



## Inventors

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## Intellectual Property Status:

Patent pending

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## Improving the Extractability and Bioavailability of the Natural Antioxidant Astaxanthin from a Green Alga

AzTE Case # M06-046

## Invention Description

The natural red pigment asataxanthin is a potent bioactive antioxidant that can lend to several applications in nutraceutical and pharmaceutical industries. It is also being widely used in aquaculture and poultry industries as a feed additive to improve the coloration of cultured salmons, crustaceans and egg yolks. The unicellular green alga, *Haematococcus pluvialis*, is the richest known natural source of astaxanthin. In recent years, mass production of *H. pluvialis* has enabled the commercial availability of the pigment. Natural astaxanthin production and commercialization is estimated to be a 1.2 billion dollar annual market. One of the major limitations with the *H. pluvialis* production system is that the astaxanthin is trapped behind thick cells walls, thus complicating the extraction process and the production yields.

Researchers at Arizona State University have developed a novel approach to improve the extractability process and bioavailability of asataxanthin *by* generating cell wall deficient strains of *H. pluvialis*. The reduction in cell wall material significantly decreases the complexity of the extraction process without altering the molecule's activity. Additionally, the *H. pluvialis* mutants produce astaxanthin at concentrations superior to the wild type.

## Potential Applications

- **Nutraceutical Industry**
- **Pharmaceutical Industry**
- **Food Coloration Application**

## Benefits and Advantages

- **Simplistic astaxanthin extraction-** decreased production cost while maintaining yield
- **Increased Bioavailability** – Less rigorous extraction translates to more astaxanthin retaining antioxidant and pigment properties