



Training session : ATOP 7[®] latest publications





10th World Congress of Veterinary Dermatology - July 20-26, 2024 - Boston, USA

Speed and amplitude of diffusion assessment of a spot-on based on natural ingredients in a dog model of tape stripping

M. LEGAIN¹, A. IDEE², M. MOSCA¹, M. CAUQUIL¹ and D. PIN¹

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²Laboratoire de Dermato-Cosmétique Animale (LDCCA)/Neutrumo, Castres, France

1. Introduction

Support mechanism of action of ATOP 7[®] spot-on:

- Absorption of the spot on
- Storage
- Controlled release
- Warmer enhancing effect with decreased transdermal water loss (TEWL) value
- Diffusion?

Hypothesis:

- The pipette diffuses evenly over the animal's skin, but requires several applications before an effect is visible.
- The pipette diffuses progressively. The effect is first visible close to the point of application and then spreads outwards in a centrifugal direction.

2. Materials and methods

2 healthy male Beagle dogs

Successive applications of DermoSpot 7[®] spot-on (1 pipette/week for 4 weeks) on the middle of the back.

TEWL and skin surface hydration (SSH) are measured, after determination of the stratum corneum by tape stripping.

Measurements are performed at 0, 5, 15, 20, 30 or 45 min from the point of application.

If the value of TEWL or/and SSH was back to normal values before tape stripping at 0 min, the measure was made at 10 min. If the value of TEWL was not changed, the measurement was stopped at this distance, a new pipette was poured on and the new measure was made one week later.

3. Results

TEWL (g.m⁻².h⁻¹)

SSH (%)

4. Discussion

In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.

The results seem to support hypothesis 1 because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values, regardless of distance, are back to normal.

The value of SSH is independent of ATOP 7[®] spot-on (results not shown).

5. Conclusion and perspectives

ATOP 7[®] spot-on diffuses from the application point in all directions and limits TEWL after barrier alteration. Three to four pipettes are needed to observe an effect at 45 min. This study is not sufficient to confirm the diffusion model of ATOP 7[®] spot-on. A new study with more dogs will be designed to validate a hypothesis of diffusion.

Courtesy of interview: M. CAUQUIL is a Research and Development manager in LDCCA/Neutrumo.

Sources of funding: Laboratoire de Dermato-Cosmétique Animale (LDCCA)

Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants

Magali Martin Biran¹, Sylvie Laurent¹, Marion Mosca¹, Didier Pin¹, Virginie Médaille¹, Marie Cauquil¹

¹Compass, Hydracis, France; ²Université de Lyon, VetAgro Sup, IntervetIONS Collèges Environnement, UFRP 2014-A154, Marcy l'Etoile, France; ³Neutrumo, Castres, France

INTRODUCTION

Classical methods for assessing skin hydration, like the corneometer, only measure surface hydration but provide no deeper insight. Innovative human dermatology techniques like Time-Domain Nuclear Magnetic Resonance (TD-NMR) offer more in-depth information.

OBJECTIVE

Our objective was to characterize by TD-NMR the hydrating properties of two topical formulas: ATOP 7[®] Hydracream and ATOP 7[®] MAX Hydracream (Dermoscent[®], Neutrumo, Castres, France) on canine skin explants.

MATERIALS & METHODS

12 canine skin explants (0.5 cm²) were collected from the back of healthy beagle dogs and divided into 3 groups (n=4):

- control (dry back)
- ATOP 7[®] MAX Hydracream (application of 1 mg per explant)
- ATOP 7[®] Hydracream (application of 1 mg per explant).

Skin hydration was assessed before and 30 minutes after application using TD-NMR methods (20 MHz), by measuring:

- Total water proton quantity
- Water proton compartmentalisation within the skin: very bound (constitutive water, bound (hygroscopic effects), and very free water (extracellular water)).

RESULTS

- Total water proton quantity

After application of the two topical formulas, total proton quantity tended to decrease.

This result is characteristic of a "masking" effect of the constitutive water of the explants, due to the lipidic content of the topically applied formulas. ATOP 7[®] Hydracream and ATOP 7[®] MAX Hydracream offer a barrier effect to maintain these epidermal hydration.

- Water compartmentalisation in the skin

After application of the two topical formulas, water compartmentalisation changed compared to control with a reduction of very free water to the benefit of bound water.

These results indicate enhanced water retention within the skin after application of the formulas.

CONCLUSION

This pilot study pioneers a novel and elegant model to assess canine skin hydration by TD-NMR. The amplitude and range of water distribution changes align with successful hydration on human skin studies, confirming the tested product's hydrating effect.

Sources of funding: Neutrumo (France), Compass (France), Hydracis (France) and Marie Cauquil are employed by Neutrumo (France).

Poster presented at the WCVI 2024
Proves that the product diffuses through the entire body

Poster presented at the ESVD congress 2025
Proves the hydrating properties



Do you blush
too easily?

Allergic skin
Pruritus
Atopic skin
Skin dryness

?

ATOP 7[®] line

To help manage pruritic,
allergic, atopic skin



SOOTHING

Definition (ICADA)

Canine Atopic Dermatitis (CAD) has been defined as a **genetically predisposed inflammatory and pruritic allergic skin disease with characteristic clinical features**. It is associated most commonly with IgE antibodies to environmental allergens.

Pathogenesis

“The pathogenesis of CAD is incompletely understood, but is believed to involve complex interactions between genetic and environmental factors that lead to **epidermal barrier dysfunction, immune dysregulation, and dysbiosis** of the cutaneous microbiome.”

Outerbridge CA, *et al.* Adv Small Anim Care. 2021;2:101-115.

To help manage pruritic, allergic, atopic skin

ATOP 7[®] Mousse

Rinse-free soothing and cleansing foam

ATOP 7[®] Spray

Steroid-free submicronic soothing emulsion

ATOP 7[®] Shampoo

Soothing cream-shampoo

ATOP 7[®] Hydra Cream

Moisturizing fluid cream



ATOP 7[®] spot-on

Soothing & skin barrier repairing spot-on

ATOP 7[®] Hydra Spray / MAX hydra

Protective hydrating mist

ATOP 7[®] spot-on

Soothing and barrier repair spot-on



**Unique natural spot-on for the
maintenance/background therapy
of atopic dermatitis**



ATOP 7[®] spot-on

Soothing and barrier repair spot-on



INDICATION

Dry, sensitive, irritated skin
Allergic, atopic, pruritic skin

Helps:

- Hydrate and reinforce the skin barrier
- Soothe pruritus & inflammation
- Purify to limit secondary infections



- 100% natural tailor-made spot-on to address the needs of atopic skins: phytoceramides and precursors of ceramides (types 1-3-9)
- Efficient diffusion agent with a simple and compliant dosage: 1 single dose at a single point, once per week
- Can substitute daily intake of Omega 3 and 6
- Scientifically proven efficacy
- Eco-friendly packaging

1 pipette per week as long as necessary



4 pipettes



KEY INGREDIENTS

- Hemp and wheat seed oils, rich in EFA
- Wheat phytoceramides
- Soothing EO: turmeric, wintergreen, shiu wood + Bisabolol
- Tea tree EO and purifying neem extract
- Vegetable antioxidant vitamin E

SCIENTIFIC EVIDENCE

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Supposed mechanism of action of ATOP 7[®] spot-on:

- Absorption of the spot-on
- Storage
- Gradual Release
- Barrier enhancing effect with decreased transepidermal water loss (TEWL) value
- Diffusion

Hypothesis:

- The pipettes diffuse evenly over the animal's skin, but require several applications before an effect is visible
- The pipettes diffuse progressively. The effect is first visible close to the point of application and then spreads outwards in a centrifugal direction.

2. Materials and methods

- 2 healthy male Beagle dogs
- Successive applications of Dermoscent ATOP 7[®] spot-on (1 pipette/week for 4 weeks) on the middle of the back.
- TEWL and skin surface hydration (SSH) are measured, after deamination of the stratum corneum by tape stripping.
- Measurements are performed at 5, 10, 15, 20, 30 or 40 cm from the point of application.
- If the value of TEWL or/and SSH was back to normal (value before tape stripping) at 5cm, the measure was made at 10cm. If the value of TEWL was not changed, the measurement was stopped at this distance, a new pipette was poured on and the new measures were made one week later.

Week 1 Week 2 Week 3 Week 4

is TEWL or SSH value at 5cm equal to the value before tape stripping (x1.10%) ?

Yes: New measurements at 10cm further

No: New pipettes are applied and new measurements are made one week later

3. Results

Dog 1

Dog 2

- At study start, mean TEWL values before (Pre-TS) and after stratum corneum tape stripping (Post-TS) were respectively 37.7 and 87.3 $\mu\text{m}^2\cdot\text{h}^{-1}$ in dog 1 and 45.3 and 93.4 $\mu\text{m}^2\cdot\text{h}^{-1}$ in dog 2.
- For dog 1, TEWL after tape stripping was back to baseline at 10cm (TEWL=40.3 $\mu\text{m}^2\cdot\text{h}^{-1}$) after 2 weeks and at 20, 25, 30 and 40cm (TEWL=34.8 $\mu\text{m}^2\cdot\text{h}^{-1}$) 3 weeks.
- For dog 2, TEWL after tape stripping was back to baseline at 5cm after 2 weeks (TEWL=39 $\mu\text{m}^2\cdot\text{h}^{-1}$), at 10cm after 3 weeks (TEWL=53 $\mu\text{m}^2\cdot\text{h}^{-1}$) and at 15, 20, 25, 30 and 40cm after 4 weeks (TEWL=35.5 $\mu\text{m}^2\cdot\text{h}^{-1}$)

4. Discussion

- In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.
- The results seem to support hypothesis 1 because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values, regardless of distance, are back to normal.
- The value of SSH is independent of ATOP 7[®] spot-on (results not shown)

5. Conclusion and perspectives

ATOP 7[®] spot-on diffuses from the application point in all directions and limits TEWL after barrier alteration. Three to four pipettes are needed to observe an effect at 40cm. This study is not sufficient to confirm the diffusion model of ATOP 7[®] spot-on. A new study with more dogs will be designed to validate a hypothesis of diffusion.

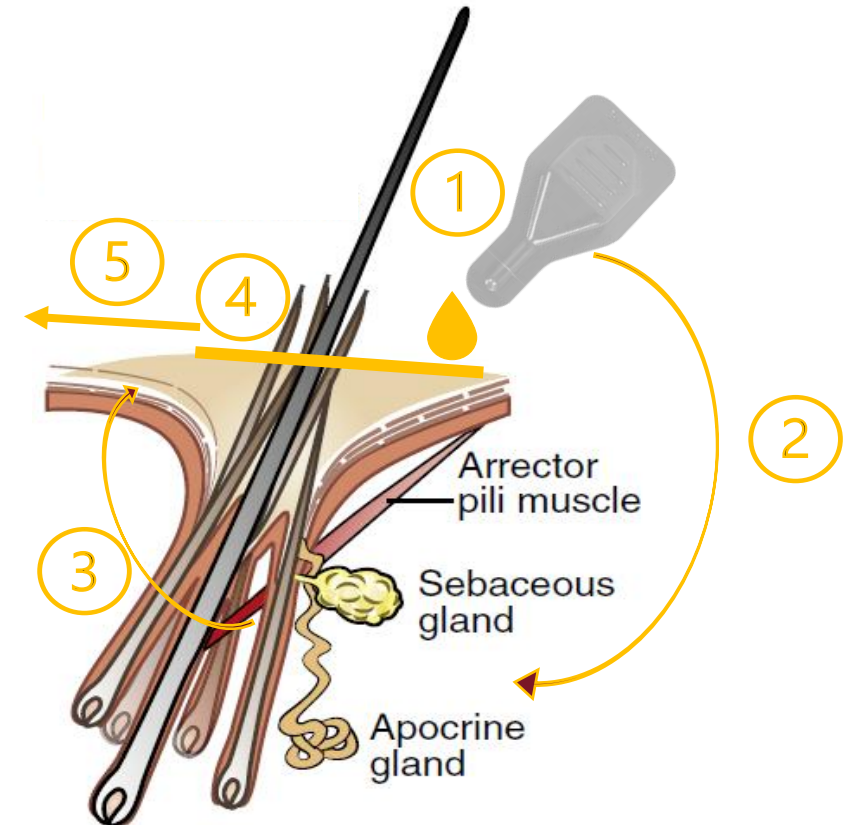
Conflict of interest : M. CAUQUIL is a Research and Development manager in LDCA/Nextmune.

Source of funding : Laboratoire de Dermo-Cosmétiques Animale (LDCA)

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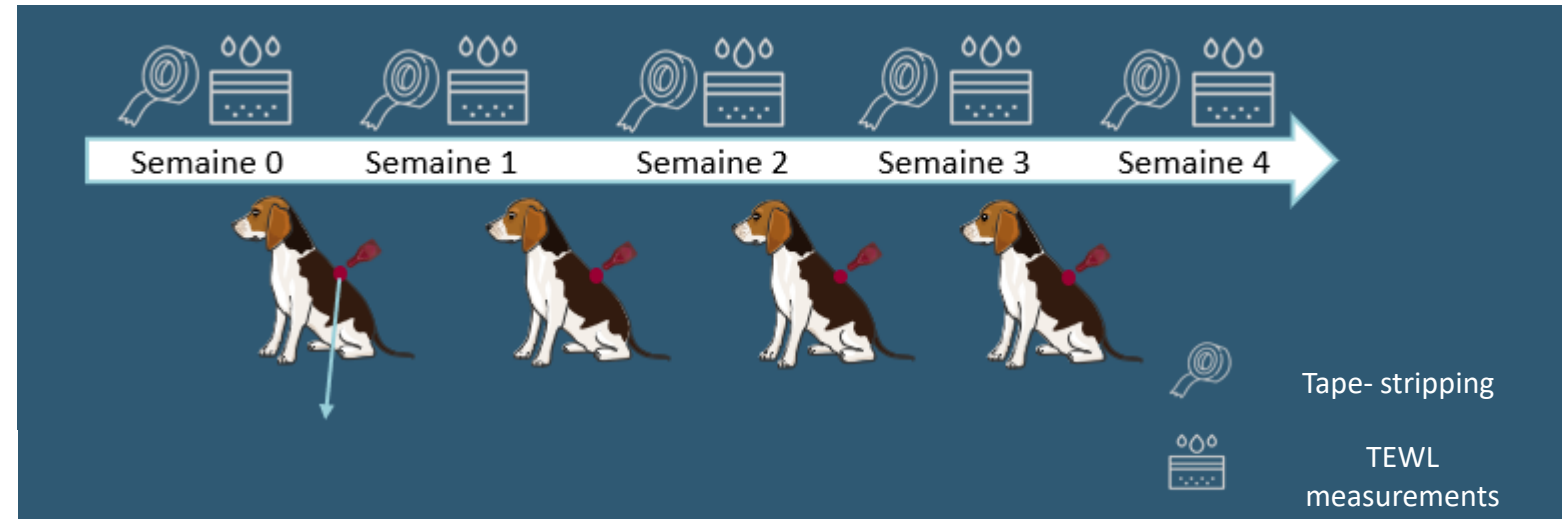
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Source of funding : Laboratoire de Dermato-Cosmétique Animale (LDCA)

3. Materials & method

- 2 healthy male Beagle dogs
- Successive applications of Dermoscent[®] ATOP 7[®] spot-on (1 pipette per week for 4 weeks) on the middle of the back
- TEWL is measured, before and after delamination of the *stratum corneum* by tape-stripping.



SCIENTIFIC EVIDENCE

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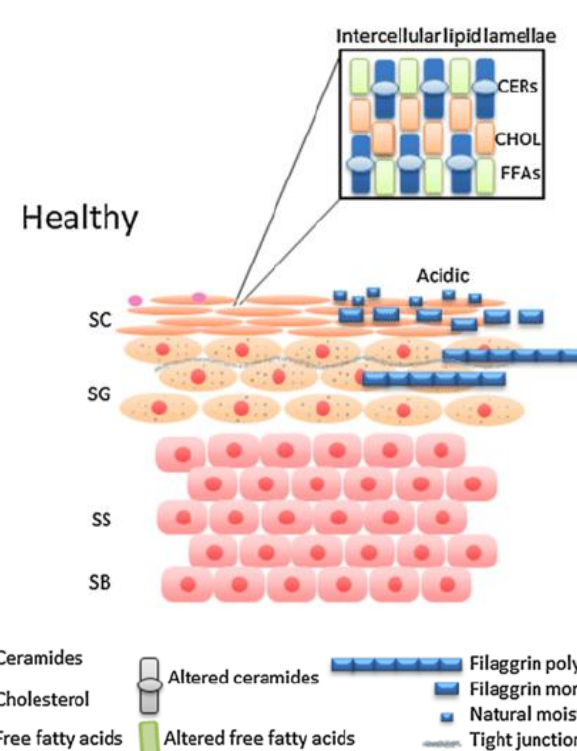
Conflict of Interest: M. CAUQUIL is a Research and Development manager in LDCA/Nextmune.

Source of Funding: Laboratoire de Dermo-Cosmétique Animale (LDCA)

3 bis. Focus on tape-stripping method



Healthy dog



Skin barrier is healthy and acts as a protective shield

Trans epidermal water loss (TEWL) is low

SCIENTIFIC EVIDENCE

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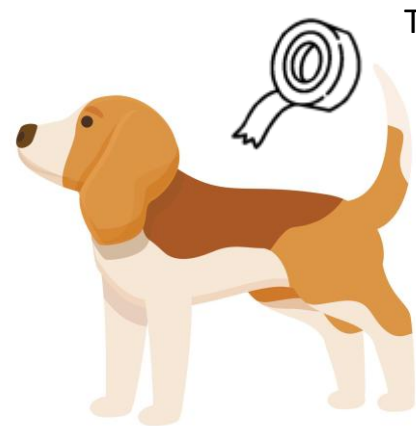
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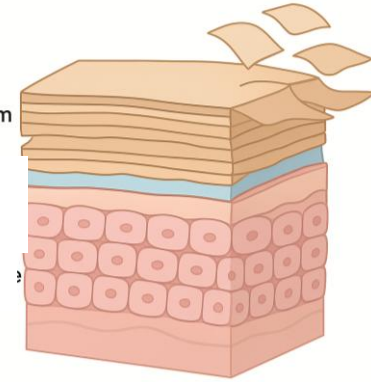
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For dog 2, TEWL after tape stripping was back to baseline at 5cm after 2 weeks (TEWL=39 $\mu\text{m}^2\cdot\text{h}^{-1}$), at 10cm after 3 weeks (TEWL=53 $\mu\text{m}^2\cdot\text{h}^{-1}$) and at 15, 20, 25, 30 and 40cm after 4 weeks (TEWL=35.5 $\mu\text{m}^2\cdot\text{h}^{-1}$).

3 bis. Focus on tape stripping method



Tape-stripping



Altered skin barrier

Trans epidermal water loss (TEWL) is high

Healthy dog

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For dog 1, TEWL after tape stripping was back to baseline at 10cm (TEWL=40.3g.m⁻².h⁻¹) after 2 weeks and at 20, 25, 30 and 40cm (TEWL=34.9g.m⁻².h⁻¹) 3 weeks.

For dog 2, TEWL after tape stripping was back to baseline at 5cm after 2 weeks (TEWL=39g.m⁻².h⁻¹), at 10cm after 3 weeks (TEWL=53g.m⁻².h⁻¹) and at 15, 20, 25, 30 and 40cm after 4 weeks (TEWL=35.5g.m⁻².h⁻¹)

4. Discussion

In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.

The results seem to support hypothesis 1 because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values, regardless of distance, are back to normal.

The value of SSH is independent of ATOP 7[®] spot on (results not shown)

5. Conclusion and perspectives

ATOP 7[®] spot-on diffuses from the application point in all directions and limits TEWL after barrier alteration. Three to four pipettes are needed to observe an effect at 40cm. This study is not sufficient to confirm the diffusion model of ATOP 7[®] spot-on. A new study with more dogs will be designed to validate a hypothesis of diffusion.

Conflict of interest : M. CAUQUIL is a Research and Development manager in LDCANextmune.
Source of funding : Laboratoire de Dermo-Cosmétique Animale (LDCA)

Reference

Idee, A., Mosca, M., Pin, D. Skin Barrier Reinforcement Effect Assessment of a Spot-on Based on Natural Ingredients in a Dog Model of Tape Stripping. *Vet. Sci.* 2022, 9, 390. <https://doi.org/10.3390/vetsci9080390>

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3. Materials & method

Semaine 0 **Semaine 1** **Semaine 2** **Semaine 3** **Semaine 4**

Tape-stripping

TEWL measurements

- We measured the TEWL at 5,10,15,20,30 and 40cm from the point of application
- If the value of TEWL was back to normal (value before tape stripping) at 5cm, the measure was made at 10 cm. If the value of TEWL was not changed, the measurement was stopped at this distance and a new pipette was poured on and the new measures were made one week later.

SCIENTIFIC EVIDENCE

Poster WCVD 2024 – Speed and amplitude of diffusion assessment of a spot-on based on natural ingredients in a dog model of tape stripping. M.LEGAIN, A. IDEE, M. MOSCA, M.CAUQUIL and D.PIN.

10th World Congress of Veterinary Dermatology - July 25-29, 2024 - Boston, USA

Speed and amplitude of diffusion assessment of a spot-on based on natural ingredients in a dog model of tape stripping

M. LEGAIN*, A. IDEE*, M. MOSCA*, M. CAUQUIL** and D. PIN*

*Université de Lyon, VetAgro Sup, Interactions Cells Environnement, Marcy l'Etoile, France
** Laboratoire de Dermo-Cosmétique Animale (LDCA)/Nextmune, Castres, France

1. Introduction

Supposed mechanism of action of ATOP 7[®] spot-on:

- Absorption of the spot-on
- Storage
- Gradual Release
- Barrier enhancing effect with decreased transepidermal water loss (TEWL) value
- Diffusion?

Hypothesis:

- The pipettes diffuse evenly over the animal's skin, but require several applications before an effect is visible
- The pipettes diffuse progressively. The effect is first visible close to the point of application and then spreads outwards in a centrifugal direction.

2. Materials and methods

- 2 healthy male Beagle dogs
- Successive applications of Dermoascent ATOP 7[®] spot-on (1 pipette/week for 4 weeks) on the middle of the back.
- TEWL and skin surface hydration (SSH) are measured, after deamination of the stratum corneum by tape stripping.
- Measurements are performed at 5, 10, 15, 20, 30 or 40 cm from the point of application.
- If the value of TEWL or/and SSH was back to normal (value before tape stripping) at 5cm, the measure was made at 10cm. If the value of TEWL was not changed, the measurement was stopped at this distance, a new pipette was poured on and the new measures were made one week later.

3. Results

4. Discussion

- In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.
- The results seem to support hypothesis 1 because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values, regardless of distance, are back to normal.
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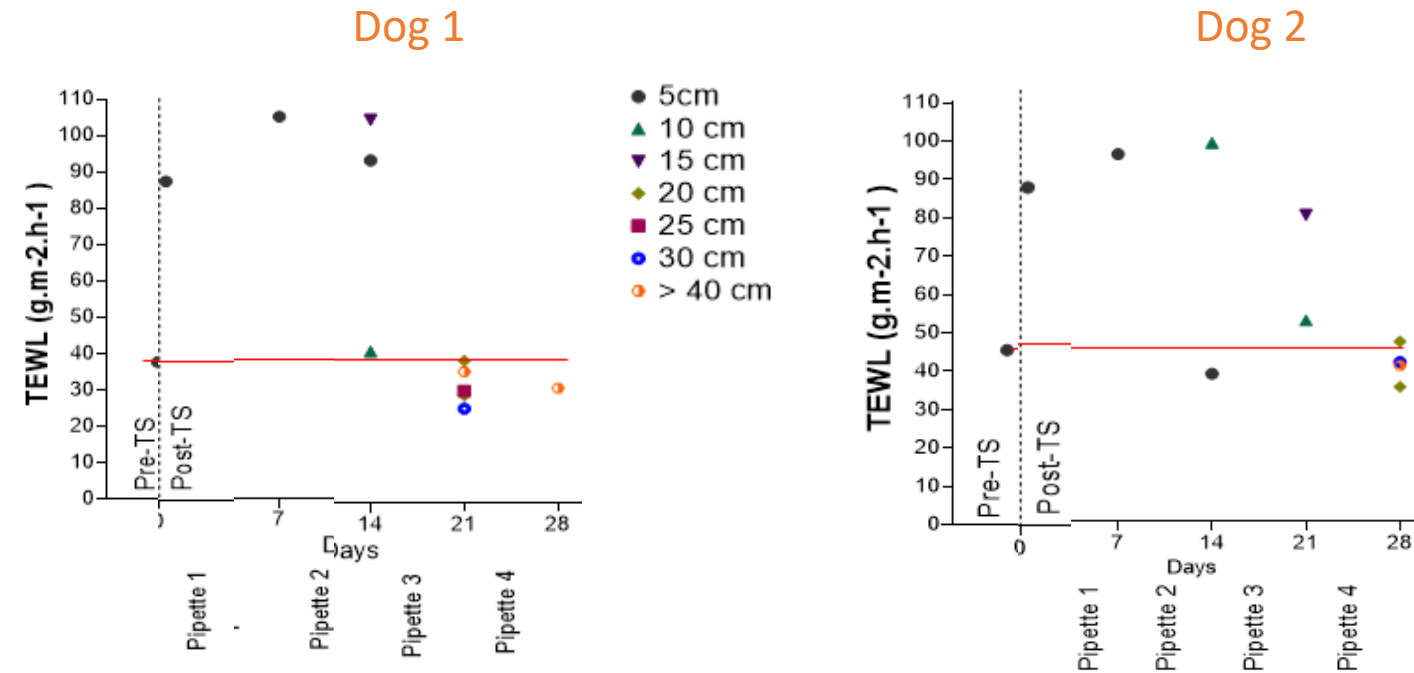
Conflict of interest : M. CAUQUIL is a Research and Development manager in LDCA/Nextmune.

Source of funding : Laboratoire de Dermo-Cosmétique Animale (LDCA)

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4. Results



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- Measurements are performed at 5, 10, 15, 20, 30 or 40 cm from the point of application.
- If the value of TEWL or/and SSH was back to normal (value before tape stripping) at 5cm, the measure was made at 10cm. If the value of TEWL was not changed, the measurement was stopped at this distance, a new pipette was poured on and the new measures were made one week later.

3. Results

- At study start, mean TEWL values before (Pre-TS) and after stratum corneum tape stripping (Post-TS) were respectively 37.7 and 87.3 $\mu\text{m}^2\cdot\text{h}^{-1}$ in dog 1 and 45.3 and 95.4 $\mu\text{m}^2\cdot\text{h}^{-1}$ in dog 2.
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4. Discussion

- In this model we supposed that if the TEWL value measured at one point is not back to normal (TEWL value before tape stripping), the pipette had not diffused to this point.
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- The value of SSH is independent of ATOP 7[®] spot-on (results not shown)

5. Conclusion and perspectives

ATOP 7[®] spot-on diffuses from the application point in all directions and limits TEWL after barrier alteration. Three to four pipettes are needed to observe an effect at 40cm. This study is not sufficient to confirm the diffusion model of ATOP 7[®] spot-on. A new study with more dogs will be designed to validate a hypothesis of diffusion.

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Conflict of Interest : M. CAUQUIL is a Research and Development manager in LDCA/Nextmune.
Source of Funding : Laboratoire de Dermo-Cosmétique Animale (LDCA)

5. Discussion & conclusion

Hypothesis :

The pipettes diffuse evenly over the animal's skin, but require several applications before an effect is visible

Finally, based on the results :

⇒ They seem to support this hypothesis because after 3 pipettes for dog 1 and 4 pipettes for dog 2, all TEWL values regardless of distance, are back to normal.

⇒ **ATOP 7[®] spot-on** diffuses from the application point in all directions and limits TEWL after barrier alteration. 3 to 4 pipettes are needed to observe an effect at 40cm.

SCIENTIFIC EVIDENCES

Studies available

Title	Objective	Protocol	Conclusion
<p>EX VIVO STUDY ON RECONSTRUCTED CANINE EPIDERMIS (RCE) MODEL C. DARMON-HADJAJE, J. DELLACASAGRANDE & N. ALMARIC Short Communication ESVD 2021</p>	Evaluate the efficacy of ATOP 7 [®] spot-on designed specifically for allergy-prone skin on reconstructed canine epidermis miming a canine atopic disease.	Reconstructed Canine epidermis to mimic atopic skin. Criteria = * Cell's morphology * Filaggrin production * IL 8 production. With ATOP 7 [®] and with tofacitinib.	ATOP 7[®] spot-on has benefits on skin structure by improving cell cohesion and hydration and finally, it has less inflammation due to the reduction of the pro-inflammatory marker IL-8.
<p>Skin Barrier Reinforcement Effect Assessment of a Spot-on Based on Natural Ingredients in a Dog Model of Tape Stripping. A.IDEE, M.MOSCA & D.PIN Poster ESVD 2021</p>	Assess the effect of ATOP 7 [®] spot-on in a non-invasive model of acute rupture of the skin barrier.	Tape stripping model to mimic atopic skin. Evaluation after NO application of ATOP 7 [®] spot-on (week 0), after 1 pipette applied (week 1), after 2 pipettes (week 2) and after 3 pipettes (week 3) of the TEWL.	ATOP 7[®] spot-on reinforces and protects the skin against the alteration of the skin barrier
<p>Weekly topical therapy based on plant extracts combined with lokivetmab in canine atopic dermatitis. E. BENSIGNOR and E. VIDEMONT Vet dermatology, 2021</p>	Determine the effects of combining lokivetmab, an effective treatment for CAD, with a weekly topical treatment consisting of a shampoo followed by a spot-on.	<p>* 28 atopic dogs, 12 received lokivetmab in injection and 16 dogs received lokivetmab in injection + ATOP 7[®] spot-on and ATOP 7[®] shampoo once weekly.</p> <p>* Duration of the study : 1 month.</p> <p>* Evaluated criteria : CADLI, pruritus, cosmetic improvement & time needed to second injection.</p>	The use of a combination therapy appears to be more effective than lokivetmab alone. ATOP 7[®] products have a sparing-effect when combining with lokivetmab.
<p>Topical therapy with a spot-on and a hydrating spray containing essential fatty acids and other plant-extracts delays the injection of lokivetmab in atopic dogs: a multicentric study Poster NAVDF 2023</p>	Evaluate the sparing-effect on the use of lokivetmab when combining it with topicals over a period of several months.	<p>*7 dogs with atopic dermatitis received an injection of lokivetmab + ATOP 7[®] MAX Hydra twice weekly & ATOP 7[®] spot-on once weekly.</p> <p>* Duration of the study : several months</p> <p>* Evaluated criteria : pruritus, CADLI, cosmetic criteria & interval between lokivetmab injection.</p>	It suggests that a multimodal management of CAD for several months lokivetmab with topicals aiming at hydrating and reinforcing the skin barrier allows a significant sparing-effect and tends to reduce severity of clinical signs.

ATOP 7[®] Hydra Cream

Fluid moisturizing cream



**Natural skincare
to bring comfort and help
reduce lichenification**





INDICATION

Dry to very dry skin (xerosis)
Lichenification
Allergy-prone skin

Helps:

- Nourish and restore the suppleness of the skin
- Relieve distressed skin
- Acidify the pH to strengthen the skin's defenses
- Promote hydration and reinforce the skin barrier



A fluid texture designed to rapidly penetrate areas of alopecia and lichenification

Once to twice a day



50 ml

ATOP 7[®] Hydra Cream

Fluid moisturizing cream




Hairless area !

100% NATURAL ACTIVE INGREDIENTS

- Squalane of vegetable origin
- Sodium PCA
- Glycerin from vegetable origin
- Allantoin
- Red microalgae extract
- Essential oil of orange

SCIENTIFIC EVIDENCE

Study & clinical case available

Title	Objective	Protocol	Conclusion
<p>Study on hydrating capacity of Dermoscent[®] ATOP 7[®] Hydra Cream Dr O. FANTINI, Dr D. PIN.</p>	<p>Evaluate the hydrating capacity of ATOP 7[®] Hydra Cream on dogs.</p>	<p>*6 healthy beagle dogs. *Duration of the study : 3 days with one application per day. *Clinical follow-up 3 times a day : before application, 2h after application and 6h after application.</p>	<p>ATOP 7[®] Hydra Cream has a prolonged intensive hydrating capacity on both intact and damaged skin. The use of ATOP 7[®] Hydra Cream in the cases of dry to very dry skin (xerosis) or allergy-prone skin is thus highly recommended thanks to its hydrating properties</p>
<p>Clinical case Auricular lichenification on atopic dog Dr. C. THOMAS</p>	<p>Help a female dog suffering from CAD + otitis + lichenification using ATOP 7[®] Hydra cream.</p>	<p>*A female Yorkshire dogs with with chronic otitis and lichenification of ear canals. *Application once a day of ATOP 7[®] Hydra Cream for 3 weeks.</p>	<p>Significant improvement of lichenification.</p>  <p>D0 D21 D0 D21</p>

ATOP 7[®] MAX hydra

Moisturizing mist



**Natural skincare
to hydrate the skin and help
prevent dysbiosis**

PRE+PROBIOTIC
COMPLEX



ATOP 7[®] MAX Hydra

Moisturizing mist



INDICATION

Dry to very dry skin (xerosis)
Allergy-prone skin
Skin dehydrated by treatments or environment

Helps:

- ✓ Intensely moisturizes the skin
- ✓ Stimulates the skin's natural defenses thanks to a pre & probiotic complex that promotes the development of the skin's beneficial flora to the detriment of undesirable germs
- ✓ Helps protect and support the skin barrier



- Unique 2-in-1 natural solution: hydrates & balances
- Mist texture provides an easy and homogeneous hand-free application on large skin surface
- Non sticky texture

Once to twice a day



PRE+PROBIOTIC
COMPLEX



200 ml



KEY ACTIVE INGREDIENTS

- Natto gum
- Vegetable glycerin
- Pre & probiotic complex
- Red microalgae extract
- Hemp seed oil, rich in EFA

SCIENTIFIC EVIDENCE

Poster ESVD 2025—Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants. Magali Martin Biran, Sylvie Laurent, Marion Mosca, Virgil Méallet, Marie Cauquil.

Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants

Magali Martin Biran¹, Sylvie Laurent¹, Marion Mosca², Didier Pin³, Virgil Méallet⁴, Marie Cauquil⁵

¹ Cereva, Montpellier, France. ² Université de Lyon, VetAgro Sup, Interactions Côté Environnement, UFRP 2016, ATUL, Marcy l'Etoile, France. ³ Nextmune, Castres, France.

INTRODUCTION

Classical methods for assessing skin hydration, like the corneometer, only measure surface hydration but provide no deeper insight. Innovative human dermatology techniques like Time-Domain Nuclear Magnetic Resonance (TD-NMR) offer more in-depth information.

OBJECTIVE

Our objective was to characterise by TD-NMR the hydrating properties of two topical formulas: ATOP 7[®] Hydra Cream and ATOP 7[®] MAX Hydra (Dermoscent[®], Nextmune, Castres, France) on canine skin explants.

MATERIALS & METHODS

12 canine skin explants (0.5 cm²) were collected from the back of healthy Beagle dogs and divided into 3 groups (n=4):

- control (dry brush)
- ATOP 7[®] MAX Hydra (application of 1 mg per explant)
- ATOP 7[®] Hydra Cream (application of 1 mg per explant).

Skin hydration was assessed before and 30 minutes after application using TD-NMR methods (20 MHz), by measuring:

- ◆ Total water proton quantity
- ◆ Water proton compartmentalisation within the skin: very bound (constitutive water), bound (hygroscopic effect), and very free water (extracellular water).

RESULTS

- **Total water proton quantity**
After application of the two topical formulas, total proton quantity tended to decrease.
This result is characteristic of a “masking” effect of the constitutive water of the explants, due to the lipidic content of the topically applied formulas. ATOP 7[®] Hydra Cream and ATOP 7[®] MAX Hydra offer a barrier effect to maintain deep epidermal hydration.
- **Water compartmentalisation in the skin**
After application of the two topical formulas, water compartmentalisation changed compared to control with a reduction of very free water to the benefit of bound water.
These results indicate enhanced water retention within the skin after application of the formulas.

Data are expressed as median with interquartile ranges.

CONCLUSION

This pilot study pioneers a novel and elegant model to assess canine skin hydration by TD-NMR. The amplitude and range of water distribution changes align with successful hydration on human skin studies, confirming the tested product's hydrating effect.

1. Introduction

- Classical methods for assessing skin hydration, like the corneometer, only measure surface hydration but provide no deeper insight.
- Innovative human dermatology techniques like **Time-Domain Nuclear Magnetic Resonance (NMR)** offer more in-depth information : analysis of protons, as a “marker” of water in the skin



SCIENTIFIC EVIDENCE

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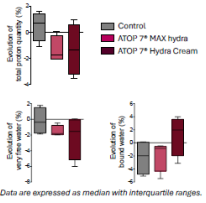
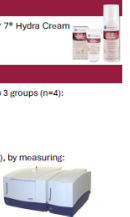
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- **Water compartmentalisation in the skin**
After application of the two topical formulas, water compartmentalisation changed compared to control with a reduction of very free water to the benefit of bound water.
These results indicate enhanced water retention within the skin after application of the formulas.

Data are expressed as median with interquartile ranges.

CONCLUSION

This pilot study pioneers a novel and elegant model to assess canine skin hydration by TD-NMR. The amplitude and range of water distribution changes align with successful hydration on human skin studies, confirming the tested product's hydrating effect.



2. Objective

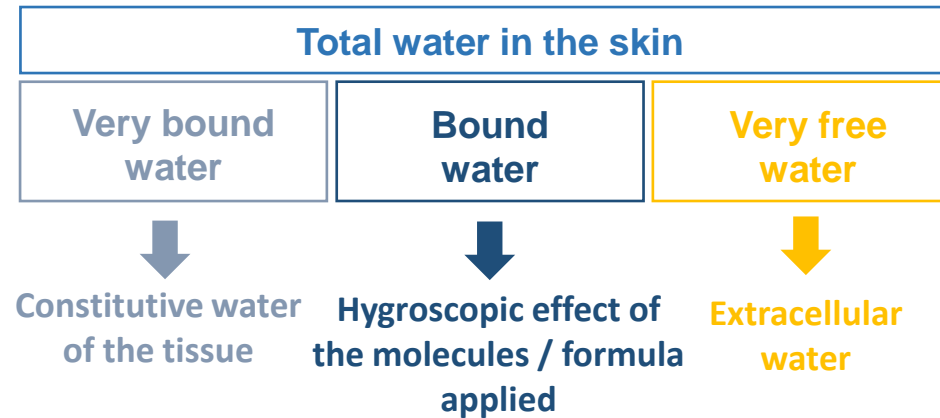
- Characterize by TD-NMR the hydrating properties of two topicals formulas : ATOP 7[®] MAX HYDRA and ATOP 7[®] Hydra Cream on canine skin explants.
- **2 analysis were made :**
 - * **Total water proton quantity** = total number of hydrogen nuclei => measure how much water is contained in the skin explants.
 - * **Compartmentalisation of the water protons** within the skin explants.



SCIENTIFIC EVIDENCE

Poster ESVD 2025—Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants. Magali Martin Biran, Sylvie Laurent, Marion Mosca, Virgil Méallet, Marie Cauquil.

3. What do we mean by compartmentalisation of the water protons ?



- **Moisturizing products can act on these different compartments** by attracting water (e.g., glycerin, hyaluronic acid), retaining water (e.g., oil, wax, etc.) and restoring overall balance (lipids, ceramides, etc.).
- **Hydration does not mean adding water but helping the skin to manage its water effectively at all levels.**

Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants

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Skin hydration was assessed before and 30 minutes after application using TD-NMR methods (20 MHz), by measuring:

- Total water proton quantity
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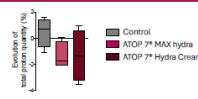


RESULTS

Total water proton quantity

After application of the two topical formulas, total proton quantity tended to decrease.

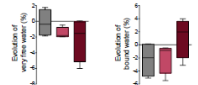
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Source of funding: Nextmune France. Conflicts of interest: Virgil Méallet and Marie Cauquil are employed by Nextmune France.

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- ◆ Water proton compartmentalisation within the skin: very bound (constitutive water), bound (hygroscopic effect), and very free water (extracellular water).

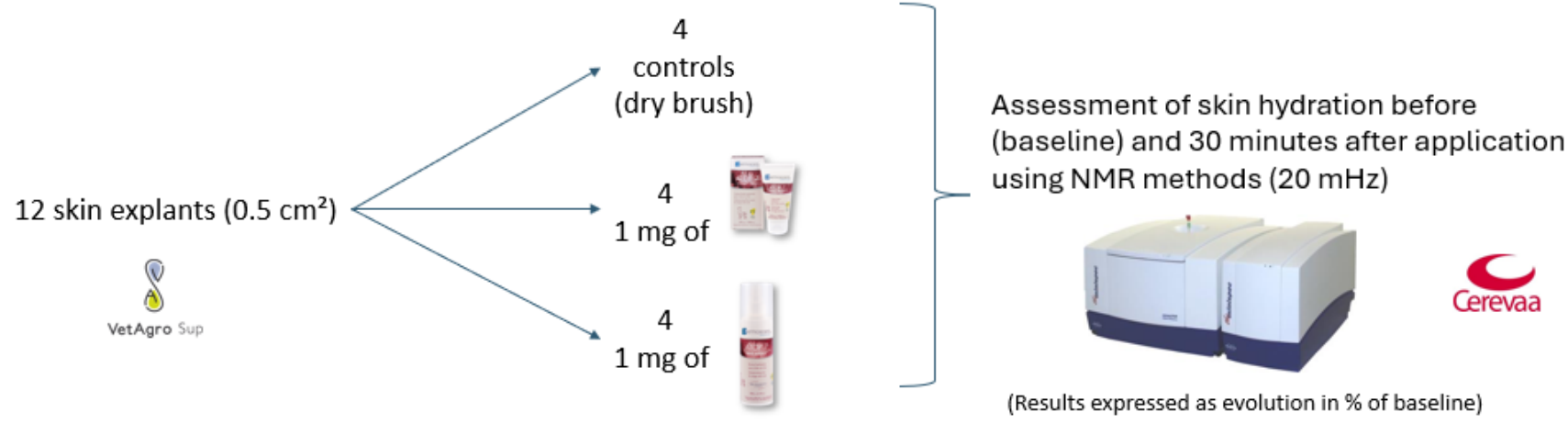
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- **These results indicate enhanced water retention within the skin after application of the formulas.**

CONCLUSION

This pilot study pioneers a novel and elegant model to assess canine skin hydration by TD-NMR. The amplitude and range of water distribution changes align with successful hydration on human skin studies, confirming the tested product's hydrating effect.

4. Methods



SCIENTIFIC EVIDENCE

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Assessment of the hydrating capacity of two topical formulas by Time-Domain Nuclear Magnetic Resonance on canine skin explants

Magali Martin Biran¹, Sylvie Laurent¹, Marion Mosca², Didier Pin³, Virgil Méallet⁴, Marie Cauquil⁵

¹ Cereva, Marillac, France. ² Université de Lyon, VetAgro Sup, Interactions Côté Environnement, UFRP 2016, ATDA, Nany (T)Bida, France. ³ Nextmune, Castres, France.

INTRODUCTION

Classical methods for assessing skin hydration, like the corneometer, only measure surface hydration but provide no deeper insight. Innovative human dermatology techniques like Time-Domain Nuclear Magnetic Resonance (TD-NMR) offer more in-depth information.

OBJECTIVE

Our objective was to characterise by TD-NMR the hydrating properties of two topical formulas: ATOP 7[®] Hydra Cream and ATOP 7[®] MAX hydra (Dermoscent[®], Nextmune, Castres, France) on canine skin explants.

MATERIALS & METHODS

12 canine skin explants (0.5 cm²) were collected from the back of healthy Beagle dogs and divided into 3 groups (n=4):

- control (dry brush)
- ATOP 7[®] MAX hydra (application of 1 mg per explant)
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Skin hydration was assessed before and 30 minutes after application using TD-NMR methods (20 MHz), by measuring:

- ◆ Total water proton quantity
- ◆ Water proton compartmentalisation within the skin: very bound (constitutive water), bound (hygroscopic effect), and very free water (extracellular water).

RESULTS

- **Total water proton quantity**
After application of the two topical formulas, total proton quantity tended to decrease.
This result is characteristic of a “masking” effect of the constitutive water of the explants, due to the lipidic content of the topically applied formulas. ATOP 7[®] Hydra Cream and ATOP 7[®] MAX hydra offer a barrier effect to maintain deep epidermal hydration.
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5. Results

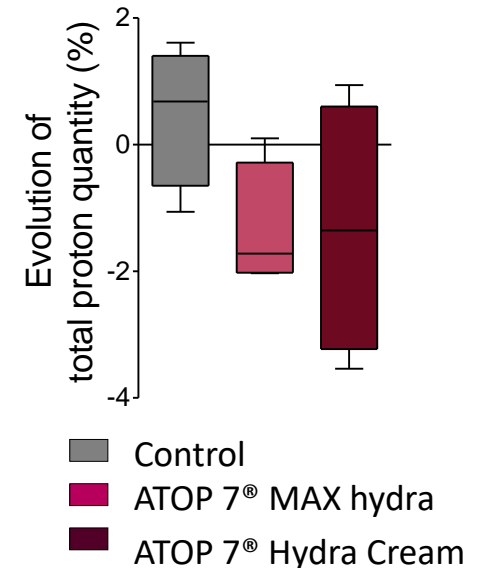
1st analysis : PROTON QUANTITY



The more the protons are free, the more intense is the signal.
The more impermeable the skin surface is, the fewer protons are detected by this analysis.

Application of the two topical formulas → proton quantity tended to decrease

- The protons might be less “free” and more “bound” in the skin
- &
- This is characteristic of a “barrier” effect on the skin, due to the lipidic content of the topicals applied → ATOP 7[®] Hydra Cream and ATOP 7[®] MAX hydra offer a barrier effect to maintain deep epidermal hydration.



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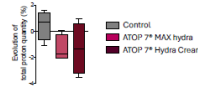


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Total water proton quantity

After application of the two topical formulas, total proton quantity tended to decrease.

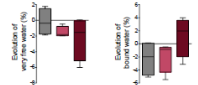
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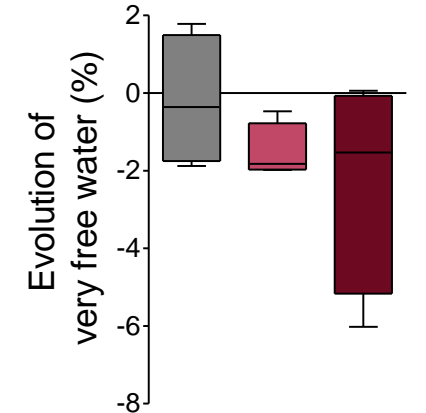
5. Results

2nd analysis : WATER COMPARTMENTALISATION IN THE SKIN

Very free water

- *The water that can be the most easily lost (trans epidermal water loss...)*
- *Does NOT ensure lasting hydration*

→ Reduction of very free water after application of the topicals



- Control
- ATOP 7[®] MAX Hydra
- ATOP 7[®] Hydra Cream

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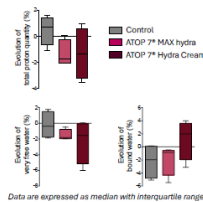
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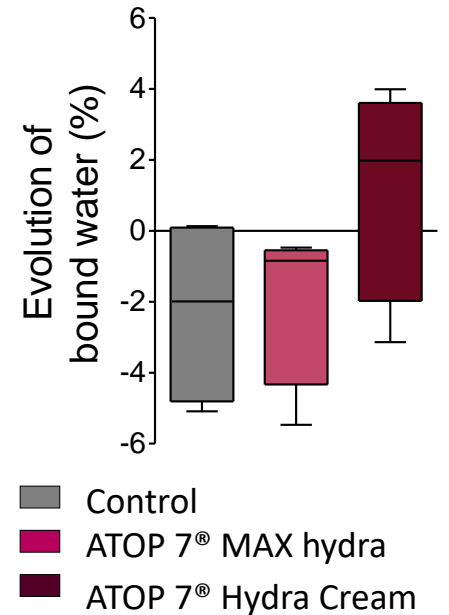
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2nd analysis : WATER COMPARTMENTALISATION IN THE SKIN

Bound water

- *Interaction with molecules in the skin*
- *If increased after topical application, it indicates a hygroscopic* effect*

**Hygroscopic effect = ability of a substance to attract and retain water.*



→ Increase of bound water after application of the topicals

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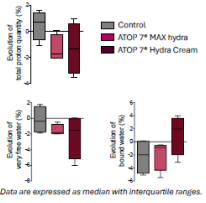
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6. Conclusion

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