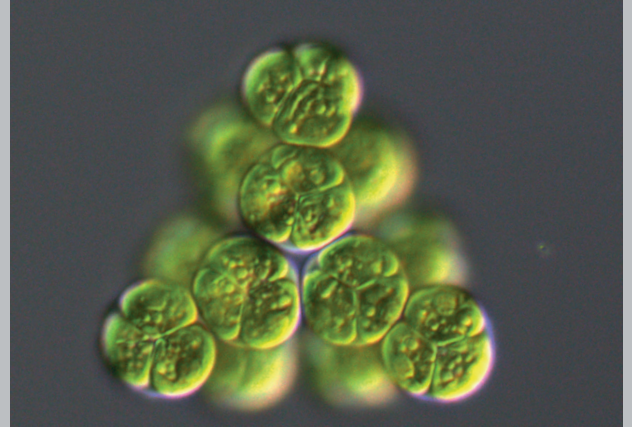

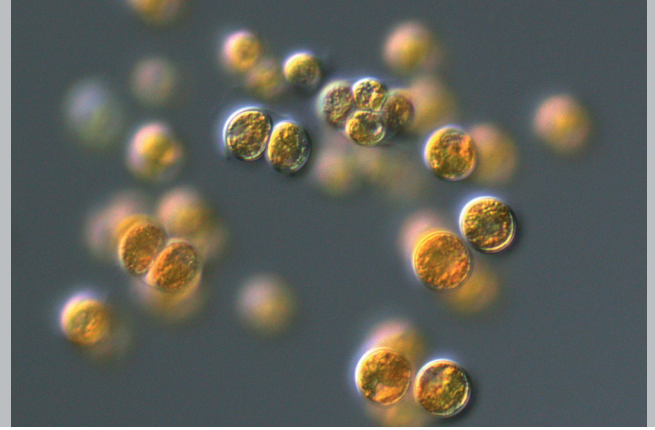

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Permafrost Algae

One quarter of our Earth's ice-free land area is permafrost, ground with soil temperatures in the deep below the freezing point throughout the whole year. Microalgae growing on this habitat not only have to survive freezing temperatures just like Snow Algae, they also have to adapt to temperatures above 15 °C on the soil surface during summer. These algae with such an adapted metabolism usually grow best at temperatures around 10 °C, but at the same time they are extremely robust against many kinds of environmental influences.

These so-called **Permafrost Algae** have evolved adaptations against **dehydration** by means of **extracellular polysaccharides** (EPS, gels) and many of them produce **highly active antioxidants**, such as astaxanthin and vitamin E. Due to their robustness regarding nutrients, light and temperature demands, they are **especially suitable for a mass cultivation.**

Services

The CCCryo culture collection is offering more than 450 strains of algae, mosses and cyanobacteria as a new bioresource for your exclusive use in e.g.:

- Molecular biology – **cold-active enzymes** like polymerases, helicases and other essential ingredients for your research
- Biotechnology – **enzymatic catalysts** for your chemical productions under cold conditions
- Supply of pure microalgal biomass cultivated under GMP conditions including microbiological quality control for the use in cosmetics and food
- Pigment and fatty acid analyses by HPLC (DAD) and gas chromatography (GC-FID)
- Cryopreservation and backup of your valuable production strains at the Fraunhofer IZI-BB cryobank CCCryo at Potsdam (near Berlin)

Contact

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THE CCCRYO COLLECTION – MICROFLORA FROM EXTREME HABITATS FOR COSMETIC PRODUCTS




Snow Algae

Since Aristotle explorers were mystified by red and green coloured snow fields on glaciers in the high alpine mountains and polar regions. Today we know that this phenomenon called Red Snow is caused by microalgae that are perfectly adapted to these cold and freezing environment, some of the most challenging habitats on earth.

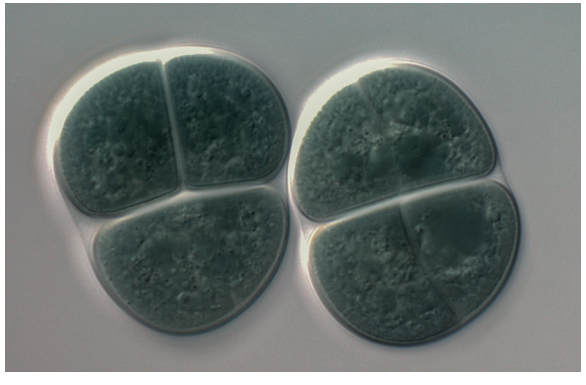
These so-called Snow Algae, like other microalgae, are the ancestors of higher plants and likewise gain their energy from sunlight. At freezing temperatures, the algae are exposed to **dehydration, osmotic stress and UV light**, but they have developed strategies to contend with these different stresses by unique adaptations of their cell morphology and metabolism. The strategies include **ice-binding/ice-structuring proteins** (IBP, ISP) with **antifreeze properties** (AFP), different **antioxidants**, mechanisms for scavenging reactive oxygen species (ROS) and a range of inducible **UV-blocking compounds**, which can reduce UV-A and UV-B irradiation and minimize cell damage (mycosporine like-amino acids, MAAs).

Snow Algae and their metabolites already caught the attention of the cosmetics industry and their components are promising, novel ingredients for different cosmetics products. **Some of our snow algal metabolites can be found in cosmetics on the market already.**

Desert Algae

Algae and cyanobacteria have evolved mechanisms to cope with high levels of sunlight and UV radiation. This is especially true for organisms from desert regions, with little natural irradiation protection from clouds, shrubs or trees.

Our research only just has begun to unveil their exceptional capabilities to cope with such stresses. Not only are Desert Algae able to grow well under extreme sunlight and UV-B, they are also designated **excellent sources for antioxidants and protective compounds** for the cosmetics industry. Furthermore, an additional range of **exciting pigments** in different shades of **blue, violet, and pink** complete the colour palette of **orange and red** shades from Snow and Permafrost Algae.



Permafrost Mosses

Next to Snow, Permafrost and Desert Algae, our strain collection CCCryo also comprises Polar Mosses.

Approximately 450 million year ago mosses evolved from green algae to cover rocks, trees and soils from alpine to desert regions. Mosses are water organisms, evolutionarily just being on the verge to climb on land. Thus, they have the ability to **store and retain water to fight dehydration**. Additionally they produce **yellow-coloured flavonoids** with **antioxidant activity**. **Flavours** such as limonene or pinene are also described.