

# $\gamma$ -aminobutyric acid boosts astaxanthin production

October 23 2020, by Zhang Nannan

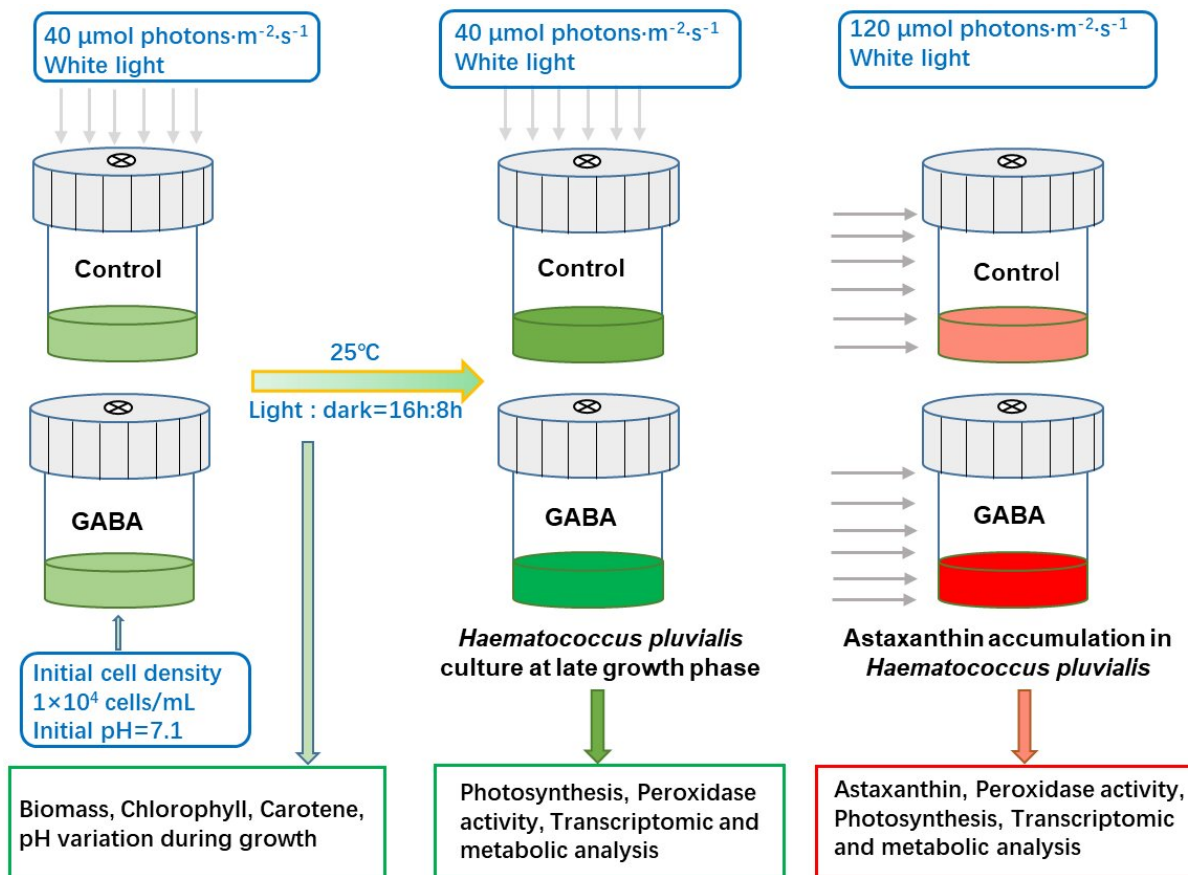


Fig. 1. The growth reactor and experimental process. Credit: HUANG Qing

Recently, the research group of Prof. Huang Qing from the Institute of Intelligent Machines (IIM), Hefei Institutes of Physical Science (HFIPS)

found that the  $\gamma$ -aminobutyric acid (GABA) can promote the growth of *Haematococcus pluvialis* and increase the astaxanthin accumulation.

Published in the journal *Algae Research*, the team reported how they tried different ways to promote the growth of *Haematococcus pluvialis* till they found that GABA can effectively increase the biomass of it, leading to promotion of [astaxanthin](#) yield.

*Haematococcus pluvialis* is one of the best sources for obtaining nature astaxanthin, which has medicinal and nutritional functions in health due to its strong antioxidant capacity. To complete the accumulation of astaxanthin in *Haematococcus pluvialis*, strong [light](#) irradiation is required. But strong light will cause irreversible photo-oxidative damage to the [algae cells](#), resulting in the reduction of astaxanthin production. So improving astaxanthin production from *Haematococcus pluvialis* remains a challenge for researchers.

This study also sheds light on the mechanism of GABA working on *Haematococcus pluvialis*. The researchers found that at the late green growth stage, GABA can enhance the ability of algae cells to resist stress with the increased expression of PP2C, SnRK2, CPK, HASP90, PTOX genes related to stress resistance, while in the early red cyst stage, GABA had a photoprotective effect on algae cells exposed to strong light as the expression of light harvesting protein Lhca2 was up-regulated.

The addition of GABA not only increases the biomass, it also reduces the photo-oxidation damage and cell death in the process of strong light conversion. As such, GABA improves the photosynthetic performance of algal cells, giving rise to better light adaptability and stronger heat dissipation capacity.

**More information:** Lamei Li et al. Exogenous  $\gamma$ -aminobutyric acid promotes biomass and astaxanthin production in *Haematococcus*

pluvialis, *Algal Research* (2020). DOI: [10.1016/j.algal.2020.102089](https://doi.org/10.1016/j.algal.2020.102089)

Provided by Chinese Academy of Sciences

Citation:  $\gamma$ -aminobutyric acid boosts astaxanthin production (2020, October 23) retrieved 25 April 2024 from

<https://phys.org/news/2020-10-aminobutyric-acid-boosts-astaxanthin-production.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.