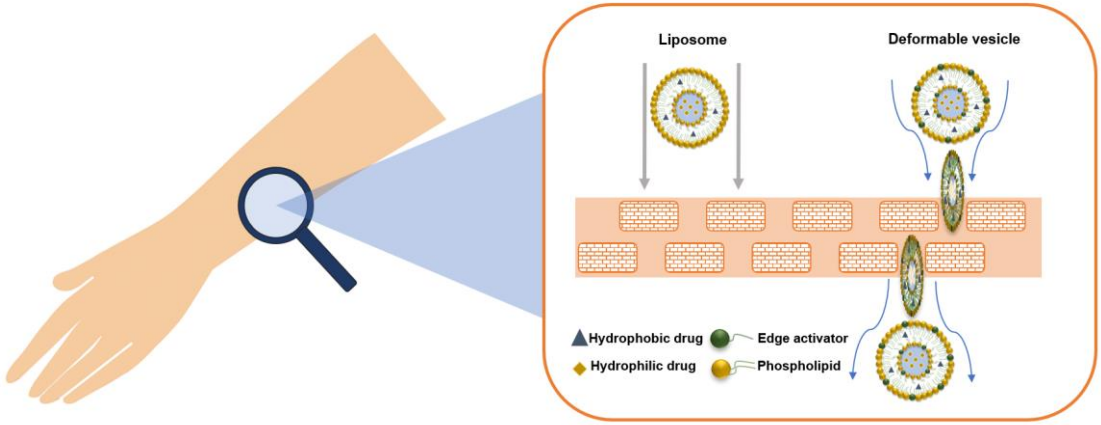




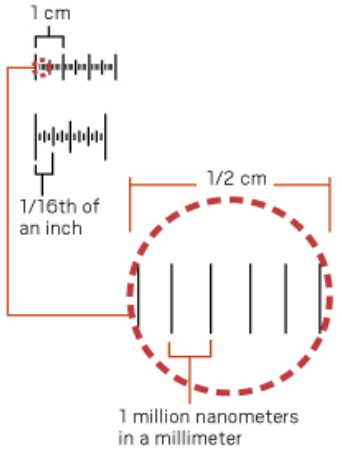
Diseased skin

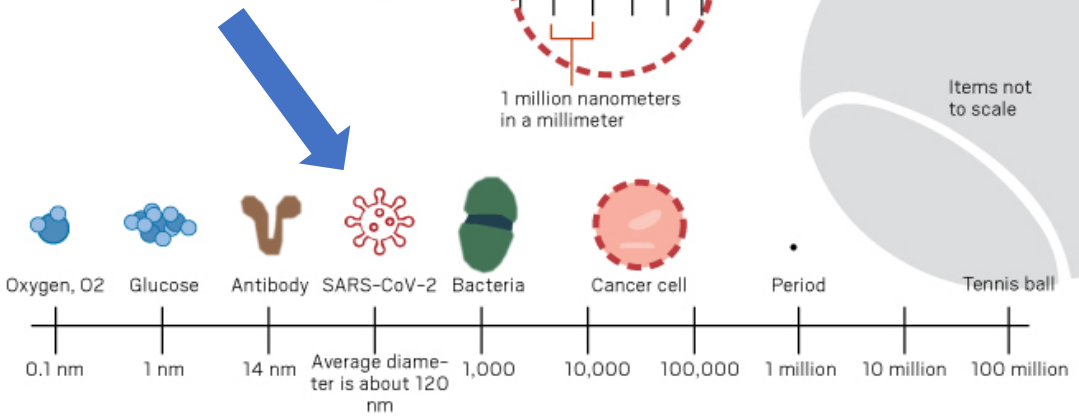
TOPICAL DRUG DELIVERY SYSTEMS



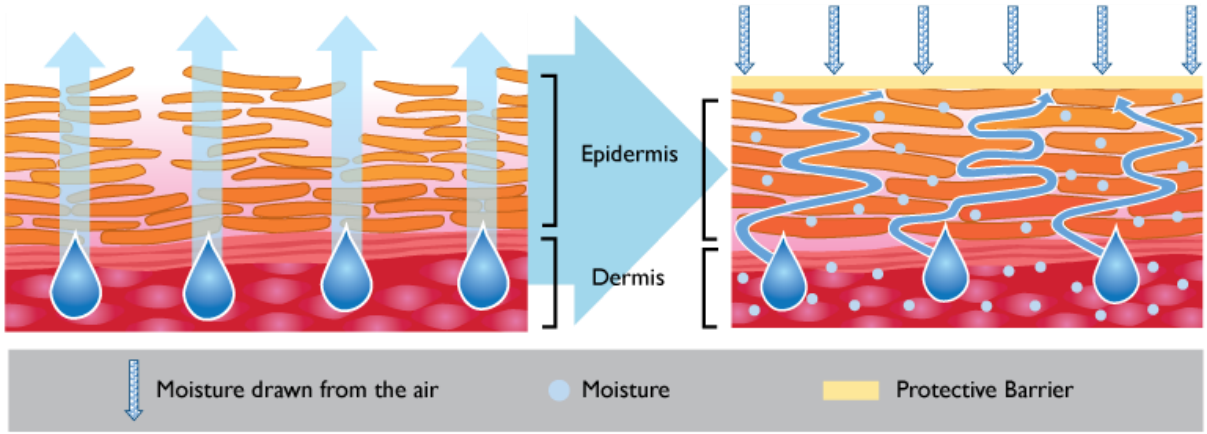


(Int J Nanomed, 2020, submitted)



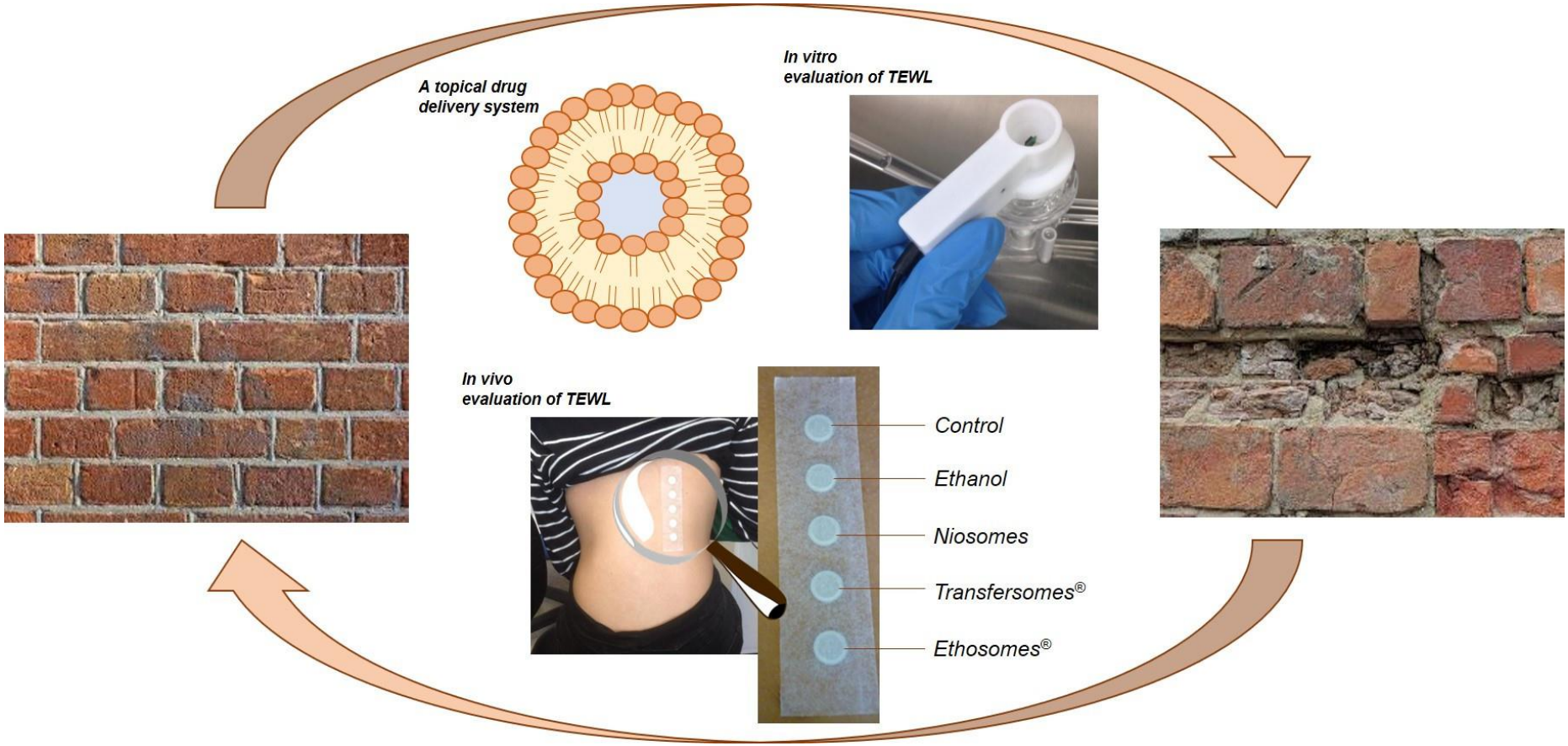


TEWL AS WARNING SIGNALS



SKIN BARRIER ALTERATION

AIM OF THE WORK



(J Pharm Biomed Anal, 2020, 186, 113295)

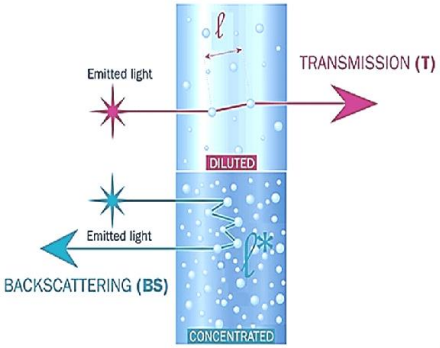
RESULTS (1)

Sample	Size (nm)	PDI[a]	ZP[b] (mV)
Niosomes	117 ± 0.2	0.23 ± 0.01	−23 ± 1.0
Transfersomes®	173 ± 2.0	0.19 ± 0.01	−34 ± 0.4
Ethosomes®	154 ± 1.0	0.14 ± 0.01	−26 ± 1.0

[a] PDI = polidispersity index.
[b] ZP = Z-potential.

Table 1. Physicochemical characterization of niosomes, ethosomes® and transfersomes®. Results are the average of three independent experiments (n = 10) ± standard deviation (SD).

Turbiscan™ Lab



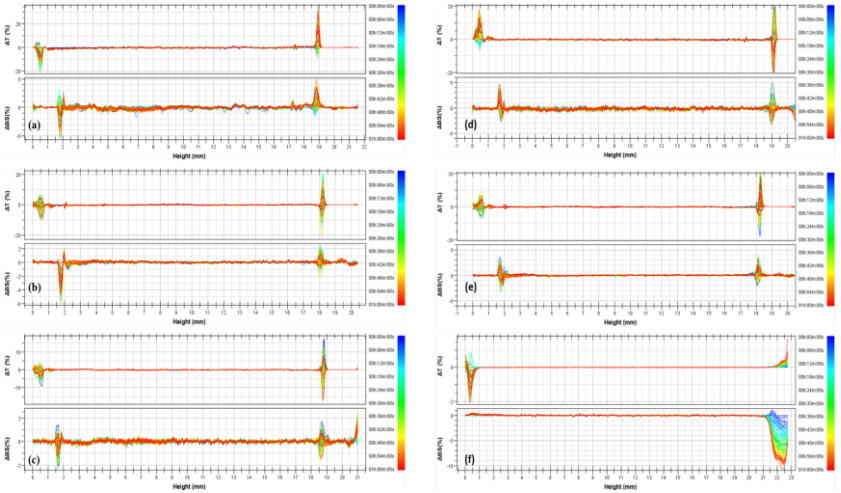


Fig. S1. Turbiscan Lab® Expert analysis. Delta transmission (Δt) and delta back scattering (Δbs) profiles of niosomes (a, d), transfersomes® (b, e) and ethosomes® (c, f) at 25°C (left side) and 37°C (right side), are reported as a function of time (0-1 h) and sample height (8 mm).

RESULTS (2)

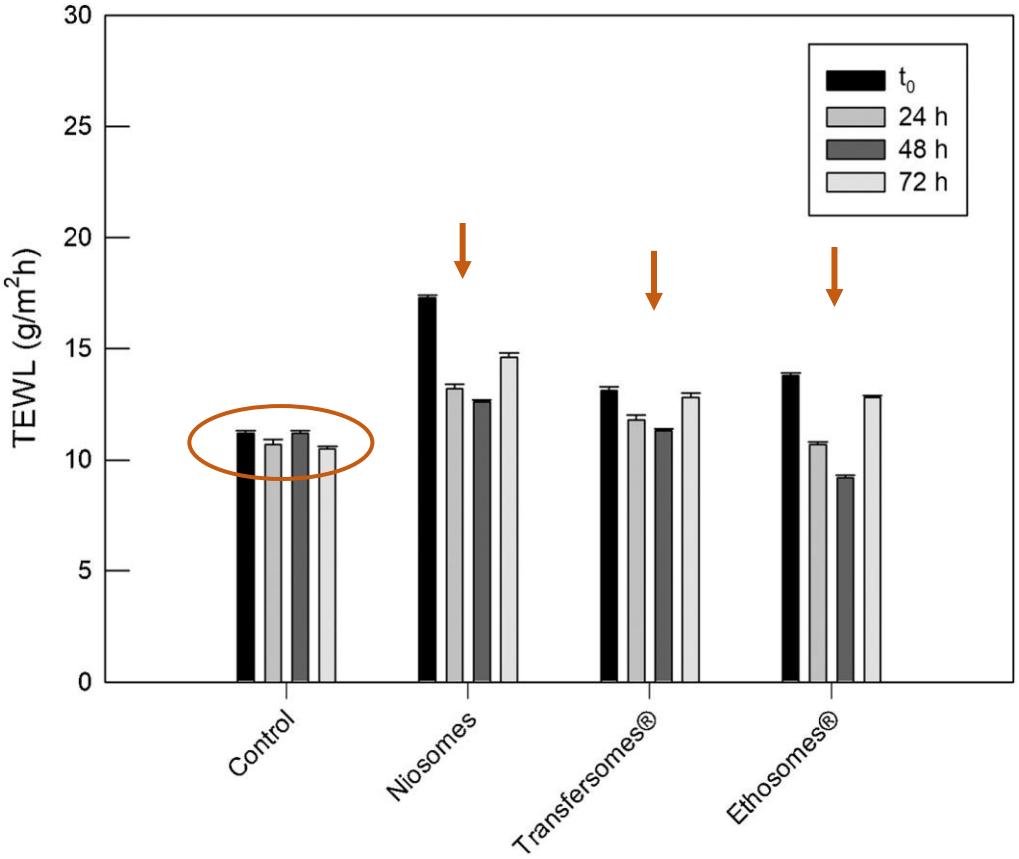
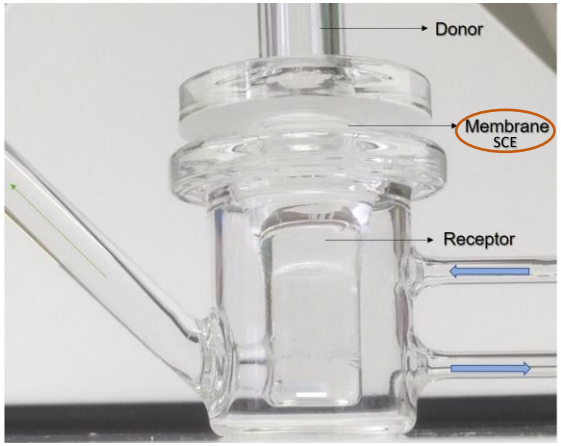


Fig. 1. *In vitro* TEWL values of niosomes, ethosomes® and transfersomes® topically applied on the SCE membrane models in non-occlusive conditions. Results are the average of three different independent experiments ± standard deviation. If bar is not reported, it is within the column.



Franz diffusion vertical cell

In vitro Tewameter® VT310

(Arch Dermatol, 1963, 88, 702-705)

RESULTS (3)

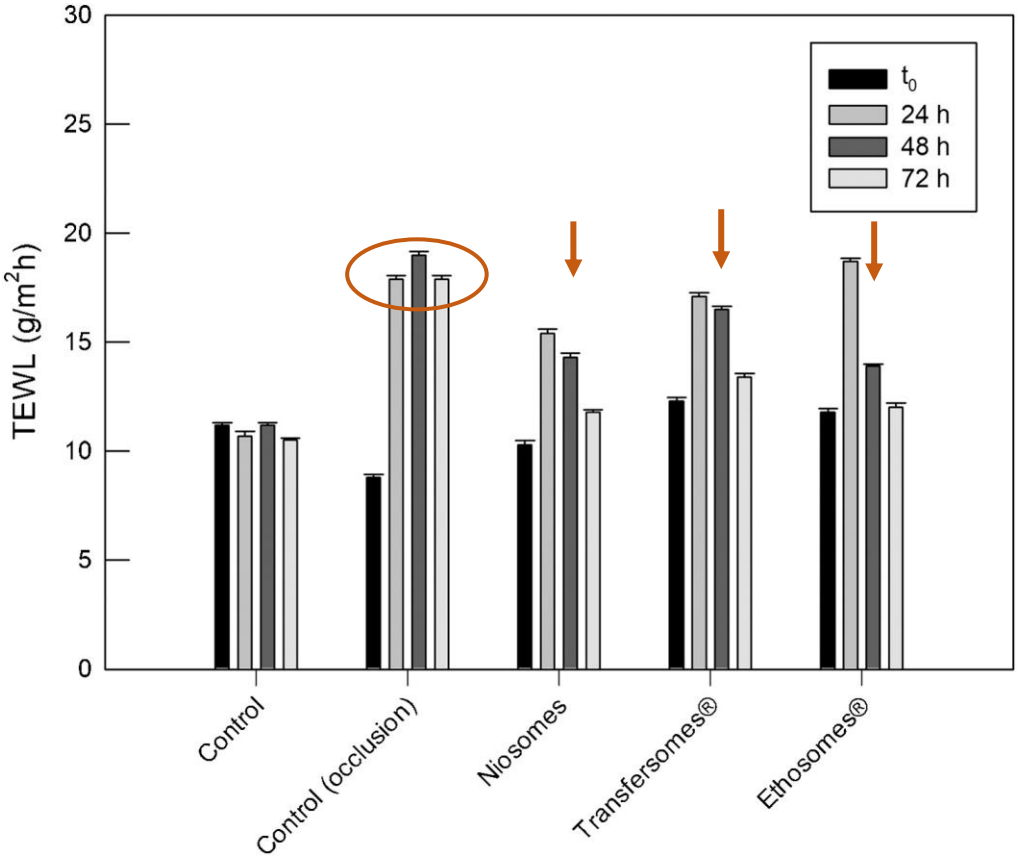
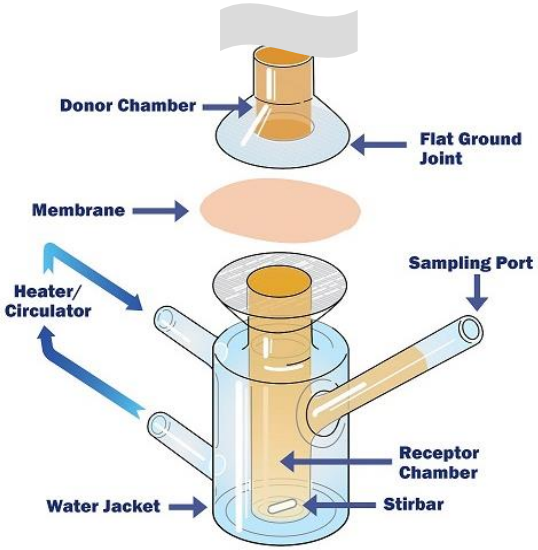


Fig. 2. TEWL values of niosomes, ethosomes® and transfersomes® topically applied on the SCE membrane models in occlusive conditions. Results are the average of three different independent experiments ± standard deviation. If bar is not reported, it is within the column.



RESULTS (4)

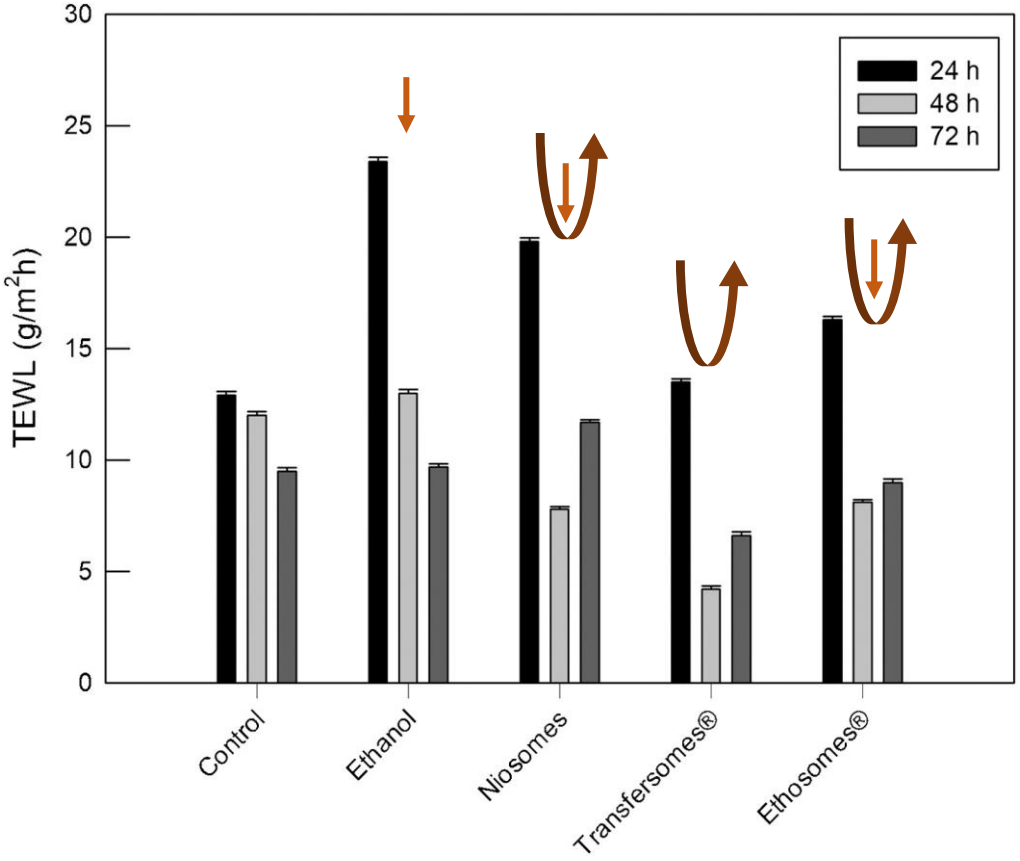
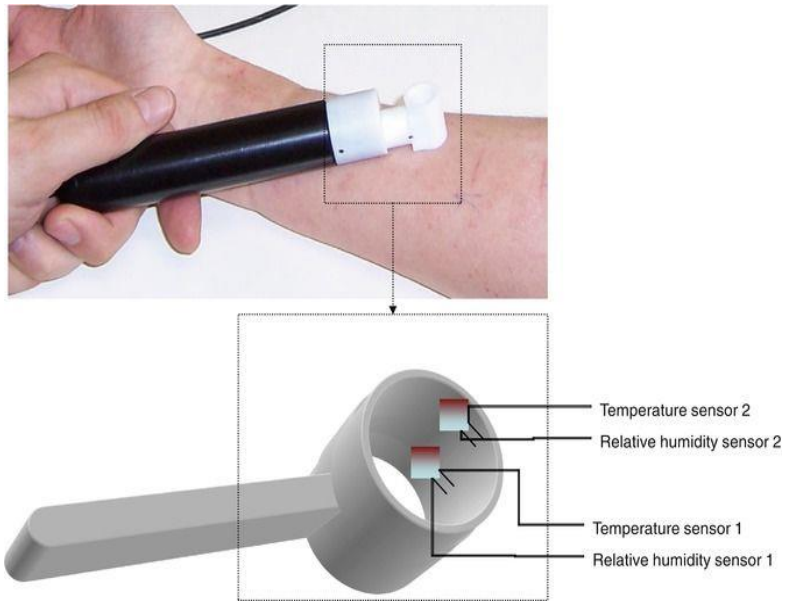


Fig. 3. TEWL values of niosomes, ethosomes® and transfersomes® topically applied on healthy human volunteers (n=15, totally) in non-occlusive conditions. Results are the average of three different independent experiments ± standard deviation. If bar is not reported, it is within the column.



Tewameter® TM 300

RESULTS (5)

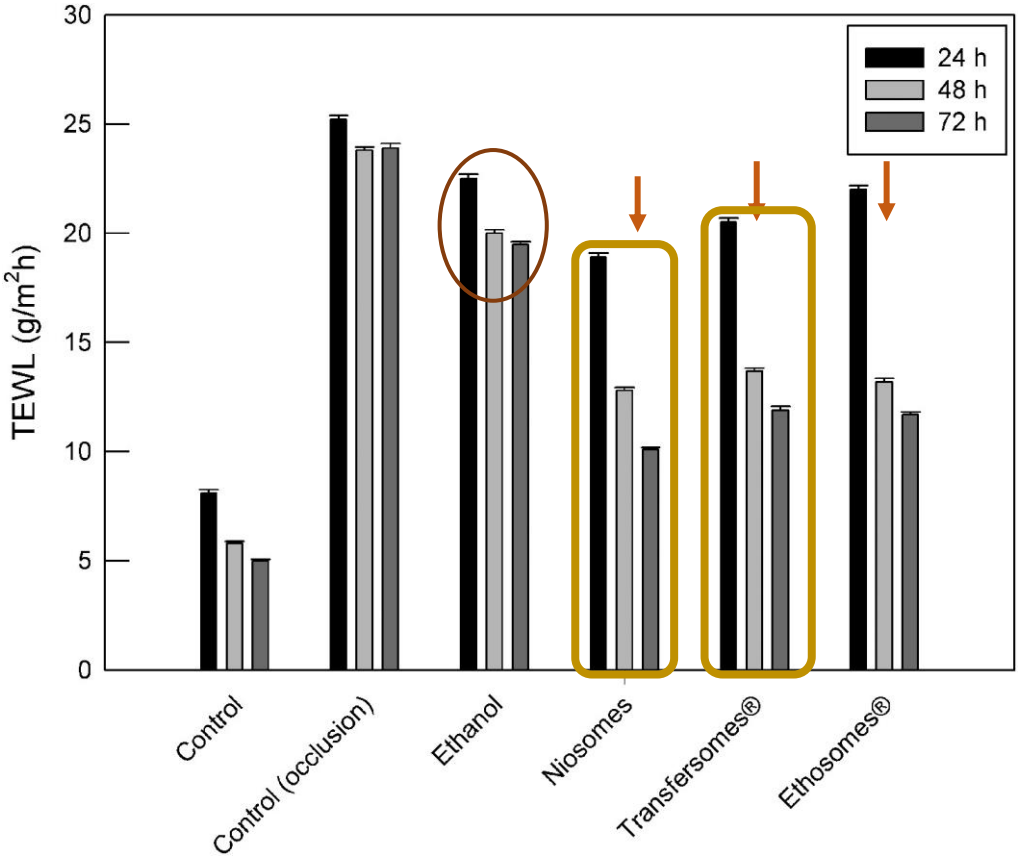
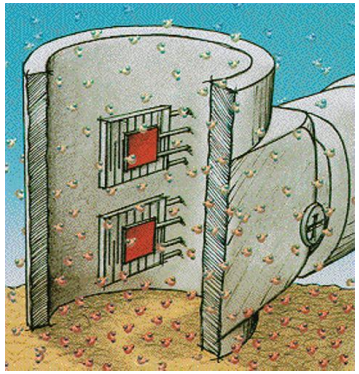
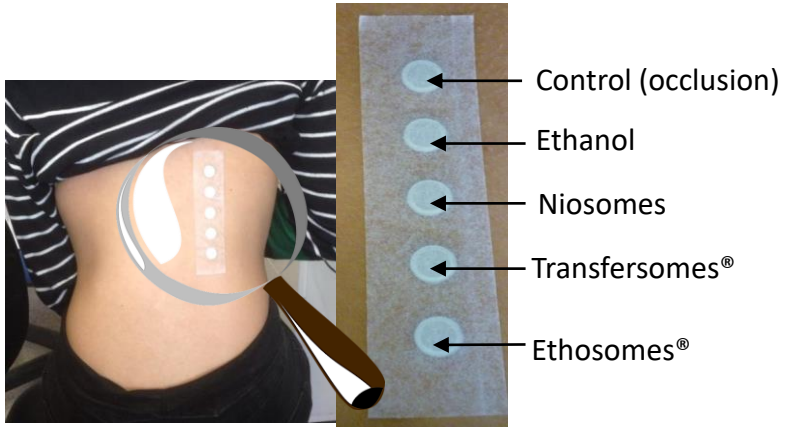


Fig. 4. TEWL values of niosomes, ethosomes® and transfersomes® topically applied on healthy human volunteers (n=15, totally) in occlusive conditions. Results are the average of three different independent experiments ± standard deviation. If bar is not reported, it is within the column.





CONCLUSIONS

TEWL values provide some parameters to evaluate and predict the integrity of skin lipid structure after topical administration of formulations.

The advantages of these innovative apparatus is that TEWL values could be evaluated without altering SCE membrane of the skin and causing local pain to patients and/or healthy volunteers after the topical administration of colloidal nanocarriers but also drug, patches and other stimuli.

TEWL values depend on the composition of the nanocarriers, the experimental conditions and incubation times. In particular, lipids, surfactants and edge activator of nanocarriers modify the TEWL values of the skin and the water loss are affected by the occlusive and non occlusive conditions.

TEWL values are time-dependent and gradually recovered from 24 to 72 h due to the rearrangement of lipids in SCE membranes reaching compact structure similar to the native skin before the topical application of nanocarriers.

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