

**Outreach note of the study report 20E5077 SUBLIO**

According to the study plan D20-290-2

**Assessment of skin penetration of various oligo-elements  
on human skin explants on Franz cells**

- Tested products
- **Non-ionic sea water**
  - **Sea water hyperionized 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 20E5077, returned to SUBLIO France, only owner of these results.

It was performed according to the OCDE recommendation 428 except for the temperature that was raised to 34-35°C to be in the similar conditions as the ones of thalassotherapy.

Date of the <b>beginning of the study</b>	13 <sup>th</sup> January 2021
Date of the <b>end of the technical phase of the study</b>	18 <sup>th</sup> February 2021
Subcontracting partners performing the analytical phase	<b>AR2i</b> 20 Avenue Edouard Herriot 92350 Le Plessis-Robinson

## TESTED PRODUCTS

Sea water collected on the 12<sup>th</sup> of January 2021 by SUBLIO France company (stored at 4°C and used within the 48h after sampling).

A part of sea water was hyperionized with Sublio Ionic WaterBox *Pro* device, supplied by SUBLIO France company.

Sea water and sea water hyperionized with Sublio Ionic WaterBox *Pro* device were analyzed:

Oligo-elements (µg/L)	Concentrations dosed in the products to be tested	
	Sea water	Hyperionised sea water
<b>Sulfur</b>	931000	938200
<b>Boron</b>	3700	3700
<b>Molybdenum</b>	< LOD	< LOD
<b>Silica</b>	350	360
<b>Iron</b>	< LOQ	< LOQ
<b>Zinc</b>	< LOQ	< LOQ
<b>Manganese</b>	< LOD	< LOQ
<b>Copper</b>	< LOQ	< LOQ

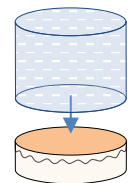
LOQ : Limit of quantification

LOD : Limit of detection

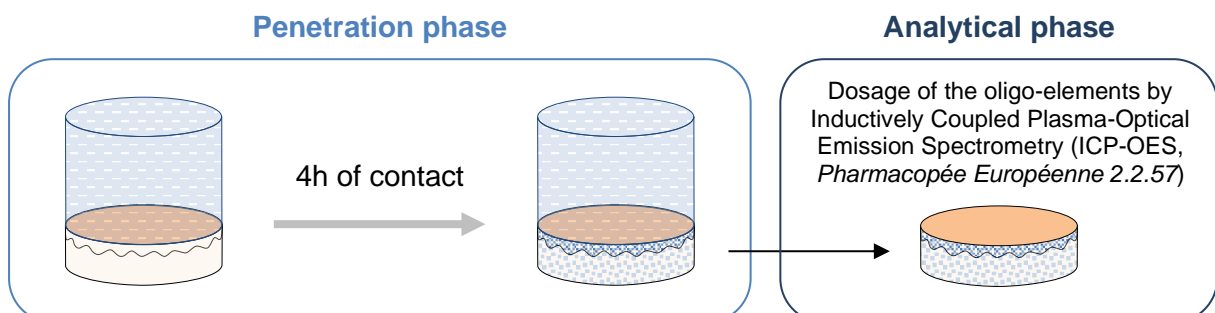
**The treatment of the sea water with the device SUBLIO IONIC WaterBox *Pro* does not modify the concentrations of oligo-elements. The treatment with this device does not add any oligo-element which could distort the cutaneous penetration analysis.**

## MATERIALS & METHODS

The principle of the study is to put in contact 2 milliliters of sea water at 34.5°C with 1,7 cm<sup>2</sup> of skin for 4 hours. At the end of this exposition, the oligo-elements are dosed in the skin.

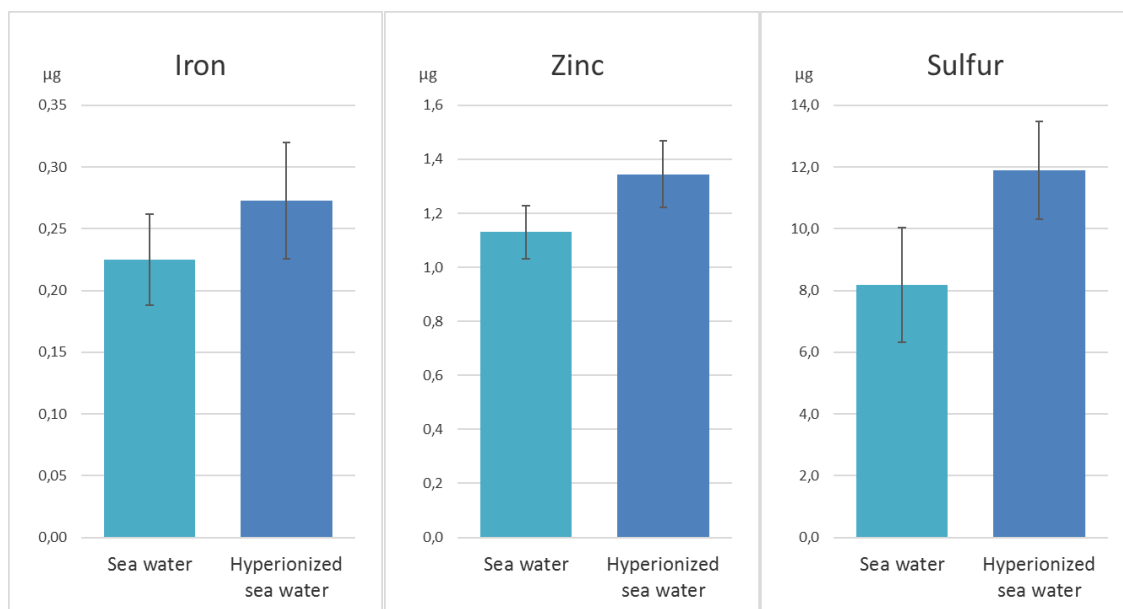


The sea water and the sea water treated with the Sublio Ionic Waterbox *Pro* were tested in the same operational conditions



## RESULTS

### Average quantities of oligo-elements dosed in the skin after 4h of contact



### Increase percentage of the oligo-elements penetration when sea water is hyper-ionized with the SUBLIO IONIC WaterBox Pro system

<b>Iron</b>	<b>+21%</b> (significativity of 83%)
<b>Zinc</b>	<b>+19%</b> (significativity of 96%)
<b>Sulfur</b>	<b>+46%</b> (significativity of 98%)
<b>Boron</b>	Quantities inferior to the detection or dosage limits
<b>Silica</b>	
<b>Copper</b>	

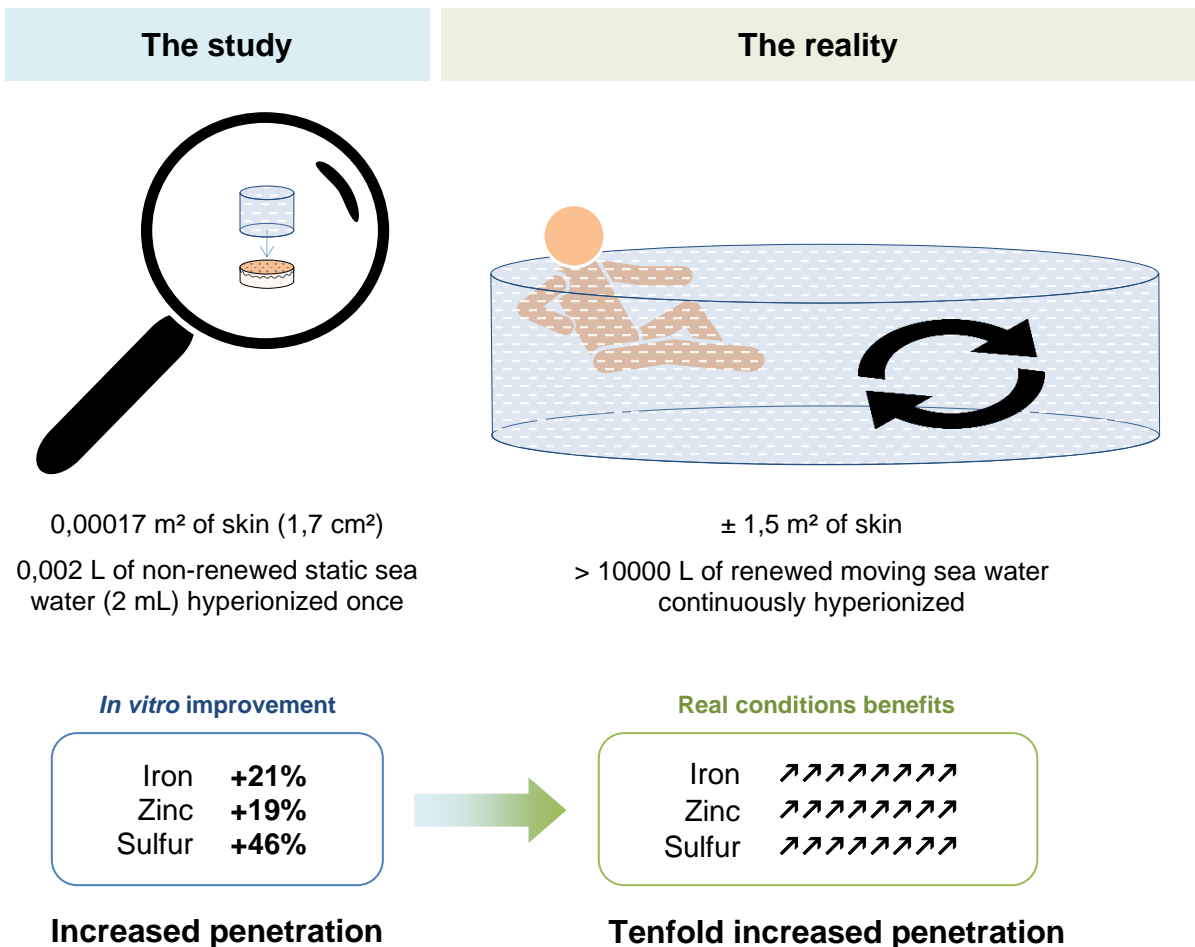
## CONCLUSION

### The treatment of sea water with the SUBLIO IONIC WaterBox Pro system increases significantly the penetration of oligo-elements

The weak natural concentration of most of oligo-elements found in sea water does not allow to highlight their levels of cutaneous penetration with a sampling of only 2mL.

**From the study model to reality**

In this study, we tried to recreate the conditions of a cutaneous exposition to sea water by mimicking the characteristics of body immersion close to those of thalassotherapy. With this in mind, if the sea water, the contact period and the temperature perfectly reproduce those conditions, it should be noted that because of the technical constraints, this study was performed with the application of 2ml of non-renewed static sea water during the study phase.



Considering the excellent results obtained with 0.002 L of non-renewed static water, it is possible to extrapolate the expected results in the case of a body immersion in thousands of liters of moving hyperionized sea water, which is renewed and continuously reactivated.

Indeed, being in normal thalassotherapy conditions, the use of the SUBLIO IONIC WaterBox Pro system would tenfold increase the cutaneous penetration of oligo-elements.

The clearly enhanced input of the whole oligo-elements constituting the active reinforcement of the immune barrier, thanks to the SUBLIO IONIC WaterBox Pro system, allows to considerably amplify the benefits of thalassotherapy.

**APPENDIXE**

**Review of the oligo-elements and their implications**

Oligo-elements	Theoretical concentration in sea water	Risk of deficiency		Thématiques associées
		Demonstrated	Not demonstrated	
Name	mg/L			
<b>Iodine</b>	± 150	x		Hormones, nervous system
<b>Sulfur</b>	<b>± 60</b>	<b>x</b>		<b>Allergies, asthma, immune basis</b>
<b>Boron</b>	± 30	x		Inflammation, metabolism, erythropoiesis
<b>Molybdenum</b>	±	x		Anemia
<b>Silica</b>	± 0,01		x	Arthrosis, osteoporosis, hair, nails
<b>Iron</b>	<b>± 0,005</b>	<b>x</b>		<b>Anemia, anxiety, insomnia</b>
<b>Zinc</b>	<b>± 0,005</b>	<b>x</b>		<b>Skin, hair, acne, immunity, inflammation</b>
<b>Manganese</b>	± 0,003		x	Allergies, arthrosis
<b>Copper</b>	± 0,001	x		Inflammation, arthrosis
<b>Tin</b>	± 0,001	x		Anti-infectious, immunity, hair
<b>Chromium</b>	± 0,0004	x		Satiety, glycemia, obesity
<b>Selenium</b>	± 0,0002	x		Inflammation, antioxidant
<b>Vanadium</b>	± 0,0002		x	Diabetes
<b>Fluorine</b>	± 0,0001	x		Teeth, arthrosis, calcium metabolism
<b>Lithium</b>	± 0,00001	x		Stress, nervous system
<b>Cobalt</b>	0		x	Blood flow, migraines
<b>Nickel</b>	0		x	Anemia, hypotensor

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