

A new multifunctional  
active personal care  
ingredient

**ALGICA<sup>®</sup>**



*In 2016, a powerful vision was born. Angela Wulff, a professor in marine ecology, and Sofie Allert, a biotechnical engineer with a master's in business development, founded Swedish Algae Factory. Their goal? To showcase the incredible potential of algae as a raw material and to create a climate-positive business that harnesses its powers. Today, with 14 employees and their first commercial plant located in Kungshamn, Sweden, Swedish Algae Factory is making waves in Scandinavia and beyond. Join us on our journey to create a brighter future for our planet.*



"I fell in love with algae during my bachelor thesis in biotechnology. For me, it was an extremely sustainable underused resource since algae grow fast and can be cultivated on saltwater and

wastewater. Back then most algae species that had been studied for industrial use preferred warm and sunny climates.

I met my co-founder Angela in 2013. She had recently joined a research expedition to Antarctica sampling ice-inhabiting microalgae. Together we thought that if algae could grow in the ice it would also be possible to create an algae industry in the cold and dark climates of the Nordics. With our love for algae and our passion to contribute to a better world we decided to set out to show that it is possible to create a climate positive industry with the help of algae."

**Sofie Allert, CEO and co-founder**



"I took the step from being a passionate SCUBA diver to a PhD in marine ecology with focus on microalgae. The more I learned, the more fascinated I became and I was particularly interested in

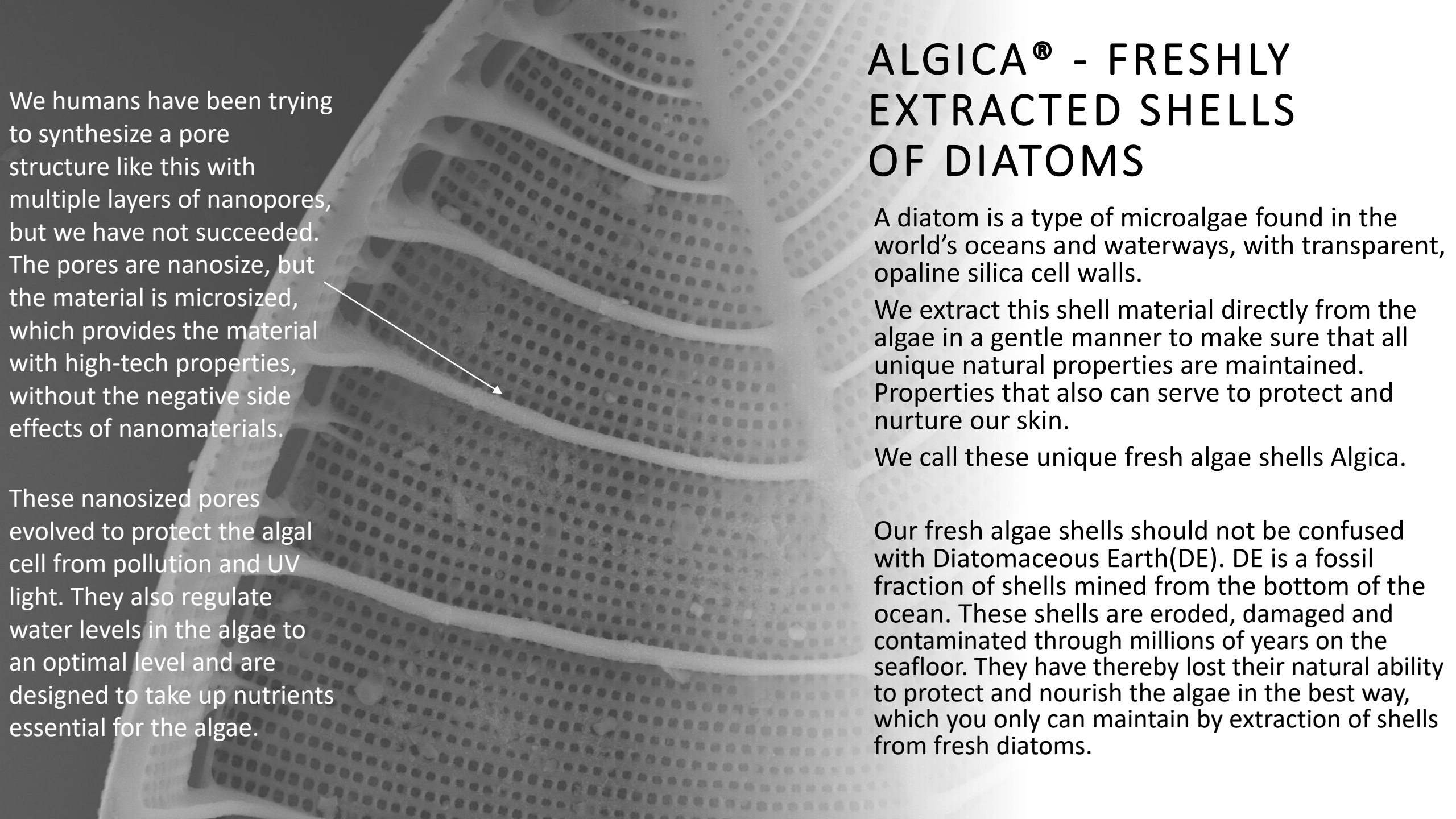
microalgae living in extreme environments, like inside ice. I wanted to further explore their potential in industrial applications and luckily I met Sofie."

**Angela Wulff, co-founder**

**S W E D I S H  
A L G A E  
F A C T O R Y**







We humans have been trying to synthesize a pore structure like this with multiple layers of nanopores, but we have not succeeded. The pores are nanosize, but the material is microsized, which provides the material with high-tech properties, without the negative side effects of nanomaterials.

These nanosized pores evolved to protect the algal cell from pollution and UV light. They also regulate water levels in the algae to an optimal level and are designed to take up nutrients essential for the algae.

## ALGICA® - FRESHLY EXTRACTED SHELLS OF DIATOMS

A diatom is a type of microalgae found in the world's oceans and waterways, with transparent, opaline silica cell walls.

We extract this shell material directly from the algae in a gentle manner to make sure that all unique natural properties are maintained. Properties that also can serve to protect and nurture our skin.

We call these unique fresh algae shells Algica.

Our fresh algae shells should not be confused with Diatomaceous Earth (DE). DE is a fossil fraction of shells mined from the bottom of the ocean. These shells are eroded, damaged and contaminated through millions of years on the seafloor. They have thereby lost their natural ability to protect and nourish the algae in the best way, which you only can maintain by extraction of shells from fresh diatoms.

# ALGICA® – PERSONAL CARE CLAIMS

Independent clinical studies showcase the multifunctional effects of Algica. When used in low concentrations of 0,1 %, Algica increased the SPF of a sunscreen formulation with an average of 23 % in in vitro studies.

At the same level of inclusion air pollution such as Nitrogen oxides (NOx) and Particulate matter (PM) will be blocked from entering the skin by 24 %-50 % based on results from two in vivo studies.

The moisturizing effect is at least similar to medium molecular hyaluronic acid and the cleansing effect is at least 10 times better and 3 times faster than other commonly used cleansing ingredient according to externally validated studies.

A cosmetic evaluation study showed that formulations with Algica is easy to apply, absorb quickly into the skin and give a nice skin feeling.

COSMOS APPROVED

Natural Index 1

Globally compliant (including China)

Vegan

Produced in a circular production process



COSMOS  
APPROVED



Circular



Vegan



Globally compliant

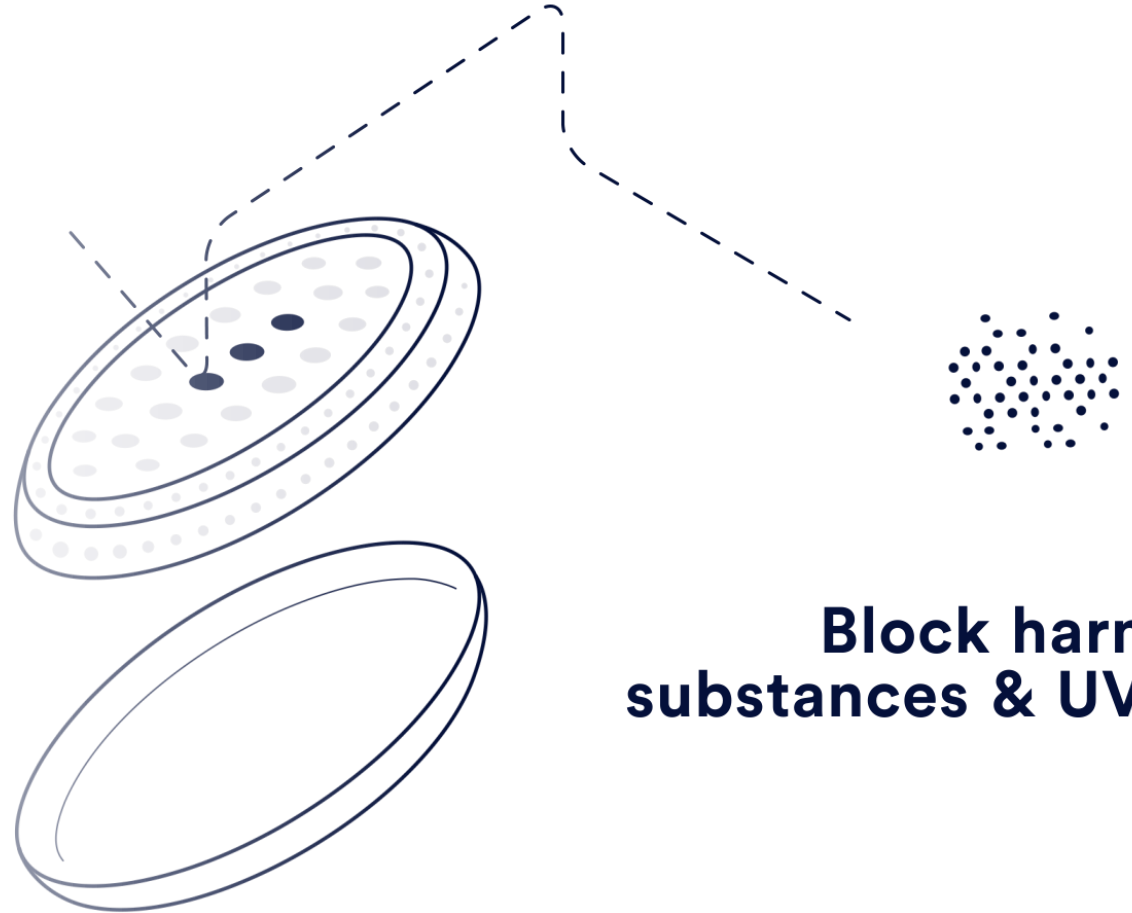


# ALGICA® – A FUTURE UV FILTER?

In 2018 our co-founder Angela Wulff published an article in the reputable science magazine Nature Science Reports<sup>1</sup> together with renowned researchers in optics.

With this article they showed that shells of diatoms protect the DNA of diatoms from ultraviolet light in an efficient way since a polymeric film was not photobleached at all after exposure of UV light when a monolayer of Algica had been added on top of the polymeric film. Algica seems to reflect the UV light, but some absorption is also seen. The absorption seems to be linked to manipulation of visible light to UV light as well as scattering through the pores of the material.

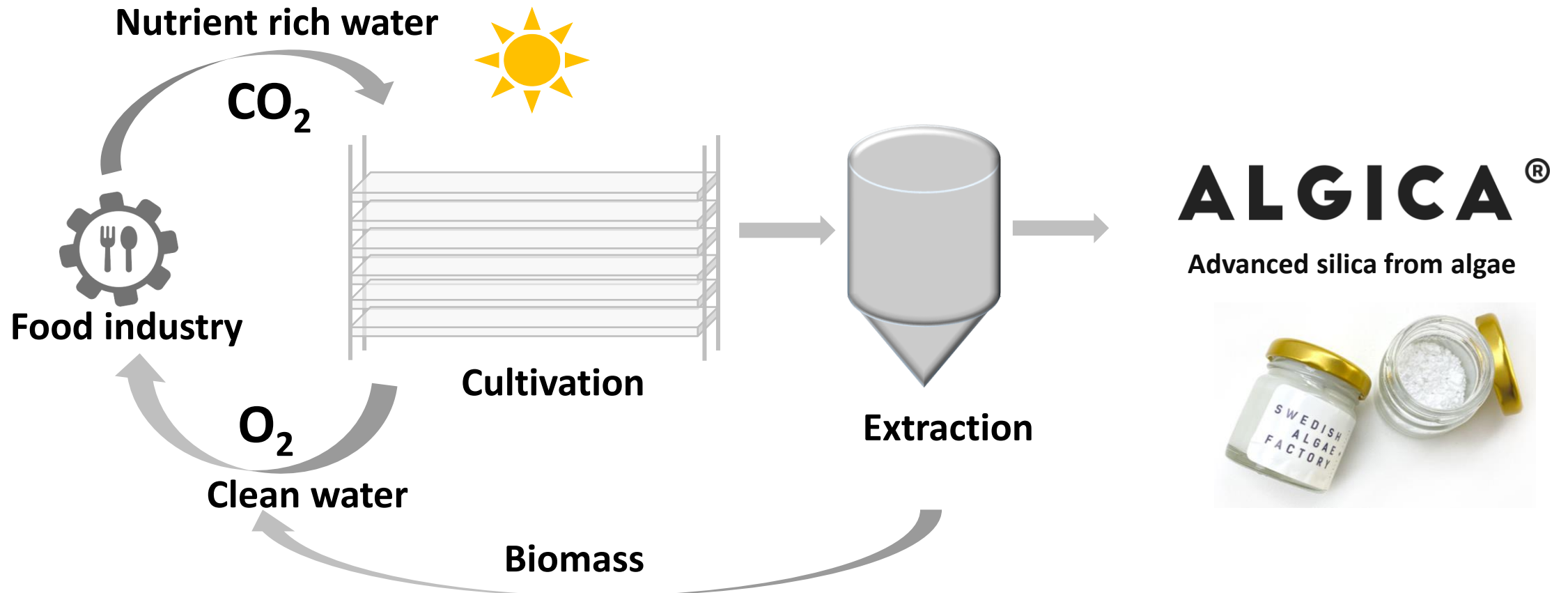
(1) Aguirre LE, Ouyang L, Elfving A, Hedblom M, Wulff A, Inganäs O. (2018) Diatom frustules protect DNA from ultraviolet light. Nature Scientific Reports 8:5138



**Block harmful substances & UV radiation**

# CIRCULAR PRODUCTION

Our algal cultures serve as a natural greenhouse gas trap and wastewater treatment solution. We obtain nitrogen and phosphorous from water from a nearby food industry, preventing it from being wasted. Each ton of Algica traps at least 8 tons of carbon dioxide and returns at least 1 ton of nitrogen and 100 kg of phosphorus from wastewater into the food value chain annually during the algae growth stage of the production. By using the organic by-product after extraction of Algica for feed, energy and fertilizer production, we ensure a circular production process. This creates an extra value in relation to the sustainability of Algica and can help push the industry towards becoming even more sustainable.



## Expected challenges

- We are a new small actor that is aiming to create global awareness with our product Algica
- Recently started production in a large scale, are on the verge to start producing large volumes of Algica
- We need to maintain a high stable production of Algica, to be able to distribute the large amounts of Algica that the market requests.

## The next step planned

- Ongoing research about the encapsulation and release of vitamins and peptides
- Improve and identify new claims through research on more diatom species and their shells.
- With the increased demand of Algica, the plan is to build a second greenhouse in the coming years.

From our first pilot plant, we have distributed small amounts of Algica. Today there are over 30 launched products on the market. The actors are small to midsize brands that are placed in the Nordics, USA, Australia and Europe.



*With this brief presentation, we hope to give you a broad picture of our new and innovative ingredient Algica. An ingredient that we believe can change the industry to become even more sustainable. Thank you!*

*Algica produced by Swedish Algae Factory AB :: [www.algica.com](http://www.algica.com) :: [www.swedishalgaeafactory.com](http://www.swedishalgaeafactory.com)*

SWEDISH  
ALGAE  
FACTORY

