

• OLIVE TREE •

COSMETICS

**NATRISÉ
EXOSOME**

•

**NEXT
BEAUTY
EXPERIENCE**

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EXOSOMES IN COSMETICS

Intercellular communication is the future of advanced cosmetics for the beauty and well-being of the skin.

In this system of communication, exosomes perform a fundamental carrier function: **they transport and exchange information and bioactive molecules between the cells** of our body. They store the contents they carry to their destination and are able to penetrate even the deepest layers of the skin.

Valued for their antioxidant, anti-inflammatory and cell regeneration properties, they are mainly used in cosmetic treatments to attenuate and delay the processes of skin ageing.

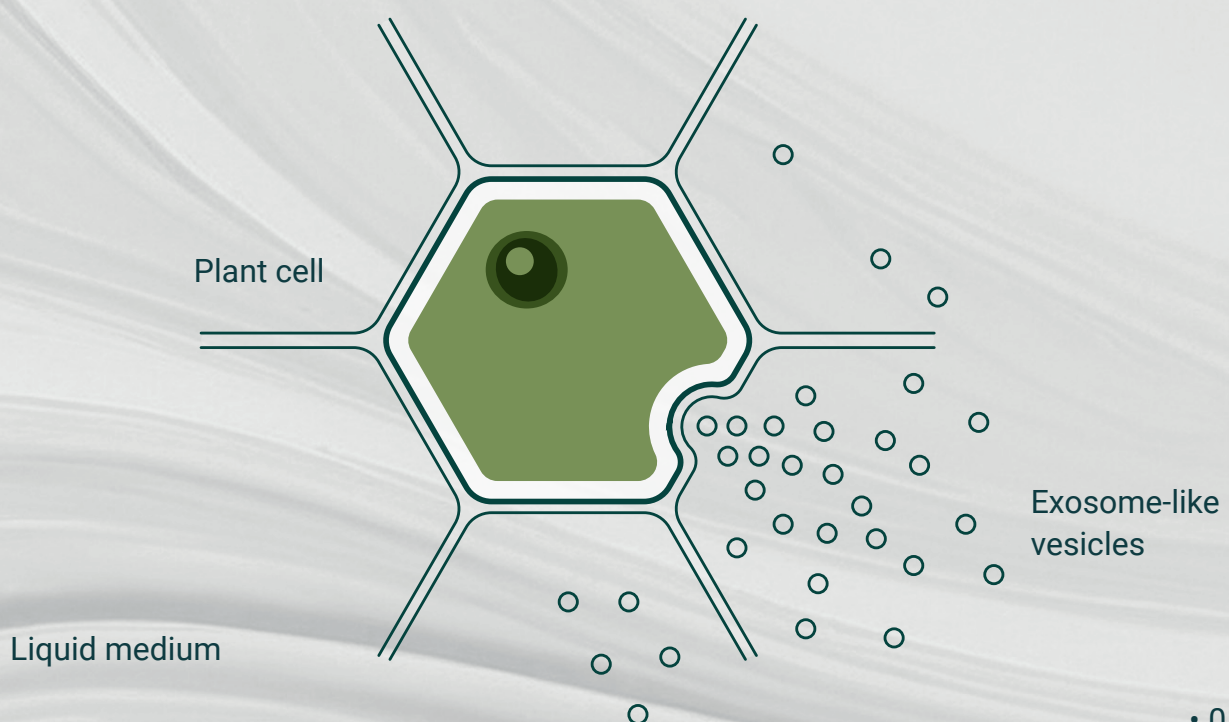
PLANT EXOSOMES FROM PLANT CELL SUSPENSION CULTURES

At ABResearch, we produce *exosome-like* plant extracellular vesicles (Plant Evs) for the cosmetics market, more commonly known as **plant exosomes, from plant cell suspension cultures**.

We use our **Natrise Exosome biotechnology, a production platform that preserves the integrity of plant exosomes**.

Natrise Exosome plant exosomes are the result of physiological processes occurring in the plant cells that we cultivate in liquid medium and which are released by the plant cells themselves in a completely natural way, with no external intervention.

We use neither animal products nor GMOs in our production process.

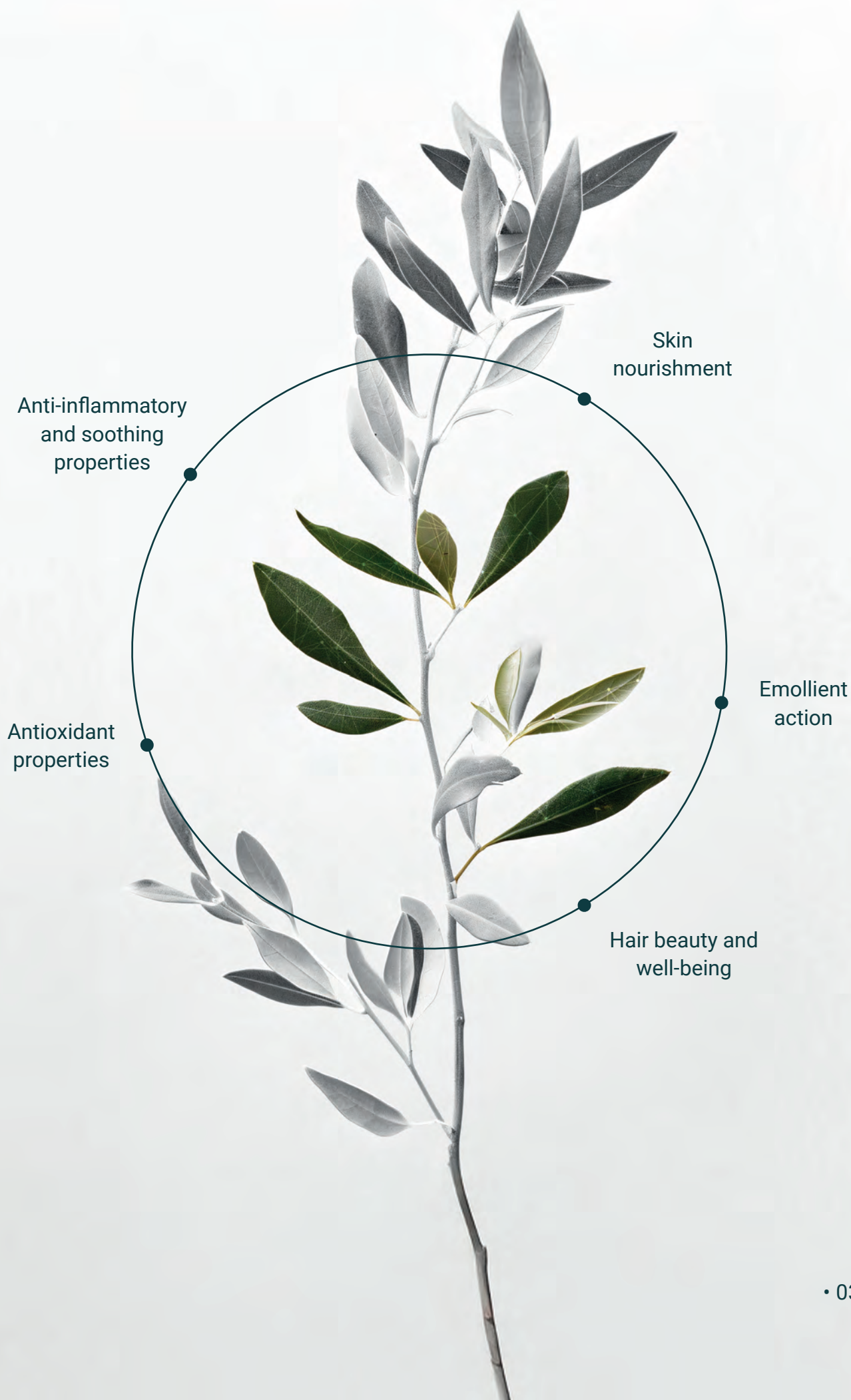


OLIVE TREE • *OLEA EUROPAEA*

Olea europaea is a cosmetic ingredient traditionally used in skin products for face and body and in specific hair formulations. An ally for all skin types, even the most sensitive, it is **rich in natural antioxidants**.



- Due to its **anti-inflammatory and soothing properties**, it is used in cosmetic products for skin prone to redness and inflammation.
- **It fights cellular ageing** by countering the oxidative damage caused by free radicals and softening the signs of ageing on the skin.
- **It is an ally of the skin barrier** against environmental stresses such as pollution and UV damage.
- It performs an effective **emollient action** for smooth and soft skin.
- As an ingredient in hair lotions, it **promotes the well-being of the scalp** and the beauty of the hair.



PLANT EXOSOMES FROM *OLEA EUROPAEA* CELL SUSPENSION CULTURES

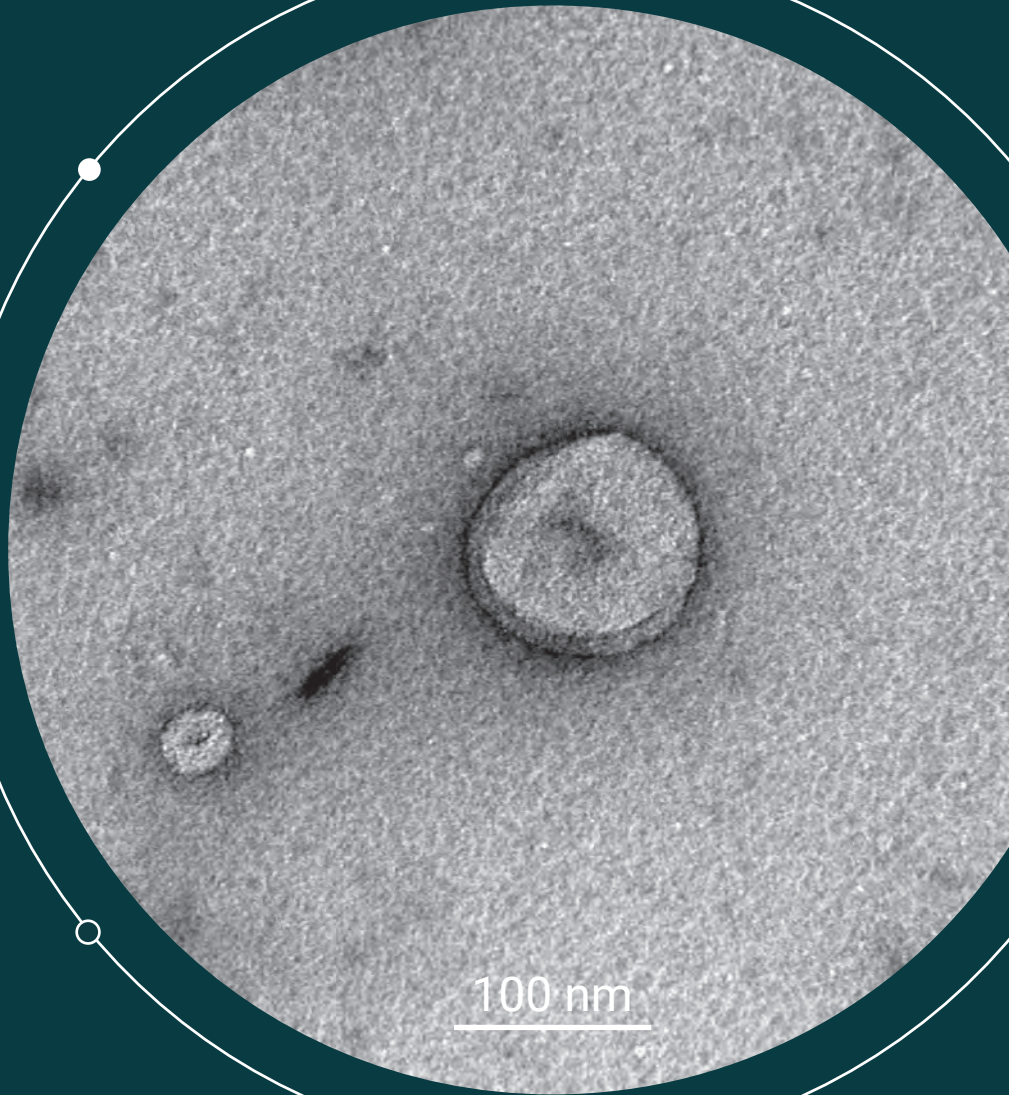
At ABResearch, we use our Natrise Exosome biotechnology to produce **plant exosomes from *Olea europaea* cell suspension cultures**.

Our plant-derived *Olea europaea* exosomes have **concentration standards of 2.0×10^{11} exosomes/litre** and a size of **between 50 and 160 nanometres**.

SIZE
50 – 160 nm

CONCENTRATION
 2.0×10^{11}

Viewing with a transmission
electron microscope



100 nm

RECOMMENDED USE

Our plant-derived *Olea europaea* exosomes can be used in cosmetic formulations with **anti-inflammatory and soothing properties**, ideal for skin prone to redness or inflammation.

FUNCTIONAL TESTS

- Anti-inflammatory capacity
- Toxicity
- Antioxidant power
- Protection against oxidative stress
- Cell regeneration

ANTI-INFLAMMATORY CAPACITY

We have evaluated the anti-inflammatory capacity of our *Olea europaea* plant exosomes using an *in-vitro* assay that measures the concentration of the inflammatory cytokine interleukin-6 (IL-6). To induce inflammation, control cells and cells pre-treated with *Olea europaea* exosomes were stimulated with an inflammatory cocktail.

The test highlighted the **high anti-inflammatory action of our *Olea europaea* exosomes** diluted at 1% and 0.2%.



ABSENCE OF TOXICITY

In-vitro tests on a keratinocyte cell model and on a fibroblast cell model confirmed that **our plant-derived *Olea europaea* exosomes are non-toxic**. On the contrary, tests showed that *Olea europaea* exosomes **contributed positively to cell proliferation**.

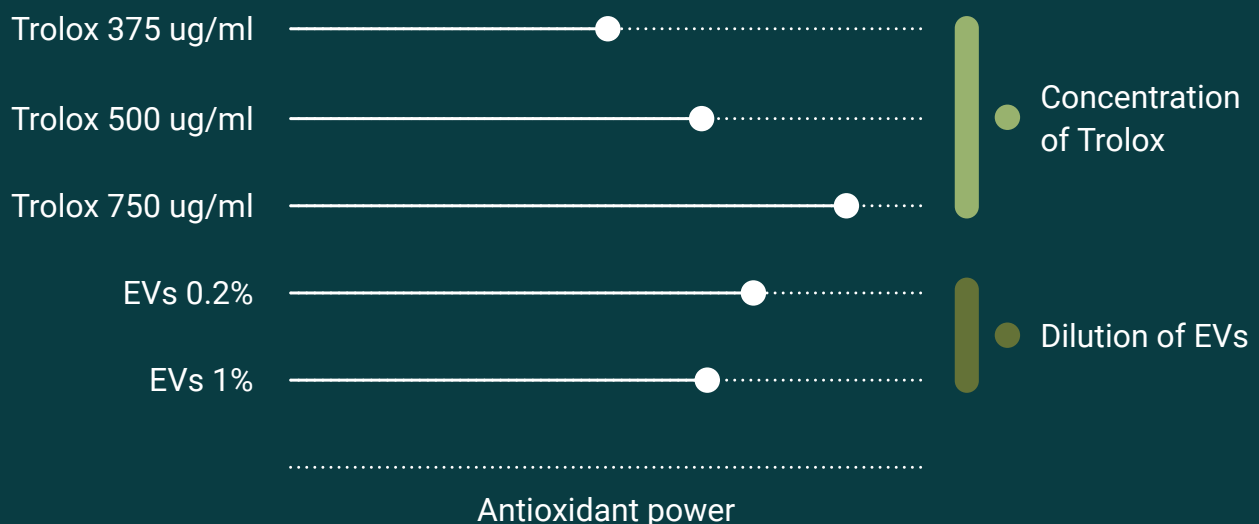
The number of cells, in fact, increased by about 20 per cent. The tests were carried out with 0.2% and 0.1% diluted exosomes.

ANTIOXIDANT POWER

We carried out *in-vitro* tests to assess the effective antioxidant power of our plant-derived *Olea europaea* exosomes.

DPPH test

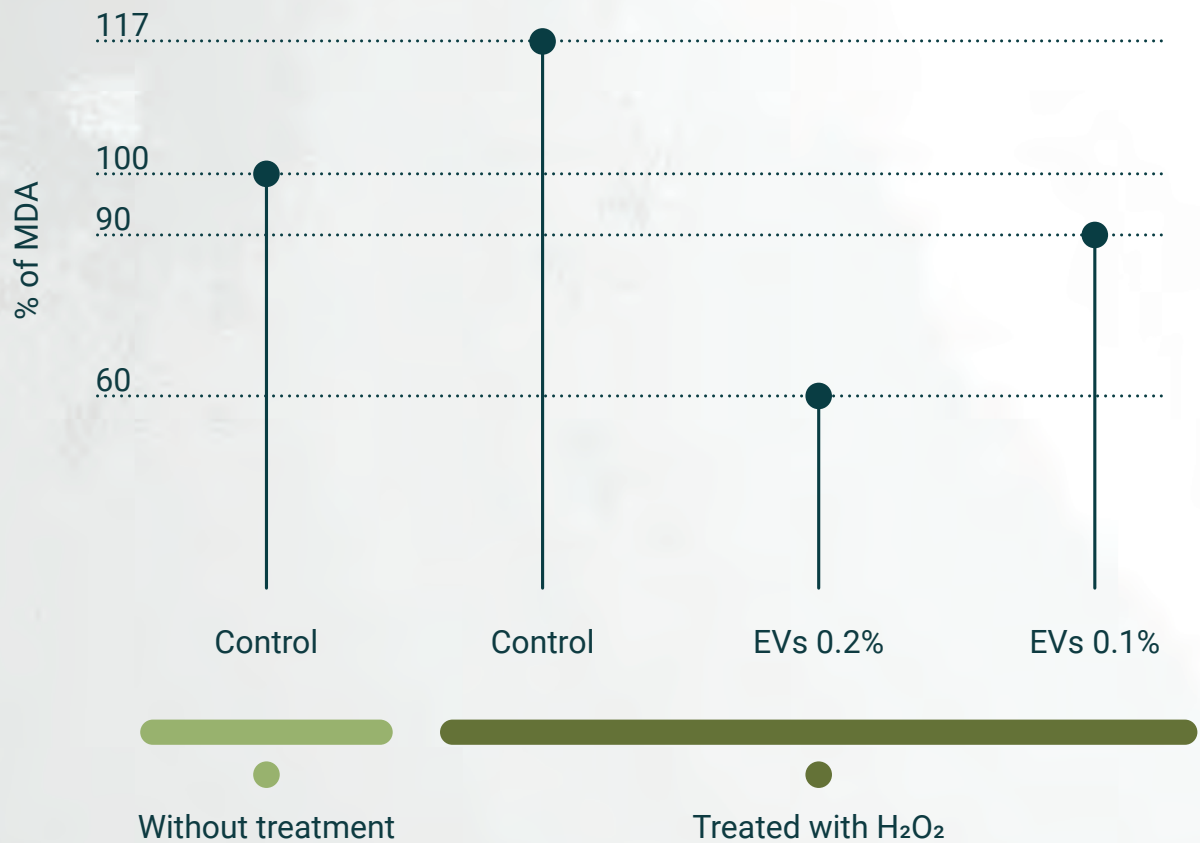
A comparison test with Trolox (Vitamin E) showed that **our plant-derived *Olea europaea* exosomes**, even at dilutions of 0.2 and 0.1 %, retain a **high antioxidant capacity**.



MDA test

We evaluated the degree of lipid peroxidation by measuring the level of malondialdehyde, the marker of oxidative stress in lipids. The cells were subjected to oxidative stress induced by hydrogen peroxide.

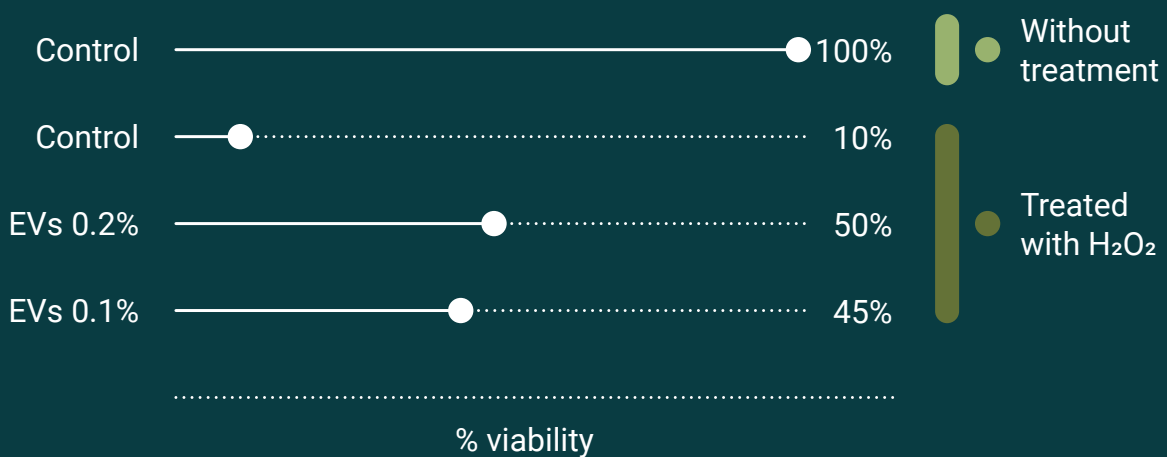
The MDA test has confirmed **the antioxidant capacity of our plant-derived *Olea europaea* exosomes, capable of protecting cells from damage by free radicals.**



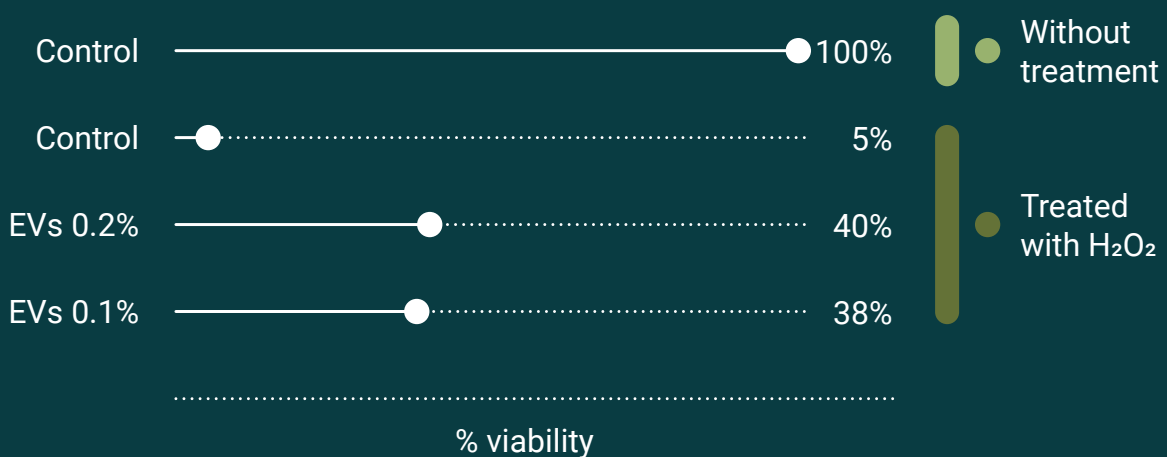
PROTECTION AGAINST OXIDATIVE STRESS

In-vitro tests on the survival of cells subjected to more or less intense and long-lasting oxidative stress were conducted to assess the ability of plant-derived *Olea europaea* exosomes to protect cells. To this end, we treated the cells with hydrogen peroxide for 2 and 24 hours. **In both acute and prolonged oxidative stress, *Olea europaea* exosomes preserved high cell viability.**

MTT test (2 hours)



MTT test (24 hours)



CELL REGENERATION

Using the scratch test technique, we evaluated the ability of **our plant-derived *Olea europaea* exosomes to promote cell regeneration**.

After 48 hours, the repopulated surface area was greater in the sample containing cells and exosomes than in the cell-only sample.

38%

Control

70%

EVs 0.2%

52%

EVs 0.1%

CUT

Microscope vision

**48 HOURS WITH
EXOSOMES 0.2%**

**48 HOURS
WITHOUT
EXOSOMES**

● Product

Plant-derived *Olea europaea* exosomes (Olive tree)

● Product name

EVin OLEA

● INCI name

Glycerol, with INCI name Glycerin; Water, with INCI name Water; Exosomes, with INCI name **Olea Europaea (Olive) Callus Extracellular Vesicles**

● Field of application

Ingredient for B2B cosmetic applications

● Suggested claims

Anti-inflammatory and soothing properties

● Size of exosomes

50 - 160 nanometres

● Concentration standards

2.0×10^{11} exosomes/litre

● Recommended usage level

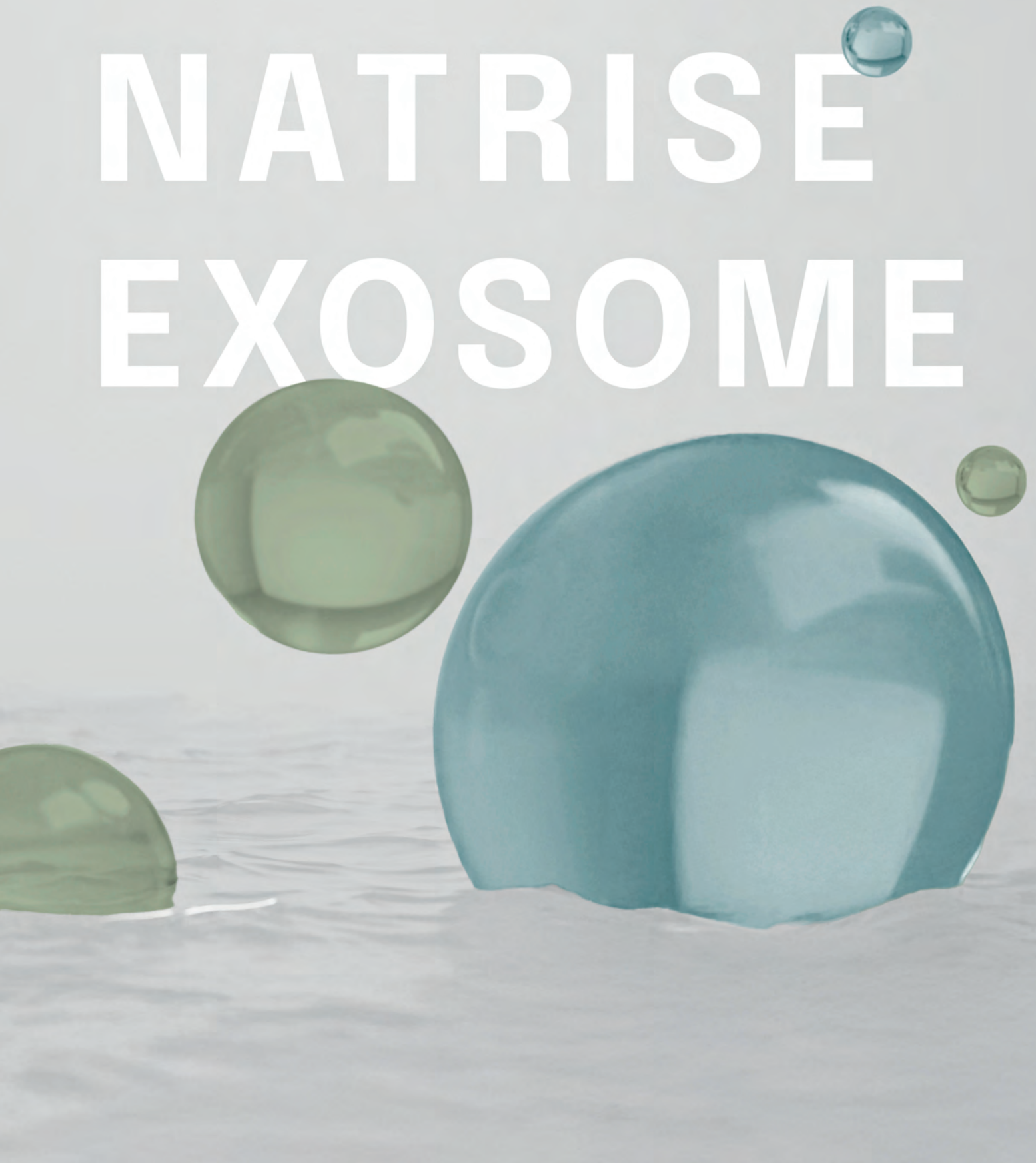
0.2 - 1%

● Technology

NATRISE EXOSOME Platform (plant cell suspension cultures)



NATRISÉ[®] EXOSOME





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