

Outreach note of the study report 20E5078 SUBLIO

According to the study plan D20-823-1

(Part 2)

Assessment of the efficacy of a product on the improvement of a psoriatic skin on human skin explants *ex vivo*

- Tested products
- **City water (Longjumeau)**
 - **City water (Longjumeau) hyperionised with the Sublio Ionic WaterBox *Pro* system**

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STUDY

This study was subject to a complete and detailed report under the reference 20E5078, returned to SUBLIO France, only owner of these results.

Date of the beginning of the study	2 nd April 2021
Date of the end of the technical phase of the study	24 th May 2021

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TESTED PRODUCTS

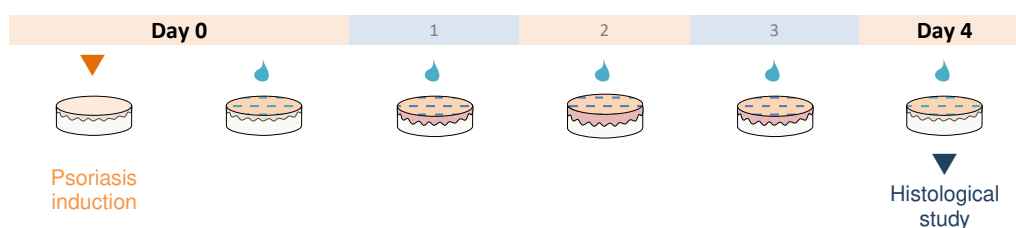
P1 Water (Longjumeau city), sterilised by filtration at 0,22 μ m.

P2 Water (Longjumeau city), sterilised by filtration at 0,22 μ m and hyperionised thanks to the **Sublio Ionic WaterBox Pro** device supplied by the SUBLIO France company.

MATERIALS & METHODS

The aim of the study is to induce a psoriatic skin state on human skin explants kept in survival and to apply water (hyperionised or not) daily for 4 days.

Then, a histological study was conducted to highlight the treatments activity.



The induction of the psoriatic state was performed by removal of the superior layers of the *stratum corneum* and the application of a pharmacologically active substance (Imiquimod, 2 mg/cm²).

Three conditions of treatment were performed: no treatment (blank), a treatment with Longjumeau water (2 μ L/cm²) and a treatment with Longjumeau water hyperionised with Sublio Ionic WaterBox Pro device (2 μ L/cm²).

These treatments are repeated every day for 4 days.

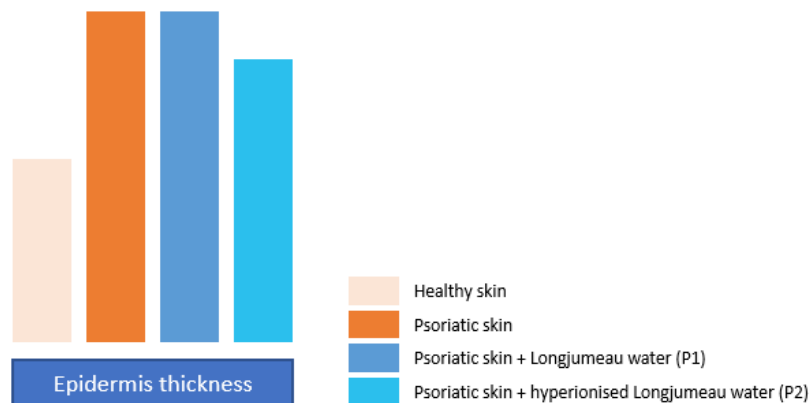
A histological study is then conducted to highlight the four characteristic parameters of a psoriatic state:

- An increase of the epidermis thickness reflecting a keratinocytes hyperproliferation and an inflammatory environment.
- An overexpression of cytokeratin 16 linked to cell proliferation.
- An overexpression of psoriasin linked to an alteration of the skin barrier function.
- An overexpression of the TNF- α , a major cytokine linked to inflammation

RESULTS

1. Epidermis thickness => reflects keratinocytes hyperproliferation

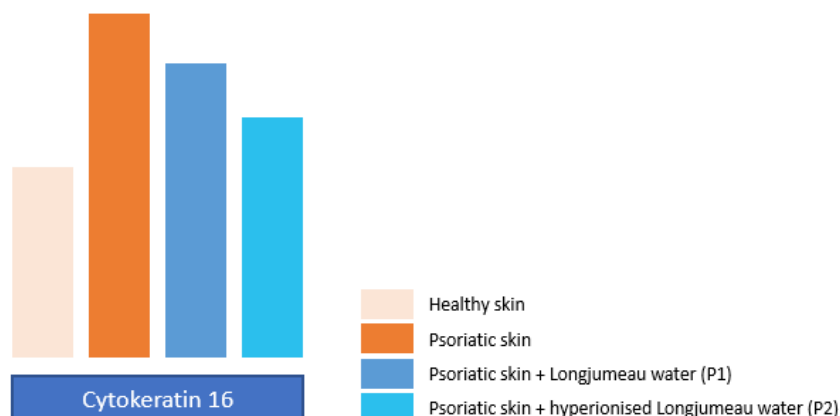
The induction of the psoriatic state leads to a significant increase of the epidermis thickness by 71%.



- The treatment **P1** (Longjumeau water) induces no significant modification of the epidermis thickness.
- The treatment **P2** (hyperionised Longjumeau water) induces a significant decrease of 13% of the epidermis thickness.

2. Cytokeratin 16 => reflects cell proliferation

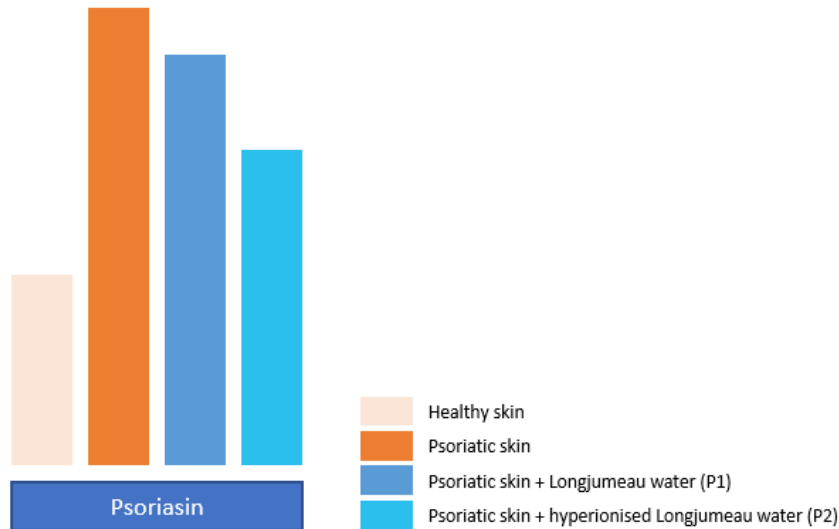
The induction of the psoriatic state leads to a very clear increase of cytokeratin 16 expression in the epidermis.



- The treatment **P1** (Longjumeau water) induces a slight decrease of cytokeratin 16, linked to a hyperproliferative state.
- The treatment **P2** (hyperionised Longjumeau water) induces a clear decrease of cytokeratin 16, linked to a hyperproliferative state.

3. Psoriasin => reflects skin barrier alteration

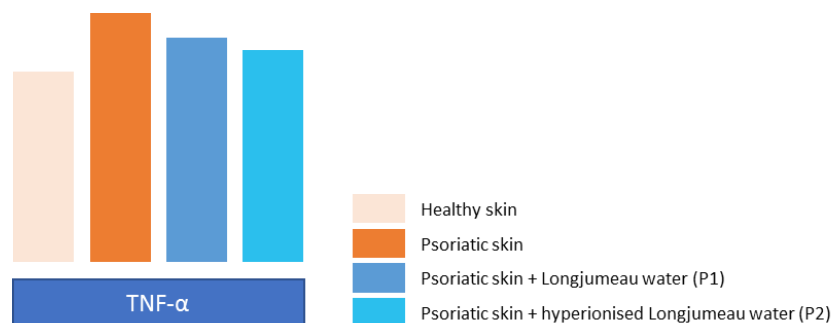
The induction of the psoriatic state leads to a strong increase of psoriasin expression in the epidermis.



- ↪ The treatment **P1** (Longjumeau water) slightly reduces psoriasin linked to the alterations of the cutaneous barrier.
- ↪ The treatment **P2** (hyperionised Longjumeau water) clearly reduces psoriasin linked to the alterations of the cutaneous barrier.

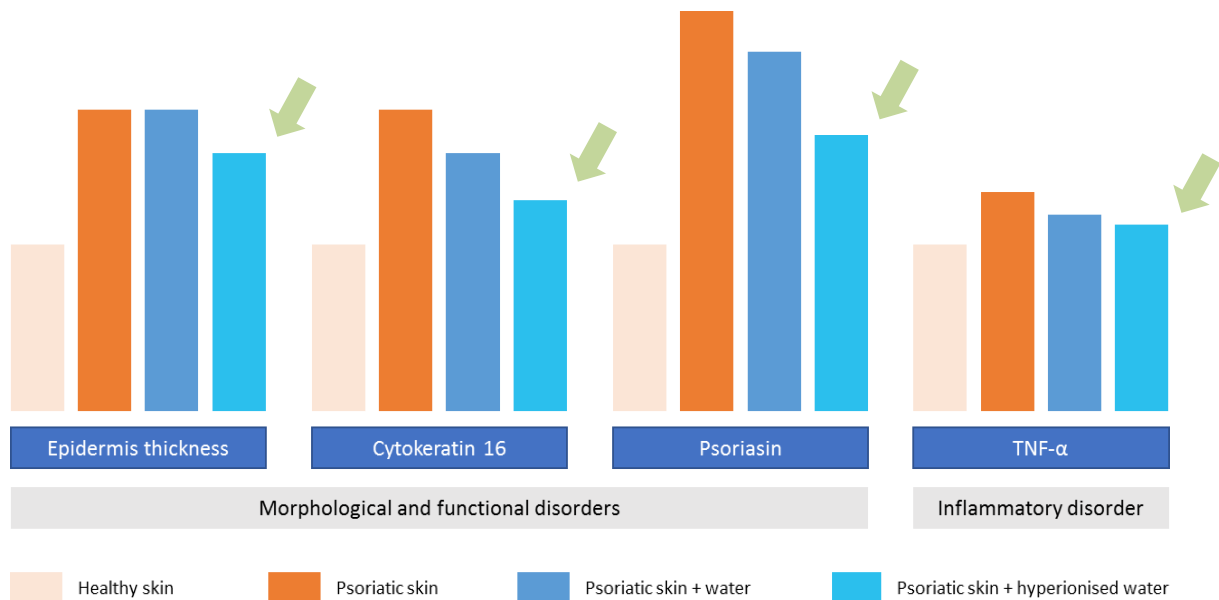
4. TNF-α cytokine => reflects inflammation

The induction of the psoriatic state leads to a significant increase of TNF-α cytokine production by 24%.



- ↪ The treatment **P1** (Longjumeau water) non-significantly reduces TNF-α linked to the inflammation.
- ↪ The treatment **P2** (hyperionised Longjumeau water) significantly reduces TNF-α linked to inflammation state by 13%.

CONCLUSION



These results show that a daily treatment of 4 days with only 2 microliters/cm² of water hyperionised with Sublio Ionic WaterBox *Pro* device, allows to reduce three main markers of morphological and functional disorders of psoriatic skin.

In addition it significantly reduces a major marker of the inflammatory disorders of psoriatic skin.