Process to produce natural astaxanthin without cell harvesting

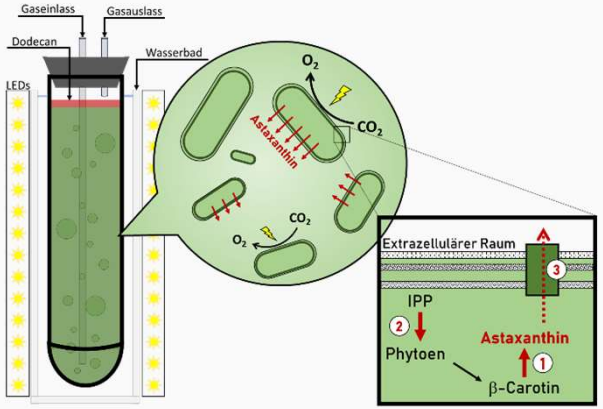
Microalgae-based production and secretion of astaxanthin

STATUS QUO

Astaxanthin is a natural red coloring agent and powerful antioxidant that can be used in a wide range of products. It also has health benefits. The natural form of astaxanthin is more active due to the esterified hydroxyl groups and has a higher bioavailability than synthetic astaxanthin. The natural form is usually produced by microalgae. These use sunlight and CO_2.

OUR TECHNOLOGY

We have modified a microalgae to produce astaxanthin. Although such strains already exist, their use is very laborious. It requires harvesting the cells and then extracting the astaxanthin from the biomass. Our development largely eliminates these steps. Using a membrane transporter, the microalgae release the produced astaxanthin directly into the culture medium. The cultures are then coated with an organic solvent for extraction. The organic solvent can then simply be evaporated, which then leaves astaxanthin as a powder.



BENEFITS

- ► 1. Optimized astaxanthin synthesis
- ► 2. increase in yield
- ► 3. astaxanthin secretion

APPLICATION POSSIBILITIES

The developed microalgae strain can be used for the production of natural astaxanthin; in combination with our production process, no harvesting and extraction step is then required.

COMMERCIALIZATION OPPORTUNITIES

There are various possibilities for cooperation between the industrial partner and TU Darmstadt: from an exchange with the know-how carriers of the technology up to a close cooperation in case of further development needs. The technology is protected by intellectual property rights and can be used by the industry partner after a sale or licensing agreement.

CURRENT STAGE OF DEVELOPMENT TECHNOLOGY READINESS LEVEL (TRL)

9	Product ready to launch
8	
7	
6	Prototype
5	
4	
3	Proof of Concept
2	
1	Idea

The technology development is at Level 6: We obtained a strain that produces astaxanthin and also releases it into the culture medium. We are currently working on increasing the yield and upscaling.

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